THE MELIOLINEAE - A SUPPLEMENT

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ACKNOWLEDGEMENTS

I am grateful to Dr. N.C. Nair, Dr. N.P. Balakrishnan, Dr. A.N. Henry, Messrs. B.V. Shetty, K. Vivekananthan, A.K. Pathak, and Dr. P. Daniel, Botanical Survey of India, Southern Circle, Coimbatore for their help in various ways; Mr. R. Ganesan & colleagues and Mr. K. Chidambaram, Wildlife Warden for facilities during field trips. I gratefully acknowledge the help of Prof. R.D. Goos (USA), Drs. U. Braun (Germany), Katia C. Porto (Paris), K. Katumoto (Japan), H.Y. Hu (China), L. Alessandrini (USA) and A. Sivanesan (UK) for their help in providing needful literature.

I am grateful to the Scientists' Pool Scheme of CSIR for financial support.
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INTRODUCTION

The genus *Meliola*, the first named genus of the family Meliolaceae, was proposed by Fried in 1825. Beeli (1920) gave an account of the species known to him and proposed a formula for identification, now known as the "Beeli formula". Stevens (1927, 1928) used this formula extensively and extended the concept to include several other genera.

The most recent monograph of this group is that of Hansford (1961). Hansford (1963) and Deighton (1968) supplemented the monograph with *icones* and also validated and corrected several of the taxa. Hansford (1961) failed to include in his monograph some fungi earlier reported. To fill this lacuna, Katumoto and Hosagoudar (1989) compiled a checklist of these fungi as a supplement.

The Meliolaceae have attracted the attention of many researchers and more than 300 additional taxa have been added to the group. This paper is an attempt to compile all of the works published since Hansford's monograph to facilitate easy reference. The authenticity of individual taxa must be confirmed by regional researchers. Utmost care has been taken to examine the figures and to correlate them with the descriptions wherever it was possible. Descriptions of each taxon have been rewritten to bring it into conformity with the style used by Hansford in his monograph. Current nomenclature of the taxa treated by Hansford is summarized at the end of this paper. A key to species has been provided under each host family, which are alphabetically arranged. The fungal taxa (both genus and species) have been arranged alphabetically. A key to the genera is also provided.
TAXONOMY

KEY TO THE GENERA

1. Mycelium endophytic ... IV. Endomeliola
1. Mycelium ectophytic ... 2
2. Perithecia flattened-globose, hidden in the mycelial mat ... I. Amazonia
2. Perithecia globose, not hidden in the mycelial mat ... 3
3. Perithecia with larviform appendages ... 4
3. Perithecia without larviform appendages ... 5
4. Mycelial setae repent and prostrate ... VII. Prataprajella
4. Mycelial setae not repent ... II. Appendiculella
5. Perithecial setae present ... V. Irenopsis
5. Perithecial setae absent ... 6
6. Mycelium, subiculum of perithecia and perithecia setose ... VI. Meliiola
6. Mycelium, subiculum of perithecia and perithecia devoid of setae ... III. Asteridiella

KEY TO THE SPECIES

ACANTHACEAE

Asteridiella
3103. 3220 ... 60. A. poracensis

Meliola
3111. 3221 Col. subdense, crustose; phialides with hy.; ms. flexuous ... 131. M. blepharidis
3111. 3222 Col. subdense, crustose; phialides separate; ms. straight ... 125. M. barleriae
3111. 3221 Col. dense; phialides with hy.; ms. straight to curved ... 281. M. nilgirianthi

ACERACEAE

Asteridiella
2101. 5240 ... 57. A. negundinis

AGAVACEAE

Meliola
3131. 5321 Ms. dentate, bifurcate to dichotomously branched at the tip.
... 322. M. sansevieriicola
3111. 6343 Hy. up to 32 µm long; ms. scattered; sp. 52-62 µm long ... 95. M. agavicola
3111. 4232 Hy. less than 20 µm long; ms. grouped around perithecia; sp. 31-41 µm long.
... 185. M. dracenea-terniflorae

ANACARDIACEAE

Meliola
3133. 4332 Col. hypophyllous; hy. alternate & opposite; hc. entire to sublobate; ms. dentate to furcate ... 89. M. abraensis
3111. 5332 Hc. entire to angular; sp. 49-56 x 21-25 µm ... 327. M. semecarpi-anacardii
3111. 4322 Hc. entire to angular; sp. 43-46.5 x 18-22 µm ... 358. M. travancoricae
3111. 4233 Col. hypophyllous; hc. sublobate; ms. up to 954 µm long ... 135. M. buchananiicola

ANCISTROCLADACEAE

Meliola
3113. 3221 ... 106. M. ancistrocladi

ANGIOPTERIDACEAE

Meliola
3111. 3222 ... 107. M. angiopteridis var. indica
ANNONACEAE

Meliola
3111. 5322  2  273. M. mitrephorae

APOCYNACEAE

Meliola
3111. 5242  Col. hypophyllous; hc. entire to angular; ms. broadly hamate
3111. 4232  Col. hypophyllous; hc. entire to sublobate; ms. subflexuous
3111. 4222  Col. amphigenous; ms. straight to curved
3111. 4213  Col. hypophyllous; cause leaf spot & shot holes; hc. sublobate
3111. 3223  Col. subdense; hyphae undulate; ms. straight; phialides separate
3111. 3222  Col. subdense, crustose; hyphae straight; ms. straight
3111. 3211  Col. thin; hc. sublobate; sp. up to 31 µm long
3111. 3231  Col. amphigenous; phialides separate; ms. acute to variously dentate

AQUIFOLIACEAE

Meliola
3113. 5332  229. M. ilicis-malabaricae

ARALIACEAE

Amazonia
3101. 5240  18. A. novae-caledoniae

Meliola
3141. 6332  Col. hypophyllous; hy. alternate; ms. furcate
3123. 4222  Col. epiphyllous; hy. 15% opposite; ms. simple and branched
3113. 5332  Col. amphigenous; hy. opposite & alternatae; ms. simple, straight

Meliola
3111. 5242  Col. hypophyllous; hc. entire to angular; ms. broadly hamate
3111. 4232  Col. hypophyllous; hc. entire to sublobate; ms. subflexuous
3111. 4222  Col. amphigenous; ms. straight to curved
3111. 4213  Col. hypophyllous; cause leaf spot & shot holes; hc. sublobate
3111. 3223  Col. subdense; hyphae undulate; ms. straight; phialides separate
3111. 3222  Col. subdense, crustose; hyphae straight; ms. straight
3111. 3211  Col. thin; hc. sublobate; sp. up to 31 µm long
3111. 3231  Col. amphigenous; phialides separate; ms. acute to variously dentate

AQUIFOLIACEAE

Meliola
3113. 5332  229. M. ilicis-malabaricae

ARALIACEAE

Amazonia
3101. 5240  18. A. novae-caledoniae

Meliola
3141. 6332  Col. hypophyllous; hy. alternate; ms. furcate
3123. 4222  Col. epiphyllous; hy. 15% opposite; ms. simple and branched
3113. 5332  Col. amphigenous; hy. opposite & alternatae; ms. simple, straight
3113. 42X2  Col. epiphyllous; hy. mostly opposite;  
ms. simple, straight  ... 300. M. payakii

3111. 5331  Col. hypophyllous; hy. alternate;  
ms. flexuous  ... 353. M. tieghemopanacis

**ARAUCARIACEAE**

*Appendiculella*

2203. 6340  ... 24. A. araucariae

*Meliola*

2111. 6342  Col. amphigenous; hc. entire; ms.  
500 μm long; sp. 72-90 x 34-30 μm.  ... 111. M. araucariae

2111. 6342  Col. epiphyllous; hc. entire to lobed;  
sp. 56-61 x 20-24 μm  ... 94. M. agathidis

**ARECACEAE**

*Meliola*

3111. 5333  Col. epiphyllous; hc. entire; ms. acute  
to dentate at the tip  ... 151. M. caryotae

3111. 5433  Col. hypophyllous; hc. entire to  
lobate; ms. acute at the apex.  ... 256. M. livistonaev var.  
boninensis

3111. 5333  Col. amphigenous; hc. angular to  
lobate; ms. subarcuate, acute at  
tip  ... 332. M. sparsipoda var.  
longiseta

**ARISTOLOCHIACEAE**

*Meliola*

3111. 4223  ... 114. M. aristolochiae var.  
major

**ASCLEPIADACEAE**

*Asteridiella*

2101. 5330  ... 52. A. lyoniae

*Meliola*

3113. 4232  Col. mostly hypophyllous; hy. alternate  
& 60% opposite, hc. entire ... 361. M. tylophorae

3113. 4223  Col. mostly epiphyllous; hy. alternate,  
hc. angular to lobate  ... 357. M. toxocarpi

3111. 3223  Hc. alternate at apex; ms. acute;  
sp. cylindrical  ... 346. M. telosmae var.  
radhanagariensis
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<td>3111. 3223</td>
<td>Hc. rounded; ms. obtuse; sp. subellipsoidal ... 345. <em>M. telosmae</em> var. <em>indica</em></td>
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<td>3111. 3222</td>
<td>Col. amphigenous; hy. about 1% opposite, hc. angular to slightly lobate. 157. <em>M. ceropegiae</em></td>
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**ASTERACEAE**

*Meliola*

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<tr>
<td>3111. 4232</td>
<td>Hc. lobate; phialides separate; ms. obtuse to dentate at the tip ... 201. <em>M. eupatorii</em></td>
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<tr>
<td>3111. 3221</td>
<td>Hc. entire; phialides with hy.; ms. acute at the tip ... 171. <em>M. coreopsidis</em></td>
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**BIGNONIACEAE**

*Asteridiella*

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<tr>
<td>3101. 4220</td>
<td>... 65. <em>A. schlegelii</em> var. <em>stereospermi</em></td>
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*Meliola*

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<td>3113. 5222</td>
<td>Col. hypophyllous; hy. alternate &amp; opposite; ms. dentate ... 113. <em>M. ariquemensis</em></td>
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<td>3111. 5222</td>
<td>Ste. 9-13 µm long; sp. 50-57 x 15-20 µm ... 129. <em>M. bidentata</em> var. <em>major</em></td>
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<tr>
<td>3111. 3221</td>
<td>Col. epiphyllous; hy. alternate; ms. acute; sp. 37-40 x 12-15 µm ... 173. <em>M. crescentiae</em> var. <em>major</em></td>
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**BIXACEAE**

*Meliola*

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<td>3111. 3222</td>
<td>... 366. <em>M. wenshanensis</em></td>
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**BORAGINACEAE**

*Asteridiella*

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<td>3101. 4220</td>
<td>... 43. <em>A. ehretiae</em></td>
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*Meliola*

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<td>3113. 3222</td>
<td>... 192. <em>M. ehretiicola</em></td>
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**BURSERACEAE**

*Meliola*

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<td>Hy. alternate; ms. straight to curved, dentate at the tip; sp. up to 54-56 µm long, middle cell largest ... 356. <em>M. torulosispora</em></td>
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BUXACEAE

Appendiculella
2201. 5330
... 26. A. buxi

CAESALPINIACEAE

Meliola
3113. 5243 Col. amphigenous; ms. straight to recurved; sp. 4-6 septate ... 224. M. hexaseptata
3113. 4222 Col. epiphyllous; ms. torulose at base ... 91. M. aethiops var. cassiae
3113. 4222 Col. amphigenous; ms. straight ... 152. M. cassiifoli
3113. 3221 Col. epiphyllous; ms. straight; sp. 4-septate ... 92. M. aethiops var. moullavae
3113. 4222 Col. amphigenous; ms. straight, acute to dentate at the tip ... 228. M. hylodendri
3112. 3333 Col. hypophyllous; ms. acute to dentate at the tip ... 242. M. kingiodendri
3111. 3222 Col. amphigenous; phialides 20-24 μm long, neck 5-10 μm long, 2.5-3.5 μm thick ... 138. M. caesalpiniae var. bauhiniae

CAMPANULACEAE

Meliola
3111. 4323 Col. dense; hc. lobate; phialides separate ... 141. M. campanulacearum
3111. 4322 Col. very thin; hc. entire; phialides with hy. ... 257. M. lobeliicola
CAPPARACEAE

Meliola
3112. 4222 Hy. opposite, hc. globose, entire to angular; phialides with hyphopodia; ms. acute
... 121. M. balakrishnanii
3111. 4222 Hy. alternate, hc. ovate, oblong, entire;
phialides separate; ms. obtuse
... 146. M. capparidicola

CAPRIFOLIACEAE

Meliola
3111. 4222 Hc. stellately lobate; phialides separate; ms. 450 μm long
... 214. M. goosii
3111. 3223 Hc. entire; phialides with hy.; ms.
'4:7 μm long
... 249. M. leycesteriae

CARICACEAE

Meliola
3111. 4232
... 233. M. jacarantiae

CASSYTHACEAE

Meliola
2111. 5232
... 153. M. cassythae

CELASTRACEAE

Amazonia
3101. 4320 Col. epiphyllous; hyphae straight; hc.
entire
... 17. A. mayteni
3103. 4320 Col. hypophyllous; hyphae crooked; hc.
sublobate
... 20. A. patilii

Asteridiella
3101. 3220
... 51. A. lophopetalii

Meliola
3113. 4223 Hyphae crooked; hy. variously curved,
spreading; numerous.
... 128. M. bhesae
3113. 4223 Hyphae flexuous; hy. antrorse;
ms. few
... 156. M. celastracearum
3113. 4221 Hyphae straight; hy. 5% opposite;
ms. dentate
... 200. M. euonymicola
CHRYSOBALANACEAE

Meliola
3113. 4232 ... 162. *M. chrysobalanacearum*

CLUSIACEAE

Appendiculella
3201. 4220 ... 27. *A. calophylli* var. apetali

Meliola
3111. 4233 Col. hypophyllous; hy. 18-22 μm long; ms. obtuse at the tip ... 341. *M. symphoniae*

3111. 4223 Col. amphigenous; hy. 20-30 μm long; ms. acute at the tip ... 285. *M. ochrocarpi*

3111. 3221 Col. epiphyllous; hy. 16-18 μm long; ms. obtuse at the tip ... 134. *M. brevispora*

2111. 5221 Col. epiphyllous; hy. 20-27.5 μm long; ms. acute at the tip... 208. *M. garciniicola*

COCHLOSPERMACEAE

Meliola
3113. 3222 ... 166. *M. cochlospermifolii*

COMBRETACEAE

Amazonia
3101. 4220 ... 12. *A. henryi*

Meliola
3111. 4331 ... 136. *M. buchenaviae* var. terminaliae

CONNARACEAE

Meliola
3111. 4323 Col. epiphyllous; hc. slightly lobate; sp. 45-50 x 21-25 μm. ... 170. *M. connari* var. indica

3111. 4222 Col. hypophyllous; hc. entire to angular; sp. 40-46.5 x 12-15.5 μm. ... 96. *M. agumbensis*

CONVOLVULACEAE

Meliola
3143. 4221 Hy. alternate & opposite; ms. furcate to dichotomously branched ... 112. *M. argyreia*
3123. 5232  Hy. alternate & opposite; ms. arcuate ... 195. *M. erycibis-paniculatae*

3111. 5333  Hy. alternate; ms. straight ...196. *M. erycibecola*

**CORNACEAE**

*Asteridiella*

3101. 4230  ... 54. *A. mastixiae*

**CUNONIACEAE**

*Amazonia*

3101. 4330  ... 19. *A. pancheriae*

*Meliola*

2411. 5222  ... 167. *M. codiae*

**CUPRESSACEAE**

*Appendiculella*

2203. 6340  Hy. alternate & opposite, stc. cylin­
drical to conical; pa. 80 μm long; sp. 64-72 μm long ... 31. *A. pilgerodendri*

2203. 6340  Hy. alternate & opposite, stc. cylidi­
cal to conical; pa. 15 μm long; sp. 55-65 μm long ... 25. *A. austrocedri*

2201. 6340  Hy. alternate, stc. sinuous; pa. 35 μm long; sp. 77-85 μm long ... 29. *A. fitzroyae*

**CYCLANTHACEAE**

*Meliola*

3113. 4234  ... 150. *M. carludovicae var. setosa*

**CYPERACEAE**

*Meliola*

3112. 3222  Col. epiphyllous; ms. dentate; sp. 35-40 x 11-14 μm. ... 317. *M. remireae*

3111. 4233  Col. epiphyllous; ms. dentate; sp. 42-48 x 16-19 μm ... 161. *M. choryzandrae*

3111. 3222  Col. amphigenous; ms. obtuse; sp. 30-37 x 9-13.5 μm. ... 148. *M. carecis var. microspora*

**CYRILLACEAE**

*Meliola*

3111. 5222  ... 178. *M. cyrillacearum*
DAPHNIPHYLLACEAE

Amazonia
3101. 3240 ... 7. A. daphniphylli

DICHAPETALACEAE

Asteridiella
3101. 6330 ... 69. A. tapurae

DILLENIACEAE

Meliola
3111. 4232 ... 282. M. notabilis

DIOSCOREACEAE

Meliola
3111. 5222 ... 369. M. zambalesica

EBENACEAE

Asteridiella
3103. 4320 Col. amphigenous; hyphae straight; hc. conoid ... 49. A. kapoorii
3103. 4220 Col. mostly hypophyllous; hyphae flexuous; hc. cylindrical, rounded to truncate at the apex ... 45. A. euclea var. microspora

Meliola
3111. 5221 ... 266. M. megalocarpa var. microspora

ELAEOCARPACEAE

Asteridiella
3101. 4220 ... 44. A. elaeocarpi-tuberculati

ERICACEAE

Amazonia
3101. 4230 ... 14. A. karii

Asteridiella
3101. 4220 ... 59. A. pentapterygii

ERYTHROPALACEAE

Meliola
3111. 4222 ... 197. M. erythropali
EUPHORBIACEAE

Asteridiella
3101. 4220 Col. hypophyllous, dense; hyphae undulate; hc. sublobate; sp. 44-48 µm long ... 41. A. crotonis

3101. 3230 Col. amphigenous; hyphae flexuous; hc. angular to sublobate; sp. 32-34 µm long ... 46. A. euphorbiacearum

3101. 3220 Col. epiphyllous, thin; hyphae tortuous; hc. entire; sp. 38-40 µm long ... 53. A. macarangicola

3113. 5230 Col. hypophyllous, crustose; hyphae crooked; hc. irregularly lobed; sp. 52-59 x 12-15 µm ... 62. A. resinosi

Meliola
3141. 4221 Hc. sublobate; phialides separate; sp. 40-47 x 15-27 µm ... 158. A. chandleri var. excoecariae

3141. 3212 Hc. entire; sp. 34-40 x 12-15 µm ... 225. M. himalayensis

3113. 4222 Col. amphigenous; ms. dentate; phialides with hy. ... 352. M. thiteana

3111. 5323 Col. epiphyllous; ms. straight to arcuate; phialides separate ... 90. M. acunae

3113. 4223 Col. amphigenous; hy. 30% alternate; ms. 630 µm long ... 211. M. glochidii var. velutini

3113. 3223 Col. dense, velvety; hyphae very crooked; sp. straight ... 240. M. karnatakensis

3113. 3223 Col. thin, spreading; hyphae slightly crooked; sp. slightly curved ... 312. M. radhanagariensis

3113. 3222 Col. hypophyllous; hy. 10% opposite; ms. 315 µm long ... 188. M. drypeticola

3112. 4332 Col. epiphyllous; hy. opposite; phialides with hy. ... 289. M. ostodis

3111. 4231 Col. amphigenous; hc. entire; phialides separate ... 262. M. malloticola

3111. 4221 Col. hypophyllous; hc. lobate... 295. M. papillosa
3111. 3221 Col. epiphyllous, very thin; hc.
entire; phialides with hy. ... 359. M. trewiae

FABACEAE

Amazonia
3101. 5220 ... 16. A. leguminosarum

Meliola
3131. 4222 Col. epiphyllous; ms. all dentate
at the tip; sp. 33-43.5 μm long
... 182. M. desmodii-laxiflorii var.
dentata

3113. 4222 Col. epiphyllous, thin to subdense;
hyphae straight; sp. 31-43.5 μm
long ... 271. M. millettiae-chrysophyllae var.
indica

3113. 3223 Col. amphigenous, dense; hyphae sub-
straight to crooked; sp. 37-40.5 μm
long ... 348. M. teramni var.
millettiae

3113. 3221 Col. epiphyllous, thin; hyphae crooked;
sp. 30-34 μm long.
... 276. M. mucunae-acuminatae var.
indica

3113. 3221 Col. epiphyllous, dense; hyphae
undulate; sp. 34-40 μm long ... 118. M. atylosiae

3113. 3221 Col. epiphyllous, dense; hyphae
flexuous; sp. 25-30 μm long
... 338. M. stizolobii var.
microspora

3113. 4221 Hy. antrorse to retrorse; phialides
separate; sp. 36-42 μm long ... 165. M. clitoriae

3113. 4220 Hy. spreading to antrorse; phialides
with hy.; sp. 34-50 μm long.
... 124. M. bantamensis var.
keralensis

3113. 3223 Hyphae flexuous to crooked; hc.
curved; sp. 34-37.5 μm long ... 172. M. millettiae-
racemosae

3113. 3222 Hyphae undulate; hc. globose,
entire; sp. 30-36 μm long ... 277. M. mucunae var.
hirsutae

3113. 3221 Col. amphigenous; hy. antrorse to
subantrorse; ms. scattered, obtuse
... 184. M. dipterericicola

3113. 3221 Col. epiphyllous; hy. antrorse to
spreading; ms. grouped around
perithecia, acute ... 301. M. phaseoli
3113. 3212 Hy. antrorse to subantrorse; phialides with hy.; sp. 34-37 µm long ... 123. M. banosensis var. puerariicola

3111. 4222 Col. dense; hc. 4-9 x 5-9.5 µm; sp. fusiform ... 287. M. ormosae

3111. 3231 Col. thin; hc. 9-11 x 9-12.5 µm; sp. cylindrical ... 122. M. banosensis var. puerariae

FAGACEAE

Amazonia
3101. 4320 ... 5. A. balakrishnanii

Meliola
2111. 5232 Hy. alternate, hc. entire; sp. 3-septate ... 283. M. nothofagi

3111. 3222 Hy. alternate, hc. entire; ms. dentate ... 132. M. bosei

3111. 4322 Hy. alternate, hc. entire; sp. 4-septate ... 263. M. mannii

3113. 4233 Hy. alternate & opposite, hc. entire; sp. 4-septate ... 227. M. hystericis

FLACOURTIACEAE

Amazonia
3101. 4220 ... 8. A. flacourtiae

Asteridiella
2101. 5230 ... 37. A. caseariicola

3103. 4220 Hy. 5% opposite, hc. rarely angular; sp. 4-septate, straight, obovoidal ... 66. A. scolopiae

Meliola
2111. 5332 ... 326. M. scolopiae var. indica

GENTIANACEAE

Meliola
3111. 3222 ... 202. M. exaci

GESNERIACEAE

Asteridiella
3101. 3220 ... 42. A. cyrtandrae var. didymocarpi
GNETACEAE

Meliola
3111. 32x3

HAMMAMELIDACEAE

3111. 4222
2 Col. hypophyllous; hc. entire; ms. straight, tortuous, uncinate; sp. 4-septate

2111. 5231 Col. epiphyllous; hc. lobate; ms. straight; sp. 3-septate

HOUMIRIACEAE

3113. 5333

HYPERICACEAE

Asteridiella
3101. 4220

ICACINACEAE

Amazonia
3101. 5320

Meliola
3113. 4222

LAMIACEAE

Meliola
3111. 3222

LAURACEAE

Amazonia
3102. 4220

Hy. opposite, crowded; hc. entire
Meliola

311. 5333
3

Col. mostly hypophyllous; hc. sub-
globose, entire; sp. 16-23 μm wide.

... 236. M. kagonoki

311. 5333
3

Col. hypophyllous; hc. entire to
angular; sp. 12-20 μm wide.

... 126. M. beilshmediae var.
cinnamomicola

311. 5324
3

Col. hypophyllous; hyphae crooked;
sp. middle cell largest..328. M. sempeiensis var.
icobarica

311. 4323
4

Col. hypophyllous, subdense; hyphae straight
to crooked; ms. furcate ... 237. M. kakachiana

311. 4223
3

Hy. distantly placed, 1% opposite;
ms. 730 μm long ... 329. M. shettyi

311. 4223
3

Hy. 10% opposite; ms. 300 μm
long ... 174. M. cryptocariicola

312. 4322
3

Col. epiphyllous; hyphae straight; ms.
straight to uncinate and dentate ... 298. M. patileana

311. 5244

Col. hypophyllous; hyphae crooked;
Hy. 5% opposite; phialides separate

... 252. M. litseae

var. floribundae

311. 4223

Col. hypophyscult, thin; hyphae
crooked; ms. numerous ... 253. M. litseae var.
insignis

312. 4233

Col. hypophyllous; hyphae crooked;
ms. arcuate to hamate..187. M. drepanocheata var.
insignis

311. 5323

Col. hypophyllous, very thin; hyphae
crooked; hc. slightly lobate; ms.
flexuous ... 241. M. kaveriappai

311. 5323

Col. epiphyllous, subdense; hyphae
crooked; hc. angulose ... 310. M. pudukadensis

311. 53x3

Col. epiphyllous, crustose; hyphae
straight; hc. entire ... 206. M. floridensis var.
pudukadensis

311. 4222

Col. epiphyllous on black spots;
hyphae straight; ms. few ... 313. M. ramacharrii
3111. 4222  Col. amphigenous, dense; hyphae flexuous; ms. few ... 127. *M. beilschmiediicola*

3111. 3233  Col. epiphyllous, subdense; hyphae straight; ms. numerous ... 255. *M. litseae var. microspora*

3111. 3223  Col. epiphyllous, subdense; ms. few; grouped around perithecia; perithecia on exhyphopodiate mycelia ... 254. *M. litseae var. keralensis*

**LEEACEAE**

*Irenopsis*

3401. 3220  ... 82. *I. leeae var. indica*

*Meliola*

3111. 4222  ... 264. *M. maredumilliana*

**LOGANIACEAE**

*Amazonia*

3101. 4240  ... 9. *A. geniostomatis*

*Meliola*

3111. 4221  Col. epiphyllous, subdense; ms. numerous, geniculate, arcuate, obtuse to dentate at the tip. 294. *M. pampangensis*

3111. 4221  Col. amphigenous, thin; ms. straight, clavate at the tip ... 172. *M. couthoviae*

3111. 3221  Col. epiphyllous, dense; ms. straight to curved, acute to obtuse at the tip ... 209. *M. gardneriae var. indica*

**LYTHRACEAE**

*Meliola*

3111. 3221  ... 367. *M. woodfordiae*

**MALPHICIACEAE**

*Meliola*

3111. 4233  ... 179. *M. danertii*

**MALVACEAE**

*Amazonia*

3103. 3220  ... 2. *A. abutili*

*Irenopsis*

3401. 3220  Hy. 11-20 μm long; sp. 34-37 x 12-14 μm ... 85. *I. sawadai*
Meliola
3111. 4222
... 213. M. goianensis

MARANTACEAE

Meliola
3111. 5233
... 140. M. calatheicola var. minor

MELASTOMATACEAE

Meliola
3113. 3213
Col. mostly epiphyllous, dense; hy. 20% opposite ... 270. M. memecylicola var. indica
3111. 3223
Col. hypophyllous, very thin; hy. alternate ... 93. M. affinis var. indica

MELIACEAE

Irenopsis
3401. 4330
Hy. distantly placed, stc. cylindrical, he. entire to angular; phialides with hy. ... 81. I. indica
3401. 4230
Hy. closely to distantly placed, stc. flexuous, he. entire to lobate; ph. separate ... 77. I. chukrasiae

Meliola
3133. 4221
Col. amphigenous; hyphae straight; hy. few opposite in young colonies; ms. straight, dentate to furcate at the tip. ... 339. M. swieteniicola
3123. 5232
Col. epiphyllous; hyphae straight; hy. alternate & opposite; ms. arcuate ... 189. M. dysoxyli-nitidi
3113. 4331
2
Hy. 70% opposite; ms. 250 μm long; sp. 38-41.5 x 11-15.5 μm. ... 190. M. dysoxyli-nitidi var. minor
3112. 5333
Hy. opposite; ms. 572 μm long; sp. 52-56 x 18-22 μm. ... 110. M. aphanamixidis
3112. 4322
2
Hy. opposite; ms. 360 μm long; sp. 42-45 x 18-22 μm ... 316. M. reinwardtiodendri
3111. 3222
Hc. attenuate; ms. few, grouped around perithecia, straight to flexuous ... 279. M. nairii
3111. 3222  Hc. rounded; ms. numerous, straight to curved ... 162. M. chukrasiae

MELIANTHACEAE

Irenopsis
3101. 5330  ... 83. I. masakensis var. major

MENISPERMACEAE

Meliola
3132. 5222  Hy. irregular; ms. straight, dentate; sp. 43-59 x 13-15 μm  ... 297. M. parreirae
3111. 4222  Hc. sublobate; ms. substraight to subarcuate; sp. 39-47 x 13-16 μm.  ... 245. M. kreiseliana
3111. 3222  Hc. entire; ms. straight; sp. 34-40 x 16-20 μm.  ... 176. M. cyclea

MIMOSACEAE

Amazonia
3403. 4220  ... 1. A. abaremae

Irenopsis
3403. 4220  ... 76. I. berggrenii var. quadrisepata

Meliola
3113. 3223  Col. mostly epiphyllous; hy. alternate & opposite; ms. obtuse to dentate at tip ... 267. M. melanoxyylonis
3123. 4221  Col. amphigenous; hy. alternate & opposite; ms. unciate ... 302. M. pithocellobi var. uncinata
3113. 4233  Col. hypophyllous; hy. alternate & opposite; ms. straight. 99. M. albiziae-granulosae
3113. 3223  Col. on stems & petioles; ms. straight ... 362. M. venezuelana var. neocaledonica
3111. 3222  Col. amphigenous; ms. tortuous ... 98. M. albiziae var. odoratissimae

MORACEAE

Meliola
3111. 5222  Col. hypophyllous; hy. alternate; hc. angular; ph. separate; ms. obtuse ... 116. M. artocarpi var. indica
3123. 4221  Col. epiphyllous; hy. 60% opposite; hc. entire; ph. with hy.; ms. dentate
... 230. M. integrifolii

MYRISTICACEAE

Meliola
3111. 3232  ... 278. M. myristicae

MYRSINACEAE

Meliola
3113. 4233  Col. hypophyllous; hy. alternate & opposite; ms. 520 μm long; sp. 46-50 μm long
... 314. M. rapaneae var. microspora
3111. 6221  Col. epiphyllous; hy. alternate; ms. 300 μm long; sp. 51-64 μm long .120. M. australis

MYRTACEAE

Amazonia
3101. 4220  ... 22. A. syzygii

Asteridiella
3101. 5330  Perithecium 275 μm in diam., pc. 30 μm long; sp. 45-51.5 μm long . 55. A. melaleucae
3101. 4340  Perithecium 343 μm in diam., pc. 70 μm long; sp. 43-46 μm long . 58. A. ohiana var. major

Meliola
3111. 6224  Col. thin; hyphae tortuous; sp. fusoid, 37-60 μm long . 360. M. trichostroma var. macrosperma
3111. 5334  Col. dense; hyphae straight; sp. cylindrical, 49-56 μm long . 210. M. gersoppaensis
3111. 4233  Col. thin; hyphae substraight; sp. 42-48 μm long
... 198. M. eugeniae-jamboloidis var. amphigena
3111. 3223  Col. thin; hyphae undulate; ms. few; sp. 36-40.5 μm long ... 248. M. laxa var. indica
3111. 4223  Col. dense; hyphae crooked; ms. numerous, uncinate ... 199. M. eugeniae-stocksii
2 2111. 5222  Col. dense; ms. straight to uncinate; sp. fusoid ... 260. M. maduraiensis
2 2111. 4221  Col. very thin; ms. straight; sp. obovoidal ... 311. M. pulchella var. syzygii
### NYCTAGINACEAE

**Meliola**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3113.5333</td>
<td>Col. epiphyllous; hy. alternate &amp; opposite; ms. 600 μm long</td>
<td>... 280. <em>M. neeae</em></td>
</tr>
<tr>
<td>3112.4234</td>
<td>Col. hypophyllous; hy. opposite; ms. 1300 μm long</td>
<td>... 139. <em>M. calpidiae</em></td>
</tr>
</tbody>
</table>

### OLACACEAE

**Meliola**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3113.4222</td>
<td>...</td>
<td>286. <em>M. molacicola</em></td>
</tr>
</tbody>
</table>

### OLEACEAE

**Asteridiella**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Reference</th>
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</thead>
<tbody>
<tr>
<td>3101.5320</td>
<td>Hy. 24-26 μm long; sp. 47-60 x 19-26 μm</td>
<td>... 63. <em>A. riethii</em></td>
</tr>
<tr>
<td>3101.3220</td>
<td>Hy. 15-22 μm long; sp. 37-40.5 x 15-18.5 μm</td>
<td>... 73. <em>A. web.teri</em></td>
</tr>
</tbody>
</table>

**Meliola**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Reference</th>
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</thead>
<tbody>
<tr>
<td>3111.6332</td>
<td>Hc. entire to angulare; ms. 310 μm long; sp. 53-62 x 20-23.5 μm</td>
<td>... 288. <em>M. osmanthi-cymosi</em></td>
</tr>
<tr>
<td>3111.4223</td>
<td>Hc. entire to angular; ms. 585 μm long; sp. 36-42 x 12-18 μm</td>
<td>... 234. <em>M. jasminicola</em> var. <em>indica</em></td>
</tr>
<tr>
<td>3111.4222</td>
<td>Hc. angular to sublobate; ms. 500 μm long; sp. 40-46.5 x 12-18 μm</td>
<td>... 265. <em>M. mayapeicola</em> var. <em>indica</em></td>
</tr>
<tr>
<td>3111.4221</td>
<td>Hc. truncate, angulose, rarely sublobate; ms. 272 μm long; sp. 40-46 x 15-19 μm</td>
<td>... 251. <em>M. linoceirae-malabaricae</em></td>
</tr>
<tr>
<td>3111.3221</td>
<td>Hc. entire to angulare; ms. 270 μm long; sp. 36-40 x 14-16 μm</td>
<td>... 250. <em>M. ligustri</em></td>
</tr>
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</table>

### OPILIACEAE

**Meliola**

<table>
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<th>Description</th>
<th>Reference</th>
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<tbody>
<tr>
<td>3113.4232</td>
<td>Hy. alternate &amp; opposite; ms. dentate at the tip; sp. 4-septate</td>
<td>... 142. <em>M. cansjeræae</em> var. <em>indica</em></td>
</tr>
<tr>
<td>2111.5343</td>
<td>Hy. alternate; ms. acute at the tip; sp. 3-septate</td>
<td>... 143. <em>M. cansjericola</em></td>
</tr>
</tbody>
</table>
PANDANACEAE

Meliola
3111. 5331
2

PERIPLOCACEAE

Meliola
3111. 5232 Col. amphigenous; hy. subantrorse to retrorse; sp. up to 55 μm long

3111. 3223 Col. epiphyllous; hy. antrorse; sp. up to 35 μm long

PIPERACEAE

Amazonia
3103. 3220

Meliola
3113. 4232 Col. amphigenous; hy. opposite and alternate; ms. hamate

3111. 3222 Col. epiphyllous; hy. alternate; ms. straight to curved

POACEAE

Meliola
3141. 4221 Col. epiphyllous; ms. dichotomously branched

3111. 4223 Col. amphigenous; ms. simple

PODOCARPACEAE

Meliola
3111. 5334

POLYGONACEAE

Meliola
3111. 3221

3112. 4222

PROTEACEAE

Asteridiella
2101. 6320

220. M. hemidesmi

221. M. hemidesmicola

21. A. pipericola

331. M. singeri

353. M. thetei

177. M. cymbopogonis

349. M. themedae var. indica

304. M. polygoni

305. M. polygonicola

50. A. knightiae
Meliola
3111. 5332 Col. epiphyllous; hc. entire; ms.
dentate at the tip ..216. M. grevilleae-gillivrayi
3111. 5333 Col. amphigenous; hc. lobate; ms.
sinuous, obtuse at the tip ... 337. M. stenocarpi

RANUNCULACEAE

Appendiculella
2201. 4230 ... 23. A. alpina

RHAMNACEAE

Amazonia
3101. 3220 ... 11. A. gouaniae

Appendiculella
2201. 4320 ... 30. A. hoveniae

Irenopsis
3401. 4230 ... 86. I. tenuissima var. major

RHIZOPHORACEAE

Meliola
3111. 5224 ... 108. M. anisophyllea var. caralliae

ROSACEAE

Asteridiella
2101. 42X0 ... 61. A. pygei var. microspora

Meliola
3113. 5223 Hy. opposite & alternate; hc. to lobate;
ms. numerous, 550 µm long ... 319. M. rubi var. grahwalensis
3111. 3221 Hy. l% opposite; hc. entire; ms. few,
grouped around perithecia, 250 µm long ... 320. M. rubiella var. indica

RUBIACEAE

Asteridiella
3101. 3220 Hy. alternate, 14-24 µm long; sp.
36-38 x 14-15 µm ... 64. A. rondeletifolii
3103. 4230 Hy. alternate and opposite; sp.
38-44 x 14-17 µm ... 70. A. tarlacensis
Endomeliola
3101. 6440 Hyphae internal and intercellular; hy. on mycelial tip; ph. on crust or perithecial wall ... 75. E. dingleyae

Meliola
3111. 5234 Ms. straight, flexuous to spirally twisted; perithecia 245 μm diam.; sp. 38-60 x 11-14 μm ... 333. M. spirobelia
3111. 3222 Hy. many, ms. 360 μm long; sp. 36-40.5 x 15-18.5 μm long ... 238. M. kanniyakumariana
3111. 3221 Ms. few, more or less arcuate, rarely straight; perithecia 180 μm diam.; sp. 33-40 x 13-15 μm ... 247. M. lasianthi
3111. 2221 Ms. numerous, straight, arcuate to irregularly curved; perithecia 120 μm diam.; sp. 20-30 x 10-12 μm ... 244. M. knoxiae
3113. 5334 Hy. alternate & rarely opposite; ms. straight to subsinuuous; sp. 46-55.5 x 19-22 μm ... 285. M. dognyensis
3112. 4223 Hy. opposite; ms. straight; sp. 40-43.5 x 15-18.5 μm ... 232. M. ixorae-coccineae
3111. 5332 Col. amphigenous, dense; stc. cuneate; sp. 43-53 x 18-22 μm ... 144. M. canthii-angustifolia
3111. 5222 Col. hypophyllous, thin; stc. tortuous, 1-several celled; sp. 52-56 x 16-18 μm ... 168. M. coelicosa
3111. 4322 Col. amphigenous, dense; hyphae undulate; hc. entire to angular ...364. M. weberae
3111. 4224 Col. hypophyllous, thin; hyphae tortuous; hc. angulose to slightly lobate ... 231. M. ixorae var. macrospora
3111. 4224 Col. hypophyllous, dense; hyphae substraight; hc. irregularly sublobate ... 158. M. chandolensis
3111. 4222 Col. amphigenous, dense; hyphae crooked; hc. slightly angular ..365. M. wendlandiae
3111. 4222 Col. mostly epiphyllous; hyphae straight; hc. entire ... 222. M. henryi
3111. 3223 Hyphae flexuous; hc. sublobate; ms. straight to curved ... 308. M. psychotriae-nudiflorae
3111. 3222 Hyphae straight; hc. rounded to subacute at the apex; phialides with hy. ... 180. M. delae

RUTACEAE

Amazonia
3101. 4320 ... 3. A. acronychiae

Asteridiella
3103. 5330 Hy. alternate, few opposite; phialides few; sp. 45-51 x 21-23 µm ... 32. A. acronychiae
3101. 3320 Hy. alternate, 27-40.5 µm long; phialides numerous; sp. 34-37.5 x 15-21.5 µm ... 33. A. acronychiae-pedunculatae

Meliola
3141. 4231 Col. mostly hypophyllous; ms. dichotomously branched ... 347. M. tenella var. atalantiicola
3131. 6332 Col. hypophyllous; ms. simple, dentate at the tip. ... 169. M. comptonella
3123. 4231 Col. amphigenous; ms. straight, geniculate, arcuate to irregularly curved, dentate to furcate at the tip ... 268. M. melicopes
3113. 4223 Col. epiphyllous, thin; hc. entire; ms. 747 µm long ... 164. M. clausenae
3113. 4223 Col. mostly hypophyllous, crustose; hc. conoid; ms. 765 µm long ... 117. M. atalantiae
3113. 3233 Col. hypophyllous, thin; hc. entire; ms. 540 µm long. ... 137. M. cadigensis var. glycosmidis
3113. 3223 Col. hypophyllous, thin; hc. entire to angulose; ms. 575 µm long ... 296. M. paramignyae
3113. 3223 Col. mostly hypophyllous, dense; hc. often angulose; ms. 810 µm long ... 318. M. rickiana var. zantherxyli
3111. 6344 Col. hypophyllous; hy. alternate; ms. straight, obtuse to dentate at the tip, 1000 µm long ... 275. M. mouensis
3111. 5323 Col. amphigenous; ms. straight & very few uncinate, 930 µm long ... 363. M. vepridis
3111. 5331 Col. amphigenous; hyphae crooked; hc. trilobate; sp. 54-59.5 x 23-27 µm ... : 243. *M. kisubensis* var. *acronychiae*

3111. 5322 Col. amphigenous; hyphae flexuous; hc. entire; sp. 46-51 x 18-22 µm ... 370. *M. zanthoxyli-ovalifolii*

3111. 4222 Col. hypophyllous; hyphae straight; hc. entire; sp. 40-42 x 14-18 µm .259. *M. luvungae*

**SABIACEAE**

*Asteridiella*

3101. 5330 ...

*Meliola*

3113. 5223 ...

**SANTALACEAE**

*Meliola*

3113. 4231 3 Col. amphigenous; hy. alternate & opposite; ms. straight, obtuse to dentate at the tip ... 218. *M. hainanensis*

3112. 4222 Col. amphigenous; hy. opposite; ms. straight, obtuse at the tip .. ...

3111. 4221 Col. mostly epiphyllous; hy. alternate; ms. very thin, straight, acute to obtuse at the tip ... 290. *M. osyridicola* var. *indica*

3111. 3221 Col. mostly hypophyllous; hy. alternate; ms. acute to obtuse at the apex. ...

**SAPINDACEAE**

*Asteridiella*

3101. 4230 ...

*Meliola*

2111. 4221 Col. epiphyllous; hy. alternate; ms. obtuse at the tip ... 175. *M. cupani'cola*

3113. 4221 3 Col. mostly epiphyllous; hy. alternate & 40% opposite; ms. obtuse to dentate at the tip ... 291. *M. otonephelii*
Hyphae straight; hc. globose; ms. 550 μm long; sp. 37-40.5 x 15 x 18.5 μm ... 100. M. allophylli-concanici

Hyphae straight; hc. conoid; ms. 320 μm long; sp. 30-35 x 12-15.5 μm ... 146. M. capensis var. schleicheri

Hyphae flexuous to tortuous; hc. ovate; ms. 300 μm long; sp. 30-33.5 x 12-15.5 μm ... 204. M. filicii

Hy. opposite; hc. conoid; ms. 450 μm long; sp. 37-40.5 x 15-18.5 μm ... 145. M. capensis var. emerginat

Hy. alternate and opposite; ms. 800 μm long; sp. 46-54 x 21-27 μm ... 299. M. paullinifolii

Hy. opposite, rarely alternate; hc. ellipsoid; ms. 560 μm long; sp. 32-36 x 15-17 μm ... 193. M. elatostachydis

Hy. 1% opposite, hc. ovate to oblong; ms. 360 μm long; sp. 37-40 × 15-18.5 μm ... 205. M. filiciicola

Hy. 1% opposite, hc. sinuously lobate; sp. 30-36.5 x 12-15 μm ... 292. M. otophorae var. indica

Meliola

Hy. alternate; ms. 300 μm long, dentate to furcate up to 37 μm at the tip ... 323. M. sapotacearum

Hy. alternate, 5% opposite; ms. few, few dentate at the tip, 545 μm long ... 235. M. jayachandranii

Hy. alternate; ms. dentate at the tip, 250 μm long ... 330. M. sideroxylicola

Asteridiella

... 35. A. astilbincola

SCHISANDRACEAE

Asteridiella

... 48. A. kadsuricola
SCROPHULACEAE

Meliola
3111. 3222  ...  354. M. toreniae

SELAGINELLACEAE

Asteridiella
2101. 4240  ...  68. A. selaginellae

SIMAROUBACEAE

Meliola
3111. 3221  Hy. alternate; ms. acute to dentate at the tip; sp. 37-40.5 x 13-15.5 \( \mu m \)  ...  97. M. ailanthi
3112. 4232  Hy. opposite; ms. acute at the tip; sp. 40-46 x 15-18 \( \mu m \)  ...  154. M. castelae

SMILACACEAE

Meliola
3111. 4233  Hy. 18-22 \( \mu m \) long; perithecia 280 \( \mu m \) in diam.; sp. 37-43.5 x 15-18.5 \( \mu m \)  ...  207. M. gamblei
3111. 4223  Hy. 18-22 \( \mu m \) long; perithecia 198 \( \mu m \) in diam.; sp. 42-50 x 18-20 \( \mu m \)  ...  321. M. salleana var. smilacis

Solanaceae

Asteridiella
3101. 4230  ...  36. A. boerhaviifolii

Meliola
3111. 3222  ...  261. M. mahabaleshwarensis

STAPHYLEACEAE

Meliola
3112. 3211  ...  335. M. staphyleacearum

Prataprajella
3211. 5244  ...  371. P. turpiniiicola

STERCULIACEAE

Asteridiella
3101. 5320  ...  34. A. anamalaiana
**Irenopsis**

3401. 3220 Hyphae substraight; hy. 14-16 μm long, hc. entire to angular; ps. 72 μm long … 79. I. eriolaenae

3401. 3220 Hyphae tortuous; hy. 18-29 μm long, hc. entire to slightly lobate; ps. 120 μm long … 80. I. helicteridis

**Meliola**

3113. 3222 Hy. alternate & 5-10% opposite, hc. sublobate; sp. 37-40.5 μm long … 309. M. pterospermi var. microspora

3111. 5223 Hy. alternate, hc. entire; sp. 42-51 μm long … 315. M. reevesiae

31x1. 322x Hy. alternate, hc. entire; sp. 35-40 μm long … 223. M. heritieriicola

**STYRACACEAE**

Meliola

3121. 3231 … 246. M. kweichowensis var. UNCINATA

**SYMPLOCACEAE**

Amazonia

3101. 3220 … 15. A. karnatakensis

Meliola

3113. 4222 Hy. alternate & rarely opposite, 18-22 μm long; ms. 410 μm long; sp. 15-18.5 x 15-16.5 μm … 130. M. bissei

3111. 4333 Hy. alternate, 25-32 μm long; ms. 500 μm long, grouped around perithecia; sp. 45-48.5 x 17-24 μm … 344. M. tanakaena

**SYMPHOREMACEAE**

Meliola

3113. 3222 2 Col. mostly hypophyllous; hyphae crooked; hy. 5% opposite; ms. straight, uncinate, geniculate … 342. M. symphorematicola

3111. 3222 2 Col. mostly epiphyllous; hyphae undulate; hy. alternate; ms. arcuate to curved … 343. M. symphorematis
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<td>Meliola</td>
<td>3111. 5323 Hyphae crooked; hc. lobate; phialides separate; ms. 615 μm long; sp. 52-56 x 22-28 μm</td>
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<td>3111. 4221 Hyphae straight; hc. entire to slightly lobate; phialides with hy.; sp. 41-46.5 x 14-16 μm</td>
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<td>3111. 3222 Hyphae undulate; hc. entire; phialides separate; sp. 25-36 x 15-18.5 μm.</td>
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VERBENACEAE

*Asteridiella*
3101. 4220 Infection spots stretch remaining leaf surface, result in shot holes ... 39. *A. clerodendricola*

3101. 3230 Col. epiphyllous; hyphae crooked; hc. entire to angular; sp. 31-37 x 12.5-18.5 μm ... 72. *A. vivekananthanii*

*Meliola*
3141. 6331 Hc. lobate; ms. dichotomously branched; sp. 56-64.5 x 22-24.5 μm .293. *M. oxerae*

3121. 4232 Hc. lobate; ms. arcuate, dentate at the tip; sp. 41-50 x 16-19 μm .115. *M. arnoldii*

3113. 4223 Hy. 30% opposite, hc. entire; ms. dentate at the tip; sp. 42-48 x 14-16 μm . ... 306. *M. premnicola*

3113. 3342 Hy. alternate & opposite, hc. entire; sp. 41-42 x 15-21 μm .104. *M. ambigua var. macrospora*

3111. 4221 Col. epiphyllous; hc. cylindrical; ms. 250 μm long; sp. 30-45 x 10-13.5 μm ... 155. *M. castlerockensis*

3111. 3222 Col. cauricolous, epiphyllous; ms. 360 μm long; sp. 31-34 x 12-14 μm. ... 102. *M. altissimae*

VITACEAE

*Asteridiella*
3103. 4220 ... 71. *A. tetrastigmatis*

*Irenopsis*
3401. 5330 ... 87. *I. vitecifolii*

XANTHOPHYLLACEAE

*Irenopsis*
3141. 4220 ... 88. *I. xanthophylli*

ZINGIBERACEAE

*Meliola*
3113. 4223 ... 105. *M. amomicola var. longispora*
I. AMAZONIA


Type: A. psychotriae (Henn.) Theiss.


Colonies epiphyllous, dense, up to 8 mm in diameter. Hyphae straight to substraight, branching opposite at acute angles, closely reticulate and form solid mycelial mat, cells 12-15.5 x 4-6 μm. Hyphopodia alternate, closely arranged, closely antrorse, 15-18.5 μm long; stalk cells cuneate, 3-6 μm long; head cells ovate, globose, entire, 9-12.5 x 9-11 μm. Phialides few, mixed with hyphopodia, opposite to alternate, ampulliform, 15-18.5 x 6-9.5 μm. Perithecia scattered to grouped, flattened-globose, up to 202 μm in diam.; ascospores cylindrical, 4-septate, slightly constricted, 34-37 x 12.5-15.5 μm.


Colonies epiphyllous, subdense, up to 2 mm in diameter. Hyphae substraight to slightly flexuous, branching alternate at wide angles, loosely reticulate, cells 24-50 x 6-9.5 μm. Hyphopodia alternate and about 10% opposite, straight to curved, antrorse to recurved, 12-19 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells ovate, globose, entire to truncate at the apex, 9-12.5 x 8-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 9-25 x 6-8 μm. Perithecia scattered, flattened-globose, up to 120 μm in diam.; ascospores mostly cylindrical, 4-septate, 37-40.5 x 15--18.5 μm.

On leaves of Abutilon ramosum (Malvaceae), Nilgiris, Tamil Nadu, India, Jan. 25, 1990, V.B. Hosagoudar HCIO 30354.


Colonies amphigenous, mostly epiphyllous, subdense, up to 3 mm in diameter, confluent. Hyphae substraight, branching opposite at wide angles, closely reticulate, cells 22-30 x 8-10 μm. Hyphopodia
alternate, closely antrorse, straight to curved, 24-44 μm long; stalk cells cuneate, 10-22 μm long; head cells ovate, clavate, angular to irregularly sublobate, 18-22 x 14-18 μm. Phialides numerous, mixed with hyphopodia, conoid to ampulliform, 22-30 x 8-10 μm. Perithecia scattered, flattened-globose, up to 110 μm in diam.; ascospores obovoidal, 4-septate, constricted, 42-46 x 20-22 μm.

On Acronychia pedunculata (Rutaceae), Idukki, Kerala, India, June 12, 1983, V.B. Hosagoudar HCIO 40463.


Colonies epiphyllous, dense, up to 5 mm in diameter, confluent. Hyphae straight to slightly undulate, branching alternate at acute to wide angles, densely reticulate, cells 26-36 x 3-5 μm. Hyphopodia alternate, scattered, antrorse, spreading, straight to recurved, 16.5-20 μm long; stalk cells cylindrical to cuneate, 3-8 μm long; head cells ovate, globose, pyriform, stellately lobate, rounded at the apex, 10-15 x 10-16.5 μm, phialides few, mixed with hyphopodia, alternate, ampulliform, 13-26.5 x 6-10 μm. Perithecia closely scattered, flattened-globose, up to 165 μm in diam.; ascospores cylindrical, 4-septate, constricted, 43-46 x 15-16.5 μm.


Colonies epiphyllous, subdense, up to 3 mm in diameter. Hyphae mostly straight, branching opposite to alternate at acute to wide angles, closely reticulate, cells 15-18.5 x 9-12.5 μm. Hyphopodia alternate, antrorse, 24-25 μm long; stalk cells cuneate, 6-9.5 μm long; head cells versiform to cylindrical, entire, 15-18.5 x 12-15.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 18-25 x 9-12.5 μm. Perithecia seated on exhyphopodiate mycelia, scattered, flattened-globose, up to 118 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted at the
septa, 34-43.5 x 21-25 μm.

On leaves of *Castenopsis armata* (Fagaceae), Assam, India, Jan. 1887, G. Mann HCIO 39434a.


Colonies epiphyllous, dense, crustose, up to 2 mm in diam., confluent. Hyphae straight to substraight, branching opposite at wide angles, loosely to closely reticulate and almost solid in the centre, cells 15.5-19 x 6-9.5 μm. Hyphopodia opposite, few solitary, crowded, antrorse, mostly straight, 18-22 μm long; stalk cells cuneate, 4-6 μm long; head cells ovate, versiform, entire, 12-15.5 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 21-25 x 9-12.5 μm. Perithecia globose, up to 162 μm in diam.; ascospores ellipsoidal, 4-septate, constricted, 40-44 x 15-19 μm.

On *Cinnamomum riparium* (Lauraceae), Pooyankutty, Kerala, India, June 16, 1983, V.B. Hosagoudar IMI 321576.


Colonies epiphyllous, crustose, up to 2 mm in diameter. Hyphae straight to crooked, branching alternate to irregular at acute angles, closely reticulate and form solid mycelial mat at the centre, cells 20-30 x 6-7 μm. Hyphopodia alternate to unilateral, antrorse to spreading, 15-18 μm long; stalk cells cylindrical to cuneate, 6-7 μm long; head cells ovate to globose, entire, 9-15.5 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15-22 x 6-7 μm. Perithecia few, grouped at the centre, flattened-globose, up to 313 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 30-37.5 x 9-15.5 μm.

On leaves of *Daphniphyllum neilgherrense* (Daphniphyllaceae), Kodaikanal, Tamil Nadu, India, Nov. 29, 1987, R.S. Sawant HCIO 39883.

Colonies amphigenous, thin to subdense, up to 2 mm in diameter, confluent. Hyphae substraight to flexuous, branching opposite at acute angles, loosely reticulate, cells 12.5-22 x 6-9.5 μm. Hyphopodia alternate, straight, rarely curved, antrorse, 15.5-25 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovate, entire, 12.5-20.5 x 8-14 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15.5-22 x 6-9.5 μm. Perithecia flattened-globose, scattered, up to 124 μm in diam., ascospores obovoidal, 4-septate, strongly constricted at the septa, 34-46.5 x 12.5-18.5 μm.

On leaves of *Flacourtia* sp. (Flacouriaceae), Nilgiris, Tamil Nadu, Feb. 16, 1991, V.B. Hosagoudar HCIO 30617.


Colonies amphigenous, dense, up to 4 mm in diameter. Hyphae straight, branching opposite to irregular at acute angles, closely reticulate, cells 15-31 x 6-10.5 μm. Hyphopodia alternate, antrorse, 19-27 μm long; stalk cells cylindrical to cuneate, 6-10.5 μm long; head cells ovate, sublobate, 17-22 x 13-16.5 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 12-22 x 6-9.5 μm. Perithecia scattered, dimidiate, up to 400 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 39-51 x 15-21 μm.

On leaves of *Geniostoma oleifolia* (Loganiaceae), New Caledonia, Sept. 16, 1966, NC 66107.


Colonies hypophyllous; dense, crustose, up to 2 mm in diam. Hyphae straight to substraight, branching alternate at acute angles, closely reticulate and thalloid, cells 9-12.5 x 6-9.5 μm. Hyphopodia alternate, crowded, very closely antrorse, 21-25 μm long; stalk cells cuneate, 6-9.5 μm long; head cells ovate, mostly globose, entire, 12-18.5 x 9-12.5 μm. Phialides not seen.
Perithecia few, scattered, up to 160 μm in diam.; ascospores obovoidal, 4-septate, strongly constricted, 56-59 x 21.5-25 μm.

On Gomphandra coriacea (Icacinaceae), Idukki, Kerala, India, Dec. 15, 1982, V.B. Hosagoudar IMI 321577 (type).


Colonies epiphyllous, subdense, up to 2 mm in diam. Hyphae straight to undulate, branching opposite to irregular at acute angles, loosely reticulate, cells 27-30 x 7-9.5 μm. Hyphopodia alternate, straight to curved, antrorse to spreading, 18.5-25 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, globose, entire, 12-15.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15.5-18.5 x 9-12.5 μm. Perithecia scattered, flattened-globose, up to 161 μm in diam., ascospores obovoidal, 4-septate, constricted, 31-40.5 x 12-15 μm.

On Gouania microcarpa (Rhamnaceae), Gudalur, Nilgiris, Tamil Nadu, India, March 11, 1969, D.B. Deb HCIO 40464.


Colonies foliicolous, amphigenous, dense, up to 2 mm in diam., rarely confluent. Hyphae straight to undulate, branching mostly opposite, rarely alternate at wide angles, loosely reticulate, cells 18.5-25 x 8-12.5 μm. Hyphopodia alternate, straight to curved, antrorse to spreading, 18.5-21 μm long; stalk cells cylindrical, to cuneate, 6-9.5 μm long; head cells globose, truncate, rarely angular, entire, 12-15.5 μm. Phialides borne on a separate mycelial branch, alternate to opposite, conoid to ampulliform, 15-25 x 12-15.5 μm. Perithecia scattered, flattened-globose, up to 124 μm in diam.; ascospores broadly ovate, 4-septate, constricted, 31-40.5 x 13-15.5 μm.

On Combretum decandrum (Combretaceae), Warangal, Andhra Pradesh, India, Feb. 26, 1963, A.N. Henry, HCIO

13. Amazonia kakachiana sp. nov.

Coloniae amphigenae, plerumque epiphyllae, densae, ad 2 mm diam., raro confluent. Hyphae flexuosae, plerumque alternate
ramosae, laxe vel dense reticulate, cellulae 37-50 x 7-9.5 µm. Hyphopodia alternata, antrorsa vel anguste antrorsa, 27-43.5 µm long; cellula basali cylindracea vel cuneata, 12-25 µm longa; cellula apicali ovata, cylindracea, plerumque integra, raro truncata ad apicem to sublobata, 15-21 x 12-15.5 µm. Phialides illis capitatis commixtis, dispersa, ampullacea, 21-28 x 12-14 µm. Perithecia dispersa, planatus-globose, ad 250 µm diam.; ascospores fusiformiae, rectae vel curvulae, 3-septatae, constrictae, 52-56 x 21-23 µm.

On leaves of Vaccinium lescenaultii Wight var. zeylanica Clarke (Vaccinaceae), Kakachi Cliffe, Tirunelveli dist., Tamil Nadu, India, Feb. 25, 1994, V.B. Hosasgoudar ECIO 41621 (type).

This forms the first report of the genus Amazonia on the rare plant of the family Vaccinaceae (Hansford, 1961; Henry et al. 1987).


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching opposite at acute angles, closely reticulate and form solid mycelial mat at the centre, cells 24-34 x 9-12.5 µm. Hyphopodia alternate, mostly straight, antrorse to spreading, 18-25 µm long; stalk cells cylindrical to cuneate, 6-9.5 µm long; head cells ovate, globose, entire, angulose to sublobate, 10-12.5 x 9-12 µm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 27-46.5 x 12-15.5 µm. Perithecia closely scattered, flattened-globose, up to 217 µm in diam.; ascospores obovoidal, 4-septate, 40-43.5 x 15-19 µm.


Colonies amphigenous; subdense to dense, up to 3 mm in diameter, confluent. Hyphae straight to substraight, branching opposite to irregular at acute angles, loosely reticulate, cells
12-22 x 9-12.5 \( \mu m \). Hyphopodia alternate, mostly antorse, 21-28 \( \mu m \) long; stalk cells cylindrical to cuneate, 6-9 \( \mu m \) long; head cells ovate to globose, straight to curved, stellately lobate, 15-19 x 15-22 \( \mu m \). Phialides mixed with hyphopodia, mostly opposite, ampulliform, 15-22 x 9-12 \( \mu m \). Perithecia scattered, flattened-globose, up to 155 \( \mu m \) in diam., ascospores obovoidal, 4-septate, constricted at septa, 31-34 x 12-15.5 \( \mu m \).

On leaves of *Symplocos* sp. (Symplocaceae), Madikeri, Karnataka, India, Sept. 18, 1987, S. Manian IMI 82158.


Colonies epiphyllous, scattered to effuse, velvety. Hypha branches opposite to alternate, cells 24-27 x 6-8 \( \mu m \). Hyphopodia alternate to unilateral, antorse to subantrorse, 18-24 \( \mu m \) long; stalk cells cylindrical to cuneate, 5-8 \( \mu m \) long; head cells ovoid, globose, entire, straight to curved, 13-16 x 10-13.5 \( \mu m \). Phialides mixed with hyphopodia, alternate to opposite, ampuliform, 17-27 x 5-8 \( \mu m \). Perithecia scattered, flattened-globose, up to 150 \( \mu m \) in diam.; ascospores cylindrical, oblong, 4-septate, constricted at the septa, 40-54 x 11-19 \( \mu m \).

On leaves of Leguminosae member, Brazil, May 9, 1961, R. Garnier IMUR 23380.


Colonies predominantly epiphyllous, crustose to velvety, up to 2 mm in diam. Hyphae straight to substraight, branching alternate at acute angles, very closely reticulate, compact and almost opaque, cells 12-15.5 x 6-9.5 \( \mu m \). Hyphopodia alternate, subantrorse, 15-18.5 \( \mu m \) long; stalk cells cylindrical to cuneate, 3-5 \( \mu m \) long; head cells globose, entire, 12-14 x 12-15.5 \( \mu m \). Phialides not seen. Perithecia scattered, flattened-globose, up to 190 \( \mu m \) in diam.; ascospores obovoidal, 4-septate, constricted, 37-43.5 x 15-22 \( \mu m \).


Colonies hypophyllous, round, dense, up to 5 mm in diameter. Hyphae brown, closely reticulate and form solid mycelial mat, cells 15-25 x 6-8 μm. Hyphopodia alternate, antrorse, straight to curved, 18-23 μm long; stalk cells cuneate, 5-6 μm long; head cells ovate, entire, 13-17 x 6-8 μm. Phialides not seen. Perithecia scattered, flattened-globose, hidden under the mycelial mat, up to 400 μm in diam., stellately dehisce at the upper part; ascospores brown, oblong, curved, 4-septate, slightly constricted, 47-56 x 13-15 μm.

On leaves of *Schefflera vieillardii* (Araliaceae), New Caledonia, Mekee 5174 pp. in Herb. Kew.


Colonies amphigenous, black, dense, up to 2 mm in diameter. Hyphae straight to sinuous, branching opposite at wide angles, loosely reticulate, cells 13-23 x 10-11.5 μm. Hyphopodia alternate, 21-33.5 μm long; stalk cells cylindrical, 8-11.5 μm long; head cells angulose to lobate, 13-22 x 16-21 μm. Phialides mixed with hyphopodia, alternate, ampulliform, 17-23 x 7-13.5 μm. Perithecia dimidiate to hemisphaerical, up to 300 μm in diam.; ascospores 4-septate, ellipsoidal, 62-66 x 27-28.5 μm.

On leaves of *Pancheria* sp. (Cunoniaceae), New Caledonia, Sept. 19, 1966, Schmid NC 66158.

20. *Amazonia patilii* sp. nov.

Coloniae hypophyllae, densae, crustosae, ad 1 mm diam., raro confluentes. Hyphae subrectae vel anfractuae, alternate vel irregulariter acuteque ramosae, dense reticulatae et solidae, cellulae 15-18.5 x 8-10 μm. Hyphopodia alternata, ad 2% opposita, antrorsa, 18-25 μm longa; cellula basali cylindracea vel cuneata, 6-9.5 μm. longa; cellula apicali angularis vel irregulariter lobata, ovata vel globosa, 12-15.5 x 12-14 μm. Perithecia illis capitatis commixta, alternata, ampullacea, 12-18.5 x 6-8 μm.
40

Perithecia dispersa, applanato-globosa, ad 150 μm diam.; ascosporae obovoideae, 4-septatae, fortiter constrictae, 40-43.5 x 15-22 μm.

On Maytenus emarginata (Gymnosporia montana) (Celastraceae), Amboli, Maharashtra, India, Feb. 13, 1977, M.S. Patil 32525 (type).

The new species differs from Amazonia stevensii Hansf. in having 4-septate ascospores.


Colonies amphigenous, round, up to 2 mm in diameter. Hyphal branches alternate to opposite at acute angles, 17-22 x 5-7.5 μm. Hyphopodia alternate, antrorse, 17-24 μm long. Phialides opposite, ampulliform, 17-20 x 5-6.5 μm. Perithecia flattened-globose, scattered, up to 140 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 32-34 x 11-12 μm.


Colonies amphigenous, subdense, crustose to slightly velvety, up to 2 mm in diameter, rarely confluent. Hyphae substraight to slightly undulate, branching mostly opposite at wide angles, closely reticulate, cells 16-20 x 6-8 μm. Hyphopodia alternate, straight, antrorse to spreading, 18-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate to subglobose, entire, 10-14 x 8-10 μm. Phialides mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 20-24 x 8-10 μm. Perithecia flattened-globose, scattered to grouped, up to 180 μm in diam.; ascospores obovate, 4-septate, slightly constricted, 44-48 x 16-20 μm.

On leaves of Syzygium cumini (Myrtaceae), Idukki, Kerala, India, Dec. 13, 1992, V.B. Hosagoudar HCIO 40469.
II. APPENDICULELLA

Type: A. calostroma (Desm.) Hoehnel.

23. Appendiculella alpina (Togashi & Mentzer) comb. nov.

Colonies mostly epiphyllous, rarely hypophyllous and caulicolous, minute, velvety, scattered, up to 4 mm in diameter, rarely confluent. Hyphae mostly straight, branching irregular at acute angles, closely reticulate, cells 30-45 x 5-8 μm. Hyphopodia alternate, antrorse to recurved, 22-35 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells globose, oblong, irregularly sublobate, 15-25 μm in diameter. Phialides not seen. Perithecia grouped in the centre of the colony, globose, up to 270 μm in diam.; peridial appendages numerous, vermiform, cylindrical, mostly curved, strongly striated, obtuse at the tip, up to 80 μm long; ascospores ellipsoid to cylindrical, 3-septate, constricted, 27-48 x 11-16 μm.

On leaves of _Coptis trifoliata_ (Ranunculaceae), Mounte Iwate, Aug. 5, 1935, N. Hiratsuka & Togashi (type).

Colonies amphigenous, up to 3 mm in diameter. Hyphae closely branched and reticulate, cells 5-7 μm wide. Hyphopodia alternate and opposite, antrorse to subantrorse, 35-60 μm long; stalk cells cylindrical, 15-30 μm long; head cells irregularly lobed, 20-30 μm in diam. Phialides not seen. Perithecia scattered, few, up to 600 μm in diam.; peridial appendages translucent, cylindrical, oblong, curved, transversely striated, up to 160 μm long; ascospores ellipsoidal to fusiform, end cells obtuse, 3-septate, slightly constricted at the septa, end cells very small and central cells larger, 75-90 x 25 μm.

On leaves of _Araucaria angustifolia_ (Araucariaceae), Brazil, Sept. 16, 1976, H. Butin & Speer (type).

Colonies amphigenous, mostly epiphyllous, black, up to 4 mm in diameter. Hyphae sinuous, branching irregularly and loosely reticulate, cells 32-38 x 5-7 μm. Hyphopodia alternate and opposite, 38-45 μm long; stalk cells cylindrical to conical, 10-15 μm long; head cells irregularly lobate, 18-24 x 12-16 μm. Phialides not seen. Perithecia scattered, verrucose, up to 320 μm in diam.; perithecial appendages brown, obtuse-conical, striated transversely, up to 15 μm long; ascospores ellipsoidal, 3-5-septate, constricted at the septa, 55-65 x 20-23 μm.

On leaves of *Austrocedrus chillensis* (Cupressaceae), Chile, Sept. 28, 1968, H. Batin

26. **Appendiculella buxi** (Hino & Katumato) comb. nov.


Colonies amphigenous, caulicolous, up to 3 mm in diameter. Hyphae irregularly branched, closely reticulate, 7.5-8.5 μm wide. Hyphopodia alternate, unilateral, straight, perpendicular to the hyphae, 25-30 μm long; stalk cells 9-10 μm long; head cells globose, 4-5 lobed, 16-19.5 x 18-22.5 μm. Perithecia grouped, globose, up to 240 μm in diam.; perithecial appendages larviform, mostly curved, muricately septate, attenuated and obtuse at the apex, up to 48.5 μm long; ascospores oblong to fusiform, slightly curved, 3-5 septate, constricted at the septa, 45.5-59 x 16-21.5 μm.

On leaves, petioles and twigs of *Buxus microphylla* var. *japonica* (Buxaceae), Aug. 4, 1955, K. Katumato (type).


Colonies hypophyllous, subdense, crustose, up to 3 mm in diam., rarely confluent. Hyphae substraight to flexuous, branching alternate, opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 30-46.5 x 6-9.5 μm. Hyphopodia
alternate, less than 1% opposite, straight to curved, antrorse to recurved, 30-43.5 μm long; stalk cells cylindrical to cuneate, 6-31 μm long; head cells ovoid to globose, entire, angular, sublobate to sunuate, 12-25 x 9-25 μm. Phialides mixed with hyphopodia, opposite and alternate, ampulliform, 15-31 x 9-12.5 μm. Perithecia scattered, up to 125 μm in diam.; perithecial appendages numerous, subcylindrical to mammiform, obtuse to hamate at the tip, up to 25 μm long; ascospores obovoidal, 4-septate, slightly constricted, 43-46.5 x 15-18.5 μm.


Colonies amphigenous, diffused, velvety, up to 5 mm in diameter. Hyphae straight to flexuous, branching opposite to irregular at acute to wide angles, closely reticulate, cells 20-28 x 6-8.5 μm. Hyphopodia alternate to unilateral, antrorse, straight to curved, 27-37 μm long; stalk cells cylindrical to cuneate, 9.5-17.5 μm long; head cells subglobose to ovate, broadly angular to 2-4 sub-lobate, 17.5-22.5 x 14.5-19 μm. Phialides mixed with hyphopodia, alternate to opposite, conoid to ampulliform, 19-24 x 8-9.5 μm. Perithecia scattered, globose, up to 190 μm in diam.; perithecial appendages larviform, transversely striated, attenuated to obtuse at apex, substraight to curved, up to 50 μm long; ascospores fusiform to ellipsoidal, straight to slightly curved, 3-septate, constricted at the septa, 49-58 x 19-25.5 μm.

On leaves of Cunninghamia lanceolata (Taxodiaceae), Qujiang, Guangdong Province, China, July 6, 1986, Hu Yan-xing GDIM 86004.


Colonies amphigenous, black, irregularly rounded, up to 2 mm in diameter. Hyphae brown, densely branched, cells 8-10 μm broad. Hyphopodia alternate, 32-40 μm long; stalk cells cylindrical, irregularly sinuous, 12-16 μm long; head cells irregularly rounded, lobate, 20-30 x 20-26 μm. Phialides ampulliform, few. Perithecia
grouped, globose, up to 370 μm in diam.; perithecial appendages brown, conical to lineate, acute, transversely striated, up to 35 μm long; ascospores brown, ellipsoidal, 3-septate, constricted at the septa, 77-85 x 25 μm.

On leaves of *Fitzroya cupressoides* (Cupressaceae), Chile, March 15, 1970, H. Butin.


Colonies amphigenous, thin, up to 3 mm in diameter. Hyphae straight to undulate, branching opposite at acute angles, closely reticulate, cells 27-49.5 x 6-10 μm. Hyphopodia alternate, straight, antrorse to spreading, 15-31 μm long; stalk cells cylindrical to cuneate, 12-22 x 15-18.5 μm. Phialides mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 12-28 x 9-12.5 μm. Perithecia scattered to grouped, up to 225 μm in diam.; perithecial appendages conoid, twisted, simple, up to 62 μm long; ascospores ellipsoidal, straight to slightly curved, 3-septate, slightly constricted at the septa, 37-42 x 15-18.5 μm.


Colonies amphigenous, black, irregularly rounded, up to 4 mm in diameter. Hyphae sinuous, brown, loosely reticulate, 5-6 μm wide. Hyphopodia alternate and opposite; stalk cells cylindrical to conical, 9-13 μm long; head cells irregularly lobat. Phialides not seen. Perithecia mostly grouped, rarely solitary, black, globose, up to 450 μm in diam.; perithecial appendages transversely striated to sulcate, up to 80 μm long; ascospores brown, ellipsoidal, 3-septate, constricted, 64-72 x 23 μm.

On leaves of *Pilgerodendron uvifum* (Cupressaceae), Chile, March 15, 1970, H. Butin.
III. ASTERIDIELLA

Asteridiella McAlpine in Proc. Linn. Soc. New South Wales, p. 38, 1897.
Type: A. solani McAlpine

Colonies amphigenous, orbicular, up to 3 mm in diameter. Hyphae straight to substraight, branching opposite to irregular at acute angles, loosely reticulate, cells 19-26 x 9-12 μm. Hyphopodia alternate, rarely opposite, antrorse, straight, 38-48 μm long; stalk cells cylindrical to cuneate, 9-13 μm long; head cells subglobose to clavate, entire to irregularly rounded to angular, 12-26 x 9-16 μm. Phialides few, mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 19-34 x 7-8 μm. Perithecia grouped, verrucose, up to 226 μm in diam.; peridial cells conoid, obtuse, up to 19 μm long; ascospores ellipsoidal, 4-septate, constricted at the septa, 45-51 x 21-23 μm.
On leaves of Acronychia pedunculata (Rutaceae), Dinghu Shan, Guangdong, China, July 20, 1982, Y.X. Hu GDIM 82044.

Colonies amphigenous, dense, crustose, up to 2 mm in diameter, rarely confluent. Hyphae straight to substraight, branching alternate to opposite at acute angles, loosely reticulate, cells 27-34 x 7-9.5 μm. Hyphopodia alternate, straight to slightly curved, antrorse to subantrorse, 27-40.5 μm long; stalk cells cylindrical to cuneate, 9-18.5 μm long; head cells clavate, ovate, cylindrical, entire to angular, 18-21.5 x 12-15.5 μm. Phialides numerous, mixed with hyphopodia, alternate to opposite, ampulliform, 24-31 x 9-12.5 μm. Perithecia scattered, up to 115 μm in diam.; perithecial cells conoid to mammiform, up to 18.5 μm long; ascospores obovoidal, 4-septate, constricted at the septa, 34-37.5 x 15-21.5 μm.
On leaves of *Acronychia pedunculata* (Rutaceae), Coimbatore, Tamil Nadu, India, Dec. 20, 1990, V.B. Hosagoudar HCIo 30515.


Colonies epiphyllous, scattered, dense, crustose to velvety, up to 2 mm in diameter. Hyphae substraight to crooked, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 24-28 x 6-8 μm. Hyphopodia alternate, mostly antrorse, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells globose, angular to rarely sublobate, 15-18 x 18-22 μm. Phialides numerous, mixed with hyphopodia, opposite to alternate, ampulliform, 18-22 x 6-9.5 μm. Perithecia scattered, up to 140 μm in diam.; peridial cells protruded, conoid, curved at the apex, up to 15 μm long; ascospores obovoid to cylindrical, 4-septate, slightly constricted at the septa, 43-53 x 18-22 μm.

On leaves of *Sterculia urens* (Sterculiaceae), Coimbatore, Tamil Nadu, India, Dec. 23, 1990, V.B. Hosagoudar HCIo 30529 (as *Meliola anamalaiana*).


Colonies epiphyllous, minute, up to 2 mm in diameter. Hyphae undulate, branching irregular, cells 6-9 μm wide. Hyphopodia alternate, more or less antrorse, 16-26 μm long; stalk cells cylindrical, 3-8 μm long; head cells ovoidal to ellipsoidal, entire, 10-16 x 11-15 μm. Phialides opposite to alternate, ampulliform, 18-21 x 6-8.5 μm. Perithecia globose, up to 200 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, constricted at the septa, 32-37 x 12-14 (10-11) μm.

On leaves of *Astilbe philippinensis* (Saxifragaceae), Philippines, June 1923, M.S. Clemens No. 1535.


Colonies amphigenous, scattered, up to 3 mm in diameter. Hyphae sinuous, branching irregular at acute angles, closely reticulate. Hyphopodia alternate, unilateral, antrorse, 14-19 μm
long; stalk cells cuneate, 4-6 μm long; head cells subglobose, entire, 10-13 μm in diameter. Phialides mixed with hyphopodia, scattered, alternate to opposite, ampulliform, 16-22 x 5-8 μm. Perithecia grouped, up to 245 μm diam.; ascospores cylindrical, 4-septate, constricted, 36-43 x 11-16 μm.

On leaves of *Solanum boerhaviifolia* (Solanaceae), Brazil, P.A. Saccardo in Herb. Univ. Paduae, Italiae.

In the line drawings, few hyphopodia are opposite.

37. *Asteridiella caseariicola* sp. nov.

Coloniae amphigenae, plerumque epiphyllae, densae, crustosae, ad 1 mm diam., raro confluentes. Hyphae rectae vel subrectae, plerumque opposite acuteque ramosae, laxe vel dense reticulatae, cellulae 18-28 x 6-8 μm. Hyphopodia alternata, antrorsa, 27-43.5 μm longa; cellula basali cuneate, 9-18.5 μm longa; cellula apicis globosa, stellato lobata 18-24, 18-25 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 18-28 x 6-8 μm. Perithecia laxe aggregate, ad 250 μm diam.; cellulae peridiales mammiformiae, 15-25 μm longae; ascosporae fusiformiae, plerumque curvulae, 3-septatae, 49-53 x 15-18.5 μm.

On leaves of *Casearia esculenta* Roxb. (Flacourtiaceae), M.K. Vayal, Kaniyakumari dist., Tamil Nadu, India, Feb. 27, 1994, V.B. Hosagoudar HCIO 41628 (type).

Stellately lobed head cells of hyphopodia and 3-septate ascospores distinguishes the present new species from the rest of the *Asteridiella* species reported on the members of the family Flacourtiaceae.


Colonies gregarious to confluent, up to 3 mm in diameter. Hyphae 6-8 μm wide. Hyphopodia alternate to unilateral, 20-28 μm long; stalk cells cylindrical to cuneate, 5-12 μm long; head cells clavulate to irregularly ovoid to angular, 16-20 x 12-16 μm. Phialides intermixed with hyphopodia, mostly opposite, 20-24 x 7-9 μm. Perithecia up to 280 μm in diam.; perithecial cells conoid, up to 40 μm long; ascospores ellipsoidal, 4-septate, slightly
constricted at the septa, 48-50 x 20-22 μm.

On leaves of Sapindaceae member, Brazil, Dec. 4, 1977, Dumort et al. BR 899, NY.


Colonies amphigenous, mostly epiphyllous, dense, scattered, up to 10 μm in diameter, rarely confluent and cause stretching of the surrounding, leaf surface with a yellow halo surrounding the spots. Hyphae strongly appressed to the leaf surface, not easily separable, tortuous, branching alternate to opposite at wide angles, strongly reticulate, cells 18-38 x 6-8 μm. Hyphopodia alternate to unilateral, straight to curved, antrorse to spreading, 22-30 μm long; stalk cells cylindrical to cuneate, 8-16 μm long; head cells globose, angulose, entire to sublobate, 14-16 x 12-16 μm. Phialides few, mixed with hyphopodia, opposite to alternate, ampulliform, 20-22 x 8-10 μm. Perithecia mostly aggregated, up to 245 μm in diam.; perithecial surface cells irregularly protruded, 30-36 μm long; ascospores ellipsoidal, 4-septate, straight to slightly curved, 36-42 x 14-18 μm.


Colonies amphigenous, mostly epiphyllous, thin, up to 5 mm in diameter, confluent. Hyphae substraight to undulate, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 16-28 x 6-8 μm. Hyphopodia alternate, antrorse, straight, 16-26 μm long; stalk cells cylindrical to cuneate, 5-8 μm long; head cells globose to ovate, entire, 16-19 x 13-16 μm. Phialides mixed with capitate hyphopodia, opposite to alternate, ampulliform, 16-19 x 7-10 μm. Perithecia scattered, globose, up to 154 μm in diam.; peridial cells obtusely conoid, up to 13 μm long; ascospores ellipsoidal, 4-septate, constricted at the septa, 40-46 x 16-19 μm.
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On leaves of *Cratoxylon ligustrinum* (Hypericaceae), Zhanxian, Hainan Province, China, June 18, 1984, Hu Yan-xing GDIM 84059.


Colonies hypophyllous, dense, up to 5 mm in diameter. Hyphae substraight to undulate, branching opposite at wide angles, loosely to closely reticulate and form a solid mass of mycelia, cells 18-24 x 6-8 μm. Hyphopodia alternate and unilateral, spreading, antorse to recurved, 22-26 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells ovate, entire to imperfectly lobate, 16-20 x 12-18 μm. Phialides few, mixed with hyphopodia, opposite to alternate, ampulliform, 16-18 x 6-8 μm. Perithecia scattered, up to 196 μm in diam.; perithecial cells conoid, 20-26 μm long; ascospores ellipsoidal, 4-septate, constricted, straight to slightly curved, 44-48 x 16-20 μm.


Colonies amphigenous, minute, dense, velvety, up to 2 mm in diameter. Hyphae flexuous, branching alternate at acute angles, loosely reticulate, cells 24-28 x 5-7 μm. Hyphopodia alternate, straight, antorse, 15-22 μm long; stalk cells cuneate, 6-9.5 μm long; head cells ovate, globose, 9-12.5 x 10-12 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15-18.5 x 6-8 μm. Perithecia scattered to loosely grouped, up to 170 μm in diam.; perithecial cells conoid to mammiform, up to 10 μm long; ascospores obovoidal, 4-septate, 31-34 x 13-15.5 μm.

On *Didymocarpus humboltianus* (Gesneriaceae), Erattiar, Seithur Hills, Kamarajar dist., Tamil Nadu, India, Oct. 13, 1992, V.B. Hosagoudar HCIO 40747.


Colonies hypophyllous, dense, crustose, up to 5 mm in
diameter, rarely confluent. Hyphae straight to substraight, branching alternate to opposite at acute angles, loosely to closely reticulate, cells 24-28 x 6-8 μm. Hyphopodia alternate, straight to curved, antrorse to recurved, 21-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells globose, stellately and irregularly sublobate to lobate, 15-18.5 x 12-18.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-22 x 6-8 μm. Perithecia scattered, widely opened at maturity, up to 120 μm; protruding cells not distinct; ascospores obovoidal, 4-septate, slightly constricted, 42-45 x 18-28 μm

On leaves of *Ehretia canarensis* (Boraginaceae), Gerusoppa, Uttara Kannada, Karnataka, India, May 23, 1992, P.A. Raghu HCIO 40748.


Colonies epiphyllous, subdense, up to 2 mm in diameter, confluent. Hyphae substraight to undulate, branching opposite at wide angles, loosely reticulate, cells 31-36 x 4-6.5 μm. Hyphopodia alternate, straight to curved, antrorse, 18-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells globose, ovate, truncate at the apex, entire, 16-18.5 x 12-15.5 μm. Phialides borne on a separate mycelial branch, mostly opposite, ampulliform, 18-25 x 6-9.5 μm. Perithecia scattered, seated on exhyphopodiate mycelia, globose, up to 124 μm in diam.; perithecial cells conoid, curved, acute at the apex, up to 15 μm long; ascospores obovoidal, 4-septate, slightly constricted at the septa, 40-46.5 x 15-18.5 μm.

On leaves of *Elaeocarpus tuberculatus* (Elaeocarpaceae), Nilgiris, Tamil Nadu, India, Jan. 29, 1990, V.B. Hosagoudar HCIO 30357.

45. *Asteridiella eucleae* Hansf. var. *microspora* V.B. Hosagoudar et P.A. Raghu, var. nov.

Differt a var. *eucleae hyphopodiis capitatis et ascosporis brevioribus.*

Colonies amphigenous, mostly hypophyllous, dense, crustose, up to 5 mm in diameter, rarely confluent. Hyphae substraight to
flexuous, branching opposite at acute to wide angles, loosely to closely reticulate, cells 24-31 x 6-8 µm. Hyphopodia opposite, solitary to alternate, straight to rarely curved, 12-22 µm long; stalk cells cylindrical to cuneate, 3-5 µm long; head cells cylindrical, entire to angular, rounded to truncate at the apex, 9-17 x 9-12.5 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, neck elongated, 24-28 x 9-12.5 µm. Perithecia scattered, up to 155 µm in diam.; perithecial cells conoid, straight to curved, 9-15 µm long; ascospores obovoidal, 4-septate, slightly constricted at the septa, 40-43.5 x 15-18.5 µm.


This collection is close to Asteridiella eucleae Hansf. in having alternate and opposite hyphopodia but the new variety differs from var. euclea in having smaller capitate hyphopodia and ascospores.


Colonies mostly epiphyllous, rarely hypophyllous, up to 3 mm in diameter, confluent. Hyphae straight to flexuous, branching at acute to wide angles, loosely reticulate, cells 16-46 x 7-8 µm. Hyphopodia alternate to spreading, 14-23 µm long; stalk cells cylindrical to cuneate, 2-7 µm long; head cells oblong to clavate, angular to sublobate, 12-16 x 8-10 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 10-24 x 7-8 µm. Perithecia scattered, up to 240 µm in diam.; perithecial cells conoid, up to 24 µm long; ascospores oblong to ellipsoid, 4-septate, slightly constricted at the septa, 32-34 x 13-15 µm.

On leaves of Euphorbiaceae member, Brazil, Dec. 4, 1977, Dumont et al. BR - 897, NY.

47. Asteridiella grewiae C.R. Patil et V.B. Hosagoudar, sp. nov.

Coloniae epiphyllae, densae, ad 2 mm diam. Hyphae anfractuae, irregulariter acutaeque vel laxe ramosae, laxe vel dense reticulatae, cellulae 27-31 x 6-8 µm. Hyphopodia alternata, recta vel curvula, antrorsa vel retrorsa, 15-25 um longa; cellula basali
cylindracea vel cuneata, 3-9.5 μm longa; cellula apicali ovata, globosa, integra, angularia vel sublobata, 12-15.5 x 12-14 μm. Phialides illis capitatis commixa vel opposita, ampullacea, 18-25 x 6-8 μm. Perithecia dispersa, positus in exhyphopodialis mycelialis; cellulae peritheciales indistinctae; ascosporae obovoideae vel cylindracea, 4-septatae, constrictae, 40-44 x 15-18.5 μm.


This species is distinct from the other Asteridiella species reported on the members of Tiliaceae in having crooked mycelia, indistinct perithecial cells and smaller ascospores.


Colonies amphigenous, subdense, subvelvety, up to 5 mm in diameter. Hyphae flexuous, branching opposite to irregular at acute to wide angles, cells 30-40 x 8-10 μm. Hyphopodia alternate, antrorse, spreading, 20-37 μm long; stalk cells cylindrical to cuneate, 5-8 μm long; head cells clavate to pyriform, entire to angular, 15-20 x 12-15 μm. Phialides mixed with hyphopodia, mostly opposite, conoid to ampulliform, 15-22 x 7-8 μm. Perithecia scattered, globose, up to 110 μm in diam.; peridial cells conoid to mammiform, up to 28 μm long; ascospores cylindrical, oblong, 4-septate, constricted at the septa, 43-48 x 18-20 μm.

On leaves of Kadsura coccinea (Schisandraceae), Guangdong, China, Aug. 18, 1985, Legit Hu Hai & Yang Jia-Cheng RNYANG 018.

49. Asteridiella kapoorii V.B. Hosagoudar et P.A. Raghu, sp. nov.

Coloniae amphigenae, subdensae, patentiae, ad 8 mm diam. Hyphae rectae, alternate vel irregulariter laxae ramosae, laxae reticulatae, cellulae 31-37 x 6-8 μm. Hyphopodia opposita (60%) vel alternata, raro solitaria, recta vel curvula, antrorsa, subantrorsa vel retrorsa, 15-25 μm longa; cellula basali cylindracea vel cuneata, 3-6.5 μm longa; cellula apicali recta vel curvula, oblonga, cylindracea vel plerumque conoidae, integra, 12-18.5 x 9-
12.5 μm. Phialides illis hyphopodiis commixtis, alternatis vel oppositis, ampulliformis, 21-25 x 9-12.5 μm. Perithecia dispersa, plerumque immatura, ad 135 μm diam.; cellulae perdiales mammiformae, 8-10 μm longae; ascosporae obovoidae, 4-septatae, constrictae ad septae, 40-46.5 x 18-22 μm.

On leaves of Diospyros sp. (Ebenaceae), Kudremukh, Chikmagalur, Karnataka, India, Feb. 1, 1993, P.A. Raghu HCIO 4111 (type).

Asteridiella diospyricola (Hansf. & Deight.) Hansf. and A. eucleae Hansf. are known on the members of the family Ebenaceae. The present new species is close to A. eucleae Hansf. in having alternate and opposite capitate hyphopodia but differs from it in having predominantly opposite and conoid head cells of the capitate hyphopodia and smaller ascospores.


Colonies epiphyllous, up to 3 mm in diameter. Hyphae straight to sinuous, branching opposite or irregularly alternate at acute to wide angles, loosely to closely reticulate, cells 22-48 x 7-9 μm. Hyphopodia alternate, mostly antrorse, straight to irregularly curved, 32-65 μm long; stalk cells cylindrical to cuneate, 18-43 μm long; head cells deeply and irregularly lobate, 18-36 x 16-29 μm. Phialides ampulliform, 20-36 x 8-10.5 μm. Perithecia scattered, up to 185 μm in diam.; perithecial cells mamillate, obtuse or conoid at the tip; ascospores ellipsoidal, 3-septate, constricted, 72-79 x 25-28 μm.


Colonies epiphyllous, dense, crustose to velvety, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching mostly opposite at acute angles, very closely reticulate and form solid mycelial mat, cells 9-12.5 x 6-9.5 μm. Hyphopodia alternate, antrorse, 15-22 μm long; stalk cells cuneate, 2-6.5 μm long; head
cells ovate to globose, entire, angular to sublobate, 13-15.5 x 9-12.5 μm. Phialides mixed with hyphopodia, alternate, ampulliform, 18-22 x 6-9.5 μm. Perithecia grouped at the centre of the colonies, up to 220 μm in diam.; perithecial cells mammiform, straight to curved at the apex, up to 25 μm long; ascospores obovoidal, 4-septate, strongly constricted at the septa, 37-40.5 x 15-18.5 μm.


Colonies amphigenous, mostly epiphyllous, crustose, up to 7 mm in diameter. Hyphae regularly oppositely branched at acute angles, cells 22-28 x 6-9.5 μm. Hyphopodia alternate, antrorse to subantrorse, 19-22 μm long; stalk cells cylindrical, 6-6.5 μm long; head cells pyriform, entire, 12-16 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite, ampulliform, 15-25 x 6-7 μm. Perithecia scattered, verrucose, up to 285 μm in diameter; peridial cells conoid to mammiform, up to 10 μm long; ascospores ellipsoidal, straight to curved, 3-septate, constricted at the septa, 47-53.5 x 16-22 μm.

On leaves of Lyonia calycosa (Asclepiadaceae), Cuba, May 30, 1971 Kr. 2355.


Colonies epiphyllous, thin, indistinct, up to 2 mm in diameter. Hyphae tortuous, branching opposite to alternate, loosely reticulate, cells 38-44 x 6-8 μm. Hyphopodia alternate, straight to curved, spreading, mostly antrorse, 20-28 μm long; stalk cells cylindrical to cuneate, 8-12 μm long; head cells globose, ovate, entire, rarely slightly angulose, 12-16 x 6-10 μm. Perithecia scattered, up to 180 μm in diam.; perithecial cells conoid, up to 14 μm long; ascospores ellipsoidal, 4-septate, constricted, 38-40 x 16-18 μm.

54. *Asteridiella mastixiae* V.B. Hosagoudar et P.A. Raghu, sp. nov.

Coloniae amphigenae, densae, crustosae, ad 2 mm diam., raro confluentes. Hyphae subrectae, irregulariter acutaeque vel laxae ramosae, laxae vel dense reticulatae, cellulae 30-46.5 x 8-9.5 μm. Hyphopodia alternata vel unilateralia, antrorsa vel subantrorsa, 27-34 μm longa; cellula basali cylindracea vel cuneata, 9-15.5 μm longa; cellula apicali ovata, globosa, integra vel sublobata, 15-25 x 15-22 μm. Phialides illis hypopodiis commixa, alternata vel opposita,conoidea vel ampullacea, 24-31 x 6-9.5 μm. Perithecia dispersa, ad 280 μm diam.; cellulae peritheciales cylindraceae, conoideae, rectae, ad 20 μm longae; ascosporae plerumque curvulae, 4-septatae, leniter constrictae ad septae, 40-46.5 x 15-18.5 μm.

On leaves of *Mastixia arborea* (Cornaceae), Kudremukh, Chikmagalur, Karnataka, India, Feb. 1, 1993, P.A. Raghu HCIO 41112 (type).

The new species differs from *Asteridiella aucubae* (Henn.) Hansf. in having substraight mycelium, straight peridial cells and smaller ascospores.


Colonies amphigenous, black, thin, up to 3 mm in diameter. Hyphae subsinuoso, branching opposite to irregular at wide angles, loosely reticulate, cells 16-26 x 7-9 μm. Hyphopodia alternate, slightly antrorse, 20-25 μm long; stalk cells cylindrical to cuneate, 5-7.5 μm long; head cells ovate, cylindrical, rounded, straight to curved, 13-18 x 10-13 μm. Phialides mixed with hyphopodia, ampulliform, 15-26 x 3-9 μm. Perithecia scattered, globose, up to 275 μm in diam.; perithecial cells conoid, up to 36 μm long; ascospores cylindrical, 4-septate, constricted at the septa, 45-51.5 x 18-21 μm.

On leaves of *Melaleuca gridioidis* (Myrtaceae), New Caledonia, Oct. 27, 1966, NC 66168.


Colonies epiphyllous, subdense to dense, up to 3 mm in diameter, rarely confluent. Hyphae straight to crooked, branching
mostly opposite at acute angles, loosely to closely reticulate, cells 27-37 x 7-9.5 µm. Hyphopodia alternate, straight to curved, mostly antrorse, 24-34 µm long; stalk cells cylindrical to cuneate, 9-15.5 µm long; head cells globose, mostly irregularly sublobate, 15-18.5 x 15-22 µm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 21-25 x 9-12.5 µm. Perithecia scattered to grouped, up to 247 µm in diam.; perithecial cells projected, conoid, up to 43 µm long; ascospores obovoidal, straight to curved, 4-septate, constricted at the septa, 45-53 x 15-22 µm.

On leaves of Meliosma simplicifolia (Sabiaceae), Jalpaiguri, West Bengal, India, Nov. 7, 1967, IMI 133538.


Colonies caulicolous, orbicular to irregular, up to 6 mm in diameter. Hyphae septate, reticulate, 10-40 x 6-8 µm broad. Hyphopodia alternate to unilateral, 20-35 µm long; stalk cells cylindrical, 3-15 µm long; head cells irregularly lobate, 15-30 x 9-22 µm. Phialides not seen. Perithecia grouped at centre, globose, verrucose, up to 325 µm in diam.; ascospores, 3-septate, straight to slightly curved; subcylindrical, 40-58 x 15-20 µm.


Colonies amphigenous, mostly epiphyllous, up to 5 mm in diameter. Hyphae straight to undulate, branching opposite at acute angles, loosely to closely reticulate, cells 21-28 x 6-8 µm. Hyphopodia alternate, straight to slightly curved, subantrorse to antrorse, 15-22 µm long; stalk cells cylindrical to cuneate, 3-6 µm long; head cells ovate, versiform, entire, 12-15.5 x 9-12.5 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 20-28 x 5-8 µm. Perithecia scattered, up to 343 µm in diam.; perithecial cells conoid, up to 70 µm long; ascospores obovoidal, 4-septate, constricted at the septa, 43-48.5 x 20-25 µm.
On leaves of *Syzygium claviflora* (Myrtaceae), Jalpaiguri, West Bengal, India, Nov. 7, 1967, IMI 133537.

Colonies epiphyllous; dense, scattered, up to 2 mm in diameter. Hyphae straight, branching opposite at acute to wide angles, loosely to closely reticulate, cells 9-13 μm long. Hyphopodia alternate, straight to curved, antrorse to spreading, 18-22 μm long; stalk cells cylindrical to cuneate, 4-6.5 μm long; head cells globose to ovate, entire, rarely angular, 13-16.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 19-26.5 μm. Perithecia scattered, up to 152 μm in diam.; perithecial cells conoid, up to 36.5 μm long; ascospores cylindrical, 4-septate, constricted at the septa, 39.5-43 x 13-20 μm.

On leaves of *Pentapterygium serpens* (Ericaceae), Darjeeling, West Bengal, India, May 12, 1967, IMI 133534.

Colonies amphigenous, mostly hypophyllous, loosely scattered, mostly solitary, 1-3 mm in diameter, dense to subdense. Hyphae slightly undulate, branching opposite, reticulate, cells 5-7 μm broad. Hyphopodia numerous, alternate, rarely opposite, antrorse to slightly spreading, rarely irregular, 15-20 μm long; stalk cells cylindrical, 3-4.5 μm long; head cells obtusely angular to rarely 2-5 indistinctly lobate. Phialides opposite, rarely alternate, ampulliform, 16-20 x 4-6.5 μm. Perithecia scattered, globose, up to 150 μm in diameter; perithecial cells irregularly angulose, hemispherical, up to 20 μm long; ascospores oblong to ellipsoidal, rarely cylindrical, 4-septate, slightly constricted, 30-36 x 14-17 (-12-13) μm.

On leaves of Acanthaceae member, Luzon, Philippines, 1923, M.S. Clemens Nr. 4569.

61. *Asteridiella pygei* Hansf. var. *microspora* var. nov.
Differt a var. *pygei* ascosporis brevioribus.
On Rubus sp. (Rosaceae), Senghila, Sikkim, India, April 14,
1962, J.N. Kapoor HCIO 28365 (type) (p.p.).

Curved ascospores, entire to angular head cells of hyphopodia brings the present collection close to *Asteridiella pygei* Hansf. However, the new variety differs from the var. *pygei* in having smaller ascospores.

62. *Asteridiella resinosi* sp. nov.

Colonies hypophyllae, densae, crustosae, in maculae brunneae, ad 5 mm diam., raro confluentes. Hyphae anfractuae, opposite vel irregulariter laxe ramosae, laxe vel dense reticulatae, cellulae 27-31 x 6-9.5 μm. Hyphopodia alternata, ad 3% opposita, varie curvata, 18-31 μm longa; cellula basali cylindricea vel cuneata, recta vel raro anfractua, 6-12.5 μm longa; cellula apicali ovata, globosa, integra, irregulariter sub-lobata, vel lobata, truncata and apicem, 12-18.5 x 15-22 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 15-22 x 6-8 μm. Perithecia dispersa, ad 217 μm diam.; cellulae peritheciales conoideae, hamatae, ad 18 μm longae; ascosporae cylindraceae, rectae vel curvulae, 4-septatae, leniter constrictae, 52-59 x 12-15.5 μm.


Hypophyllous colonies on leaf spots; 3% opposite, irregularly curved and entire to irregularly sublobate to lobate head cells of the hyphopodia warants its placement under a new species.


Colonies epiphyllous, crustose, surrounded by yellow haloes, up to 5 mm in diameter, confluent. Hyphae straight, branching opposite at acute angles, cells 14-20 x 9-10 μm. Hyphopodia alternate, antrorse, 24-26 μm long; stalk cells cylindrical, 6-10 μm long; head cells clavate, rounded to subangulose at the apex, 15-19 x 15.5-16 μm. Phialides borne on a separate mycelial branch, opposite, ampulliform, 12-16 μm long. Perithecia scattered to grouped at the centre, globose, verrucose, up to 125 μm in diam.; peridial cells prostrate, rounded; ascospores ellipsoidal, 4-
septate, constricted at the septa, 47-60 x 19-26 μm.


Colonies amphigenous, up to 1 mm in diameter. Hyphae undulate, branching opposite, cells 13-24 x 4-6 μm. Hyphopodia alternate, 14-25 μm long; stalk cells cylindrical, 2-7.5 μm long; head cells clavate, entire to sublobate, 12-14 x 4.5-12 μm. Phialides mixed with hyphopodia, scattered, mixed with hyphopodia, ampulliform, 14-18 x 4-6.5 μm. Perithecia closely scattered, up to 176 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 36-38 x 14-15 μm.

On leaves of Rondelettia sp. (Rubiaceae), Monte Alegrillo, Puerto Rico, Nov. 14, 1913, F.L. Stevens IMUR 13391.


Colonies amphigenous, dense, crustose, up to 3 mm in diameter. Hyphae straight to substraight, branching alternate to opposite at acute angles, closely reticulate, cells 12-22 x 6-9.5 μm. Hyphopodia alternate, straight to variously curved, antorose, 21-31 μm long; stalk cells cylindrical to cuneate, 6-15.5 μm long; head cells ovate, globose, mostly sublobate, rarely entire to angular, 15-18.5 x 12-15.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-21.5 x 6-7 μm. Perithecia scattered, up to 124 μm in diam; perithecial cells conoid to mammiform, straight to curved, up to 25 μm long; ascospores obovoidal, 4-septate, slightly constricted, 40-43.5 x 18-22 μm.

On leaves of Stereospermum colais (Bignoniaceae), Gersoppa, Uttara Kannada, Karnataka, India, May 24, 1992, P.A. Raghu HCIO 40749.

66. Asteridiella scolopiae sp. nov.

Coloniae amphigenae, densae, ad 3 mm diam., dispersae, raro
confluentes. Hyphae rectae vel subrectae, plerumque opposite acuteque ramosae, laxe vel dense reticulatae, cellulae 12-15.5 x 5-7 μm. Hyphopodia alternata, ad 1% opposita in coloniae laxe reticulatae et ad 5% opposita in coloniae dense reticulatae, antrorsa, 15-18 μm longa; cellula basali cuneata, 3-12.5 μm longa; cellula apicali globosa, ovata, oblonga, plerumque integra, raro angulosa, 12-15.5 x 9-12.5 μm. Phialides illis capitatis commixta, opposita vel alternata, ampullacea, 15-18.5 x 5-7 μm. Perithecia dispersa, ad 186 μm diam.; cellulae peritheciales mammiformiae, rectae vel curvulae, ad 22 μm longae; ascosporae obovoideae, 4-septatae, fortiter constrictae, 43-47 x 17-19 μm.

On Scolopia crenata (Flacouriaceae), Kakachi Forest, Tirunelveli, Tamil Nadu, Feb. 21, 1994, V.B. Hosagoudar HCIO (type).

This species is close to Asteridiella deightonii Hansf. in having few opposite hyphopodia but differs from it in having substraight hyphae, entire to angular head cells of hyphopodia and smaller ascospores.


Colonies amphigenous, dense, confluent. Hyphae undulate, reticulate, cells 18-30 x 5-10.5 μm. Hyphopodia alternate, 18.5-25 μm long; stalk cells cylindrical, 8-9.5 μm long; head cells ovoid to subangulose, 10-15.5 x 13-18.5 μm. Phialides not seen. Perithecia scattered, up to 350 μm in diam.; ascospores cylindrical, 3-septate, constricted at the septa, 52-59 x 20-23 μm.

On leaves of Austrotaxis spicata (Taxaceae), New Caledonia, Sept. 19, 1966, Schmid No. 1423.


Colonies amphigenous, dense, confluent. Hyphae sinuous, branching alternate to unilateral, 6-8 μm wide. Hyphopodia alternate to unilateral, 20-30 μm long; stalk cells cylindrical to cuneate, 8-14 μm long; head cells irregularly subglobose, stellately lobed, rarely subentire, 12-18 μm in diameter. Phialides not seen. Perithecia globose, up to 370 μm in diam.; perithecial
cells up to 30 μm long; ascospores ellipsoid, straight to curved, 3-septate, slightly constricted at the septa, 37-48 x 14-20 μm.

On leaves of Selaginella pilfera var. pringlei (Selaginellaceae), Mexico, Feb. 26, 1946, Johnson & Barkley TEX 15141.


Colonies amphigenous, subdense, up to 6 mm in diameter, confluent. Hyphae straight, cells 20-32.5 x 8-10 μm. Hyphopodia alternate, straight, antrorse to spreading, 27-35 μm long; stalk cells cylindrical, 8-10 μm long; head cells broadly ellipsoidal to ovoid, entire to angular to sublobate, 16-26 x 13-20 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform to conoid, 17-22.5 x 6-8.5 μm. Perithecia scattered, up to 280 μm in diam.; peridial cells obtusely conoid, up to 45 μm long; ascospores broadly ellipsoidal, 4-septate, constricted at the septa, 57-70 x 25-31.5 μm.


Colonies amphigenous; dense, scattered, up to 2 mm in diameter, confluent. Hyphae straight to undulate, branching opposite, closely reticulate, cells 6-10 μm wide. Hyphopodia alternate, rarely opposite, mostly antrorse, straight, rarely curved, 21-30 μm long; stalk cells cylindrical to cuneate, 6-13 μm long; head cells ovoidal, ellipsoidal, cylindrical to subglobose, entire to lobate, 12-20 x 10-13 μm. Phialides few, mostly opposite, ampulliform, 16-21 x 6-9 μm. Perithecia loosely to closely scattered, globose, up to 220 μm in diam.; peridial cells conoid, up to 20 μm long; ascospores oblong to ellipsoidal, straight, 4-septate, constricted at the septa, 38-44 x 14-17 (-12-13) μm.

On leaves of Plectronia inonstrosa (Rubiaceae), Philippines, Nov. 1923, M. Clemens Nr. 2621.

Colonies amphigenous, mostly epiphyllous, subdense, up to 3 mm in diameter, confluent. Hyphae straight to undulate, branching opposite, loosely reticulate, 5-7 μm wide. Hyphopodia alternate, rarely opposite, antrorse to spreading, straight to curved, 22-33 μm long; stalk cells cylindrical to cuneate, 5-16 μm long; head cells ovoid, broadly ellipsoidal to subglobose, slightly angular to 2-4 lobate, 14-21 x 13-20 μm. Phialides few, alternate to opposite, ampulliform to conoid, 14-22 x 5-6.5 μm. Perithecia scattered, globose, up to 170 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, slightly constricted at the septa, 38-43 x 15-18 (13-14) μm.

On leaves of *Tetrastigma harmandii* (Vitaceae), Philippines, Dec. 1924, M.S. Clemens.


Colonies epiphyllous, subdense to dense, up to 4 mm in diameter, confluent. Hyphae flexuous to crooked, branching alternate to irregular at acute angles, very closely reticulate, cells 15.5-18.5 x 4-6.5 μm. Hyphopodia alternate to unilateral, straight to mostly curved, antrorse to spreading, 16-31 μm long; stalk cells cylindrical to cuneate, 3-12.5 μm long; head cells ovate, globose, entire to angulose, 15-18.5 x 12-15.5 μm; few hyphopodia 46-50 μm long and stalk cells 1-septate, 15-18.5 μm long. Phialides few, mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 15-31 x 6-12.5 μm. Perithecia scattered, up to 250 μm in diam.; perithecial cells conoid to mammiform, up to 22 μm long; ascospores obovoidal, 4-septate, slightly curved, 31-37 x 12.5-18.5 μm.

On leaves of *Clerodendrum viscosum* (Verbenaceae), Anamalai, Tamil Nadu, India, Jan. 17, 1987, V.B. Hosagoudar HCIO


Colonies epiphyllous, dense, crustose, up to 4 mm in diameter,
confluent. Hyphae straight, substraight to slightly crooked, branching opposite to irregular at wide angles, loosely to closely reticulate, cells 27-31 x 4.5-6.5 μm. Hyphopodia alternate, mostly antrorse, rarely recurved, 15-22 μm long; stalk cells cylindrical to cuneate, 3-8 μm long; head cells ovoid, entire to rarely angular, straight to curved, 12-15.5 x 9-12.5 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 12-15.5 x 9-12.5 μm. Perithecia scattered, initially flattened, globose at maturity, up to 115 μm in diam.; perithecial cells conoid, up to 10 μm long; ascospores obovoidal, 4-septate, slightly constricted at the septa, 37-40.5 x 15-18.5 μm.

On leaves of Olea dioica (Oleaceae), Coimbatore, Tamil Nadu, India, March 24, 1990, V.B. Hosagoudar HCIO 30379.

Colonies epiphyllous, rarely hypophyllous, subdense, up to 2 mm in diameter, confluent. Hyphae undulate, branching-opposite, loosely to closely reticulate, cells 6-8 μm wide. Hyphopodia alternate, more or less antrorse, 14-23 μm long; stalk cells cylindrical to conical, 3-5 μm long; head cells ovoid, broadly ellipsoidal, rarely globose, entire to slightly sublobate, 11-15 x 10-14 μm. Phialides opposite to alternate, ampulliform, 16-20 x 5-6.5 μm. Perithecia loosely scattered, globose, up to 150 μm in diam.; peridial cells irregularly projected, up to 16 μm long; ascospores oblong to ellipsoidal, 4-septate; slightly constricted at the septa, 38-40 x 14-16 (12-13.5) μm.

On leaves of Wickstroemia meyeniana (Thymeleaceae), Philippines, Dec. 24-31, 1925, M.S. Clemens Nr. 7381.

IV. ENDOMELIOLA


Mycelium produced from the ascospores entire the mesophyll and
palaside tissues through stomata. Hyphae intercellular, produce 1-3 celled hyphopodia distinguished into stalk cells and apical cell. Emerging hyphae through stomata form stromata on the epidermis. Phialides produced on the superficial stromata or on the wall of ascomata. Ascomata produced on the superficial stromata, dark, subglobose, ostiolate, periphysate paraphyses hyaline, simple, non-septate; asci unitunicate, ellipsoidal, quadrisporous; ascospores ellipsoidal to subcylindrical, compressed, 4-septate, constricted at the septa.

**Type:** *E. dingleyae* Hughes & Pirozynski


Colonies hypophyllous, scattered, up to 5 mm in diameter, marginally greyish brown. Hyphae intercellular in the mesophyll tissues, substraight to crooked, branching irregular, cells 2-36 x 4-8 μm. Immersed hyphal branches end in a single hyphopodium; stalk cells 4-12 μm long; head cells ellipsoidal, subglobose, angular to lobed, 14-23 x 9=12.5 μm. Stromata formed superficially, bear ascomata and phialides. Phialides solitary or in groups, produced either on the stromata or on the wall of the ascomata, erect, straight to slightly curved, flask shaped, brown to dark brown, 14-19 x 7-9 μm. Phialides scanty, solitary, hyaline, ellipsoidal, 3.5-4.5 x 1-4 μm. Ascomata subglobose, seated on stromatic crust, black, verruculose, ostiolate, 260-330 μm high and up to 360 μm broad, perithecial cells protruded, ellipsoidal to conoid, 30-36 μm long, ostiole periphysate. Asci ellipsoidal, unitunicate, 4-spored, 72-108 x 30-35 μm, paraphysate, paraphyses lateral, hyaline, straight to curved, up to 165 μm long; ascospores broadly ellipsoidal to subcylindrical, 4-septate, slightly constricted at the septa, brown to dark-brown, 55-73 x 28-31.5 μm.

V. IRENOPSIS

Type: T. tortuosa (Wint.) Stev.


Colonies epiphyllous, rarely hypophyllous, up to 10 mm in diameter, rarely confluent. Hyphae sinuous, branching opposite at acute angles, closely reticulate, cells 21-32 x 6-8.5 μm. Hyphopodia alternate and opposite, 15-21.5 μm long. Phialides mixed with hyphopodia, opposite, ampulliform, 14-20 x 7-10 μm. Perithecia globose, up to 204 μm in diam.; perithecial setae straight, erect, simple, apex recurved, up to 127 μm long; ascospores ellipsoidal, 4-septate, constricted at the septa, 40-46 x 13-16 μm.

On leaves of Mimosa caesalpiniaefolia (Mimosaceae), Brazil, April 16, 1958, O. Soares IMUR 17264.


Colonies hypophyllous, subdense to dense, strongly appressed to the leaf, up to 4 mm in diameter, rarely confluent. Hyphae substraight to crooked, branching alternate to irregular at acute angles, closely reticulate, cells 24-31 x 6-9.5 μm. Hyphopodia closely to distantly placed, alternate, straight, curved to flexuous, antrorse to recurved, 18-46.5 μm long; stalk cells cylindrical to cuneate, straight to flexuous, 1-3 celled, 6-34 μm long; head cells ovate, globose, angular to sublobate to deeply lobate, 9-15.5 x 12-18.5 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 21-25 x 5-7 μm. Perithecia scattered, verrucose, up to 210 μm in diam.; perithecial setae 5-12, erect to prostrate, simple, straight, acute to obtuse at the tip, bulbous at the base, up to 110 μm long; ascospores oblong, obovate, 4-septate, 40-46.5 x 15-18.5 μm.

On leaves of Chukrasia tabularis (Meliaceae), North to Pachaiyar Estate, Seithur Hills, Kamarajar dist., Tamil Nadu, India, Sept. 9, 1992, V.B. Hosagoudar HCIO 40750.
78. Irenopsis coimbatorica V.B. Hosagoudar, C.M. Pillai & P.A. Raghu, sp. nov.

Coloniae epiphyllae, densae, ad 3 mm diam., confluentes. Hyphae rectae vel subrectae, opposite acuteque vel laxae ramosae, laxae reticulatae, cellulae 25-31 x 6-8 μm. Hyphopodia alternata, antrorsa, plerumque recta, 18-20 μm longa; cellula basali cylindracea vel cuneata, 3-6.5 μm longa; cellula apicali plerumque globosa, integra, 12-15.5 x 12-14 μm. Phialides illis capitatis commixta, dispersa, ampullacea, 18-22 x 7-9.5 μm. Setae myceliales paucae, dispersae, simplices, rectae vel leniter curvulae, acutae vel bi-dentatae ad apicem, ad 500 μm longae. Perithecia dispersa, verrucosa, ad 140 μm diam.; ascosporae cylindraceae, 4-septatae, constrictae, 40-43.5 x 15-18.5 μm.

On Quercus leucotrictiophora (Fagaceae), Dolighat, Ranikhet, Uttar Pradesh, India, Jan. 18, 1961, S.K. Bose HCIO 29121 (type).

This species can be compared with Meliola melanochaeta Sydow but differs from it in having epiphyllous colonies, straight hyphae, scattered and acute to bi-dentate and smaller mycelial setae and ascospores.


Colonies epiphyllous, thin, scattered, up to 3 mm in diameter, confluent. Hyphae substraight to undulate, branching alternate to opposite at wide angles, loosely reticulate, cells 30-34 x 6-8 μm. Hyphopodia alternate to unilateral, straight, antrorse to unilateral, straight, antrorse to spreading, 14-16 μm long; stalk cells cylindrical to cuneate, 4-5 μm long; head cells ovate, clavate, entire to slightly angular, 10-12 x 8-10 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 12-20 x 6-9 μm. Perithecia scattered, verrucose, up to 110 μm in diam.; perithecial setae 8-12, straight, simple, septate, olivaceous brown, acute to obtuse at the tip, up to 72 μm long and 6-8 μm broad; ascospores obovoidal, 4-septate, constricted, 32-38 x 10-14 μm.
On leaves of *Eriolaena quinquelocularis* (Sterculiaceae), Idukki, Kerala, India, Dec. 23, 1983, V.B. Hosagoudar HCIO 40487.


Colonies epiphyllous, dense, up to 2 mm in diameter. Hyphae tortuous, branching irregular at acute angles, closely to loosely reticulate, cells 24-40 x 6-9 μm. Hyphopodia alternate, straight to curved, antorose, subantorose to recurved, 18-29 μm long; stalk cells cylindrical to cuneate, 3-15.5 μm long; head cells ovate, globose, versiform, angular, truncate to slightly lobate, 12-15.5 x 15.5-19 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 40-46.5 x 12-15.5 μm. Perithecia scattered, globose, up to 175 μm in diam.; perithecial setae 4-10, straight to curved, obtuse at the apex, up to 120 μm long; ascospores obovoidal, 4-septate, constricted at the septa, 31-40.5 x 12-15.5 μm.

On leaves of *Helicteres isora* (Sterculiaceae), Nilgiris, Tamil Nadu, India, Jan. 24, 1990, V.B. Hosagoudar HCIO 30358.


Colonies hypophyllous, subdense to dense, scattered, up to 3 mm in diameter. Hyphae crooked, branching irregular at acute to wide angles, loosely reticulate, cells 24-37 x 6-9.5 μm. Hyphopodia alternate, distantly arranged, straight to variously curved, 15-18.5 μm long; stalk cells cuneate to cylindrical, 3-6.5 μm long; head cells ovate, entire to angular, 9.5-12.5 x 12.5-15.5 μm. Phialides few, mixed with hyphopodia, alternate, ampulliform, 18.5-25 x 9-12.5 μm. Perithecia mostly grouped, up to 233 μm in diam.; perithecial setae 10-15, straight, simple, septate, acute to obtuse at the tip, 108-140 x 6-9.5 μm; ascospores obovoidal, 4-septate, constricted, 40-43.5 x 18.5-22 μm.


Colonies epiphyllous, very thin, up to 3 mm in diameter. Hyphae straight to undulate, branching opposite to alternate at wide angles, loosely reticulate, cells 18-28 x 6-8 μm. Hyphopodia scattered, alternate to unilateral, closely antrorse, 18-24 μm long; stalk cells cuneate, 6-10 μm long; head cells ovoid, globose, entire to irregularly sublobate, 10-18 x 16-20 μm. Phialides numerous, mixed with hyphopodia, alternate to opposite, ampulliform, 16-22 x 8-10 μm. Perithecia scattered to grouped, verrucose, up to 150 μm in diam.; perithecial setae 3-8, straight to flexuous, spreading, dark at the base and paler towards the apex, tip obtuse, 84-150 x 8-10 μm; ascospores obovoidal, 4-septate, constricted, 30-36 x 12-16 μm.


Colonies hypophyllous, rarely amphigenous, black, up to 3 mm in diameter. Hyphae oppositely to unilaterally branched, head cells entire, 40-43 x 24-27 μm. Phialides mixed with hyphopodia, mostly opposite, 16-19 x 6-8 μm. Perithecia globose, up to 300 μm in diam.; perithecial setae morron black, 5-10 in number, 3-septate, straight, granulose, apex recurved to uncinate up to 145 μm long; ascospores cylindrical, 4-septate, constricted at the septa, 48-54 x 16-22 μm.

On leaves of *Eschweilera ovata* (Melianthaceae), Brazil, April 15, 1960, O.S. Silva, IMUR 19039.


Colonies epiphyllous, subdense, up to 3 mm in diameter, confluent. Hyphae flexuous to tortuous, branching alternate to
irregular at acute angles, loosely reticulate, cells 34-37 x 6-9.5 μm. Hyphopodia alternate, scattered, mostly antrorse, 15-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells globose, ovate, entire to slightly angulose, 9-15.5 x 12-15.5 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 18-28 x 6-9 μm. Perithecia scattered, verrucose, up to 140 μm in diam.; perithecial setae 4-10, straight to curved, dark, obtuse at apex, up to 110 μm long; ascospores obovoidal, mostly cylindrical, 4-septate, 37-40.5 x 15-18.5 μm.

On leaves of Kydia calycina (Malvaceae), Nilgiris, Tamil Nadu, India, Jan. 24, 1990, V.B. Hosagoudar HCIO 3059.

85. Irenopsis sawadai nom. nov.


Colonies epiphyllous, scattered to gregarious, effuse, orbicular, black, up to 4 mm in diameter, confluent. Hyphae opposite to alternately branched, 6-8 μm wide. Hyphopodia alternate, 11-20 μm long; stalk cells 2-7 μm long; head cells globose to ellipsoid, 9-13 x 10-13 μm. Phialides opposite to alternate, ampulliform, slightly curved, 13-19 x 8-11 μm. Perithecia globose, up to 195 μm in diam.; perithecial setae 2-5, simple, slightly curved, apex acute, up to 130 μm long; ascospores elongate-ellipsoid to oblong, 4-septate, slightly constricted at the septa, 34-37 x 12-14 μm.

On leaves of Sida javensis (Malvaceae), Tainan, Taiwan, China, Jan. 6, 1908 sk.

86. Irenopsis tenuissima (Stev.) Stev. var. major Kar & Maity,


Colonies epiphyllous, thin, up to 5 mm in diameter, confluent. Hyphae mostly straight, branching opposite at wide angles, loosely to closely reticulate, cells 37-40.5 x 6-8 μm. Hyphopodia alternate, straight, subantrorse, 15-18.5 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, globose, entire, straight to rarely curved, 9-12.5 x 12-15.5 μm. Phialides
mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 12-15.5 x 7-9.5 \( \mu m \). Perithecia scattered, up to 300 \( \mu m \) in diam.; perithecial setae straight, flexuous at the apical portion, simple, septate, obtuse at the tip, up to 165 \( \mu m \) long; ascospores obovoidal, 4-septate, constricted at the septa, 40-46.5 x 15-18.5 \( \mu m \).

On leaves of Gouania leptostachya (Rhamnaceae), Jalpaiguri, West Bengal, India, Nov. 1, 1967, IMI 133539.


(vitexifolii)

Colonies hypophyllous, up to 15 mm in diameter. Hyphae undulate, branching at acute wide angles, cells 15-27 x 6-12 \( \mu m \). Hyphopodia unilateral to alternate, 2-celled, 22-87 x 16-22 \( \mu m \). Phialides opposite to unilateral, 15-23 x 8-11 \( \mu m \). Perithecia scattered, up to 290 \( \mu m \) in diam.; perithecial setae simple, septate, straight, obtuse to curved at the tip, up to 150 \( \mu m \) long; ascospores cylindrical, 4-septate, constricted at the septa, 51-60 x 21-27 \( \mu m \).

On leaves of Vitex sp. (Verbenaceae), Puerto Rico, Sept. 20, 1903, F.L. Stevens IMUR 13304.


Colonies epiphyllous, dense, crustose, up to 3 mm in diameter. Hyphae straight, substraight to slightly crooked, branching mostly opposite at acute to wide angles, loosely to closely reticulate, cells 18-25 x 6-9.5 \( \mu m \). Hyphopodia alternate, antrorse to subantrorse, straight to curved, 21-31 \( \mu m \) long; stalk cells cylindrical to cuneate, 6-12.5 \( \mu m \) long; head cells globose, ovate, entire to irregularly sublobate, 15-18.5 x 14-18 \( \mu m \). Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15-21 x 9-12.5 \( \mu m \). Perithecia scattered, globose, up to 155 \( \mu m \) in diam.; perithecial setae 10-12, straight, black, slightly flexuous at the apical portion, obtuse at the tip, up to 155 \( \mu m \) long; perithecial
cells protruding, conoid, up to 12 μm long; ascospores obovoidal, 4-septate, slightly constricted at the septa, 34-43.5 x 12-18.5 μm.

On leaves of *Xanthophyllum flavescens* (Xanthophyllaceae), Coimbatore, Tamil Nadu, India, Dec. 28, 1990, V.B. Hosagoudar HCIO 30526.

VI. MELIOLA


*Lectotype*: *M. trichostroma* (Kunze) Toro

Cifferi (1954) divided the genus *Meliola* into several subgenera. They are validly not published. Batista & Maia (1960) and Bataista *et al.* (1962) gave them generic status. They are not applicable in practice.


Colonies amphigenous, mostly hypophyllous, dense, subvelvety, up to 3 mm in diameter, confluent. Hyphae straight to undulate, branching opposite, 9-10 μm wide. Hyphopodia alternate and rarely opposite, 22-33 μm long; stalk cells cylindrical, 5-12 μm long; head cells cylindrical to pyriform, mostly curved, rarely straight, entire, angular to rarely 1-lobate, 20-26 x 10-14 μm. Phialides opposite, conoid to subampulliform, 15-20 x 7-10 μm. Mycelial setae straight to subarculate, obtuse to 2-4, to 1-2 times dichotomously furcate at the apex, up to 350 μm long, branches and branchlets up to 23 μm long, branchlets divergent. Perithecia scattered, verrucose, up to 230 μm in diam.; peridial cells protruded; ascospores oblong to ellipsoidal, 4-septate, constricted at the septa, 40-50 x 20-24 (14-17) μm.

On leaves of *Semecarpus* (? *philippinensis*) (Anacardiaceae), Philippines, Feb. 1923, M.S. Clemens Nr. 68.

90. *Meliola acunae* Schmiedeknecht, Beitrage zur Phytotaxonomie 38: 192, 1969 (*acunai*).

Colonies epiphyllous, crustose to subvelvety, up to 7 mm in diameter, confluent. Hyphae straight to sinuous, branching opposite at acute angles, closely reticulate, cells 30-38 x 9-11 μm.
Hyphopodia alternate, straight, antrorse, 25-28.5 µm long; stalk cells cylindrical, 9-10 µm long; head cells broadly clavate, apex rounded to subconical, 14-18.5 x 15-16 µm. Phialides borne on separate mycelial branch, opposite, ampulliform, up to 22 µm long. Mycelial setae grouped around perithecia, straight, arcuate, unicinate, acute to obtuse at the tip, up to 800 µm in diam.; ascospores broadly elliptical, 4-septate, constricted at the septa, 45-57 x 20-26 µm.


Colonies epiphyllous, thin, confluent. Hyphae sinuous, branching at acute angles, loosely reticulate, cells 6-7.5 µm wide. Hyphopodia alternate and rarely opposite, straight to curved, 12-15 µm long, 9-12 µm wide. Phialides mixed with hyphopodia, opposite, ampulliform, 15-24 x 7-9 µm. Mycelial setae scattered to grouped around perithecia, straight, simple, torulose near the apex, up to 340 µm long. Perithecia scattered, up to 187 µm in diam.; ascospores obovoidal, 4-septate, constricted, 34-42 x 12-16.5 µm.

On leaves of *Cassia fistula* (Caesalpiniaceae), Pakhal Forest, Andhra Pradesh, India, Nov. 24, 1962, P.N. Rao OUB 181.


Colonies epiphyllous, thin to dense, up to 2 mm in diameter, confluent. Hyphae straight to flexuous, branching opposite to irregular at acute angles, loosely reticulate, cells 21-25 x 5-7 µm. Hyphopodia alternate, 10% opposite, straight to rarely curved, subantrorse, 15-17 µm long; stalk cells cylindrical to cuneate, 3-6.5 µm; head cells ovate, globose, 9-12.5 x 8-12 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15-18.5 x 9-12.5 µm. Mycelial setae grouped around perithecia, straight, simple, acute, up to 288 µm long. Perithecia scattered, verrucose, up to 124 µm in diam.; ascospores obovoidal
to slightly fusiform, 4-septate, slightly to deeply constricted, 31-34.5 x 9-12.5 \textmu m.


Colonies hypophyllous, very thin, up to 5 mm in diameter, confluent. Hyphae substraight to undulate, branching opposite to irregular at wide angles, loosely reticulate, cells 21-30 x 6-8 \textmu m. Hyphopodia alternate, rather distantly arranged, straight to curved, mostly antrorse, 15-22 \textmu m long; stalk cells cuneate, 9-12.5 \textmu m long; head cells ovate, pointed towards apex with broadly rounded ends, entire, 9-12.5 x 6-9.5 \textmu m. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 21-25 x 6-9 \textmu m. Mycelial setae grouped around perithecia, straight, simple, acute, up to 630 \textmu m long. Perithecia scattered, verrucose, up to 120 \textmu m in diam.; ascospores obovoidal, 4-septate, constricted, 37-40.5 x 15-18.5 \textmu m.


Colonies epiphyllous, densely thalloid with distinct margin, orbicular, velvety, up to 5 mm in diameter, confluent. Hyphae closely appressed to the host to form a radiating disk, cells 8-18 x 7-8 \textmu m. Hyphopodia alternate, closely antrorse and adhering to the hyphae, 24-35 \textmu m long; stalk cells cylindrical, 8-12 \textmu m long; head cells obovate, entire to lobed, 16-23 x 9-11 \textmu m. Phialides scattered, cylindrical to conical, 16-19 x 8-10 \textmu m. Mycelial setae numerous, curved, up to 450 \textmu m long, obtuse to subacute at the apex. Perithecia globose, verrucose, surface cells obtusely conoid, up to 400 \textmu m in diam.; ascospores brown, ellipsoid, slightly curved, 3-septate, constricted at the septa, 56-61 x 20-24 \textmu m.


Colonies amphigenous, mostly epiphyllous, dense, up to 6 mm in diameter. Hyphae undulate, closely reticulate, cells 17-25 x 7-10 µm. Hyphopodia alternate, straight to curved, antiorse to spreading, 20-32.5 µm long; stalk cells cylindrical, 4-6.5 µm long; head cells globose, subglobose to oblong, entire, 13-18.5 x 12-20 µm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 20-30 x 7-10 µm. Mycelial setae numerous, scattered, straight, obtuse at apex, up to 850 µm long. Perithecia scattered, verrucose, up to 360 µm in diam.; ascospores oblong-ellipsoid, 4-septate, constricted at the septa, 52-62.5 x 17-23.5 µm.


Colonies hypophyllous, scattered, subdense to dense, up to 3 mm in diam. Hyphae substraight, undulate to tortuous, branching opposite at wide angles, loosely reticulate, cells 31-40.5 x 6-9.5 µm. Hyphopodia alternate, unilateral, straight, antiorse to spreading, 18.5-25 µm long; stalk cells cylindrical to cuneate, 6-9.5 µm long; head cells ovate to globose, entire to angular, 12-15.5 µm. Phialides borne on a separate mycelial branch, alternate, ampulliform, 15.5-18.5 x 9-12 µm. Mycelial setae few, scattered, straight, simple, acute to obtuse at the tip, up to 430 µm long. Perithecia few, scattered, up to 155 µm in diam.; ascospores obovoidal to cylindrical, 4-septate, slightly constricted, 40-46.5 x 12-15.5 µm.

On leaves of *Rourèa praineana* (Connaraceae), Agumbe, Karnataka, India, Dec. 16, 1974, A.W. Subhedar AMH 2730.

Colonies epiphyllous, scattered, dense, velvety, up to 2 mm in diameter. Hyphae straight, rarely substraight, branching mostly opposite at acute angles, loosely to closely reticulate, cells 24-31 x 5-7 μm. Hyphopodia alternate, straight, antrorse, 15-22 μm long; stalk cells cylindrical to cuneate, 5-7 μm long; head cells ovate to cylindrical, entire, 10-15.5 x 9-11 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-22 x 9-12.5 μm. Mycelial setae numerous, straight to slightly curved but not uncinate, simple, acute to 2-3 dentate at the tip, up to 260 μm long. Perithecia scattered to loosely grouped, verrucose, up to 172 μm in diam.; ascospores obvoidal, 4-septate, constricted at the septa, 37-40.5 x 13-15.5 μm.

On leaves of Ailanthus triphysa (Simaroubaceae), Vettiyar, Mavelikara, Kerala, India, Sept. 14, 1992, C.M. Pillai HCIO 40752.


Colonies amphigenous, thin, up to 2 mm in diameter, confluent. Hyphae undulate, branching opposite at wide angles, loosely reticulate, cells 12-15 x 6-8 μm. Hyphopodia alternate, subantrorse to spreading, straight to curved, 12-20 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells globose to ovate, entire, 10-12 μm. Phialides mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 12-15 x 6-8 μm. Mycelial setae numerous, thinly scattered, straight to tortuous, acute at the apex, up to 350 μm long. Perithecia scattered, verrucose, up to 160 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 36-40 x 12-14 μm.

On leaves of Albizia odoratissima (Mimosaceae), Assam, India, Dec. 15, 1959, J.L. Lampitt HCIO 27275.

Colonies hypophyllous, thin. Hyphae subsinuuous, branching opposite, loosely reticulate, cells 17-35.5 x 5-8.5 μm. Hyphopodia alternate and opposite, 13-21.5 μm long; stalk cells cylindrical, 5-8.5 μm long; head cells ovate, entire, 5-13 x 9-10.5 μm. Phialides mixed with hyphopodia, ampulliform, 12-21 x 7-8.5 μm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute to subobtuse at the tip, up to 800 μm long. Perithecia scattered, up to 275 μm in diam.; ascospores ellipsoid, 4-septate, 41-46 x 18-20 μm.

On leaves of Albizia granulosa (Mimosaceae), New Caledonia, Oct. 31, 1966, NC 66165.


Colonies epiphyllous, scattered, dense, up to 2 mm in diameter. Hyphae straight, branching opposite at acute angles, loosely to closely reticulate, cells 15-22 x 9-11 μm. Hyphopodia opposite, crowded after an interval, antrorse to subantrorse, rarely recurved, 18-22 μm long; stalk cells cuneate, 6-7 μm long; head cells globose, rarely cylindrical, entire, 12-15.5 x 12-14 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-22 x 9-11 μm. Mycelial setae grouped around perithecia, simple, straight, acute, obtuse to dentate at the tip, up to 550 μm long. Perithecia scattered to loosely grouped, verrucose, up to 155 μm in diam.; ascospores obovoidal, 4-septate, constricted, 37-40.5 x 15-18.5 μm.

On leaves of Allophyllum concanics var. lanceolatus (Sapindaceae), North to Pachaiyar estate, Seithur hills, Kamarajar dist., Tamil Nadu, India, Oct. 9, 1992, V.B. Hosagoudar HCIO 40753.


Colonies hypophyllous, trait along veins, dense, velvety, up to 5 mm long. Hyphae straight to flexuous, branching opposite to irregular at wide angles, closely reticulate, cells 25-39 x 6-12
μm. Hyphopodia alternate, antrorse, 20-28.5 μm long; stalk cells cylindrical to cuneate, 5-11.5 μm long; head cells ovoid, entire to angulose, 18-18 x 14-18 μm. Phialides not seen. Mycelial setae numerous, densely scattered, broadly hamate, obtuse at apex, up to 375 μm long. Perithecia verrucose, globose, up to 350 μm in diam.; ascospores sub-ellipsoidal, 4-septate, constricted, 51-57 x 16-20.5 μm.

On leaves of *Alstonia comptonii* (Apocynaceae), New Caledonia, April 20, 1967, NC 67043.


Colonies caulicolous, epiphyllous, dense, up to 2 mm in diameter, often confluent and cover the entire adaxial leaf surface. Hyphae straight to slightly flexuous, branching most opposite at acute angles, loosely reticulate, cells 34-40.5 x 6-8 μm. Hyphopodia alternate, antrorse, straight to curved, 15-18.5 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells ovate, globose, pyriform, entire, 9-12.5 x 12-15.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-25 x 6-8 μm. Mycelial setae mostly grouped around perithecia, simple, straight, obtuse at the apex, up to 360 μm long. Perithecia scattered, up to 124 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 31-34 x 12-14 μm.


Colonies hypophyllous, thin, up to 7 mm in diam., confluent. Hyphae straight, branching opposite to irregular at wide angles, loosely to closely reticulate, cells 16-26 x 6-8.5 μm. Hyphopodia alternate, spreading to antrorse, 15-28.5 μm long; stalk cells cylindrical to cuneate, 6-8.5 μm long; head cells cylindrical to ovate, entire, angulose to sublobate, 9-20 x 12-22 μm. Phialides borne on a separate mycelial branch, opposite to alternate, conoid to ampulliform, 15-28 x 6-7 μm. Mycelial setae scattered, sub-flexuous, obtuse to subacute at the tip, up to 325 μm long.
Perithecia scattered, globose, up to 250 μm in diam.; ascospores cylindrical to subellipsoidal, 4-septate, constricted, 41-46.5 x 15-20 μm.

On leaves of Alyxia leucogyne (Apocynaceae), New Caledonia, Oct. 5, 1966, NC 66152.


Colonies amphigenous, dense, scattered, up to 3 mm in diameter, confluent. Hyphae flexuous, branching opposite to unilateral, cells 6-8 μm wide. Hyphopodia opposite and alternate, antrorse to recurved, 19-25 μm long, stalk cells cylindrical, 5-7 μm long; head cells clavate, entire, 14-18 x 8-11 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 16-22 x 5-8 μm. Mycelial setae scattered, simple, straight to slightly curved, obtuse, up to 430 μm long. Perithecia scattered to grouped, verrucose, up to 380 μm in diam.; ascospores ellipsoidal, 4-septate, constricted, 41-42 x 15-21 μm.

On leaves of Lippia nodiflora (Verbenaceae), Florida, Dec. 12, 1901, S.M. Tracy IMUR 15826.


Colonies hypophyllous, rarely epiphyllous, effuse. Hyphae undulate, branching at acute to wide angles, cells 16-32.5 x 6-8 μm. Hyphopodia alternate and opposite, 2-celled, head cell cylindrical, 11-24 x 7-9.5 μm. Phialides few, alternate, 15-24 x 5-8 μm. Mycelial setae scattered, straight to curved, simple, obtuse at the apex, up to 600 μm long. Perithecia up to 180 μm in diam.; ascospores cylindrical, 4-septate, 43-47 x 12-19 μm.

On leaves of Anomum caryophyllata (Zingiberaceae), Porto Rico, Nov. 14, 1913, F.L. Stevens IMUR 14100.

Colonies hypophyllous, rarely epiphyllous, dense, up to 10 mm in diameter, confluent. Hyphae substraight to undulate, branching mostly opposite at acute to wide angles, loosely reticulate, cells 16-20 x 4-7 μm. Hyphopodia alternate to about 10% opposite, straight to curved, antrorse to spreaded, 12-20 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells ovate to globose, entire, 10-13 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 16.5-26.5 x 10-13 μm. Mycelial setae fairly numerous, equally scattered, straight to flexuous, simple, acute to obtuse at the tip, up to 291 μm long. Perithecia few, scattered, up to 165 μm in diam.; ascospores obovate. 4-septate, constricted, 33-36.5 x 13-15 μm.


Colonies hypophyllous, thin, up to 5 mm in diameter, confluent. Hyphae straight to undulate, branching opposite to irregular at wide angles, loosely reticulate, cells 20-30 x 6-8 μm. Hyphopodia alternate to unilateral, scattered, antrorse to recurved, straight to curved, 14-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate, entire, often curved, 10-14 x 10-12 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 20-26 x 6-8 μm. Mycelial setae straight, simple, acute at the tip, up to 460 μm long. Perithecia scattered, verrucose, up to 200 μm in diam.; ascospores ellipsoidal, 4-septate, constricted, 36-40 x 12-16 μm.

On leaves of Angiopteris evecta (Angiopteridaceae), Idukki, Kerala, India, Feb. 20, 1984, B. Rajeevan HCIO 40498.

Colonies amphigenous, mostly hypophyllous, dense, crustose, confluent. Hyphae substraight to crooked, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 24-31 x 9-12.5 μm. Hyphopodia alternate, antrorse to spreaded, straight to variously curved, 15.5-22 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells straight to curved, ovate, globose, entire to angular, 9-15.5 x 12-15.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, neck elongated and curved, 21-28 x 12-15.5 μm. Mycelial setae few, simple, straight, erect, acute to obtuse at the tip, up to 1150 μm long. Perithecia scattered, up to 150 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted at the septa, 52-56 x 15-19 μm.

On leaves of Carallia brachiata (Rhizophoraceae), Amboli, Maharashtra, India, Feb. 8, 1975, M.S. Patil HCIO 31945.


Colonies amphigenous, mostly epiphyllous, effuse, orbicular, velvety, black, up to 2.5 mm in diameter. Hyphae branched, septate, brown, 8-9 μm broad, reticulate. Hyphopodia alternate, obovoid, 1-septate, 20-31 x 12-13 μm. Phialides alternate, 20-26 x 8-9 μm. Mycelial setae simple, straight to slightly curved, obtuse at apex, black, up to 440 μm long. Perithecia globose, black, up to 125 μm in diam.; ascospores ellipsoidal to cylindrical, 4-septate, constricted at septa, 41-44 x 18-19 μm.

On leaves of Anodendron affine (Apocynaceae), Taiwan, Chiang, Aug. 8, 1945, S.K.


Colonies epiphyllous, dense, velvety, up to 2 mm in diameter, rarely confluent. Hyphae substraight to slightly crooked, branching opposite to irregular at wide angles, loosely to closely reticulate, cells 12-28 x 9-12.5 μm. Hyphopodia opposite, crowded after intervals, rarely solitary, antrorse, subantrorse, recurved, 6-12.5 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long;
head cells ovate, globose, angular, truncate, straight to curved, entire, 15-18 x 9-15.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulli-form, 18-25 x 9-12.5 μm. Mycelial setae mostly grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 572 μm long. Perithecia seated on exhyophodiate mycelia, verrucose, up to 232 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 52-56 x 18-22 μm.

On leaves of *Aphanamixis polystachya* (Meliaceae), Nilgiris, Tamil Nadu, India, Nov. 23, 1972, E. Vajravelu HCIO 39435.


Colonies amphigenous, black, crustose, densely thalloid with a distinct margin, up to 4 mm in diameter, confluent. Hyphae appressed to the host surface, cells 14-22 x 5-8 μm. Hyphopodia alternate, adnate, antrorse and adhering to the hyphae, 24-38 μm long; stalk cells cylindrical to cuneate, 8-14 μm long; head cells obovate, entire, 16-24 x 8-13 μm. Phialides conoid to ampulliform, 19-30 x 8-10 μm. Mycelial setae simple, straight, thinly scattered, up to 500 μm long, obtuse at the apex. Perithecia scattered, coarsely verrucose to tuberculate, up to 400 μm in diam.; ascospores brown, ellipsoid, slightly curved, 3-septate, constricted at the septa, 72-90 x 24-30 μm, end cells conoid and paler than the central cells.

On leaves of *Araucaria cunninghamii* (Araucariaceae), Lake Danbulla, North Queensland, Australia, Feb. 15, 1972, IMI 164399.


Colonies amphigenous, dense, up to 1 mm in diameter. Hyphae substraight, branching opposite at acute angles, loosely reticulate, cells 30-36 x 6-8.5 μm. Hyphopodia alternate and opposite, antrorse to spreading, straight to curved, 23-26 μm long; stalk cells cylindrical to cuneate, 4-6.5 μm long; head cells globose, ovate, angular to sublobate, 11-20 μm in diam. Phialides not seen. Mycelial setae scattered to grouped around perithecia, simple to dichotomously branched, up to 250 μm long. Perithecia
mostly grouped, verrucose, up to 190 μm in diam.; ascospores cylindrical to ellipsoidal, 4-septate, 40-47 x 13.5 μm.

On leaves of Argyreia hookeri (Convolvulaceae), Radhanagari, Kolhapur, Maharashtra, India, Sept. 1, 1974, M.S. Patil SUK 387.


Colonies hypophyllous. Hyphae branched at acute to wide angles, cells 13-50 x 5-8 μm. Hyphopodia alternate and opposite; basal cell cylindrical, apical cell oblong, lobate, 11-25 x 8-13 μm. Phialides not seen. Mycelial setae straight to curved, simple, dentate. Perithecia up to 190 μm diam.; ascospores cylindrical, 4-septate, constricted, 47-57 x 11-15 μm.

On leaves of Bignoniaceae member, Brazil, Jan. 25, 1963, Lauro Xavier Filho IMUR 33242.


Colonies epiphyllous, crustose, scattered, up to 4 mm in diam., confluent. Hyphae substraight to flexuous, branching alternate to opposite at acute angles, cells 19-40 x 7-9.5 μm. Hyphopodia alternate, antrose, 17-20 μm long, head cells entire to sublobate. Phialides mixed with hyphopodia, opposite to alternate, 17-25 x 7-9.5 μm. Mycelial setae dispersed, straight, acute to obtuse at the tip, up to 600 μm long. Perithecia scattered, up to 190 μm in diam.; ascospores oblong, 4-septate, 43-48 x 14-19 μm.


Colonies amphigenous, dense, velvety, up to 4 mm in diameter. Hyphae undulate, branching alternate to irregular at acute angles, closely reticulate and form solid mycelial mat, cells 15-20 x 9-10
Hyphopodia alternate, antroverse to spreading, 30-46 μm long; stalk cells cylindrical, 12-16 μm long; head cells cruciform to versiform, stellately lobate, 22-30 x 21-23 μm. Phialides few, opposite, ampulliform, up to 22 μm long. Mycelial setae numerous, grouped around perithecia, arcuate, dentate at the tip, up to 500 μm long. Perithecia globose, verrucose, up to 270 μm in diam.; ascospores broadly ellipsoidal, 4-septate, constricted at the septa, 41-50 x 16-19 μm.


116. Meliola artocarpi Yates var. indica V.B. Hosagoudar, C.M. Pillai & P.A. Raghu var. nov.

Differt a var. artocarpi in hyphopodiis mucronatis in hyphis distinctis evoluti.

On Artocarpus gomezianus Wall. ex Trec. subsp. zeylanicus Jarrett (Moraceae), Gerusoppa, Uttara Kannada, Karnataka, May 29, 1992, P.A. Raghu HCol 30989 (type).

Of the three species, namely, Meliola brinkii Hansf., M. artocarpcola Stev. ex Hansf. and M. artocarpi Yates, the present collection close to M. artocarpi Yates in its morphology and measurements. However, the new variety differs from the var. artocarpi in having mucronate hyphopodia borne on a separate mycelial branch.


Colonies amphigenous, mostly hypophyllous, crustaceous, up to 8 mm in diameter, rarely confluent. Hyphae straight, substraight to crooked, branching opposite to irregular at acute angles, loosely reticulate, cells 20-28 x 6-8 μm. Hyphopodia alternate, about 20% opposite, straight to curved, subantrorse to spreading, 20-30 μm long; stalk cells cylindrical to cuneate, 4-10 μm long; head cells ovate, conoid, rounded at the apex, entire, 14-20 x 8-10 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 20-26 x 8-12 μm. Mycelial setae scattered, straight,
often curved, simple, acute to 2-3 times dentate to cristate, up to 765 μm long. Perithecia scattered, up to 160 μm in diam.; ascospores oblong, 4-septate, constricted, 40-44 x 14-16 μm.


Colonies epiphyllous, subdense to dense, up to 2 mm in diameter. Hyphae undulate, branching opposite to alternate at acute angles, loosely reticulate, cells 12-22 x 4-8 μm. Hyphopodia opposite and alternate (3:1), straight, spreading, antrorse, 12-16 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells globose, entire, slightly and bluntly pointed towards the apex, 8-10 x 10-12 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 16-20 x 6-10 μm. Mycelial setae few, scattered, simple, variously dentate at the apex, up to 270 μm long. Perithecia scattered to grouped, verrucose, up to 140 μm in diam.; ascospores oblong to obovoidal, 4-septate, constricted, 30-40 x 10-14 μm.


Colonies epiphyllous, scattered, thin, orbicular, up to 3 mm in diameter. Hyphae straight to sinuous, branching opposite to irregular, loosely reticulate, cells 15-35 x 7-8 μm. Hyphopodia opposite and rarely alternate, antrorse, straight to curved, 19-22 μm long; stalk cells cylindrical, 4-7 μm long; head cells cylindrical to clavate, straight to curved, entire, 13-15 x 7-8 μm.
Phialides few, mixed with hyphopodia, alternate to opposite, ampulliform, more or less curved, 22-24 x 7-8 µm. Mycelial setae thinly scattered, straight, simple, acute to dentate at the tip, up to 355 µm long. Perithecia loosely scattered, verrucose, up to 250 µm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 43-50 x 13-21 µm.

On leaves of Aucoumea klaiaeana (Burseraceae), Libreville, Gabon, July 27, 1968, G. Gilles (Material may be in LCMN HN, Paris).

Colonies epiphyllous, effuse. Hyphae irregularly branched, cells 23-32 x 6-7 µm. Hyphopodia alternate and opposite, curved, anttorse, 21-28 µm long; stalk cells cylindrical to cuneate, 9-10 µm long; head cells oblong, entire, 15-19 x 8-13 µm. Phialides not seen. Mycelial setae simple, straight to slightly curved, acuminate at the apex, up to 300 µm long. Perithecia scattered, up to 200 µm in diam.; ascospores oblong, 4-septate, slightly constricted at the septa, 51-64 x 11-16.6 µm.

On leaves of Rapanea neriifolia (Myrsinaceae), Japan, Aug. 8, 1955, K. Katumato

Colonies epiphyllous, thin, velvety, up to 2 mm in diameter. Hyphae substraight, branching opposite at acute angles, loosely reticulate, cells 18-34 x 6-8 µm. Hyphopodia opposite, anttorse, 15-18 µm long; stalk cells cuneate, 5-6 µm long; head cells globose, entire to angular, 10-12 x 8-10 µm. Phialides few, mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 14-20 x 8-10 µm. Mycelial setae few, grouped around perithecia, straight, simple, acute at apex, up to 400 µm long. Perithecia scattered, up to 180 µm in diam.; ascospores ellipsoidai, 4-septate, constricted at the septa, 45-50 x 13-16 µm.

On leaves of Capparis rotundifolia (Capparaceae), Maharashtra, India, Jan. 1977, V.P. Kaul HCIO.

Colonies epiphyllous, thin to subdense, up to 2 mm in diam., widely confluent. Hyphae straight, substraight to slightly crooked, branching opposite at acute to wide angles, loosely reticulate, cells 21-25 x 6-8.5 μm. Hyphopodia alternate, antrorse to subantrorse, straight to curved, 12-15.5 μm long; stalk cells cylindrical to cuneate, 3-5 μm long; head cells ovate, globose, straight to curved, entire, 9-11 x 9-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15-18.5 x 10-12.5 μm. Mycelial setae few, grouped around perithecia, straight to curved, but not uncinate, simple, acute, up to 300 μm long. Perithecia loosely grouped, globose, up to 300 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, slightly constricted, 31-37.5 x 9-12.5 μm.

On leaves of *Pueraria* sp. (Fabaceae), Coimbatore, India, Dec. 20, 1990, V.B. Hosagoudar HCIO 30531.

123. *Meliola banosensis* Sydow var. *puerariicola* var. nov.

Differ t a var. *banosensis* Phialides illis hyphododis commixtis et differ t a *M. banosensis* Sydow var. *puerariae* Hosagoudar hyphododis 10% opposite.

On leaves of *Pueraria tuberosa* DC. (Fabaceae), Koomati, Anamalai, Coimbatore, Tamil Nadu, India, March 13, 1994, V.B. Hosagoudar HCIO 41570 (type).


Colonies epiphyllous, rarely caulicolous and amphigenous, thin to subvelvety, up to 3 mm in diameter, confluent. Hyphae tortuous, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 18-36 x 6-8 μm. Hyphopodia alternate to unilateral (vary few opposite), spreading, antrorse, 14-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells globose to subglobose, angulose to shallowly lobate, often curved, 8-12 x 10-12 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 10-22 x 4-8 μm. Mycelial setae scattered, straight,
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simple, acute at the tip, up to 288 μm long. Perithecia scattered, verrucose, up to 166 μm in diam.; ascospores oblong, 4-septate, 34-50 x 12-18 μm.

On leaves of *Desmodium gyrans* (Fabaceae), Meenmutty, Idukki, Kerala, India, Dec. 12, 1982, V.B. Hosagoudar HCIO 40499.


Colonies amphigenous, subdense, crustose, confluent, up to 6 mm in diameter. Hyphae undulate, branching alternate at wide angles, closely reticulate, cells 20-44 x 6-8 μm. Hyphopodia alternate, antrorse to curved, straight to recurved, 19-24 μm long; stalk cells cylindrical to cuneate, 5-8 μm long; head cells ovate, cylindrical, entire, 9-15 x 11-14 μm. Phialides borne on a separate mycelial branch, opposite, straight to curved, 15-17 x 4-7 μm, neck elongated. Mycelial setae scattered, straight, acute, up to 400 μm long. Perithecia scattered, verrucose, up to 200 μm in diam.; ascospores oblong, 4-septate, 30-38 x 13-15 μm.

On leaves of *Barleria strigosa* (Acanthaceae), Castle Rock, Karnataka, India, Nov. 1967, Srinivasulu MUH 127.


Colonies hypophyllous, dense, velvety, up to 5 mm in diameter, rarely confluent. Hyphae flexuous, branching alternate to irregular at acute angles, closely reticulate, form almost solid mycelial mat, cells 20-30 x 6-8 μm. Hyphopodia alternate, straight to variously curved, antrorse to recurved, 20-24 μm long; stalk cells cylindrical to cuneate, 6-10 μm long; head cells globose, ovate, angular, entire, 14-16 x 12-14 μm. Phialides few, mixed with hyphopodia, opposite to alternate, ampulliform, 18-22 x 8-10 μm. Mycelial setae numerous, evenly scattered, straight, simple, acute to variously dentate at the tip, up to 684 μm long. Perithecia closely scattered, verrucose, up to 216 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted, 54-60 x 12-20 μm.

127. *Meliola beilschmiediicola* sp. nov.
Colonies amphigenae, densae, velutinae, ad 5 mm diam., confluentes. Hyphae rectae vel flexuose, alternate vel opposite acuteque ramosae, laxe vel dense reticulatae, cellulae 18-25 x 6-9.5 μm. Hyphopodia alternata, antrorsa, raro retrorsa, 18-25 μm longa; cellula apicali ovata, oblonga, raro clavata, integra, recta vel curvula, 12-15.5 x 6-9.5 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, raro colum strepto, 21-25 x 8-9.5 μm. Setae myceliales paucae, simplices, rectae, obtusae and apicem, ad 400 μm longae. Perithecia dispersa, verrucosa, ad 155 μm diam.; ascospore oblongae, 4-septatae, fortifer constrictae, 37-43.5 x 15-18.5 μm.

On leaves of *Beilschmiedia wightii* (Nees) Benth. ex Hook.f. (Lauraceae), Veerapuli Reserve Forest, Kanniyakumari dist., Tamil Nadu, India, Feb. 22, 1994, V.B. Hosagoudar HCIO 41611 (type).

The present new species differs from *Meliola beilschmiediae* Yamam. in having smaller and obtuse mycelial setae.

Colonies epiphyllous, rarely amphigenous, dense, up to 4 mm in diameter, confluent. Hyphae substraight to crooked, branching alternate to opposite at acute angles, closely reticulatae, cells 15.5-40 x 6-9.5 μm. Hyphopodia alternate, about 20% opposite, straight to variously curved, antrorse, subantrorse to spreading, 15-18.5 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells ovate, globose, entire, straight to curved, 10-12.5 x 12-15.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15-22 x 9-12.5 μm. Mycelial setae numerous, simple, straight, acute to obtuse at the apex, up to 660 μm long. Perithecia loosely scattered, up to 200 μm in diam.; perithecial cells protruded; ascospores obovoidal, 4-septate, constricted at the septa, 31-43.5 x 12.5-18.5 μm.
129. Meliola bidentata Cooke var. major Schmiedeknecht, Beiträge zur Phytotaxonomie 38: 201, 1969.

The variety differs from the var. dentata in having stalk cells of the capitate hyphopodia 9-13 µm long and ascospores 50-57 x 15-20 µm.

On leaves of Tabebuia lepidophylla (Bignoniaceae), Cuba, Feb. 9, 1969, H. Kreisel 807.


Colonies hypophyllous, dense to subdense, velvety, up to 8 mm in diameter, confluent. Hyphae straight to undulate, branching opposite at acute angles, closely reticulate, cells 20-25 x 8-9 µm. Hyphopodia alternate, unilateral to rarely opposite, antrorse, 18-22 µm long; stalk cells cylindrical, 4-6.5 µm long; head cells pyriform, entire, 12.5-14.5 x 12-14 µm. Phialides not seen. Mycelial setae numerous, straight, simple, acute at the tip, up to 410 µm long. Perithecia globose, up to 190 µm in diam.; ascospores oblong to ellipsoidal, 4-septate, constricted at the septa, 44-50 x 15-16.5 µm.

On leaves of Symplocos sp. (Symplocaceae), Cuba, May 1970, J. Bisse HAJB 2135.


Colonies amphigenous, densely velvety, up to 1.5 µm in diameter. Hyphae substraight, branching alternate to opposite at acute angles, closely reticulate, cells 13-20 x 9-11 µm. Hyphopodia alternate, straight to curved, 18-24 µm long; stalk cells cuneate, 3-7 µm long; head cells ovate, 15-17 x 7-9 µm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 13-17 x 5-7 µm, neck elongated. Mycelial setae mostly grouped around perithecia, simple, straight to flexuous, obtuse, up to 400 µm long. Perithecia
scattered, up to 300 \( \mu m \) in diam.; ascospores ellipsoid, 4-septate, slightly constricted, 30-35 \( \times \) 13-17 \( \mu m \).


132. *Meliola bosei* sp. nov.

Coloniae epiphyllae, densae, ad 3 mm diam., confluentes. Hyphae rectae vel subrectae, opposite acutaeque vel laxe ramosae, laxe reticulatae, cellulae 25-31 \( \times \) 6-8 \( \mu m \). Hyphopodia alternata, antrorsa, plerumque recta, 18-20 \( \mu m \) longa; cellula basali cylindracea vel cuneata, 3-6.5 \( \mu m \) longa; cellula apicali plerumque globosa, integra, 12-15.5 \( \times \) 12-14 \( \mu m \). Phialides illis capitatis commixta, dispersa, ampullacea, 18-22 \( \times \) 7-9.5 \( \mu m \). Setae myceliales paucae, dispersae, simplices, rectae vel leniter curvulae, acuta ve bi-dentatae ad apicem, ad 500 \( \mu m \) longae. Perithecia dispersa, verrucosa, ad 140 \( \mu m \) diam.; ascosporae cylindraceae, 4-septatae, constrictae, 40-43.5 \( \times \) 15-18.5 \( \mu m \).

On Quercus leucotrichophora (Fagaceae), Dolighat, Ranikhet, Uttar Pradesh, India, Jan. 18, 1961, S.K. Bose HCIO 29121 (type).

This species can be compared with *Meliola melanochaeta* Sydow but differs from it in having epiphyllous colonies, straight hyphae, scattered and acute to bi-dentate and smaller mycelial setae and ascospores.

133. *Meliola brassaiopsidis* sp. nov.

Coloniae amphigenae, plerumque epiphyllae, subdensae, ad 2 mm diam., confluentes. Hyphae rectae, irregulariter acutaeque vel laxe ramosae, laxe vel dense reticulatae, cellulae 24-31 \( \times \) 5-7 \( \mu m \). Hyphopodia unilateralia, alternata et ad 15% opposita, antrorsa vel subantrorsa, 15-18.5 \( \mu m \) longa; cellula basali cylindracea vel cuneata, 3-6.5 \( \mu m \) longa; cellula apicali ovata, globosa, integra, 9-12.5 \( \times \) 19-12 \( \mu m \). Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 18-20 \( \times \) 9-11 \( \mu m \). Setae myceliales dispersae et aggregatae circa perithecia; setae circa perithecia simplices, rectae, flexuosae, curvulae vel uncinatae, obtusae ad apicem, ad 175 \( \mu m \) longae; setae in myceliae 1-4-plo dichotome ramosae, 155 \( \mu m \) longae ad prime ramosae, 60 \( \mu m \) longae ad 2-ramosae,
46 μm longae ad 3-ramosae, 37 μm longae ad 4-ramosae et ramuli ultimus 22 μm longae, acutae, vel obtusae ad apicem. Perithecia dispersa, verrucosa, ad 186 μm diam.; ascosporae oblongae, 4-septatae, leniter constrictae, 43-47 x 17-19 μm.

On Brassaiopsis sp. (Araliaceae), Amboli, Maharashtra, India, Sept. 28, 1976, M.S. Patil HCIO 32524 (type).

Four to five times dichotomously branched mycelial setae and simple, straight to uncinate mycelial setae around perithecia distinguishes this species from others.

The host genus Brassaiopsis in India is known only from the Himalayan region and its occurrence in Western Ghats is to be confirmed.


Colonies epiphyllous, scattered to loosely gregarious, up to 6 mm in diameter. Hyphae reticulate, branching mostly opposite at right angles, cells 18-24 x 6-8 μm. Hyphopodia alternate, antrorse, rarely spreading, 16-18 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells subglobose to irregularly ovoid, entire to angular, 12-14 x 11-12 μm. Phialides mixed with hyphopodia, unilateral, alternate or opposite, conoid to ampulliform, 18-22 x 7-8 μm. Mycelial setae grouped around perithecia, straight to slightly curved, obtuse at the tip, up to 240 μm long. Perithecia loosely grouped, up to 200 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, 34-39 x 8-10 μm.

On leaves of Clusiaceae member, Amazonia, Nov. 22, 1977, Dumort & others Br. - 682.


Colonies hypophyllous, subdense to dense, up to 8 mm in diameter, confluent. Hyphae tortuous, branching opposite to irregular at acute to wide angles, closely reticulate and form almost solid mycelial mat, cells 20-38 x 6-10 μm. Hyphopodia alternate, straight to variously curved, antrorse to recurved, 36-50 μm long; stalk cells cylindrical to cuneate, often tortuous, 14-22 μm long; head cells ovate, globose, angulose, sublobate,
straight to variously curved, 22-30 × 12-16 μm. Phialides few, mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 14-22 × 6-8 μm. Mycelial setae numerous, simple, acute to obtuse at the tip, up to 954 μm long. Perithecia scattered, verrucose, up to 234 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted, 42-50 × 14-18 μm.


Colonies amphigenous, thin, up to 2 mm in diameter, confluent. Hyphae straight, branching opposite at acute to wide angles, loosely reticulate, cells 18-25 × 8-9 μm. Hyphopodia alternate, subantrorse to spreading, straight to curved, 27-29 μm long, stalk cells mostly cylindrical, 8-9 μm long; head cells oblong to pyriform, entire, 18-21 × 12-13 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 18-22 × 12-13 μm. Mycelial setae scattered, straight, simple, obtuse, up to 300 μm long. Perithecia scattered, verrucose, up to 240 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 40-45 × 20-21 μm.

On leaves of Terminalia tomentosa (Combretaceae), Mahabaleshwar, Maharashtra, India, Jan. 1978, V.P. Kaul HCIO.


Colonies hypophyllous, thin, scattered, up to 5 mm in diameter. Hyphae straight to undulate, branching opposite to irregular at acute angles, loosely reticulate, cells 18-24 × 6-10 μm. Hyphopodia alternate and opposite, straight to curved, spreading to antorse, 14-20 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells ovate, globose, opposite to alternate, ampulliform, 18-20 × 8-10 μm. Mycelial setae numerous, straight, simple, acute to dentate at the tip, up to 540 μm long.
Perithecia scattered, verrucose, up to 250 µm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 36-42 x 10-12 µm.

On leaves of Glycosmis mauritiana (Rutaceae), West Bengal, India, Aug. 9, 1991, S.N. Bal HCIO 3215.


The variety differs from the var. caesalpiniae by being amphigenous and having larger phialides 20-24 µm long, with extended necks 5-10 µm long, 2.5-3.5 µm thick.

On leaves of Bauhinia sp. (Caesalpiniaceae), Amazonia, Dec. 4, 1977, Dumort et al. BR 893(1).


Colonies hypophyllous, dense, velvety, up to 2.5 mm in diameter. Hyphae straight, branching irregular, densely reticulate, cells 14-21 x 6-9.5 µm. Hyphopodia opposite, antrorse, 15-20.5 µm long; stalk cells cylindrical to cuneate, 6-8.5 µm long; head cells ovate, 9-12 x 7-11.5 µm. Phialides not seen. Mycelial setae numerous, straight, acute to subobtuse at the tip, up to 1300 µm long. Perithecia grouped at the centre of the colonies, globose, up to 290 µm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 45-50 x 18-22 µm.


Colonies epiphyllous; scattered, up to 5 mm in diameter, confluent. Hyphae branched at acute angles, cells 25-30 x 6-8 µm. Hyphopodia alternate, 20-28 µm long. Phialides alternate, ampulliform, 18-25 x 8-9 µm. Mycelial setae simple, few, acute at apex, up to 562 µm long. Perithecia up to 225 µm in diam.; ascospores 4-septate, constricted, 42-45 x 15-17.5 µm.
On leaves of *Calathea tuberosa* (Marantaceae), Paudalho, Pernambuco, Brazil, March 15, 1959, Silva IMUR 16083.


Colonies epiphyllous, dense, up to 1.5 μm in diameter, surrounded by yellow holoes. Hyphae substraight to undulate, branching opposite at wide angles, closely reticulate, cells 17-25 x 7-10 μm. Hyphopodia alternate, straight to curved, antorse to spreading, 23-35 μm long; stalk cells cylindrical, 5-12.5 μm long; head cells irregularly lobate, 17-22.5 x 15-20 μm. Phialides borne on a separate mycelial branch, alternate to opposite, usually curved, ampulliform, 17-20 x 7-10 μm. Mycelial setae simple, straight, acute to obtuse at the tip, up to 540 μm long. Perithecia verrucose, up to 200 μm in diam.; ascospores ellipsoid to oblong-ellipsoid, 4-septate, constricted at the speta, 47-51.5 x 17-22.5 μm.

On leaves of *Lobelia* sp. (Campanulaceae), Cuba, May 2, 1985, M. Rodriguez HAJB 4540.


Colonies amphigenous, dense, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching opposite at acute angles, closely reticulate, cells 9-18.5 x 6-9.5 μm. Hyphopodia alternate and opposite, straight to rarely curved, antorse, 12.5-19 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovate, entire, 9-12.5 x 8-11 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15.5-18.5 x 6-12.5 μm. Mycelial setae grouped around perithecia, simple, straight to curved but not uncinate, acute, obtuse to 2-3 dentate at the tip, up to 465 μm long. Perithecia scattered, up to 214 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted at the septa, 37-43.5 x 12-15.5 μm.

On leaves of *Cansjera rheedii* (Opiliaceae), Nilgiris, Tamil Nadu, India, Feb. 18, 1991, V.B. Hosagoudar HCIO 30618.

Colonies amphigenous, subdense to dense, velvety, up to 4 mm in diameter, confluent. Hyphae straight to slightly undulating, branching alternate at acute angles, loosely to closely reticulate, cells 24-32 x 7-8 μm. Hyphopodia alternate, antrorse, spreading, 30-42 μm long; stalk cells cylindrical to cuneate, 10-12 μm long; head cells ovate, globose, sublobate to stellately lobate, 12-24 x 20-26 μm. Phialides few, mixed with hyphopodia, alternate, ampulliform, 18-20 x 8-10 μm. Mycelial setae mostly grouped around perithecia, simple, acute at the tip, up to 835 μm long. Perithecia scattered, verrucose, up to 324 μm in diam.; ascospores fusiform, straight to curved, 3-septate, end cells conoid, 48-60 x 18-22 μm.

On leaves of Gnsjera theodii (Opiliaceae), Calvary Mount, Idukki, Kerala, India, Jan. 8, 1982, V.B. Hosagoudar, HCIO 40503.

144. Meliola canthii-angustifolii sp. nov.

Coloniae amphigenae, densae, ad 1 mm diam., dispersae et confluentes. Hyphae rectae, plerumque opposite acutaeque ramosae, dense reticulatae et crebrae, cellulae 27-37 x 6-9.5 μm. Hyphopodia alternata, antrorsa, 27-31 μm long; cellula basali cuneata, 9-11 μm longa; cellula apicali ovata, integra, raro angularia, 18-22 x 15-18 μm. Phialides producentes in ramus separatam mycelialis, alternata vel opposita, ampullacea, 15-18.5 x 7-9.5 μm. Setae myceliales obtusae ad apicem, ad 357 μm longae. Perithecia aggregata, verrucosa, ad 220 μm diam.; ascosporae obovoideae, 4-septatae, leniter constrictae, 46-53 x 18-22 μm.

On leaves of Canthium angustifolium Roxb. (Rubiaceae), Veerapuli Reserve Forest, Kanniyakumari dist., Tamil Nadu, India, Feb. 22, 1994, V.B. Hosagoudar HCIO 41629 (type).

The present new species is close to Meliola canthii Hansf. but differs from it in having antrorse and entire head cells of hyphopodia and phialides borne on a separate mycelial branch.

145. Meliola capensis (Kalch. & Cooke) Theiss. var. emarginati V.B. Hosagoudar, C.M. Pillai & P.A. Raghu, var. nov.

Differt a Meliola capensis (Kalch. & Cooke) Theiss. var.
mataybae (Stev.) Hansf. in habeore hyphopodia capitata et setae myceliales longiorae, peritheciae breviorae.

On Sapindus emarginatus Vahl (Sapindaceae), Gerusoppa, Uttara Kannada, Karnataka, May 16, 1992, C.M. Pillai HCIO 30989 (type).

This new variety is close to Meliola capensis (Kalch. & Cooke) Theiss. var. mataybae (Stev.) Hansf. but differs from it in having longer capitate hyphopodia and mycelial setae, and smaller perithecia. Hansford (4) proposed M. capensis (Kalch. & Cooke) Theiss. var. mataybae (Stev.) Hansf. f. longiaristata (Ciff.) Hansf. based on Cifferi's (3) collection on Cupenia americana from San Domingo. We have neither examined this material nor seen the icon. However from the protologue it is apparent that this new variety has affinity with Cifferi's (l.c.) collection.

146. Meliola capensis (Kalch. & Cooke) Theiss. var. schlechjrae

Colonies epiphyllous, rarely amphigenous, dense, velvety, up to 2 mm in diameter, confluent. Hyphae straight, branching opposite at acute angles, loosely to closely reticulate, cells 15-25 x 6-7 \( \mu \)m. Hyphopodia opposite, crowded to sparse, antrorse, 9-15.5 \( \mu \)m long; stalk cells cuneate, 3-5 \( \mu \)m long; head cells conoid, rarely broadly rounded at the apex, entire, 6-11 x 6-9.5 \( \mu \)m. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 12-15.5 x 6-9.5 \( \mu \)m. Mycelial setae scattered, straight, acute to dentate at the tip, up to 320 \( \mu \)m long. Perithecia scattered, verrucose, up to 155 \( \mu \)m in diam.; ascospores obovoidal, 4-septate, slightly constricted, 30-35 x 12-15.5 \( \mu \)m.

On leaves of Schleichera oleosa (Sapindaceae), Vettiyar, Mavelikara, Kerala, India, Sept. 14, 1992, C.M. Pillai HCIO 40757.

147. Meliola capparidicola sp. nov.

Coloniae epiphyllae, minutae, densae, ad 1 mm diam. Hyphae rectae vel flexuosae,plerumque opposite acuteque ramosae, dense, reticulatae, cellulae 15-35 x 10-12.5 \( \mu \)m. Hyphopodia alternata, antrorsa vel subantrorsa, recta vel curvula, 24-41 um longa; cellula basali cylindracea vel cuneata, 12-18.5 um longa; cellula
apicali ovata, oblonga, integra, 12-22 x 12-15.5 μm. Phialides in hyphis separatis, alternatis vel oppositis, ampulliformis, 21-25 x 9-11 μm. Setae myceliales dispersae, simplices, rectae, obtusae ad apicem, ad 360 μm longae. Perithecia dispersa, verrucosa, ad 140 μm diam.; ascosporae obovoideae vel oblongae, 4-septatae, constrictae, 40-43 x 17-20 μm.

On leaves of Capparis divaricata (Capparaceae), Amboli, Sindhudurgh, Maharashtra, India, Jan. 4, 1984, A.B. Pawar HCIO 36389 (type).

This new species can be compared with Meliola capparidis Hansf. reported from Uganda (HCIO 10426) but differs from it in having longer and alternate hyphopodia, phialides borne on a separate mycelial branch and obtuse setae.


The variety differs from the var. caricis in having smaller ascospores (30-37 x 9-13.5 μm).


Meliola carissae Doidge var. spinari Hosag., J. Econ. Tax. Bot. 13: 37, 1989 (nom. illegit.)

Colonies epiphyllous, subdense, up to 3 mm in diam., rarely confluent. Hyphae substraight to undulate, branching opposite to irregular at acute angles, loosely reticulate, cells 24-40 x 6-9.5 μm. Hyphopodia alternate, straight to curved, antrorse to recurved, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, boat-shaped, entire, angulose to shallowly lobate, 15.5-18.5 x 9-12.5 μm. Phialides borne on a separate mycelial branch, opposite to alternate, conoid to ampulliform, 15.5-21 x 9-12.5 μm. Mycelial setae scattered, straight, simple, acute, up to 860 μm long. Perithecia scattered, verrucose, up to 155 μm in diam.; ascospores obovoidal, straight to slightly curved, 4-septate, constricted, 34-37 x 12-15.5 μm.
On leaves of *Carissa spinarum* (Apocynaceae), Uttar Pradesh, India, Jan. 5, 1976, Kamal IMI 200122.


Colonies epiphyllous, dense, up to 4 mm in diam., confluent. Hyphae substraight, branching opposite at wide angles, closely reticulate and almost solid in centre, cells mostly 20-30 x 7-9 μm. Hyphopodia opposite and alternate, spread at right angles (rarely nearly so) to the hyphae, 15-24 μm long; stalk cells cylindrical to cuneate, 3-7 μm long; head cells ovate to clavate, entire, 10-16 x 8-11 μm. Phialides few, mixed with hyphopodia, opposite to alternate, ampulliform, 15-22 x 7-10 μm. Mycelial setae densely scattered, straight, simple, subacute to obtuse at the tip, up to 1100 μm long. Perithecia scattered, verrucose, up to 240 μm in diam.; ascospores oblong, 4-septate, 40-44 x 12-16 μm.

On leaves of *Carludovica plumieri* (Cyclanthaceae), Dominico Lake, Feb. 1966, Farr BPI 2452.


Colonies epiphyllous, dense, velvety, up to 4 mm in diameter. Hyphae slightly undulate, branching opposite to alternate at acute angles, closely reticulate, cells 10-25 x 6-8 μm. Hyphopodia alternate, straight to curved, antrorse to spreading, 27-32 μm long; stalk cells cylindrical to cuneate, 7-12 μm long; head cells cylindrical to clavate, entire, 8-9 x 10-20 μm. Phialides borne on a separate mycelial branch, opposite to alternate, ampulliform, 15-25 x 4-9 μm. Mycelial setae scattered, simple, straight, acute to dentate at the tip, up to 520 μm long. Perithecia scattered, verrucose, up to 270 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 45-53 x 19-22 μm.

On leaves of *Caryota urens* (Arecaceae), Castle rock, Karnataka, India, Nov. 1967, B.V. Srinivasulu MUH 130.

Colonies amphigenous, up to 3 mm in diameter, confluent. Hyphae alternate, branched, cells 21-35 x 8-11 μm. Hyphopodia alternate to opposite, oblong, 2-celled, 19-27 x 13-16 μm. Phialides ampulliform, 14-24.5 x 8-11 μm. Mycelial setae simple, mostly straight to rarely curved, obtuse at the apex, up to 335 μm long. Perithecia scattered to grouped, up to 185 μm in diam.; ascospores cylindrical, 4-septate, constricted, 35-43 x 11-16 μm.

On leaves of Cassia bassillaris (Caesalpiniaceae), Pern., April 16, 1958, E.B. Coreia IMUR 13051.


Colonies on petioles and phyllodes, scattered, up to 3.5 mm in diameter, confluent. Hyphae flexuous, branching at acute angles, cells 15-35 x 6-9 μm. Hyphopodia alternate to unilateral, subantrorse, 12-25 μm long; stalk cells cylindrical to cuneate, 7-12 μm long; head cells ovate to globose, entire to sublobate, 12-16 x 13-17.5 μm. Phialides mixed with hyphopodia, scattered, ampulliform, 17-23 x 9-15 μm. Mycelial setae numerous, scattered, straight, simple, obtuse at apex, up to 420 μm long. Perithecia scattered, up to 270 μm in diam.; ascospores oblong-ellipsoid, 3-septate, constricted at the septa, 39-52 x 17-20 μm.

On petioles and phyllodes of Cassytha filiformis (Cassythaceae), Brazil, Feb. 20, 1962, A.L. Costa IMUR 28094.


Colonies epiphyllous, rarely hypophyllous or caulicolous, subdense, up to 2 mm in diameter. Hyphae straight to undulate, branching opposite to unilateral at acute to wide angles, cells 15-25 x 7-9 μm. Hyphopodia opposite, rarely unilateral, anttorse, 18-28 μm long; stalk cells cylindrical, 5-8 μm long; head cells rounded to irregular, 10-17 x 7-10 μm. Phialides few, alternate or unilateral, conoid to ampulliform, up to 18 μm long. Mycelial setae few, straight, simple, acute at the tip, up to 600 μm long.
Perithecia scattered, verrucose, up to 225 μm in diam.; ascospores cylindrical to subellipsoid, 4-septate, constricted at the septa, 40-46 x 15-18 μm.


Colonies epiphyllous, crustose, subdense, up to 3 mm in diameter. Hyphae straight to undulate, branching opposite at wide angles, closely reticulate, cells 12-31 x 6-8 μm. Hyphopodia alternate, antorse to subantrorse, straight to curved, 16-21 μm long; stalk cells cylindrical to cuneate, 5-7.5 μm long; head cells ovate, cylindrical, entire, 11-13.5 x 8-10 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 17-20 x 4-7 μm. Mycelial setae numerous, scattered, straight, acute to clavate at the tip, up to 250 μm long. Perithecia scattered, verrucose, up to 145 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 30-45 x 10-13.5 μm.

On leaves of Clerodendrum serratum (Verbenaceae), Castle-rock, Maharashtra, India, Nov. 1967, B.V. Srinivasulu MUH 132.

156. Meliola celastracearum V.B. Hosagoudar et B.R. Dayal, sp. nov.
Coloniae amphigenae, plerumque epiphyllae, subdensae vel densae, velutinae, ad 5 mm diam., raro confluentes. Hyphae subrectae, flexuosae, irregulariter acutaeque ramosae, laxa vel densae reticulatae, cellulae 21-37 x 5-6.5 μm. Hyphopodia alternata, ad 10% opposita, antorosa vel subantrorosa, 12-22 μm longa; cellula basali cylindracea vel cuneata, 3-6 μm longa; cellula apicali oblonga, globosa, ovata, integra, recta vel curvula, 9-15.5 x 9-12.5 μm. Phialides illis hyphopodiis, ampullacea, 18-25 x 6-9 μm, setae myceliales paucae, rectae, simplices, acutae vel obtusae ad apicem, ad 650 μm longae. Perithecia dispersa, ad 125 μm diam.; ascosporae obovoideae, 4-septatae, constrictae ad septatae, 40-44 x 14-17 μm.
On leaves of *Pleurostylia* sp. (Celastraceae), Sringeri, Chikmagalur, Karnataka, India, Dec. 2, 1992, B.R. Dayal HCIO 41120.

This new species is close to *Meliola lophopetali* Stev. ex Hansf. in having both alternate and opposite hyphopodia but differs from it in not having subconoid head cells of the hyphopodia but having longer setae and larger ascospores.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 2 mm in diameter, rarely confluent. Hyphae straight to undulate, branching mostly opposite at acute angles, loosely to closely reticulate, cells 24-37.5 x 6-8 μm. Hyphopodia alternate and about 1% opposite, mostly straight but rarely curved, antrorse to subantrorse, 18-22 μm long; stalk cells cylindrical, 5-6.5 μm long; head cells ovate, globose, entire, angular to slightly lobate, 12-15.5 x 10-15.5 μm. Phialides numerous, mixed with hyphopodia, mostly opposite, ampulliform, 18-22 x 9-12.5 μm. Mycelial setae numerous, mostly grouped around perithecia, straight, simple, acute to obtuse at the tip, rarely geniculate to curved at the apex, up to 330 μm long. Perithecia scattered, up to 130 μm in diam.; ascospores cylindrical, 4-septate, slightly constricted at the septa, 30-35 x 12-15.5 μm.

On leaves of *Ceropegia* sp. (Asclepiadaceae), Karnataka, India, Oct. 2, 1990, V.S. Ramachandran HCIO 30537.


Colonies amphigenous, minute, subdense to dense, up to 3 mm in diameter. Hyphae straight to substraight, branching alternate to irregular at acute angles, loosely to closely reticulate, cells 16-20 x 6-8 μm. Hyphopodia alternate, antrorse, spreading, recurved, 21-25 μm long; stalk cells cylindrical to cuneate, 6-10 μm long; head cells angulose to sublobate, 12-16 x 14-18 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 15-21.5 x 9-13 μm. Mycelial setae scattered, bifid to dichotomously
branched, up to 240 μm long till branching, first ray up to 20 μm long and second ray up to 13 μm long, branches reflexed, acute to obtuse at the tip. Perithecia scattered, verrucose, up to 170 μm in diam.; ascospores obovoidal, 4-septate, constricted, 40-47 x 15-17 μm.

On leaves of *Excoecaria crenulata* (Euphorbiaceae), North Arcot, Tamil Nadu, India, M.B. Viswanathan AMH 7133.

159. *Meliola chandolensis* C.R. patil ex V.B. Hosagoudar, sp. nov.

Coloniae hypophyllae, densae, velutinae, ad 5 mm diam., raro confluentes. Hyphae subrectae vel anfractuae, alternate vel irregulariter acutaeque ramosae, laxe vel dense reticulatae, cellulae 30-37 x 6-8 μm. Hyphopodia alternata, subantrorsa, 21-31 μm longa; cellula basali cylindracea vel cuneata, 6-15.5 μm longa; cellula apicali angularia vel varie lobata, raro integra, versiformia, 15-18.5 x 9-12.5 μm. Phialides producentis in hyphis separatis, alternatis vel oppositis, ampullaceus, 16-25 x 6-8 μm. Setae myceliales numerosae, dense dispersae, rectae vel leniter flexuose, acutae vel obtuseae ad apicem, ad 1145 μm longae. Perithecia dispersa, verrucosa, ad 140 μm diam.; ascosporae subfusiformae, rectae vel curvulae, 4-septatae, leniter constrictae, 43-45 x 11-14 μm.


This taxon is close to *Meliola Psychotriae-nudiflora* sp. nov. but differs from it in having the phialides borne on a separate mycelial branch, longer mycelial setae and larger ascospores.


Colonies amphigenous, caulicolous, mostly hypophyllous, subdense, velvety, up to 3 mm diameter, confluent. Hyphae undulatiae, branching opposite at acute angles, loosely to closely reticulate and form almost solid mycelial mat, cells 16-30 x 6-8 μm. Hyphopodia alternate (few opposite), straight to curved, spreading, mostly antrorse, 16-24 μm long; stalk cells cuneate to cylindrical, 4-10 μm long; head cells subglobose, ovate, angular to
sublobate, 12-16 x 12-14 μm. Phialides borne on a separate mycelial branch, alternate, mostly opposite, ampulliform, 12-20 x 6-10 μm. Mycelial setae numerous, straight, simple, acute to subacute at the tip, up to 477 μm long. Perithecia scattered, verrucose, up to 153 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted, 32-42 x 10-16 μm.

On leaves, stems and petioles of *Apodytes beddomei* (Icacinaceae), Lakshmi Estate, Idukki, Kerala, India, Dec. 15, 1982, V.B. Hosagoudar HClO 40506.


Colonies epiphyllous, orbicular, thin, up to 2.5 mm in diameter. Hyphae brown, subtortuous, branching irregular at wide angles, loosely reticulate, cells 15-25.5 x 5-9 μm. Hyphopodia few, unilateral, spreading to subantrorse, 17-29.5 μm long; stalk cells elongate, straight to curved, 6-13.5 μm long; head cells ovate, sublobate, 10-21 x 10-15.5 μm. Phialides not seen. Mycelial setae straight, simple, acute to dentate at the tip, up to 660 μm long. Perithecia scattered, globose, up to 250 μm in diam.; ascospores subellipsoidal, 4-septate, constricted at the septa, 42-48 x 16-19 μm.

On leaves of *Chorysandra cymbaria* (Cyperaceae), Caledonia, Oct. 5, 1966, NC 66126.


Colonies amphigenous, mostly epiphyllous, dense, up to 7 mm in diameter. Hyphae straight, substraight to sinuous, branching mostly opposite at acute angles, loosely reticulate, cells 8-10 μm wide. Hyphopodia alternate and opposite, antrorse to subantrorse, 14-22 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells subglobose to ellipsoid, entire to angular, 10-14 x 8-10 μm. Phialides mixed with hyphopodia, ampulliform, 20-28 x 10-12 μm. Mycelial setae numerous on the upper surface while sparse on the lower surface, simple, straight, acute to obtuse at the apex, up to 336 μm long. Perithecia scattered, up to 250 μm in diam.; ascospores oblong, 4-septate, slightly constricted at the septa, 40-50 x 16-20 μm.
On leaves of Chrysobalanaceae member, Brazil, Dec. 8, 1977, Dumont et al. BR 958.

162. Meliola chukrasiae sp. nov.

Coloniae amphigenae, tenues vel subdensae, velutinae, plerumque confluentes. Hyphae flexuosae vel leniter anfractuare, plerumque opposite acuteque ramosae, laxe reticulatae, cellulae 24-31 x 3-4 μm. Hyphopodia alternata, antrorsa, 15-18.5 μm longa; cellula basali cylindracea vel cuneata, 3-6 μm longa; cellula apicali ovata, integra, rotunda ad apicem, 9-12.5 x 9-10 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 18-22 x 5-7 μm. Setae myceliales numerosae, tenuiter dispersae, simplices, rectae vel curvulae et non uncinatae, obtusae ad apicem, ad 430 μm longae. Perithecia dispersa, verrucosa, ad 180 μm diam.; ascosporeae rectae vel leniter curvulae, oblongae vel leniter ellipsoideae, 4-septatae, 31-34 x 15-17 μm.

On Chukrasia sp. (Meliaceae), Castle Rock, Karnataka, India, Nov. 1969, A.N. Thite HCIO 31625 (type).

The present new species is close to Meliola nairrii Hosagoudar and M. togonensis Hughes var. angulata Hughes but differs from both in having entire and rounded head cells of hyphopodia and straight to curved mycelial setae.

This host was named as Alstonia scholaris and the pathogen named as Meliola alstoniae Koord.


Colonies epiphyllous, thin, up to 2 mm in diameter. Hyphae straight to slightly undulate, branching opposite at wide angles, loosely reticulate, cells 10-16 x 6-8 μm. Hyphopodia alternate, 20 % opposite, straight to curved, subantrorse to antrorse, 16-24 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells cylindrical, ovate, entire, 10-16 x 8-10 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 12-20 x 6-8 μm. Mycelial setae scattered, straight, simple, acute to 2-3 dentate, up to 747 μm long. Perithecia scattered, verrucose, up to 180 μm in
On leaves of *Clausena indica* (Rutaceae), Kanchiar Forest, Idukki, Kerala, India, Feb. 23, 1983, V.B. Hosagoudar HCIO 40508.


Colonies amphigenous, mostly epiphyllous, subdense, up to 2 mm in diameter, confluent. Hyphae substraight to slightly undulate, branching opposite at acute angles, loosely reticulate, cells 24-38 x 6-8 μm. Capitate hyphopodia alternate, unilateral to 5 % opposite, straight to curved, spreading, antorse to recurved, 12-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells globose, entire, straight to curved, 8-12 μm. Phialides mixed with hyphopodia and borne on a separate mycelial branch, alternate to opposite, ampulliform, 16-24 x 8-12 μm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute at the tip, up to 450 μm long. Perithecia scattered, verrucose, up to 180 μm in diam.; ascospores oblong, 4-septate, constricted, 36-42 x 12-14 μm.

On leaves, stems and petioles of *Clitoria ternatea* (Fabaceae), Puliyanmala Tea Estate, Idukki, Kerala, India, Dec. 15, 1983, V.B. Hosagoudar HCIO 40512.


Colonies epiphyllous, up to 6 mm in diameter. Hyphae alternately, oppositely or irregularly branched at acute to wide angles, cells 19-29.5 x 6-8 μm. Hyphopodia alternate, rarely opposite, 2-celled, 16-21.5 x 9.5-13.5 μm. Phialides opposite, ampulliform, 13.5-21.5 x 5.5-8 μm. Mycelial setae straight to curved, obtuse at the apex, up to 310 μm long. Perithecia globose, verrucose, up to 170 μm in diam.; ascospores cylindrical, 4-septate, constricted, 35-40.5 x 11-19 μm.

On leaves of *Cochlospermum insignis* (Cochlospermaceae), Pernambuco, April 21, 1958, E.B. Barros IMUR 13109.

Colonies amphigenous, mostly hypophyllous, raised along the leaf trichomes, up to 7 mm in diameter. Hyphae straight to subsinuous, branching irregular at wide angles, loosely reticulate, cells 30-50 x 6-9 μm. Hyphopodia few, alternate, spreading to antrorse, 20-33.5 μm long; stalk cells cylindrical to obconoid, straight to curved, 7-15.5 μm long; head cells clavate, angular to variously lobate, 12-19.5 x 11-17 μm. Phialides mixed with hyphopodia, ampulliform, 20-26 x 6-9 μm. Mycelial setae scattered, straight, obtuse to sinuous at apex, up to 360 μm long. Perithecia scattered, up to 210 μm in diam.; ascospores cylindrical, 3-septate, constricted at the septa, 49-57 x 18-20 μm.

On leaves of *Codia spathulata* (Cunoniaceae), New Caledonia, April 20, 1967, Amien NC 67040.


Colonies hypophyllous, thin, up to 5 mm in diameter, confluent. Hyphae substraight to flexuous, branching mostly alternate, branches of the main hyphae tortuous, loosely reticulate, cells 18-30 x 6-8 μm. Hyphopodia alternate, usually 24-34 μm long; stalk cells aseptate to many septate, straight to tortuous, aseptate cells 8-16 μm long; head cells semilunar, versiform, ovate, angular, straight to mostly curved, 16-22 x 10-14 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 20-24 x 8-10 μm. Mycelial setae thinly scattered, simple, straight, acute, up to 360 μm long. Perithecia scattered, verrucose, up to 110 μm in diam.; ascospores cylindrical to ellipsoidal, 4-septate, constricted at the septa, 52-56 x 16-18 μm.

On leaves of *Canthium dicoccum* (Rubiaceae), Mahabaleshwar, Maharashtra, India, Jan. 1978, L.N. Nair HCIO


Colonies hypophyllous, dense, up to 1.5 mm in diameter. Hyphae straight to sinuous, branching opposite to irregular, closely reticulate, cells 20-32.5 x 9-11.5 μm. Hyphopodia alternate, 25-40 μm long; stalk cells cylindrical to cuneate, 10-13.5 μm long; head cells ovate, entire, 14-26 x 15-24 μm. Phialides mixed with
hyphopodia, ampulliform, 20-23 x 9-10.5 µm. Mycelial setae simple, straight, dentate at the tip, up to 350 µm long. Perithecia globose, up to 340 µm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 65-68 x 25-27 µm.

On leaves of Comptonella drupacea (Rutaceae), New Caledonia, Sept. 16, 1966, NC 66106.


Colonies epiphyllous, thin, up to 2 mm in diameter, rarely confluent. Hyphae straight, branching alternate to opposite at wide angles, loosely reticulate, cells 12-46.5 x 6-9.5 µm. Hyphopodia alternate, antrorse, subantrorse to rarely spreading, 24-46 µm long; stalk cells cylindrical to cuneate, 6-15.5 µm long; head cells ovate, globose, cylindrical, often curved, entire to angular to slightly lobate, 15-31 x 12-18.5 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 21-28 x 9-12.5 µm. Mycelial setae few, mostly grouped around perithecia, simple, straight, acute at the apex, up to 672 µm long. Perithecia scattered, up to 140 µm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 45-50 x 21-25 µm.

On leaves of Connarus sclerocarpus (Connaraceae), Coimbatore, Tamil Nadu, India, Dec. 27, 1990, V.B. Hosagoudar HCIO 30541.


Colonies epiphyllous, thin, confluent. Hyphae straight, branching opposite to alternate, loosely reticulate, cells 22-33 x 6-8 µm. Hyphopodia alternate, antrorse to spreading, 17-27 µm long; stalk cells cylindrical to cuneate, 6-8 µm long; head cells ovate, entire, 10-16 x 6-9 µm. Phialides mixed with hyphopodia. Mycelial setae grouped around perithecia, straight, simple, acute, up to 170 µm long. Perithecia scattered, verrucose up to 110 µm in diam.; ascospores ellipsoidal, 4-septate, constricted, 30-35 x 10-18 µm.

On leaves of Coreopsis auristusa (Asteraceae), Anmode, Maharashtra, India, A.N. Thite HCIO 31622.

Colonies amphigenous, thin, velvety, up to 10 mm in diameter. Hyphae straight to flexuous, branching opposite to irregular at acute angles, loosely reticulate, cells 25-50 x 6-8 µm. Hyphopodia alternate, subantrorse, 28-41.5 µm long; stalk cells cuneate, 11-18 µm long; head cells clavate, entire, 16-26 x 14-18 µm. Phialides borne on separate mycelial branch, alternate, conoid, 15-19.5 x 5-9 µm. Mycelial setae scattered to grouped around perithecia, straight, clavate at the apex, up to 240 µm long. Perithecia grouped, up to 200 µm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 43-49 x 18-20.5 µm.

On leaves of Couthovia neocaldonica (Loganiaceae), New Caledonia, April 20, 1967, NC 67046.


Colonies epiphyllous, rarely hypophyllous, up to 4 mm in diameter. Hyphae opposite or alternately branched at acute angles, cells 20-25 x 6-8 µm. Hyphopodia alternate, antrorse to subantrorse, 15-17.5 µm long; stalk cells cylindrical to cuneate, 6-7.5 µm long; head cells entire, clavate, 9-10 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 17-20 x 7-8 µm. Mycelial setae simple, apex acute, up to 360 µm long. Perithecia grouped, up to 145 µm in diam.; ascospores ellipsoidal, 4-septate, constricted, 37-40 x 12-15 µm.

On leaves of Crescentia cujeta (Bignoniaceae), Pernambuco, Brazil, March 8, 1959, da Silva IMUR 16131.


Colonies hypophyllous, dense, crustose, spreading, confluent. Hyphae tortuous, branching opposite to irregular at acute to wide angles, closely reticulate and form solid mycelial mat, cells 12-22 x 5-6.5 µm. Hyphopodia alternate, about 10% opposite, straight to variously curved, antrorse to recurved, 18-28 µm long; stalk cells cylindrical to cuneate, 4-6.5 µm long; head cells ovate, globose to
oblong, entire, angular to slightly sublobate, 13-18.5 x 9-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 12-15.5 x 9-12.5 μm. Mycelial setae very few in some colonies but numerous in others, scattered to grouped around perithecia, simple, straight, acute, obtuse to dentate at the tip, up to 300 μm long. Perithecia scattered, up to 150 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 43-46.5 x 18-22 μm.

On leaves of Cryptocarya bourdillonii (Lauraceae), Gersoppa, Karnataka, India, Oct. 21, 1992, P.A. Raghu HCIO


Colonies epiphyllous, up to 5 mm in diameter, effuse. Hyphae straight, branching alternate, closely reticulate, cells 21-38 x 6-7 μm. Hyphopodia alternate, 2-celled, clavate, 19-30 x 9-12.5 μm. Phialides mixed with hyphopodia, ampulliform, 14-22 x 4-7.5 μm. Mycelial setae straight, obtuse at the apex, up to 240 μm long. Perithecia up to 186 μm in diam.; ascospores cylindrical to ellipsoidal, 3-septate, constricted at the septa, end cells rounded, 40-43 x 12-14 μm.

On leaves of Cupania revolutae (Sapindaceae), Pernambuco, April 13, 1958, O.S. Silva IMUR 13063.


Colonies amphigenous, mostly epiphyllous, subdense to dense, up to 3 mm in diameter, confluent. Hyphae straight to slightly undulate, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 16-28 x 6-8 μm. Hyphopodia alternate to unilateral, straight, antrorse, 20-28 μm long; stalk cells cuneate, 6-12 μm long; head cells ovate, versiform, slightly and bluntly pointed at the apex, entire, 14-18 x 12-14 μm. Phialides borne on a separate mycelial branch, alternate to opposite, conoid to ampulliform, 14-22 x 6-8 μm. Mycelial setae scattered to grouped around the perithecia, simple, acute at the tip, up to 432 μm long. Perithecia scattered, verrucose, up to 160 μm in diam.; ascospores
oblong, 4-septate, slightly constricted, 34-40 x 16-20 μm.

On leaves, stems and petioles of *Cyclea peltata* (Menispermaceae), Meenumutty, Idukki, Kerala, India, Dec. 12, 1982, V.B. Hosagoudar HCIO 40516.


Colonies epiphyllous, rarely amphigenous, subdense to dense, velvety, up to 3 mm in diameter. Hyphae straight to tortuous, straight hyphae run along the veins, tortuous hyphae cross the straight ones, branching mostly opposite at wide to acute angles, loosely to closely reticulate, cells 14-22 x 6-8 μm. Hyphopodia alternate, unilateral, antrorse to spreading, 20-24 μm long; stalk cells cylindrical to cuneate, 6-12 μm long; head cells ovate, globose, angular to sublobate, 10-14 x 10-12 μm. Phialides few, mixed with hyphopodia, opposite to alternate, ampulliform, 12-18 x 10-12 μm. Mycelial setae straight, dichotomously branched at the tip, up to 176 μm long; primary branches up to 20 μm long, while secondary branches up to 10 μm long, branchlets reflexed, acute to obtuse at the tip. Perithecia scattered, verrucose, up to 120 μm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 38-44 x 12-14 μm.

On leaves of *Cymbopogon nardus* (Poaceae), Wynad, Kerala, India, Nov. 13, 1909, W.Mc Rae HCIO 28213.


Colonies amphigenous, dense, velvety, up to 5 mm in diameter, confluent. Hyphae straight, branching opposite at acute angles, closely reticulate, cells 18-24 x 9-10 μm. Hyphopodia alternate, antrorse, 25-29 μm long; stalk cells cylindrical to cuneate, 9-10 μm long; head cells pyriform, 18-25 x 18-20 μm. Phialides opposite, ampulliform, up to 22 μm long. Mycelial setae simple, straight to flexuous, obtuse to acute at the apex, up to 350 μm long. Perithecia globose, verrucose, up to 180 μm in diam.; ascospores fusiform, slightly curved, 4-septate, constricted at the septa, 50-58 x 14-20 μm.
On leaves of *Purdiaea ophiticola* (Cyrillaceae), Cuba, Nov. 12, 1969, H. Kreisel HAJB 1438.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 5 mm in diameter, confluent. Hyphae straight, branching at acute angles, reticulate, cells 22-27 x 9-10 μm. Hyphopodia alternate to unilateral, straight, antrorse, 22-30 μm long; stalk cells cylindrical, 6.5-10 μm long; head cells clavate to broadly ovate, 17-18.5 x 15-17 μm. Phialides borne on a separate mycelial branch, opposite, ampulliform, 17-22 μm long. Mycelial setae numerous, straight, simple, obtuse at the tip, up to 660 μm long. Perithecia grouped, globose, verrucose, up to 160 μm in diam.; ascospores broadly ellipsoidal, 4-septate, constricted at the septa, 43-48 x 12-18 μm.

On leaves of *Triopteris jamaicensis* (Malphigiaceae), Cuba, Nov. 23, 1967, M. Schmiedeknecht JE.


Colonies amphigenous, dense, velvety, up to 4 mm in diameter. Hyphae straight, branching irregular at acute angles, cells 22-25 x 20-25 μm long; stalk cells cylindrical, 6-9 μm long; head cells pyriform to claviform, rounded to subacute at the apex, 14-18 x 9-10 μm. Hyphopodia opposite to alternate, ampulliform, 20-23 μm long. Mycelial setae scattered to grouped around perithecia, simple, straight, obtuse at the tip, up to 410 μm long. Perithecia mostly grouped, globose, verrucose, up to 160 μm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 30-38 x 12-16 μm.

On leaves of *Antirrhea lucida* (Rubiaceae), Cuba, Nov. 27, 1967, M. Schmiedeknecht JE 70.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up
to 3 mm in diameter. Hyphae straight, branching opposite at acute
to wide angles, closely reticulate, cells 13-13 x 8-10 µm. Hyphopodia opposite, densely arranged, antrorse to subantrorse, 12-
15 µm long; stalk cells cylindrical to cuneate, 3-5 µm long; head cells globose, cylindrical, entire, 8-10 x 8-9 µm. Phialides mixed
with hyphopodia, opposite, ampulliform, 15-18 x 7-9 µm. Mycelial setae numerous, scattered to grouped around perithecia, straight,
simple, obtuse at the tip, up to 500 µm long. Perithecia scattered,
globose, verrucose, up to 200 µm in diam.; ascospores subcylindrical, 4-septate, constricted at the septa, 45-48 x 16-18 µm.

On leaves of Dendrotrophe frutescens (Santalaceae), Guangdong, China, April 2, 1986, Hu HEYUAN 024.

182. Meliola desmodii-laxiflori Deight var. dentata Batista &

Colonies epiphyllous, rarely hypophyllous, scattered, up to 3
mm in diameter, rarely confluent. Hyphal branching alternate to
unilateral at acute angles, cells 11-27 x 5-8 µm. Hyphopodia alternate, antrorse to subantrorse, straight to recurved, 11-21 µm
long; stalk cells cylindrical to cuneate, 5-6.5 µm long; head cells
globose to subglobose, 10-13 x 8-10 µm. Phialides mixed with
hyphopodia, mostly opposite, ampulliform, 10-19 µm long. Mycelial setae simple, straight to slightly curved, dentate at the apex, up
to 444 µm long. Perithecia globose, up to 180 µm in diam.;
ascospores cylindrical to ellipsoidal, 4-septate, constricted at
septa, 33-43.5 x 8-13 µm.

On leaves of Desmodium incanum (Fabaceae), Brazil, Aug. 6,

183. Meliola dimidiatae Hosagoudar in Hosagoudar & Goos,

Colonies epiphyllous, subdense, subvelvety, scattered, up to
3 mm in diameter, rarely confluent. Hyphae flexous, branching
opposite to irregular at acute angles, loosely reticulate, cells
16-24 x 6-8 µm. Hyphopodia alternate and unilateral (few opposite),
straight to curved, antrorse to recurved, spreading, 16-20 µm long; stalk cells cylindrical to cuneate, 4-6 µm long; head cells mostly globose, ovate, curved, entire, 12-14 x 10-12 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 20-26 x 8-10 µm. Mycelial setae numerous, scattered, often grouped around perithecia, straight, simple, acute, up to 540 µm long. Perithecia scattered, verrucose, up to 130 µm in diam.; ascospores cylindrical, 4-septate, constricted, 42-44 x 16-18 µm.


Colonies amphigenous, scattered, up to 5 mm in diameter, confluent. Hyphal branching alternate to opposite at acute angles, cells 4-7 x 2-3 µm. Hyphopodia alternate to opposite, antrorse to subantrorse, 12-14 µm long. Phialides mixed with hyphopodia, alternate, ampulliform, 18-22 x 6-9 µm. Mycelial setae simple, straight, obtuse at the apex, up to 225 µm long. Perithecia scattered, globose, up to 200 µm in diam.; ascospores cylindrical to oblong, 4-septate, constricted at the septa, 35-37 x 15-18 µm.

On leaves of *Dipterys odorata* (Fabaceae), Brazil, Jan. 29, 1963, A.C. Batista IMUR 46682.


Colonies hypophyllous, dense, velvety, up to 30 mm in diameter, confluent. Hyphae straight to subsinuous, branching opposite at wide angles, loosely to closely reticulate, cells 22-28 x 6-8.5 µm. Hyphopodia alternate, rarely opposite, sub-antrorse, 20.5-27 µm long; stalk cells cylindrical, 6-8 µm long; head cells ovate, entire, 14-19 x 7-11.5 µm. Phialides mixed with hyphopodia, alternate to opposite, 15-21 x 7-8.5 µm. Mycelial setae scattered to grouped around perithecia, straight to subsinuous, obtuse to subacute at the apex, up to 1100 µm long. Perithecia seated on exhyphopodiate mycelia, verrucose, globose, up to 360 µm in diam.; ascospores cylindrical, 4-septate, slightly constricted at the septa, 46-55.5 x 19-22 µm.
On leaves of *Randia sezitat* (Rubiaceae), New Caledonia, Oct. 29, 1966, NC 66176.

186. *Meliola dracenae-terniflorae* sp. nov.

Colonies amphigenous, densae, ad 3 mm diam. Hyphae rectae vel subrectae, plerumque opposite acutaeque vel laxe ramosae, laxae vel dense reticulatae, cellulae 15-18.5 x 6-8 µm. Hyphopodia alternata, antorsa vel subantrorsa, 15-18.5 um longa; cellula basali cylindracea vel cuneata, 5-6.5 um longa; cellula apicali recta vel curvula, ovata vel globosa, integra, 10-12.5 x 10-12 µm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 18-25 x 5-7 µm. Setae myceliales plerumque circa perithecia aggregatae, simplices, rectae, acutae ad apicem, ad 500 um longae. Perithecia laxe dispersa, verrucosa, ad 250 um diam.; ascosporeae ellipsoideoae vel cylindraceae, rectae vel curvulae, 4-septatae, constrictae, 37-41 x 12-15.5 um.

On *Dracena terniflora* (Araceae), Amboli, Sindhudurg, Maharashtra, India, March 6, 1980, M.S. Patil HCIO 36747 (type).

The present new species is close to *Meliola agavicola* Rodriguez & Camino but differs from it in having smaller hyphopodia, mycelial setae, perithecia and ascospores.


Colonies hypophyllous, dense, up to 4 mm in diameter. Hyphae crooked, branching irregular at acute angles, loosely to closely reticulate, cells 20-25 x 5-8 µm. Hyphopodia alternate, distantly placed, spreading, 24-31 µm long; stalk cells cylindrical to cuneate, 6-9.5 µm long; head cells ovate, globose, angulose to irregularly sublobate, straight to variously curved, 18-21.5 x 12-18.5 µm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15.5-25 x 6-9.5 µm. Mycelial setae numerous, mostly grouped around perithecia, simple, acute to obtuse at the tip, arcuate to hamate, up to 860 µm long. Perithecia scattered, verrucose, up to 264 µm in diam.; ascospores fusiform, 4-septate, constricted, 40-45 x 12.5-18.5 µm.
On leaves of *Litsea insignis* (Lauraceae), Valparai, Coimbatore, Tamil Nadu, India, Jan. 17, 1987, V.B. Hosagoudar HCIO 39308.


Colonies hypophyllous, scattered, dense, velvety up to 10 mm in diameter, confluent. Hyphae substraight to undulate, branching opposite to irregular at wide angles, loosely reticulate, cells 24-30 x 6-8 μm. Hyphopodia alternate, unilateral to 10% opposite, straight, spreading, antrorse to recurved, 12-16 μm long; stalk cells cylindrical to cuneate, 2-6 μm long; head cells globose, entire, curved, 10-12 x 8-10 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 18-20 x 8-10 μm. Mycelial setae numerous, scattered, straight, simple, acute at the tip, up to 315 μm long. Perithecia scattered, verrucose, up to 160 μm in diam.; ascospores obovoidal, 4-septate, constricted, 36-40 x 14-16 μm.

On leaves of *Drypetes macrophylla* (Euphorbiaceae), Idukki, Kerala, India, Feb. 18, 1983, V.B. Hosagoudar HCIO 40521.


Colonies epiphyllous, dense, velvety, up to 2.5 mm in diameter. Hyphae straight, branching opposite at wide angles, closely reticulate, cells 13-18 x 7-9 μm. Hyphopodia alternate and opposite, subantrorse, 18-22 μm long; stalk cells cuneate, 5.5-6.5 μm long; head cells clavate, entire, 14-15.5 x 9-10.5 μm. Phialides mixed with hyphopodia, ampulliform, 18-19.5 x 6-7.5 μm. Mycelial setae scattered, simple, arcuate, obtuse to subacute at the tip, up to 310 μm long. Perithecia verrucose, globose, up to 275 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 45-52.5 x 16-19.5 μm.

On leaves of *Dysoxylum nitidum* (Meliaceae), New Caledonia, Aug. 1966, Mckee NC 67044.

Colonies epiphyllous, dense, velvety, up to 2.5 mm in diameter. Hyphae straight, branching opposite at wide angles, closely reticulate, cells 13-18 x 7-9 μm. Hyphopodia alternate and about 70% opposite, subantrorse, 14-19.5 μm long; stalk cells cuneate, 3-5 μm long; head cells clavate, 11-14.5 x 7-9 μm. Phialides mixed with hyphopodia, ampulliform, 18-19.5 x 6-7.5 μm. Mycelial setae simple, straight to arcuate, obtuse at the apex, up to 250 μm long. Perithecia verrucose, globose, up to 275 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 38-41.5 x 11-15.5 μm.

On leaves of *Dysoxylum* sp. (Meliaceae), New Caledonia, April 20, 1967 NC 67045.


Colonies amphigenous, suborbicular to effuse, velvety, up to 14 mm in diameter. Hyphae straight, branching opposite at acute angles, loosely to closely reticulate, antrorse to subantrorse, 22-27 μm long, head cells ovoid to pyriform, entire to angular, alternate to opposite, ampulliform, 19-30 x 8-11 μm. Mycelial setae numerous, 'simple, straight, acute at the tip, up to 900 μm long. Perithecia scattered, up to 230 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 50-60 x 16-24 μm.

On leaves of *Saccoglottis* sp. (Houmiriaceae), Brazil, Feb. 7, 1967, C.A. Batista IMUR 20693.

192. *Meliola ehretiicola* sp. nov.

Coloniae amphigenae, plerumque epiphyllae, densae, velutinae, ad 5 mm diam. Hyphae rectae, alternate, opposite vel irregulariter acuteque ramosae, dense reticulatae et solidae, cellularae 15-18.5 x 9-11 μm. Hyphopodia alternate, 20% opposite, antrorse, 18-22 μm
longa; cellula basali cuneata, 9-11 μm longa; cellula apicali
globosa, 2-3 toties irregulariter sublobata, 9-12.5 x 12-15.5 μm.
Phialides illis capitatis commixta, dispersa, ampullacea, 15-22 x
9-11 μm. Setae myceliales dense dispersae, simplices, rectae,
acutae vel obtusae ad apicem, ad 500 μm longae. Perithecia dense
dispersae, ad 155 μm diam.; ascosporae obovoideae, 4-septatae,
leniter constrictae, 37-40.5 x 15-17 μm.

On leaves of Ehretia canarensis (Clarke) Gamble (Boraginaceae), Veerapuli Reserve Forest, Kanniyakumari dist., Tamil Nadu, India, Feb. 22, 1994, V.B. Hosagoudar HCIO 41560 (type).

The present new species differs from the three species of the
genus Meliola reported on the members of the family Boraginaceae
in having 20% opposite capitate hyphopodia with sublobate head
cells.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up
to 3 mm in diameter, confluent. Hyphae straight, branching opposite
at wide angles, closely reticulate, 6-9 μm wide. Hyphopodia
opposite, rarely alternate, irregularly antrorse, spreading, 10-16
μm long; stalk cells cylindrical to cuneate, 3-5 μm long; head
cells ellipsoid to cylindrical, entire, 6-13 x 6-7.5 μm.
Phialides not seen. Mycelial setae scattered, straight to
subarcuate-curved, acute to obtuse at the tip, up to 560 μm long.
Perithecia scattered, up to 200 μm in diam.; ascospores oblong to
ellipsoid, 4-septate, constricted at the septa, 32-36 x 15-17
(10-12) μm.

On leaves of Elattostachys sp. (Sapindaceae), Philippines,
June 5, 1925, M.S. Clemons Nr. 6698.


Colonies epiphyllous, rarely amphigenous, thin, up to 4 mm in
diameter, confluent. Hyphae undulate, branching mostly opposite at
wide angles, loosely reticulate, cells 24-31 x 4.5-6 μm. Hyphopodia
alternate, straight to curved, antrorse, recurved, spreading, 12-18
μm long; stalk cells cuneate to cylindrical, 2-3 μm long; head
cells ovate, globose, slightly angular to sublobate, straight to
curved, 13.5-15.5 x 9-10.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 12-16.5 x 6-8 μm. Mycelial setae few, grouped around perithecia, straight, simple, acute to obtuse, up to 208 μm long. Perithecia scattered, verrucose, up to 93 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted, 27-31 x 11-12.5 μm.

On Ervatamia heyneana (Apocynaceae), Anamalai, Coimbatore, Tamil Nadu, India, Jan. 17, 1987, V.B. Hosagoudar HCIO


Colonies amphigenous, mostly hypophyllous, often show yellow haloes around the colonies, subdense, up to 4 mm in diameter, rarely confluent. Hyphae substraight, branching mostly opposite at acute angles, closely reticulate, cells 16-24 x 6-10 μm. Hyphopodia closely arranged, mostly opposite, closely antrorse, straight to curved, 20-26 μm long; stalk cells cuneate, 6-10 μm long; head cells ovate to obovate, entire, 12-18 x 10-12 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 16-22 x 8-10 μm. Mycelial setae scattered to grouped around perithecia, arcuate, simple, acute to obtuse at the tip, up to 378 μm long. Perithecia scattered, verrucose, up to 225 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 45-52 x 14-20 μm.

On leaves of Erycibe paniculata (Convolvulaceae), Idukki, Kerala, India, Dec. 12, 1982, V.B. Hosagoudar HCIO 40522.


Colonies mostly epiphyllus, effuse, orbicular, velvety, up to 7 mm in diameter. Hyphal branching alternate and densely reticulate, cells 10-11 μm broad. Hyphopodia alternate, 34-41 μm long; head cells slightly lobate. Mycelial setae simple, straight to slightly curved, obtuse to acute at the tip, up to 650 μm long. Perithecia loosely grouped, up to 260 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 53-60 x 18-25 μm.

On leaves and petioles of Erycibe henryi (Convolvulaceae), China, Nov. 24, 199, S.K.

Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 4 mm in diameter, confluent. Hyphae slightly undulate, branching opposite to irregular at acute angles, loosely reticulate, cells 12-32 x 5-8 μm. Hyphopodia alternate to unilateral, straight, antrorse, spreading, 18-20 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells ovate, globose, entire, 12-14 x 10-12 μm. Phialides few, mixed with hyphopodia, alternate to opposite, ampulliform, 14-20 x 8-10 μm. Mycelial setae scattered, simple, straight, acute at the tip, up to 315 μm long. Perithecia scattered, verrucose, up to 180 μm in diam.; ascospores oblong, 4-septate, slightly constricted, 38-44 x 10-16 μm.


Colonies amphigenous, thin, up to 4 mm in diameter, confluent. Hyphae substraight, branching opposite at wide angles, loosely reticulate, cells 13-26.5 x 6-7 μm. Hyphopodia alternate, unilateral, mostly antrorse, straight to curved, 20-31 μm long; stalk cells cylindrical to cuneate, 6-11.5 μm long; head cells ovate, globose, cylindrical, entire to angular, 13-20 x 8-10 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 21-26.5 x 6-7 μm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute at the apex, up to 938 μm long. Perithecia mostly grouped, verrucose, up to 211 μm in diam.; ascospores oval to ellipsoidal, 4-septate, constricted at the septa, 42-46 x 11-17 μm.

On leaves of *Syzygium jambos* (Myrtaceae), Jalpaiguri, West Bengal, India, M.K. Maity PCC 1484.

199. *Meliola eugeniae-stocksii* sp. nov.

Coloniae hypophyllae, densae, velutinae, ad 5 mm diam., raro confluentes. Hyphae subrectae vel anfractuae, opposite vel irregulariter laxe ramosae, laxe vel dense reticulatae, cellulæ
24-31 x 5-7 μm. Hyphopodia alternata, recta vel curvula, antrorsa, subantrorsa vel patentia, 21-25 μm longa; cellula basali cylindracea vel cuneata, 9-12.5 μm longa; cellula apicali ovata vel globosa, irregulariter sublobata vel lobata, 12-15.5 x 12-15 μm. Phialides producentes in hyphis separatis, alternatis vel oppositis, conoidis vel ampullaceus, 12-25 x 5-7 μm. Setae myceliales numeroseae, simplices, rectae, curvulae vel uncinatae, acute vel obtuseae ad apicem, ad 715 μm longae. Perithecia dispersa et occultus in setae myceliales, verrucosa, ad 170 μm diam.; ascosporae ellipsoideae, rectae vel leniter curvulae, 4-septatae, leniter constrictae, 40-47 x 11-13 μm.


This species can be compared with Meliola megalopoda Sydow having irregularly lobate head cells of the hyphopodia but differs from it in having phialides on a separate mycelial branch, ellipsoidol and very narrow ascospores.

200. Meliola euonymicola sp. nov.

Colonies hypophyllous, pertenues, patentia et confluentes. Hyphae rectae, plerumque opposita laxae ramosae, laxae reticulatae, cellularae 18-22 x 6-8 μm. Hyphopodia alternata et 5% opposita, antrorsa vel subantrorsa, 15-18.5 μm longa; cellula basali cylindracea vel cuneata, 5-6.5 μm longa; cellula apicali ovata vel globosa, integra, 10-12.5 x 9-11 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 12-22 x 6-9.5 μm. Setae myceliales plerumque circa perithecia aggregatae, simplices, rectae, obtusae vel 2-3 cristatae ad apicem, ad 300 μm longae. Perithecia dispersa vel laxae aggregatae, verrucosa, ad 155 μm diam.; ascosporae oblongae vel ellipsoideae, 4-septatae, constrictae, 37-41 x 15-18.5 μm.

On Euonymus indicus (Celastraceae), Radhanagari, Kolhapur, Maharashtra, India, Feb. 10, 1978, M.S. Patil HCIO 32522 (type).

Globose head cells of hyphopoda and obtuse to cristate mycelial setae distinguishes this new species from the known Meliola species on Celastraceae.

Colonies epiphyllous, rarely amphigenous, dense, velvety, up to 2 mm in diameter, confluent. Hyphae undulate, branching alternate at acute angles, closely reticulate, cells 31-38 x 9-10 \(\mu m\). Hyphopodia alternate, antrorse, 28-31.5 \(\mu m\) long; stalk cells cylindrical, 11-13 \(\mu m\) long; head cells cruciform, versiform, lobate, 16-19 x 22-25 \(\mu m\). Phialides borne on a separate mycelial branch, opposite to unilateral, ampulliform, up to 28.5 \(\mu m\) long. Mycelial setae scattered to grouped around perithecia, straight to subarcuate, obtuse to dentate at the apex, up to 400 \(\mu m\) long. Perithecia loosely grouped at the centre of the colony, verrucose, up to 250 \(\mu m\) in diam.; ascospores elongated-elliptic, 4-septate, constricted at the septa, 42-50 x 16-22 \(\mu m\).


202. *Meliola exaci* sp. nov.

Coloniae amphigenae, densae, crustosae, fortiter appressae, ad 2 mm diam. Hyphae flexuosae vel anfractucae, opposite vel irregulariter acuteque ramosae, dense reticulatae, cellulae 27-31 x 6-9.5 \(\mu m\). Hyphopodia alternata, antrorsa, 12-25 (-37) \(\mu m\) long; cellula basali cylindracea vel cuneata, 3-9.5 (-15.5) \(\mu m\) longa; cellula apicali ovata, clavata, oblonga, integra, 15-22 x 12-15.5 \(\mu m\). Phialides in hyphis separatis, oppositis vel alternatis, ampullaceus, 15-18.5 x 5-6.5 \(\mu m\). Setae myceliales circa perithecia aggregate, simplices, rectae vel leniter flexuosae, acutae vel obtusae ad apicem, ad 360 \(\mu m\) longae. Perithecia dispersa, verrucosa, ad 125 \(\mu m\) diam.; ascospores obovoideae vel cylindraceae, 4-septatae, constriectae, 34-37.5 x 12-15.5 \(\mu m\).

On *Exacum tetragonum* (*E. bicolor*) (Gentianaceae), Radhanagari, Maharashtra, India, Aug. 4, 1976, HCIO 36750 (type).

This new species is distinct from *Meliola chelonanthisi* Hansf. and *M. chelonanthisi* Hansf. var. *bisgoeppertiae* Hansf. in having only alternate, ovate and entire head cells of hyphopodia.

Colonies amphigenous, sparse, orbicular, slightly crustose, up to 3 mm in diameter. Hyphae undulate, branching opposite to alternate at acute angles, loosely reticulate, cells 15-20 x 7-10 \( \mu \text{m} \). Hyphopodia opposite, few alternate, antrorse, straight to curved, 15-20 \( \mu \text{m} \) long; stalk cells cuneate to cylindrical, 3-5 \( \mu \text{m} \) long; head cells elliptic, entire, 11-15 x 8-10 \( \mu \text{m} \). Phialides few, borne on separate mycelial branch, alternate to opposite, ampulliform, 15-18 x 7-8 \( \mu \text{m} \). Mycelial setae scattered, straight to slightly curved, simple, obtuse at apex, up to 350 \( \mu \text{m} \) long. Perithecia scattered, globose, verrucose, black, 220 \( \mu \text{m} \) in diam.; ascospores oblong, 4-septate, constricted at septa, apex rounded, brown, 42-53 x 17-22 \( \mu \text{m} \).


Colonies epiphyllous dense, up to 2 mm in diameter. Hyphae straight, flexuous to tortuous, branching mostly opposite at wide angles, closely reticulate, cells 15-31 x 3-6.5 \( \mu \text{m} \). Hyphopodia opposite and alternate, antrorse to recurved to spreading, 15-18.5 \( \mu \text{m} \) long; stalk cells cylindrical to cuneate, 3-6 \( \mu \text{m} \) long; head cells ovate, globose, straight to curved, entire to truncate at the apex, 12-14 x 6-9.5 \( \mu \text{m} \). Phialides few, mixed with hyphopodia, opposite to alternate, ampulliform, 12-28 x 12-15.5 \( \mu \text{m} \). Mycelial setae densely scattered, straight, simple, obtuse to dentate at the apex, up to 800 \( \mu \text{m} \) long; perithecia scattered to grouped, up to 160 \( \mu \text{m} \) in diam.; ascospores obovoidal, 4-septate, slightly constricted, 30-33.5 x 12-15.5 \( \mu \text{m} \).

On leaves of *Filicium decipiens* (Sapindaceae), Idukki, Kerala, India, Feb. 8, 1981, N.C. Nair HCIO 30391.

205. *Meliola filiciicola* V.B. Hosagoudar, K. Udaiyian et P. Ponnusamy, sp. nov.

Coloniae hypophyllae, subdensae, crustosae, patentiae, ad 8 mm diam., confluentes. Hyphae rectae vel flexuosae, opposite acuteque vel laxe ramosae, laxe reticulatae, cellulae 18-31 x 5-7 \( \mu \text{m} \).
Hyphopodia alternata, minus quam 1% opposita, recta cylindrea vel cuneata, 5-7 μm longa; cellula apicali ovata, oblonga, integra vel raro angularia, 12-15.5 x 9-12.5 μm. Phialides illis capitatis commixa, alternata vel opposita, ampullacea, 18-25 x 9-12.5 μm. Setae myceliales dispersae vel aggregatus circa peritheciae, simplices, rectae, obtusae ad apicem, ad 360 μm longae. Perithecia dispersa, verrucosa, ad 177 μm in diam.; ascosporae obovoideae vel cylindraceae, 4-septatae, constrictae, 37-40 x 15-18.5 μm.

On leaves of Filicium decipiens (Wight & Arn.) Thw. (Sapindaceae), Koomati, Anamalai, Coimbatore, Tamil Nadu, India, March 13, 1994, V.B. Hosagoudar HCIO 41564 (type). Meliola filicii Hosag. is the only known species on this host. The present new species is distinct from it in having hypophyllous and spreading colonies, alternate hyphopodia and obtuse mycelial setae. Both species may occur at the same time on this host.


Colonies epiphyllous, crustose to slightly dense, up to 3 mm in diameter. Hyphae straight, branching mostly opposite at acute angles, loosely reticulate, cells 21-33 x 7-12.5 μm. Hyphopodia alternate, mostly straight, antrorse, 18.5-31 μm long; stalk cells cuneate, 6-9.5 μm long; head cells ovate to globose, entire, 12.5-21.5 x 12.5-15.5 μm. Phialides mixed with hyphopodia, opposite to alternate, conoid to ampulliform, 21.5-28 x 9-12.5 μm. Mycelial setae scattered, simple, straight, acute to obtuse, up to 500 μm long. Perithecia immature. Ascospores obovoidal, 4-septate, slightly constricted, 49.5-53 x 18.5-22 μm.

On Persea macrantha (Lauraceae), Anamalai, Coimbatore, Tamil Nadu, India, Jan. 17, 1987, V.B. Hosagoudar HCIO.


Colonies epiphyllous, dense, crustose, up to 2 mm in diameter, confluent. Hyphae substraight to crooked, branching opposite at acute angles, loosely to closely reticulate, cells 18-31 x 6-9 μm. Hyphopodia alternate, straight to curved, antrorse to spreading,
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18-22 μm long; stalk cells cylindrical to cuneate, 4-5 μm long; head cells ovoid to globose, straight to curved, often bluntly pointed at the apex, entire, 12-15.5 x 12-14 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15-25 x 6-9.5 μm. Mycelial setae few, straight, simple, acute to obtuse at the apex, up to 650 μm long. Perithecia scattered, verrucose, up to 280 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 37-43.5 x 15-18.5 μm.

On leaves of Smilax zeylanica (Smilacaceae), Karnataka, India, Dec. 16, 1918, J.S. Gamble HClO 80546.

Colonies epiphyllous, black, subvelvety, up to 3 mm in diameter. Hyphae straight to flexuous, branching irregular at acute to wide angles, closely reticulate, cells 20-28 x 4-7 μm. Hyphopodia alternate, more or less antrorse, rarely straight, 20-27.5 μm long; stalk cells cylindrical to cuneate, 4-9.5 μm long; head cells subglobose, angulose to sublobate, 11-16 x 3-4 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15-19 x 4-7 μm. Mycelial setae scattered, straight, simple, acute to subacute at apex, up to 300 μm long. Perithecia scattered, verrucose, up to 132 μm in diam.; ascospores ellipsoidal, 3-septate, slightly constricted at the septa, 45-57.5 x 16-18 μm.

On leaves of Garcinia obligantha (Clusiaceae), Prov. of Guangdense, China, Aug. 1958, G.C. Jiang HMAS 24317.

Colonies epiphyllous, dense, velvety, up to 6 mm in diameter. Hyphae straight to flexuous, branching opposite to alternate at acute angles, loosely to closely reticulate, cells 18-25 x 5-7 μm. Hyphopodia alternate, antrorse to subantrorse, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, versiform, entire, 12-18.5 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite to alternate, elongated, conoid to
ampulliform, 21-25 x 6-8 μm. Mycelial setae numerous, scattered, simple, straight to curved, acute to obtuse at the apex, up to 300 μm long. Perithecia loosely grouped, verrucose, up to 160 μm in diam.; perithecial cells conoid, protruded; ascospores obovoidal, 4-septate, 31-35 x 15-18.5 μm.

On leaves of Gardenia ovata (Loganiaceae), Nilgiris, Tamil Nadu, India, Feb. 16, 1991, V.B. Hosagoudar HCIO 30619.

210. Meliola gerusoppaensis V.B. Hosagoudar, C.M. Pillai & P.A. Raghu sp. nov.

Colonies amphigenae, densae, crustosae on epiphyllae et numerosae vel velutinae on hypophyllae, ad 3 mm diam., plerumque confluentes. Hyphae rectae vel leniter anfractuae, opposite acuteque ramosae, densae reticulatae, cellulae 12-25 x 6-9.5 μm. Hyphopodia alternata et minusva 1% opposita, recta vel curvula, antorsa vel recurva, 21-28 um longa; cellula basali cylindracea vel cuneata, 6-7 um longa; cellula apicali recta vel curvula, ovata, globosa, integra vel angularia, 15-22 x 15-18.5 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 24-31 x 9-12.5 μm. Setae myceliales paucae in coloniae epiphyllae, numerosae in coloniae hypophyllae, simplices, rectae, acute vel obtusae ad apicem, ad 1150 um longae. Perithecia laxe dispersae, ad 220 um diam.; cellula peritheciales protrudorae; ascosporae obovoideae vel cylindraceae, 4-septatae, leniter constrictae ad septatae, 49-56 x 18-22 um.

On Syzygium sp. (Myrtaceae), Gersoppa, Uttara Kannada, Karnataka, May 29, 1992, P.A. Raghu HCIO 30993 (type).

According to Beeli formula 3111. 5334, the present new species is close to Meliola eugeniae Sydow and M. eugeniae-jamboloidis Hansf. It differs from the former species in having longer and ovate to globose head cells of the capitate hyphopodia and longer mycelial setae. It differs from the latter species in having amphigenous colonies, straight to slightly crooked mycelium, capitate hyphopodia antorse to recurved but not irregularly sinuously bent and in having longer mycelial setae. The present new species differs from the two varieties of the latter species namely, M. eugeniae-jamboloidis Hansf. var. paulensis Hansf. and M.
eugeniae-jamboloides Hansf. var. amphigena Kar & Maity (4, 7) in having distinctly ovate to globose, entire to angular head cells of the capitate hyphopodia, longer mycelial setae and larger ascospores.


Colonies amphigenous, dense, velvety, up to 6 mm in diameter, confluent. Hyphae straight to undulate, branching opposite to alternate at acute angles, loosely reticulate, cells 24-30 x 6-8 μm. Hyphopodia opposite, about 30% alternate, straight, antrorse, 12-16 μm long; stalk cells cuneate, 4-6 μm long; head cells globose, versiform, entire, 8-12 x 8-10 μm. Phialides mixed with hyphopodia, opposite to alternate, 12-18 x 6-8 μm. Mycelial setae fairly numerous, scattered, simple, acute at the tip, up to 630 μm long. Perithecia scattered, up to 184 μm in diam.; ascospores ellipsoidal, 4-septate, constricted, 42-50 x 16-18 μm.


Colonies amphigenous, arachnoid to velvety, up to 5 mm in diameter. Hyphae substraight, branching opposite to irregular at acute angles, cells 20-28 x 5-7.5 μm. Hyphopodia alternate to unilateral, 27-33.5 μm long; stalk cells cylindrical, 7-12.5 μm long; head cells clavate to ovate, entire, rounded to angulose at the apex, 18-24 x 6-9.5 μm. Phialides with hyphopodia, ampulliform, 15-23 x 6-7 μm, neck elongated. Mycelial setae straight, simple, acute at the tip, up to 768 μm long. Perithecia scattered, globose, verrucose, immature; ascospores oblong, 4-septate, constricted at the septa, 32-33.5 x 12-15 μm.

On leaves of Gnetum montanum (Gnetaceae), Longrui Biosphere Reserve, Guangxi Provincia, China, Aug. 29, 1986, Hu Yan-xing & Yang Jia-cheng GDIM 86052.

Colonies epiphyllous, black, round, up to 5 mm in diameter. Hyphae branched at acute angles, cells 20-28 x 6-8 μm wide. Hyphopodia alternate to unilateral; head cells subglobose, 15-16 x 10-12 μm. Phialides mixed with hyphopodia, opposite to unilateral, ampulliform, 18-20 x 6-8 μm. Mycelial setae simple, straight, up to 360 μm long. Perithecia scattered, verrucose, up to 200 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, 40-45 x 15-16 μm.

On leaves of Sida sp. (Malvaceae), Brazil, Aug. 16, 1959, O.S. Silva IMUR 17506.


Colonies epiphyllous, dense, up to 2 mm in diameter. Hyphae straight to flexuous, branching alternate to opposite at acute angles, loosely to closely reticulate, cells 15-28 x 6-9.5 μm. Hyphopodia alternate, antrorse, straight to curved, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, globose, irregularly and stellately sublobate, 12-28 x 12-15.5 μm. Phialides borne on a separate mycelial branch, opposite to alternate, ampulliform, 21-28 x 9-12.5 μm. Mycelial setae scattered, straight, simple, acute to obtuse at the tip, up to 450 μm long. Perithecia scattered, up to 120 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, slightly constricted at the septa, 40-44 x 15-19 μm.

On leaves of Viburnum punctatum (Caprifoliaceae), Nilgiris, Tamil Nadu, India, Jan. 24, 1990, V.B. Hosagoudar HCIO 30363.

215. Meliola gordoniae sp. nov.

Coloniae amphigenae, densae, velutinae, confluentes et fuligineus. Hyphae rectae vel leniter flexuose, irregulariter acutaeque ramosae laxae vel dense reticulatae, cellulae 15-18.5 x 9-10 μm. Hyphopodia alternata, antrorsa, arte antrorsa vel subantrorsa, 24-31 μm longa; cellula basali cylindracea vel cuneata, 9-12.5 μm longa; cellula apicali ovata vel globosa, angulata vel leniter lobata, 15-18.5 x 15-22 μm. Phialides in
hyphis separatis, plerumque oppositis, ampullaceus, 21-28 x 9-12.5 μm. Setae myceliales dispersae, dichotoma ramosae, ad 210 μm longae ad ramificans, ramuli primarii ad 18 μm longae et secondary ad 10 μm longae, obtusae ad apicem, ramuli reflexae. Perithecia dispersa, verrucosa, ad 220 μm diam.; ascosporae oblongae vel cylindraceae, 4-septatae, constrictae, 40-44 x 15-17 μm.

On Gordonia obtusa (Theaceae), Kemmanagundi, Karnataka, India, Feb. 29, 1984, C.R. Patil HCIO 40022 (type).

This new species can be compared with Meliola schimae Hansf. but differs from it in having angular to slightly lobate head cells of hyphopodia, phialides on separate mycelial branch and also in the nature of branching pattern of mycelial setae.


Colonies, epiphyllous, dense, up to 5 mm in diameter, often confluent. Hyphae oppositely branched, closely reticulate, cells 10-31 x 7-9 μm. Hyphopodia alternate, spreading, 23-31.5 μm long; stalk cells straight to curved, 8-12.5 μm long; head cells round, entire, 15-19 x 14-22 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 17-21 x 7-9.5 μm. Mycelial setae scattered, straight, simple, acute to dentate at the tip, up to 380 μm long. Perithecia scattered, verrucose, up to 275 μm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 54-60 x 23-28 μm.

On leaves of Grevillea gillivrayi (Proteaceae), New Caledonia, Oct. 6, 1966, NC 66131.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 3 mm in diameter. Hyphae mostly straight, branching alternate at wide angles, closely reticulate, cells 31-50 x 6-10 μm. Hyphopodia alternate, antrorse to subantrorse, 23-27 μm long; stalk cells cuneate, 10-12 μm long; head cells clavate, ovate, cylindrical,
entire, angulose to slightly lobate, 13-15.5 x 13-15 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform. Mycelial setae numerous, grouped around perithecia, straight, simple, acute, up to 285 μm in diam.; ascospores oblong, 4-septate, constricted, 41-46.5 x 14-16 μm.

On Grewia teliaefolia (Tiliaceae), Mahabaleshwar, Maharashtra, India, Nov. 1967, Srinivasulu MUH 136.


Colonies amphigenous, mostly epiphyllous, caulicolous, dense, velvety, up to 3 mm in diameter. Hyphae straight, branching opposite at acute angles, closely reticulate, cells 9-11 x 8-9 μm. Hyphopodia alternate and opposite, straight, 14-17 μm long; stalk cells cylindrical to cuneate, 2-5 μm long; head cells subglobose to ovate, entire, 11-13 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 17-25 x 8-10 μm. Mycelial setae numerous, scattered to grouped around perithecia, obtuse to dentate at the tip, up to 367 μm long. Perithecia scattered, verrucose, up to 216 μm in diam.; ascospores oblong to subellipsoidal, 4-septate, constricted at the septa, 36-46 x 16-18 μm.

On leaves of Scleropyrum wallichianum (Santalaceae), Hainan Province, China, Sept. 9, 1975, Ye Dong-hai GDIM 85244.


Colonies hypophyllous, rarely epiphyllous, up to 6 mm in diameter, confluent. Hyphae flexuous, cells 17-22 x 6.5-8.5 μm. Hyphopodia alternate to unilateral, antrorse to subantrorse, 18-24 μm long; stalk cells entire, 13-18 x 10-13 μm. Phialides on a separate mycelial branch, opposite to rarely unilateral, ampulliform, 17-24 x 7-9 μm. Mycelial setae simple, straight, acute to variously dentate at the tip, up to 247 μm long. Perithecia scattered, up to 215 μm diam.; ascospores cylindrical, 4-septate, constricted, 33-39 x 9-15 μm.

On leaves of Hancornia speciosa (Apocynaceae), Brazil, IMUFPe 71.047.

Colonies amphigenous, dense. Hyphae sinuous to flexuous, branching opposite at acute to wide angles, loosely reticulate, cells 15-35 x 4-9 μm. Hyphopodia alternate, straight to curved, subantrorsse to retrorse, 9-20 μm long; stalk cells cylindrical to cuneate, 3-8 μm long; head cells ovate, entire, 6-12.5 x 4-6 μm. Phialides not seen. Mycelial setae numerous, simple, straight, acute to obtuse at the apex, up to 400 μm long. Perithecia scattered, up to 250 μm in diam.; ascospores cylindrical, 4-septate, slightly constricted at the septa, 45-55 x 12-18 μm.

On leaves of Hemidesmus indicus (Asclepiadaceae), Gorakhpur, Uttar Pradesh, India, B.K. Gupta IMI 281887.

221. Meliola hemidesmicola sp. nov.

Coloniae epiphyllae, densae et confluentes. Hyphae rectae vel leniter flexuosae, plerumque opposite laxe ramosae, laxe vel acuteque ramosae, cellularae 24-28 x 6-8 μm. Hyphopodia alternata, anatrorsa vel subantrorsa, 18-22 μm longa; cellula basali cylindracea vel cuneata, 5-7 μm longa, cellula apicali ovata, globosa, integra, 12-15.5 x 9-12.5 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 21-25 x 5-7 μm. Setae myceliales numerosae, dispersae, simplices, rectae, acute ad apicem, ad 650 μm longae. Perithecia dispersa, verrucosa, ad 124 μm diam.; ascosporae oblongae vel subellipsoideae, 4-septatae, constrictae, 32-35 x 12-15.5 μm.


Meliola hemidesmi Kamal & Gupta is known on this host but the present new species differs from it in having longer mycelial setae, smaller perithecia and ascospores.

222. Meliola henryi sp. nov.

Coloniae amphigenae, plerumque epiphyllae, densae, crustosae, ad 3 mm diam., raro confluentes. Hyphae rectae vel subrectae, plerumque opposite acuteque vel laxe ramosae et profusatim ramosae formatum solidae, cellularae 21-28 x 9-11 μm. Hyphopodia alternata,
antrorsa vel anguste antrorsa, 27-31 μm longa; cellula basali cuneata, 9-12.5 μm longa; cellula apicali ovata, cylindracea, integra, raro truncata ad apicem, 15-22 x 12-15.5 μm. Phialides producentes in ramus separatam myceliolis, alternata vel opposita, conoidea vel ampullacea, 15-18.5 x 6-8 μm. Setae myceliales paucae, dispersae, simplices, rectae, obtusae ad apicem, ad 315 μm longae. Perithecia dispersa, verrucosa, ad 186 μm diam.; ascosporae obovoideae, 4-septatae, leniter constrictae, 43-46.5 x 15-18.5 μm.

On leaves of *Canthium rheedii* DC. (Rubiaceae), Valve House, Kanniyakumari dist., Tamil Nadu, India, Feb. 28, 1994, V.B. Hosagoudar HCIO 41631 (type).

The present new species is close to *M. psychotriae* Earle var. *moreliae* Hansf. & Deight. and *M. lictorea* Ciff. However, it differs from the former in having straight and phialides on separate mycelial branch. While, it differs from the latter species in having entire head cells of the hyphopodia.

This species is named in honour of Dr. A.N. Henry for his excellent contributions to the floristic work of this district.


Colonies foliicolous, thin, confluent. Hyphae straight, branching at wide angles, loosely reticulate, cells 30-35 x 6-8 μm. Hyphopodia alternate, antrorse to spreading, 15-17 μm long; stalk cells cylindrical to cuneate, 2-4 μm long; head cells subglobose to ovate, straight to curved, entire, 12-15 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15-17 x 7-9 μm. Mycelial setae (?). Perithecia scattered, verrucose, up to 130 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, constricted at the septa, 35-40 x 12-16 μm.

On leaves of *Herietieria littoralis* (Sterculiaceae), Londha, Karnataka, India, A.N. Thite HCIO 31629.


Colonies amphigenous, circular, up to 7 mm in diameter, confluent. Hyphae substraight to flexuous, branching opposite at
acute to wide angles, reticulate, cells 25-35 x 7-9 μm. Hyphopodia opposite to alternate, 15-19 μm long; stalk cells cylindrical, apical cells oblong. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 19-26.5 x 7-10 μm. Mycelial setae straight, simple, straight to recurved, obtuse at the tip, up to 625 μm long. Perithecia globose, up to 320 μm in diam.; ascospores cylindrical, 4-6 septate, constricted at the septa, 43-60 x 16-20 μm.

On leaves of *Cupafera officinalis* (Caesalpiniaceae), Pernambuco, Brazil, April 16, 1958, IMUR 17245.


Colonies amphigenous, crustose, dense, up to 3 mm in diameter, confluent. Hyphae undulate, closely appressed to the host surface, branching opposite at wide angles, closely reticulate, cells 16-28 x 6-8 μm. Hyphopodia alternate, subantrorse to spreading, straight to curved, 16-40 μm long; stalk cells cylindrical, 8-12 μm long; head cells ovoid, broadly clavate, often bent, entire, 16-20 x 10-12 μm. Phialides not seen. Mycelial setae numerous, scattered uniformly on the colonies, up to 400 μm long, dichotomously branched, branches up to 160 μm long, secondary branches up to 60 μm long. Perithecia scattered, verrucose, up to 100 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 34-40 x 12-14 μm.

On leaves of *Bridelia montana* (Euphorbiaceae), Sribadam, Sikkim, India, April 7, 1962, J.N. Kapoor HCIO 28363.


Colonies hypophyllous, dense, up to 5 mm in diameter, often confluent, cause leaf spots and yellow haloes around the infected spots, corresponding upper surface of the leaf turned yellow and result in shot holes. Hyphae substraight to slightly undulate, branching alternate to opposite at acute angles, loosely reticulate, cells 12-26 x 6-8 μm. Hyphopodia alternate, straight to curved, antrorse, 22-30 μm long; stalk cells cuneate, 6-10 μm long; head cells broadly ovoid, entire to imperfectly sublobate, 14-22 x
10-14 μm. Phialides borne on a separate mycelial branch, alternate, unilateral, rarely opposite, ampulliform, 16-20 x 6-8 μm. Mycelial setae numerous, scattered to grouped around perithecia, simple, acute at the tip, up to 522 μm long. Perithecia scattered, verrucose, up to 76 μm in diam.; ascospores oblong, 4-septate, constricted, 38-42 x 14-20 μm.


Colonies hypophyllous, thin, up to 4 mm in diameter. Hyphae undulate to crooked, branching opposite to alternate at wide angles, loosely reticulate, cells 26-36 x 5-6 μm. Hyphopodia alternate and rarely opposite, distantly placed, antrorse to recurved, straight to curved, 10-20 μm long; stalk cells cylindrical to cuneate, 3-8 μm long; head cells ovate, entire, straight to curved, 6-13 x 6-10 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 16-24.5 x 8-10 μm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute at the apex, up to 907 μm long. Perithecia scattered to grouped, verrucose, up to 264 μm in diam.; ascospores fusiform, straight to curved, 4-septate, constricted at the septa, end cells conoid, middle cell larger, 42-46 x 16-18 μm.

On leaves of Castanopsis hystrix (Fagaceae), Darjeeling, West Bengal, India, May 11, 1967, M.K. Maity PCC 1250.


Colonies amphigenous, scattered, thin, black. Hyphae brown, straight to sinuous, branching opposite to irregular, loosely reticulate, cells 13-36 x 5-7 μm. Hyphopodia opposite and alternate, antrorse, straight to curved, 12-17 μm long; stalk cells cylindrical, 3-5 μm long; head cells cylindrical to clavate, straight to curved, entire, 10-12 x 7-9 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 17-28 x 7-8 μm.
Mycelial setae loosely scattered, straight, simple, acute to dentate at the tip, up to 390 µm long. Perithecia scattered, verrucose, up to 120 µm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 39-44 x 12-16 µm.

On leaves of *Hylodendron gaboen*s (Caesalpiniaceae), Gabon, Oct. 4, 1968, G. Gilles GN 135.


Colonies amphigenous, mostly hypophyllous, dense, crustose to velvety, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching mostly opposite at acute angles, closely reticulate, cells 18-34 x 9-12.5 µm. Hyphopodia opposite, rarely solitary, straight to curved, antrorse to subantrorse, 18-25 µm long; stalk cells mostly cuneate, 6-7 µm long; head cells ovate to globose, entire, 12-18.5 x 12-14 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, neck elongated, 21-25 x 7-9.5 µm. Mycelial setae numerous, simple, straight, acute to obtuse at the tip, up to 500 µm long. Perithecia scattered to loosely grouped, verrucose, up to 220 µm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 52-59 x 24-26 µm.


230. *Meliola integrifolii* C.R. Patil et V.B. Hosagoudar, sp. nov.

Coloniae hypophyllae, densae, velutinae, ad 5 mm diam. Hyphae anfractuæ, opposite vel irregulariter acutèque vel laxè ramosae, dense reticulatae et solidæ, cellulae 18-22 x 6-8 µm. Hyphopodia opposita (60%), alternata et raro solitaria, antrorsa vel subantrorsa, 12-18.5 um longa; cellula basali cylindracea vel cuneata, 3-6.5 um longa; cellula apicali ovata, globosa, integra, 9-13 x 9-12 µm. Phialides illis capitatis commixta, dispersa, ampullacea, 15-22 x 9-10 µm. Setae myceliales dense dispersae, simplices, rectae, curvulae, uncinatae, acutae, obtusae vel bidentatae ad apicem, ad 300 um longae. Perithecia dense aggregata, verrucosa, ad 140 um diam.; ascosporae oblongae vel
obovoideae, 4-septatae, constrictae, 43-46.5 x 18-20 µm.


Opposite hyphopodia (60%); straight, curved to uncinate and acute to bidentate mycelial setae distinguishes this species from others.


Colonies hypophyllous, thin, up to 10 mm in diameter. Hyphae tortuous, branching opposite to irregular at wide to acute angles, loosely reticulate, cells 28-32 x 6-10 µm. Hyphopodia alternate to unilateral, distantly placed, spreading, antrorse, straight to curved, 22-34 µm long; stalk cells cuneate to cylindrical, 6-12 µm long; head cells ovate, angulose to slightly lobate, 14-20 x 12-16 µm. Phialides borne on a separate mycelial branch, alternate, rarely opposite, ampulliform, 12-20 x 6-12 µm. Mycelial setae scattered, mostly grouped around perithecia, simple, acute to obtuse at the tip, up to 1035 µm long. Perithecia scattered, verrucose, up to 170 µm in diam.; ascospores obovoidal to cylindrical, terminal cells broadly conoid, 42-48 x 12-14 µm.


Colonies epiphyllous, dense, crustose, up to 1 mm in diameter, rarely confluent. Hyphae straight, branching mostly opposite at acute to wide angles, densely reticulate and form solid mycelial mat, cells 12-15.5 x 9-12.5 µm. Hyphopodia opposite, crowded, antrorse to subantrorse, mostly straight, 15-18.5 µm long; stalk cells cuneate, 5-7 µm long; head cells ovate, globose, entire, rarely attenuated at apex, 9-12.5 x 9-11 µm. Phialides few, mixed with hyphopodia, alternate to opposite, ampulliform, 15-22 x 9-12.5 µm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute to obtuse at the apex, up to 800 µm long.
Perithecia scattered, verrucose, up to 170 μm in diam.; ascospores obovoidal, 4-septate, strongly constricted, 40-43.5 x 15-18.5 μm.

On leaves of *Ixora coccinea* (Rubiaceae), Vettiyar, Mavelikara, Kerala, India, Sept. 14, 1992, C.M. Pillai HCIO 40761.


Colonies epiphyllous, round, scattered, velvety, up to 9 mm in diameter. Hyphae flexuous, branching at acute angles, cells 19-28 x 5-9 μm. Hyphopodia alternate to unilateral, up to 16-28 μm long; stalk cells cylindrical, 4-7.5 μm long; head cells ovate, oblong to cylindrical, entire, 12-20.5 x 7-10 μm. Phialides alternate to opposite, ampulliform, 16-22 x 5-6 μm. Mycelial setae simple, straight, acute to obtuse at the tip, up to 510 μm long. Perithecia scattered, up to 215 μm in diam.; ascospores oblong-cylindrical, 4-septate, constricted at the septa, 38-46 x 13-20 μm.

On leaves of *Jacarandia dodecaphylla* (Caricaceae), Brazil, Aug. 31, 1959, O.S. Silva IMUR 17530.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 6 mm in diameter, confluent. Hyphae straight to slightly undulate, branching opposite to irregular at acute angles, cells 24-32 x 6-8 μm. Hyphopodia alternate to unilateral, straight to curved, antlorse to spreading, 16-30 μm long; stalk cells cylindrical to cuneate, 4-12 μm long; head cells ovate, versiform, entire to angulose, 12-18 x 8-16 μm. Phialides mixed with hyphopodia, alternate to opposite, conoid to ampulliform, 16-18 x 6-8 μm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute at the tip, up to 585 μm long. Perithecia scattered to grouped, verrucose, up to 200 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 36-42 x 12-18 μm.

On leaves of *Jasminum auriculatum* (Oleaceae), Calcutta, West Bengal, India, June 6, 1919, S.N. Bal HCIO 3295.

Colonies epiphyllous, rarely amphigenous, subdense, up to 3 mm in diameter, scattered. Hyphae straight, branching opposite to irregular at wide angles, loosely reticulate, cells 15.5-18.5 x 7-10 µm. Hyphopodia alternate, unilateral, about 5% opposite, straight to curved, antrorse to recurved, 15.5-22 µm long; stalk cells cylindrical to cuneate, 3-6 µm long; head cells ovate, mostly curved, entire, 12.5-15.5 x 9-12.5 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 22-28 x 9-12.5 µm. Mycelial setae few, grouped around perithecia, simple, straight, rarely dentate at the tip, up to 545 µm long. Perithecia scattered, verrucose, up to 165 µm in diam.; ascospores obovoidal, 4-septate, slightly constricted, slightly curved, 40-43.5 x 21-25 µm.

On leaves of *Isonandra lanceolata* var. *anfractuosa* (Sapindaceae), Anamalai, Tamil Nadu, India, Jan. 17, 1987, V.B. Hosagoudar HCIO 39313.


Colonies amphigenous, mostly hypophyllous, up to 8 mm in diameter, confluent. Hyphae undulate, branching opposite to alternate, 8-10 µm wide. Hyphopodia alternate, 22-30 µm long; stalk cells cylindrical to cuneate, 6-10 µm long; head cells ellipsoidal, oblong to subglobose, entire, rounded at the apex, 15-20 x 13-17 µm. Phialides not seen. Mycelial setae straight to slightly curved, simple, dentate to furcate at the apex, up to 850 µm long. Perithecia grouped, up to 220 µm in diam.; ascospores oblong to ellipsoid-oblong, rounded at the apex, 4-septate, slightly constricted at the septa, 41-57 x 16-23.

On leaves of *Actinodaphne lancifolia* (Lauraceae), Japan, Oct. 1, 1956, I. Hino

237. *Meliola kakachiana* sp. nov.

Coloniae hypophyllae, subdensae, crustosae, ad 5 mm diam. Hyphae rectae vel anfractuae, plerumque opposite acuteque ramosae,
laxe reticulatae, cellulae 27-31 x 6-9.5 µm. Hyphopodia unilateralia, alternata vel ad 10% opposita, antrorsa vel subantrorsa, 12-18.5 µm longa; cellula basali cylindracea, 3-6.5 µm longa; cellula apicali globosa, rotunda vel truncata ad apicem, integra, 9-15.5 x 12-14 µm. Phialides illis capitatis commixta, alternata vel opposita, conoidea, elongata, 15-18.5 x 9-12.5 µm. Setae myceliales paucae, dispersae vel aggregatus circa peritheciae, simplices, rectae, acutae vel furcatae ad apicem, ad 572 µm longae. Perithecia dispersa, verrucosa, ad 155 µm diam.; ascosporae oblongae, cylindraceae, 4-septatae, leniter constrictae, 46-50 x 21-25 µm.

On leaves of Cryptocarya beddomei Gamble (Lauraceae), Kakachi, Tirunelveli dist., Tamil Nadu, India, Feb. 23, 1994, V.B. Hosagoudar HCIO 41543 (type).

The present new species differs from Meliola neolitseae Yamam. in having globose head cells of the hyphopodia and straight mycelial setae.

238. Meliola kanniyakumariana sp. nov.

Colonie amphigenae, tenues vel densae, ad 2 mm diam., confluentes. Hyphae flexuosaev, opposite vel irregulariter acuteque ramosae, laxa vel dense reticulatae, cellula 21-31 x 6-8 µm. Hyphopodia alternata, antrorsa, 15-31 µm longa; cellula basali cylindracea vel cuneata, 6-12.5 µm longa; cellula ovata, globosa, integra, angulosa, attenuata et rotundata ad apicem, vel truncata, 9-18.5 x 12-15.5 µm. Phialides producentes in ramus, separatam, opposita vel subopposita, conoidea, 9-12.5 x 6-8 µm. Setae myceliales dispersae, rectae, curvulæ vel uncinatae, obtusae ad apicem, ad 360 µm longae. Perithecia dispersa vel laxa aggregata, verrucosa, ad 140 µm diam.; ascosporae leniter fusoidae et cellulae terminaliae rotundae, 4-septatae, leniter constrictae, 36-40.5 x 15-18.5 µm.

On leaves of Hedyotis albo-nervia Bedd. (Rubiaceae), Valve House, Kanniyakumari dist., Tamil Nadu, India, Feb. 28, 1994, V.B. Hosagoudar HCIO 41540 (type).

Meliola oldenlandiae Hansf. & Stev. is close to the present new species but differs from it in having truncate head cells of
the hyphopodia and straight to uncinate mycelial setae.

239. Meliola kapoorii V.B. Hosagoudar et P.A. Raghu, sp. nov.


Coloniae hypophyllae, densae, velutinae, ad 5 mm diam., confluentes. Hyphae fortiter appressae ad hostes surfacionis, subrectae vel antractuae, alternate vel irregulariter acuteque vel laxe ramosae, dense reticulatae et solidae, cellulae 15-28 x 9-10 μm. Hyphopodia alternata, antrorsa vel subanrorsa, recta vel curvula, 18-25 μm longa; cellula basali cylindracea vel cuneata, 3-12.5 μm longa; cellula apicali ovata, globosa, integra, angulosa vel leniter sublobata, 12-18.5 x 12-15.5 μm. Phialides in hyphis distinctis, alternatis vel oppositis, ampulliformis, 27-31 x 9-12.5 μm. Setae myceliales numerosae, simplices, rectae, paucae uncinatae ad apicem, obtusae, ad 300 μm longae. Perithecia dispersa vel laxe aggregata, verrucosa, ad 217 μm diam.; ascosporae obovoidae vel leniter ellipsoidea, 4-septatae, leniter constrictae ad septae, 50-55 x 20-22 μm.

On leaves of *Pandanus* sp. (Pandanaceae), Kudremukh, Chikmagalur, Karnataka, India, April 24, 1993, P.A. Raghu HClO 41123.

So far, *Meliola juttingi* Hansf., *M. pandani* Sydow & *M. pandanicola* Hansf. & Deight. are known on this host genus *Pandanus*. The present new species is close to *M. juttingi* Hansf. in having uncinate mycelial setae but differs from it in having closely appressed hypophyllous colonies, very few mycelial setae are uncinate or sickle-shaped at their penultimate tip portion; entire, angular to sublobate head cells of the hyphopodia and smaller ascospores.

This species is named in honor of Dr. J.N. Kapoor for his contribution to this group.

240. Meliola karnatakensis V.B. Hosagoudar, C.M. Pillai & P.A. Raghu sp. nov.
Coloniae hypophyllae, densae, velutinae, ad 5 mm diam. Hyphae tantum anfractuae, irregulariter acutaeque ramosae, densae reticulatae, cellula 12-25 x 6-8 μm. Hyphopodia alternata et opposita, antorsa et recurvata, 12-18.5 μm longa; cellula basali cylindracea vel cuneata, 3-6.5 μm longa; cellula apicali ovata, obovata vel globosa, recta vel curvula, integra vel angulosa, 9-12.5 x 6-12.5 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 21-25 x 9-12.5 μm. Setae myceliales dispersae, rectae, simplices, acuteae vel obtusae ad apicem, ad 770 μm longae. Perithecia dispersa, ad 140 μm diam.; ascosporae obovoideae, 4-septatae, leniter constrictae ad septae, 31-37.5 x 15-16 μm.

On Glochidion sp. (Euphorbiaceae), Agumbe, Shimoga, Karnataka, May 7, 1992, C.M. Pillai HCIO 30994 (type).

The present species is close to Meliola luzonensis Sydow (3113. 3223) but differs from it in having hypophyllous colonies, crooked mycelia and in the arrangement and morphology of the capitate hyphopodia.

241. Meliola kaveriappai V.B. Hosagoudar, C.M. Pillai & P.A. Raghu, sp. nov.

Coloniae hypophyllae, tantum, tenues, patentiae, ad 10 μm diam. Hyphae fortiter appressae ad hospes, anfractuae, alternate vel irregulariter acutaeque ramosae, laxae reticulatae, cellulae 30-50 x 6-8 μm. Hyphopodia alternata, recta vel diverse curvula, antorsa, vel recurvata, 24-28 μm longa; cellula basali cylindracea vel cuneata, 6-9.5 μm longa; cellula apicali ovata, globosa, recta vel curvula, integra, angularia vel leniter, lobata, 15-18.5 x 12-15.5 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 21-25 x 6-8 μm. Setae myceliales dispersae, simplices, rectae vel raro flexuosae ad basim, acuteae vel obtusae ad apicem, ad 715 μm longae. Perithecia dispersa, ad 125 μm diam.; ascosporae obovoideae, 4-septatae, leniter constrictae ad septae, 51-54 x 24-25 μm.

On Cinnamomum sp. (Lauraceae), Agumbe, Shimoga, Karnataka, May 7, 1992, C.M. Pillai HCIO 30995 (type).

The present new species is close to Meliola cryptocaryae
Doidge and *M. sempeiensis* Yamam. in having thin hypophyllous colonies and crooked hyphae. However, it differs from the former species in having smaller capitate hyphopodia, mucronate hyphopodia mixed with capitate hyphopodia and smaller ascospores. It differs from the latter species in having entire, angular to slightly lobate head cells of the capitate hyphopodia, straight mycelial setae and smaller ascospores without central larger cell.

The species is named in honour of Prof. K.M. Kaveriappa whose contribution to the study of downy mildew and aquatic fungi has been notable.


Colonies hypophyllous, rarely amphigenous, dense, up to 5 mm in diameter, rarely confluent. Hyphae straight, very rarely crooked, branching mostly opposite at acute to wide angles, loosely reticulate, cells 27-35.5 x 6-9.5 μm. Hyphopodia opposite, rarely solitary, antrorse to recurved to spreading, 15-18 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells pyriform, conoid with rounded ends, straight, curved to recurved, entire, 12-15.5 x 6-9.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, straight to curved at the apex, 18-25 x 9-12 μm. Mycelial setae evenly scattered on the colonies, simple, straight, obtuse to dentate at the tip, up to 575 μm long. Perithecia scattered, globose, up to 248 μm in diam.; perithecial cells projected, rounded at the apex; ascospores ellipsoidal, 4-septate, constricted at the septa, 37-40.5 x 18-22 μm.

On leaves of *Kingiodendron pinnatum* (Caesalpiniaceae), Kodagu, Karnataka, India, B.R. Dayal HCIO 30836.


Colonies amphigenous, dense, up to 2 mm in diameter. Hyphae substraight to crooked, branching opposite, cells 12-27 x 7-10.5 μm. Hyphopodia alternate, 21-30.5 μm long; stalk cells cylindrical to cuneate, 7-9.5 μm long; head cells cruciform, trilobate, 15-21 x 18-21 μm. Phialides ampulliform, 18-23 x 8-12.5 μm. Mycelial
sae scattered, grouped around perithecia, simple, straight, obtuse at the apex, up to 240 \( \mu m \) long. Perithecia globose, up to 350 \( \mu m \) in diam.; ascospores sub-ellipsoidal, 4-septate, constricted at the septa, 54-59.5 x 23-27 \( \mu m \).

On leaves of *Acronychia laevis* (Rutaceae), New Caledonia, Oct. 14, 1966, Nothis no. 22.


Colonies amphigenous, rarely hypophyllous, subvelvety, up to 3 mm in diameter, confluent. Hyphae more or less undulate, irregularly branched, 4-7 \( \mu m \) wide. Hyphopodia few, alternate, antrorse to spreading, 15-20 \( \mu m \) long; stalk cells cylindrical, 4-6 \( \mu m \) long; head cells ovoid to ellipsoidal, rarely globose, entire, 10-13 x 9-12 \( \mu m \). Phialides few, opposite to alternate, ampulliform, 13-15 x 6-7 \( \mu m \). Mycelial setae numerous, straight, arcuate to irregularly curved, obtuse to acute at the tip, up to 220 \( \mu m \) long. Perithecia loosely to closely grouped, globose, up to 120 \( \mu m \) in diam.; ascospores oblong to cylindrical, 4-septate, slightly constricted at the septa, 23-30 x 10-12 (-7-9) \( \mu m \).

On leaves of *Knoxia corymbosa* (Rubiaceae), Philippines, Jan. 2, 1924, M.S. Clemens No. 1755.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 5 mm in diameter. Hyphae flexuous to undulate, branching opposite to irregular at acute angles, closely reticulate, cells 20-30 x 6-7 \( \mu m \). Hyphopodia alternate, spreading to subantrorse, 20-26 \( \mu m \) long; stalk cells cylindrical to conical, 4-7 \( \mu m \) long; head cells clavate to broadly ovate, slightly sublobate, 15-20 x 7-9 \( \mu m \). Phialides borne on a separate mycelial branch, mostly opposite, 15-20 \( \mu m \) long. Mycelial setae numerous, simple, straight to subarcuate, acute at the tip, up to 320 \( \mu m \) long. Perithecia grouped, verrucose, up to 190 \( \mu m \) in diam.; ascospores broadly elliptical, 4-septate, constricted at the septa, 39-47 x 13-16 \( \mu m \).

On leaves of *Cissampelos pareira* (Menispermaceae), Cuba, Jan. 1, 1970, H. Kreisel 1543, HAJB 1543.
Colonies epiphyllous, subdense, up to 4 mm in diameter, confluent. Hyphae straight, branching mostly opposite at wide angles, closely reticulate, cells 16-23 x 6-7 μm. Hyphopodia alternate, antrorse to recurved, 13-18 μm long; stalk cells cylindrical to cuneate, 3-5 μm long; head cells ovate, globose, entire to angular, 9-13 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 13-16.5 x 6-7 μm. Mycelial setae scattered to grouped around perithecia, simple, straight, hooked at the upper portion, acute to obtuse at the tip, up to 250 μm long. Perithecia scattered to grouped, verrucose, up to 218 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 33-36.5 x 9-13 μm.
On leaves of Styrax serrulatum (Styracaceae), Jalpaiguri, West Bengal, India, No. 1, 1967, M.K. Maity PCC 1468.

Colonies amphigenous, mostly epiphyllous, up to 2 mm in diameter, rarely confluent. Hyphae straight to undulate, branching opposite, cells 5-7 μm wide. Hyphopodia alternate, straight, antrorse to spreading, 15-21 μm long; stalk cells cylindrical to subtruncate, 3-6 μm long; head cells ovoid to broadly ellipsoidal, entire, 12-16 x 10-14 μm. Phialides few, opposite to alternate, ampulliform, 16-23 x 5-7 μm. Mycelial setae few, mostly grouped around perithecia, more or less arcuate, rarely straight, acute to dentate at the apex, up to 250 μm long. Perithecia scattered, globose, up to 180 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, slightly constricted at the septa, 33-40 x 13-15 (-10-12) μm.
On leaves of Lasianthus microphyllus (Rubiaceae), Philipp'ines, Dec. 24-30, 1925, M.S. Clemens Nr. 7316.

248. Meliola laxa Gaill. var. indica V.B. Hosagoudar, C.M. Pillai & P.A. Raghu var. nov.
Differt a var. laxa in hyphopodia mucronate illis capitatis commixta et setae myceliales longiorae.
On *Syzygium zeylanicum* (L.) DC. (Myrtaceae), Vettiyar, Mavelikara, Kerala, May 10, 1992, C.M. Pillai HCIO 30996 (type).

The collection is close to *Meliola laxa* Gaill. reported on Myrtaceae member from Ecuador. The present new variety differs from the var. *laxa* in having mucronate hyphopodia mixed with capitate hyphopodia and longer setae.


Colonies amphigenous, mostly epiphyllous, thin, up to 6 mm in diameter, confluent. Hyphae undulate, branching opposite at acute angles, loosely reticulate, cells 19-30 x 5-6.5 µm. Hyphopodia alternate, straight to curved, antrorse to subantrorse, 13-15 µm long; stalk cells cuneate, 3-5 µm long; head cells oval, globose, entire, 8-11.5 x 9-10 µm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 16-21.5 x 5-6.5 µm. Mycelial setae scattered to grouped around perithecia, simple, straight to curved, acute at the tip, up to 937 µm long. Perithecia scattered to grouped, up to 172 µm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 28-33 x 8-13 µm.


Colonies amphigenous, subdense, up to 4 mm in diameter, confluent. Hyphae flexuous, branching opposite to irregular at wide angles, loosely reticulate, cells 20-30 x 6-8 µm. Hyphopodia alternate, spreading, antrorse, straight to curved, 20-24 µm long; stalk cells cylindrical to cuneate, 6-8 µm long; head cells globose, cylindrical, versiform, angulose, entire, 12-18 x 8-10 µm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, tip twisted and elongated, 16-20 x 6-8 µm. Mycelial setae fairly numerous, scattered, simple, acute to obtuse at the tip, up to 270 µm long. Perithecia scattered, verrucose, up to 160 µm in diam.; ascospores obovoidal, 4-septate, constricted, 36-40 x
On leaves of *Ligustrum walkeri* (Oleaceae), Lakshmi Estate, Idukki, Kerala, India, June 12, 1983, V.B. Hosagoudar HCIO 40536.


Colonies hypophyllous, caulicolous, dense, velvety, up to 10 mm in diam., confluent. Hyphae straight to undulate, branching mostly opposite at wide angles, loosely to closely reticulate, cells 18-22 x 4-6 μm. Hyphopodia alternate, straight, flexuous, crooked, antrorse to recurved, 18-22 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells ovate, truncate, angulose, straight to variously curved, mostly entire, rarely sublobate, 15-17 x 6-9 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 27-31 x 8-9 μm. Mycelial setae numerous, densely scattered, simple, acute, up to 272 μm long. Perithecia scattered, verrucose, up to 140 μm in diam.; ascospores obovoidal, 4-septate, constricted, 40-46 x 15-19 μm.


Colonies hypophyllous, subdense, velvety, up to 12 mm in diameter, confluent. Hyphae tortuous to crooked, branching opposite to irregular at wide angles, loosely reticulate, cells 36-42 x 6-10 μm. Hyphopodia alternate, unilateral, 5% opposite, antrorse, spreading, straight to curved, 26-34 μm long; stalk cells cylindrical to cuneate, 8-12 μm long; head cells ovate, globose, truncate, slightly angulose to sublobate, straight to curved, 16-24 x 14-18 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 20-26 x 8-10 μm. Mycelial setae fairly numerous, grouped around perithecia, simple acute at the tip, up to 1089 μm long. Perithecia scattered to grouped, up to 342 μm in diam.; ascospores ellipsoidal, 4-septate, 46-58 x 16-20 μm.

On leaves of *Litsea floribunda* (Lauraceae), Lakshmi Estate, Idukki, Kerala, India, June 12, 1983, V.B. Hosagoudar HCIO 40538.

Colonies hypophyllous, thin, up to 10 mm in diameter, confluent. Hyphae tortuous to crooked, branching alternate to irregular at acute angles, loosely reticulate, cells 18-22 x 6-8 \( \mu \text{m} \). Hyphopodia alternate to unilateral, straight to curved, antrorse, spreading, 14-20 \( \mu \text{m} \) long; stalk cells cuneate to cylindrical, 6-8 \( \mu \text{m} \) long; head cells ovate clavate, globose, slightly angular, entire, 10-12 \( \mu \text{m} \). Phialides few, mixed with hyphopodia, alternate, ampulliform, 16-22 x 8-10 \( \mu \text{m} \). Mycelial setae fairly numerous, scattered, simple, acute to obtuse at the tip, up to 927 \( \mu \text{m} \) long. Perithecia scattered, verrucose, up to 200 \( \mu \text{m} \) in diam.; ascospores obovoidal, 4-septate, constricted, 42-50 x 14-18 \( \mu \text{m} \).

On leaves of *Litsea insignis* (Lauraceae), Idukki, Kerala, India, June 10, 1983, V.B. Hosagoudar HCIO 40539.


Colonies epiphyllous, subdense, up to 3 mm in diameter, rarely confluent. Hyphae substraight, branching opposite at wide angles, loosely reticulate, cells 14-20 x 8-10 \( \mu \text{m} \). Hyphopodia alternate, antrorse, 26-28 \( \mu \text{m} \) long; stalk cells cuneate, 6-8 \( \mu \text{m} \) long; head cells ovate, versiform, entire, 18-20 x 12-14 \( \mu \text{m} \). Phialides mixed with hyphopodia, opposite to alternate, 18-26 x 8-10 \( \mu \text{m} \). Mycelial setae few, mostly grouped around perithecia, simple, acute, up to 578 \( \mu \text{m} \) long. Perithecia mostly scattered, seated on exhyphopodiate hyphae, up to 186 \( \mu \text{m} \) in diam.; ascospores obovoidal, 4-septate, slightly constricted, 36-38 x 18-20 \( \mu \text{m} \).


Colonies epiphyllous, subdense, up to 3 mm in diameter, rarely confluent. Hyphae straight to substraight, branching opposite at wide angles, loosely reticulate, cells 15-31 x 6-9.5 \( \mu \text{m} \). Hyphopodia
alternate, straight to slightly curved, antrorse to recurved, 21-30 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells straight to slightly curved, ovate, bluntly pointed towards the apex, entire, 15.5-21.5 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 21-31 x 9-12.5 μm. Mycelial setae numerous, mostly grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 715 μm long. Perithecia scattered, up to 211 μm in diam.; ascospores obovoidal, 4-septate, 35-40 x 12-18.5 μm.

On leaves of *Litsea floribunda* (Lauraceae), Anamalai, Tamil Nadu, India, Jan. 17, 1987, V.B. Hosagoudar HC10 (type).


Colonies hypophyllous, dense, velvety, up to 2 mm in diameter, confluent. Hyphae substraight, branching opposite to alternate at acute angles, loosely to closely reticulate, cells 18-25 x 7-9 μm. Hyphopodia alternate, head cells 23-42 μm long; stalk cells 6-20 μm long; irregularly obovate, subglobose to slightly and irregularly lobate, 17-22 μm in diameter, Phialides few, alternate, ampulliform, 17-20 x 7-8 μm. Mycelial setae scattered, simple, straight to curved, acute at apex, up to 750 μm long. Perithecia scattered, verrucose, up to 250 μm in diam.; ascospores oblong, 4-septate, slightly constricted at the septa, 50-58 x 22-32 μm.


Colonies epiphyllous, very thin. Hyphae sinuous, branching at acute angles, cells 8-9 μm broad. Capitate hyphopodia alternate or unilateral, 24-38 μm long; stalk cells cuneate, 7-12 μm long; head cells ovoid to subpyriform, entire, 18-22 x 12-16 μm. Phialides mixed with capitate hyphopodia, opposite to alternate, 14-20 x 7-9 μm. Mycelial setae simple, straight, obtuse at the apex, up to 400 μm long. Perithecia globose, up to 145 μm in diam.; ascospores oblong-ellipsoidal, 4-septate, slightly constricted at the septa,
46-48 x 19-21 μm.


Colonies epiphyllous, arachnoid to velvety, up to 3 mm in diameter. Hyphae substraight, branching opposite at acute to wide angles, closely reticulate, cells 24-40 x 6-8.5 μm. Hyphopodia alternate, straight, antrorse, 25-35 μm long; stalk cells cylindrical to cuneate, 8-13 μm long; head cells subglobose, 2-4 lobate, 16-25 x 18-19.5 μm. Phialides mixed with hyphopodia, alternate, ampulliform, 20-22 x 7-8 μm. Mycelial setae numerous, scattered, simple, straight, obtuse at the apex, up to 280 μm long. Perithecia scattered, globose, verrucose, up to 210 μm in diam.; ascospores brown, fusiform, slightly curved, 3-septate, slightly constricted at the septa, 44.5-55 x 12.5-17 μm.

On leaves of *Loropetalum chinensis* (Hammamelidaceae), Wayishan Natural Reserve, Provincica, China, April 9, 1987, Hu Yan-Xing GDIM 87030.


Colonies hypophyllous, dense, velvety, up to 6 mm in diameter, confluent. Hyphae straight, branching mostly opposite and rarely alternate at acute angles, loosely reticulate, cells 12-14 x 6-8 μm. Hyphopodia alternate, straight to slightly curved, subantrorse to antrorse, 16-20 μm long; stalk cells cuneate, 4-6 μm long; head cells ovate to cylindrical, entire, 10-14 x 8-10 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 16-20 x 6-8 μm. Mycelial setae scattered, straight, simple, acute at the tip, up to 351 μm long. Perithecia scattered, verrucose, up to 166 μm in diam.; ascospores obovoidal, 4-septate, constricted, 40-42 x 14-18 μm.

On leaves of *Luvunga elutherandra* Dalz. (Rutaceae), Idukki, Kerala, India, Dec. 12, 1982, V.B. Hosagoudar HCIO 40542.

Colonies epiphyllous, dense, crustose, up to 4 mm in diameter, confluent. Hyphae straight to flexuous, branching alternate to irregular at acute angles, loosely to closely reticulate, cells 21.5-37.5 x 9-12.5 μm. Hyphopodia alternate, rarely opposite (less than 1%), straight, curved to flexuous, antrorse to recurved, 21.5-28 μm long; stalk cells straight to rarely flexuous, cylindrical, 8-10 μm long; head cells ovate, globose, entire, angular to lobate, 12-18.5 x 12-15.5 μm. Phialides mixed with hyphopodia, mostly alternate, conoid to ampulliform, 18-25 x 9-12.5 μm. Mycelial setae grouped around perithecia, simple, straight to uncinate, acute to obtuse at the apex, up to 444 μm long. Perithecia scattered to grouped, up to 190 μm in diam.; ascospores cylindrical to fusiform, straight but mostly curved, 3-septate, constricted at the septa, 46.5-53 x 15-18.5 μm.

On leaves of Syzygium lanceolatum (Myrtaceae), Madurai, Tamil Nadu, India, Aug. 25, 1990, V. Lakshmanan HCIO 30457.


Colonies amphigenous, crustose, subdense, up to 6 mm in diameter, confluent. Hyphae mostly straight, branching mostly opposite at wide angles, loosely reticulate, cells 10-44 x 6-8 μm. Hyphopodia alternate, mostly antrorse, rarely spreading, 19-24 μm long; stalk cells cylindrical to cuneate, 5-8 μm long; head cells ovate, cylindrical, entire, 9-15 x 11-14 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 15-17 x 4-7 μm. Mycelial setae scattered, simple, straight, acute at the tip, up to 400 μm long. Perithecia scattered, verrucose, up to 200 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 30-38 x 13-15 μm.

On leaves of Solanum giganteum (Solanaceae), Mahabaleshwar, Maharashtra, India, Nov. 1966, B.V. Srinivasulu MUH 139.

262. Meliola malloticola nom. nov.

Meliola malloti Srinivasulu, Nova Hedwigia Beih. 47: 430,
Colonies amphigenous, subdense, velvety, up to 2 mm in diameter. Hyphae slightly undulate, branching opposite at wide angles, loosely reticulate, cells 15-34 x 7-10 μm. Hyphopodia alternate, antlike to spreading, 25-34 μm long; stalk cells cylindrical to cuneate, 6-10 μm long; head cells ovate, globose, entire, 10-23 x 11-13.5 μm. Phialides borne on a separate mycelial branch, opposite to alternate, ampulliform, 18-22 x 6-9 μm. Mycelial setae numerous, grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 280 μm long. Perithecia grouped, verrucose, up to 254 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 38-46 x 12-20 μm.

On leaves of Mallotus philippensis (Euphorbiaceae), Castle Rock, Maharashtra, India, Nov. 1967, Srinivasulu MUH 140.

Colonies epiphyllous, thin, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching mostly opposite at wide angles, loosely reticulate, cells 31-56 x 7-9.5 μm long; stalk cells cuneate, 3-6 μm long; head cells ovate, pointed and rounded towards the apex, mostly straight but rarely recurved, entire, 12-15.5 x 9-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-25 x 9-12.5 μm. Mycelial setae very few, grouped around perithecia, simple, straight, obtuse at the apex, up to 350 μm long. Perithecia seated on exhyphopodiate mycelia, scattered, up to 124 μm in diam.; ascospores obovate to cylindrical, 4-septate, deeply constricted at the septa, 43-45 x 18-22 μm.

On leaves of Castenopsis armata (Fagaceae), Assam, India, Jan. 1887, G. Mann HCIO 39434b.

264. Meliola maredumilliana V.B. Hosagoudar et M. Mohanan, sp. nov.
Colonies amphigenae, plerumque epiphyllae, subdensae, ad 3 mm diam. Hyphae subrectae, irregulariter acuteque, ramosae, dense reticulatae, cellulae 15-31 x 6-8 μm. Hyphopodia alternata, recta
vel curvula, antrorsa vel patentia, 21-25 μm longa; cellula basali cylindracea vel cuneata, 9-12.5 μm longa; cellula apicali globosa, recta vel raro curvula, angularia et 5-6 toties sublobata, raro integra, 12-15.5 x 12-15 μm. Phialides illis capitatis commixta, alternata vel dispersa, ampullacea, 22-26 x 9-11 μm. Setae myceliales paucae, juxta perithecia aggregatae, simplices, plerumque curvulae et falcatae, obtusae ad apicem, ad 155 μm longae. Perithecia dispersa, verrucosa, ad 125 μm diam.; ascosporae oblongae vel leniter ellipsoidae, 4-septatae, constrictae, 30-38 x 15-19 μm.


This species can be compared with Meliola bakeri Sydow but differs from it in having only alternate hyphopodia, angular to sublobate head cells of hyphopodia. Hansford (1961) also noted these characters but assigned the Indian collection to M. bakeri Sydow.


Colonies epiphyllous, rarely hypophyllous, dense, crustose to velvety, up to 2 mm in diam. Hyphae substraight, branching mostly opposite at acute to wide angles, closely reticulate, cells 15-34 x 7-9.5 μm. Hyphopodia alternate, antrorse to recurved, 18-25 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, cylindrical, entire, rarely angular to sublobate, 12-15.5 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 12-18.5 x 9-12.5 μm. Mycelial setae grouped around perithecia, straight to curved, simple, acute, up to 500 μm long. Perithecia scattered, verrucose, up to 125 μm in diam.; ascospores obovoidal, 4-septate, constricted, 40-46.5 x 12-18 μm.


266. Meliola megalocarpa Sydow var. microspora var. nov.

Differt a var. megalocarpa setiis myceliales et ascosporis
brevioribus.


Colonies amphigenous, mostly epiphyllous, scattered, dense, subvelvety, up to 2 mm in diameter. Hyphae substraight to crooked, branching alternate, opposite to irregular at wide angles, loosely to closely reticulate, cells 15-22 x 3-5 μm. Hyphopodia mostly opposite, rarely alternate to solitary, straight to curved, antroorse, subantrorse to recurved, 12-18.5 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells globose, ovate, cylindrical, entire to angular, 9-12.5 x 6-9.5 μm. Phialides mixed with hyphopodia, alternate to opposite, 12-15.5 x 6-8 μm. Mycelial setae numerous, scattered, simple, straight, obtuse to 2-3 dentate at the tip, up to 650 μm long. Perithecia scattered, verrucose, up to 124 μm in diam.; asco-spores obovoidal, 4-septate, constricted, 34-37.5 x 14-16 μm.

On leaves of *Acacia melanoxylon* (Mimosaceae), Vettiyar, Mavelikara, Kerala, India, Sept. 14, 1992, C.M. Pillai HCIO 40763.


Colonies amphigenous, rarely hypophyllous, dense, velvety, up to 3 mm in diameter. Hyphae straight to undulate, branching opposite, closely reticulate, cells 6-10 μm wide. Hyphopodia alternate, rarely opposite, antroorse to spreading, 14-20 μm long; stalk cells slightly cylindrical, 4-7 μm long; head cells broadly ovoid to ellipsoidal, entire, 10-15 x 9-14 μm. Phialides few, conoid to ampulliform, 16-20 x 7-9 μm. Mycelial setae numerous, straight, geniculate, slightly arcuate to irregularly curved, acute to obtuse to dentate to furcate at the apex, up to 200 μm long. Perithecia scattered, globose, up to 230 μm in diam.; ascospores oblong to subcylindrical, 4-septate, more or less constricted at the septa, 40-46 x 14-16 (8-12) μm.
On leaves of Melicopes triphylla (Rutaceae), Philippines, May 1925, M.S. Clemens Nr. 0704.

269. Meliola meliosmae Petrak, Sydowia 12: 454, 1959 (meliosmatis). Colonies amphigenous, mostly hypophyllous, scattered, subvelvety, up to 12 mm in diameter, rarely confluent. Hyphae straight to flexuous, branching opposite to irregular, closely reticulate, cells 6-9 μm wide. Hyphopodia alternate, rarely opposite, antrorse to spreading, straight to curved, 30-36 μm long; stalk cells cylindrical to conical, 4-10 μm long; head cells ellipsoidal, ovoidal to pyriform, angular to sinuous, 20-26 x 10-16 μm. Phialides ampulliform, 16-25 x 5-10 μm. Mycelial setae straight to curved, acute to obtuse at the apex, up to 750 μm long. Perithecia loosely scattered, globose, up to 200 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, constricted at the septa, 48-53 x 16-20 (13-15) μm.

On leaves of Meliosma sp. (Sabiaceae), Philippines, June 1924, M.S. Clemens Nr. 5174.


Colonies amphigenous, mostly epiphyllous, subdense, up to 2 mm in diameter. Hyphae straight, branching opposite at acute to wide angles, loosely reticulate, cells 18-22 x 6-9.5 μm. Hyphopodia alternate and about 20% opposite, subantrorse, 15-18.5 μm long; stalk cells cuneate, 7-9.5 μm long; head cells ovate, globose, attenuate and broadly rounded at the apex, entire, 9-12.5 x 9-11 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 21-25 x 9-12.5 μm. Mycelial setae few, grouped around perithecia, straight, simple, acute at the tip, up to 575 μm long. Perithecia scattered, up to 100 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 37-38 x 15-18.5 μm.

On leaves of Memecylon depressum (Melastomataceae), Coimbatore, Tamil Nadu, India, Dec. 20, 1990, V.B. Hosagoudar HCIO 30554.
271. Meliola millettiae-chrysophyllae Deight. var. indica
Colonies epiphyllous, thin to subdense, up to 2 mm in diameter, rarely confluent. Hyphae straight to substraight, branching mostly opposite at acute to wide angles, loosely reticulate, cells 21.5-40.5 x 6-9.5 μm. Hyphopodia alternate and opposite, straight to usually curved, antrorse, 18.5-25 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovate, versiform, entire, 15.5-18.5 x 6-11 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 12-21.5 x 7-9.5 μm. Mycelial setae fairly numerous, scattered, straight to curved but not uncinate, acute, obtuse to rarely dentate at the tip, up to 425 μm long. Perithecia scattered, globose, up to 136 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 31-43.5 x 12-15.5 μm.

On leaves of Millettia splendens (Fabaceae), Nilgiris, Tamil Nadu, India, Feb. 18, 1991, V.B. Hosagoudar HCIO 30622.

272. Meliola millettiae-racemosae V.B. Hosagoudar et M. Mohanan, sp. nov.
Coloniae epiphyllae, raro amphigenae, densae, velutinae, ad 2 mm diam., plerunque confluentes. Hyphae flexuosa vel anfractuae, opposite vel irregulariter acuteque vel laxe ramosae, laxe vel densae reticulatae, cellulae 15-25 x 9-10 μm. Hyphopodia alternata, ad 5% opposita, antrorsa, subantrorsa vel retrorsa, 12-15.5 μm longa; cellula basai cylindracea vel cuneata, 3-5 μm longa; cellula apicali globosa, integra, curvata et rotundata ad apicem, 9-10 x 10-12.5 μm. Phialides illis hyphopodiis commixta, alternata vel opposita, ampullacea, 15-18.5 x 6-9 μm. Setae myceliales numerosae, dispersae, rectae, simplices, acute ad apicem, ad 575 μm longae. Perithecia dispersa, ad 171 μm diam.; ascospores cylindraceae, 4-septatae, leniter constrictae ad septae, 34-37.5 x 15-18.5 μm.

On leaves of Millettia racemosa (Fabaceae), Valamuru Forest, Maredumilli, East Godavari, Andhra Pradesh, India, Dec. 23, 1993, M. Mohanan HCIO 41529 (type).

The present collection is close to Meliola bapiae-nitidae Hansf. & Deight (3113. 3223) but differs from it in having dense
epiphyllous, crooked hyphae with only 5% opposite hyphopodia.


Colonies amphigenous, mostly epiphyllous, dense, up to 2 mm in diameter. Hyphae straight to substraight, branching opposite at acute angles, closely reticulate and solid at the centre, cells 16-31 x 6-9.5 μm. Hyphopodia alternate, antrorse, 27-31 μm long; stalk cells cuneate, 6-9.5 μm long; head cells ovate, globose, shallowly lobate, 18-22 x 18-20 μm. Phialides numerous, mixed with hyphopodia, opposite to alternate, ampulliform, 24-34 x 6-9.5 μm. Mycelial setae numerous, simple, flexuous, geniculate, very few unciae to coiled, acute at the apex, up to 365 μm long. Perithecia closely scattered, verrucose, up to 186 μm in diam.; ascospores obovoidal, 4-septate, constricted, 49-52 x 21-25 μm.


Colonies hypophyllous, thin, up to 7 mm in diameter. Hyphae straight, branching opposite at wide angles, closely reticulate, cells 17-31.5 x 5-8.5 μm. Hyphopodia alternate, straight to curved, spreading to retrorse, 21-30 μm long; stalk cells cylindrical, 7-10.5 μm long; head cells ovoid, slightly recurved, 14-20 x 12-18 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15-22 x 8-11.5 μm. Mycelial setae straight, scattered, 1-2 times furcate, up to 310 μm long. Primary branches up to 140 μm long, secondary branches up to 124 μm long, obtuse to subacute at the apex. Perithecia globose, black, verrucose, up to 240 μm in diam.; ascospores brown, ellipsoidal, 4-septate, constricted at the septa, 60-70 x 18-24 μm.


Colonies hypophyllous, dense, up to 1.5 mm in diameter. Hyphal branching opposite at wide angles, closely reticulate, cells 15-
23.5 x 11-13 μm. Hyphopodia alternate, straight, spreading to antrorse, 24-33.5 μm long; stalk cells cylindrical, 7-15.5 μm long; head cells cylindrical to oblong, 16-24.5 x 11-15.5 μm. Phialides not seen. Mycelial setae grouped around perithecia, simple, straight, obtuse to dentate at the tip, up to 1000 μm long. Perithecia globose, verrucose, up to 540 μm in diam.; ascospores cylindrical to subellipsoidal, 4-septate, constricted at the septa, 64-72.5 x 25-31 (19-20.5) μm.

On leaves of *Evodia oreophila* (Rutaceae), New Caledonia, Dec. 27, 1966, Veillon NC 67018.


Colonies epiphyllous, thin to dense, confluent. Hyphae crooked, branching opposite to irregular at wide angles, loosely reticulate, cells 15-28 x 4-6.5 μm. Hyphopodia alternate, about 5% opposite, straight to variously curved, 12-18.5 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells ovate, globose, entire, curved, 9-12.5 x 10-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, conoid to ampulliform, 18.5-25 x 6-8 μm. Mycelial setae few, grouped around perithecia, simple, straight, acute, obtuse to few dentate at the tip, up to 280 μm long. Perithecia scattered, up to 125 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 30-34 x 12-15.5 μm.


Colonies epiphyllous, thin, up to 3 mm in diameter, confluent. Hyphae undulate, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 16-34 x 6-8 μm. Hyphopodia alternate and about 40% opposite, straight, antrorse, spreading, 14-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells globose, entire, 10-12 μm. Phialides with hyphopodia, scattered, opposite to alternate, ampulliform, 16-20 x 8-10 μm.
Mycelial setae few, grouped around perithecia, straight to curved, simple, acute at the tip, up to 324 μm long. Perithecia scattered, verrucose, up to 176 μm in diam.; ascospores ellipsoidal, 4-septate, constricted, 30-36 x 12-14 μm.

On leaves of *Mucuna hirsuta* (Fabaceae), Idukki, Kerala, India, Oct. 8, 1983, V.B. Hosagoudar HCIO 40548.


Colonies amphigenous, subdense to dense, thin to velvety, up to 5 mm in diameter. Hyphae substraight to crooked, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 30-43.5 x 7-9.5 μm. Hyphopodia alternate, straight to curved, antrorse to recurved, 34-43.5 (-65) μm long; stalk cells mostly unicellular, straight, cylindrical to cuneate, rarely 1-2 septate, crooked, 12-18.5 (-40.5) μm; head cells ovate to globose, angulose to irregularly sublobate, 18-25 x 15-25 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-25 x 9-12.5 μm. Mycelial setae grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 500 μm long. Perithecia scattered to loosely grouped, up to 240 μm in diam.; perithecial cells protruding; ascospores obovoidal, 4-septate, slightly constricted, 37-40 x 18-20 μm.


Colonies epiphyllous, minute, subdense, up to 2 mm in diameter. Hyphae straight, substraight to flexuous, branching opposite to irregular at wide angles, loosely reticulate, cells 18-31 x 6-9.5 μm. Hyphopodia alternate, antrorse to subantrorse, 12-15.5 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells ovate, broadly rounded to attenuate at the apex, straight to curved, entire, 9-12.5 x 6-9.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-22 x 9-12.5 μm. Mycelial
setae few, grouped around perithecia, straight, flexuous, acute to obtuse at the tip, up to 310 μm long. Perithecia scattered, verrucose, up to 155 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 31-34 x 15-18.5 μm.

On leaves of Aphanamixis polystachya (Meliaceae), Palghat, Kerala, India, Oct. 9, 1972, N.C. Nair HCIO 39439.

280. Meliola neeae (Batista & Garnier) comb. et stat. nov.

Colony epiphyllous, round, velvety, up to 2 mm in diameter. Hypahae straight to flexuous, branching alternate to opposite, cells 13-27 x 8-9 μm. Hyphopodia opposite to alternate; antrorse to spreading, 16-25 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate, entire to angular, 12-16 x 9-16 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 13-21.5 x 8-15.5 μm. Mycelial setae numerous, simple, straight, acute at the apex, up to 600 μm long. Perithecia scattered to aggregated, up to 250 μm in diam.; ascospores elliptic-oblong, 4-septate, constricted at the septa, 40-54 x 13-21.5 μm.

On leaves of Neea sp. (Nyctaginaceae), Pernambuco, Brazil, May 17, 1959, S.S. Silva IMUR 16147.

The host Neea belongs to the family Nyctaginaceae (Willis, 1973) and the species M. kisubiensis reported on Rutaceae member (Hansford, 1961). Hence, the status has been effected here with the new combination. Further, in the species description, "hyphopodia triformia" and ascospores 2-4 septate. These characters are to be confirmed after the examination of the type.


Colonies hypophyllous, dense, up to 2 mm in diameter, rarely confluent. Hyphae substraight to undulate, branching mostly opposite at acute angles, loosely reticulate, cells 16-18 x 6-8 μm. Hyphopodia alternate to unilateral, straight to curved, antrorse to
spreading, 22-30 μm long; stalk cells cylindrical to cuneate, 8-12 μm long; head cells ovate, globose, slightly angular, entire, 14-18 x 10-16 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 14-22 x 6-8 μm. Mycelial setae few, scattered to grouped around perithecia, curved, weavy at the apex, acute to obtuse at the tip, up to 270 μm long. Perithecia aggregated, verrucose, up to 180 μm in diam.; ascospores obovoidal, 4-septate, constricted, 30-38 x 10-12 μm.


Colonies hypophyllous, scattered, thin, up to 8 μm in diameter. Hyphae mostly undulate to flexuous, branching at wide angles, 4-7 μm wide. Hyphopodia few, alternate, more or less spreading, 26-43 μm long; stalk cells cylindrical, 10-14 μm long; head cells ovoid to ellipsoidal, entire, attenuated towards the apex, 18-30 x 10-17 μm. Phialides not seen. Mycelial setae grouped around perithecia, straight to arcuate, simple, obtuse at the tip, up to 350 μm long. Perithecia scattered, globose, up to 300 μm in diam.; ascospores oblong to slightly cylindrical, 4-septate, more or less constricted at the septa, 30-50 x 14-17 (12-13) μm.

On leaves of *Saurania elegans* (Dilleniaceae), Luzon, Philippines, Nov. 19, 1925, M.S. Clemens Nr. 6409.


Colonies hypophyllous, thin, up to 20 mm in diameter, confluent. Hyphae subsinuous, branching opposite to irregular at acute angles, loosely reticulate, cells 20-38 x 5-6 μm. Hyphopodia alternate, straight to curved, spreading, 9-15.5 μm long; stalk cells cylindrical, straight to curved, 9-15.5 μm long; head cells angular to irregularly sublobate, 11-18 x 10-15.5 μm. Phialides not seen. Mycelial setae numerous, simple, straight, acute at the tip, up to 350 μm long. Perithecia scattered, verrucose, up to 300 μm in diam.; ascospores ellipsoidal, subfusiform, 3-septate, constricted at the septa, 46-57 x 15-18 μm.
On leaves of *Nothofagus baumanii* (Euphorbiaceae), New Caledonia, Dec. 27, 1966, Veillon NC 67017.


Colonies amphigenous, subdense, velvety, up to 1.5 mm in diameter, confluent. Hyphae undulate, loosely to closely reticulate, 4-6.5 μm wide. Hyphopodia alternate, antrorse, 13-19.5 μm long; stalk cells 3-6 μm long; head cells broadly ovoid to ellipsoidal, mostly globose, broadly rounded to angulose at the apex, 10-13.5 x 9-11 μm. Phialides alternate to opposite, conoid to ampulliform, 10-14 x 6-7 μm. Mycelial setae few, straight to slightly arcuate, simple, obtuse to subacuminate at the tip, up to 500 μm long. Perithecia closely scattered, globose, slightly verrucose, up to 160 μm in diam.; ascospores oblong to ellipsoidal, distinctly attenuated at both ends, straight to curved, 4-septate, slightly constricted, 28-36 x 12-14 (8-10) μm.

On leaves of *Ocimum selloi* (Lamiaceae), Argentina, April 16, 1957, R. Singer


Colonies amphigenous, thin, up to 3 mm in diameter, confluent. Hyphae straight to undulate, branching alternate at acute angles, loosely reticulate, cells 20-32 x 6-8 μm. Hyphopodia alternate, subantrorse, straight, 20-35 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells oblone-ovate, entire, 8-10 x 4-5 μm. Phialides not seen. Mycelial setae few, grouped around perithecia, simple, straight, acute at the apex, up to 650 μm long. Perithecia scattered, verrucose, up to 180 μm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 40-45 x 12-16 μm.

On leaves of *Mammia suriga* (*Ochrocarpus longifolius*) (Clusiaceae), Amboli, Maharashtra, India, Nov. 1980, A.N. Thite HClO 33671.

286. *Meliola olacicola* sp. nov.

Coloniae amphigenae, densae, ad 2 mm diam., confluentes. Hyphae rectae, opposite acuteque vel laxe ramosae, laxe vel dense reticulatae, cellulae 15-22 x 6-7 μm. Hyphopodia alternata, 15%
opposita, recta, antrorsa, 14-16 um longa; cellula basali cylindracea vel cuneata, 3-5 um longa; cellula apicali oblonga, clavata vel cylindracea, integra, 12-14 x 6-9.5 μm. Phialides illis capitatis commixta, alternata vel opposita, conoidea vel ampullacea, collum rectus vel curvatus, 15-18.5 x 6-8 μm. Setae myceliales aggregatus circa perithecia, simplices, rectae, acute ad apicem, ad 350 um longae. Perithecia dispersa, verrucosa, ad 180 μm diam.; ascosporae oblongae vel cylindraceae, 4-septatae, fortiter constrictae, 45-48 x 18-20 μm.

On Olax wightiana (Olacaceae), Amboli, Maharashtra, India, Jan. 12, 1978, M.S. Patil HCIO 32563 (type).

The present new species is close to Meliola olacis Deight. but differs from it in having smaller but alternate and opposite hyphopodia and larger ascospores.

Colonies epiphyllous, dense. Mycelial cells 3-7 μm wide. Hyphopodia alternate, 7-14.5 μm long; stalk cells 3-5.5 μm long; head cells globose to long-globose, 4-9 x 5-9.5 μm. Phialides not seen. Mycelial setae simple, straight, acute to obtuse at the apex, up to 357 μm long. Perithecia up to 135 μm in diam.; ascospores globose-fusiform, 4-septate, constricted at the septa, 33-43 x 14-18 μm.

On leaves of Ormosia formosana (Fabaceae), China, April 14, 1966, C.C. Chen (Taiwan).

Colonies epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae straight to flexuous, branching irregular and form solid mycelial mat, cells 18-20 x 8-9 μm. Hyphopodia alternate, spreading to antrorse, 16-25 μm long; stalk cells cylindrical to cuneate, 5-9.5 μm long; apical cells ovoid, entire to angulose, 11-16.5 x 12-17 μm. Phialides not seen. Mycelial setae numerous, scattered, straight, acute at the tip, up to 310 μm long. Perithecia scattered to loosely aggregated, up to 275 μm in diam.; ascospores cylindrical to subellipsoidal, 4-septate, constricted at the septa, 53-62 x 20-23.5 μm.
On leaves of *Osmanthus cymosus* (Oleaceae), New Caledonia, Dec. 12, 1963, P.S. Green NC 67033.


Colonies epiphyllous, dense, up to 3 mm in diameter. Hyphae straight, branching opposite at acute angles, closely reticulate, cells 18-30 x 5-8 μm. Hyphopodia opposite, antororse, straight to slightly curved, 12-16 μm long; stalk cells cuneate, 3-5 μm long; head cells ovate to subglobose, entire, 8-10 x 6-8 μm. Phialides mixed with hyphopodia, ampulliform, 14-16 x 4-8 μm. Mycelial setae scattered to grouped around perithecia, straight to slightly curved, simple, obtuse at the apex, up to 320 μm long. Perithecia grouped in the centre, verrucose, up to 220 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 40-44 x 12-14 μm.

On leaves of *Ostodes paniculata* (Euphorbiaceae), Sikkim, India, April 24, 1962, J.N. Kapoor HCIO 28360.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 2 mm in diameter, rarely confluent. Hyphae substraight to flexuous, branching opposite to irregular at acute angles, closely reticulate and form solid mycelial mat, cells 12-22 x 7-9.5 μm. Hyphopodia alternate to unilateral, straight, closely antorrose, 18-25 μm long; stalk cells cuneate, 6-12.5 μm long; head cells globose, ovate, entire, 9-15.5 x 12-15.5 μm. Phialides borne on a separate mycelial branch, mostly opposite, ampulliform, 15-19 x 9-12.5 μm. Mycelial setae numerous, scattered, straight, simple, very thin, acute to obtuse at the tip, up to 150 μm long. Perithecia scattered, verrucose, up to 140 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 43-46.5 x 15-18.5 μm.

On leaves of *Osyris quadriseptata* (Santalaceae), Yercaud, Tamil Nadu, India, March 1, 1984, V.B. Hosagoudar HCIO 39440.


Colonies amphigenous, mostly epiphyllous, subdense to dense,
scattered, up to 4 mm in diameter. Hyphae straight to substraight, branching mostly opposite at wide angles, loosely reticulate, cells 12-18 x 6-8 μm. Hyphopodia alternate to about 40% opposite, spreading, straight to curved, antroorse to retrorose, 16-22 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells mostly conoid, cylindrical, versiform, pyriform, straight to curved, entire, 12-14 x 6-8 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 16-22 x 8-10 μm. Mycelial setae few, grouped around perithecia, straight, simple, obtuse to variously dentate at the tip, up to 225 μm long. Perithecia few, verrucose, up to 170 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, slightly constricted, 44-48 x 16-18 μm.


Differt a var. *otophorae* hyphis rectis vel subrectis et hyphopodiis dense situs et longioris.

On leaves of *Lepisanthes senegalensis* (Juss. ex Poit.) Leenh. (Sapindaceae), Aliyar submersible area, near Monkey Falls, Coimbatore, Tamil Nadu, India, March 16, 1994, K. Ravikumar HCIO 41568 (type).


Colonies epiphyllous, dense, velvety, up to 4.5 mm in diameter. Hyphae straight, branching irregular at wide angles, cells 20-31 x 9-13 μm; stalk cells cylindrical to cuneate, 7-11.5 μm long; head cells clavate, angulose to irregularly lobate, 23-33.5 x 16-23.5 μm. Phialides not seen. Mycelial setae numerous, dichotomously branched, up to 290 μm long; branches straight to curved, acute at the apex, branchlets recurved, primary branches up to 110 μm long and secondary 138 μm long. Perithecia scattered, verrucose, up to 260 μm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 56-64.5 x 22-24.5 μm.

On leaves of *Oxera robusta* (Verbenaceae), New Caledonia, Jan. 1, 1967, NC 67012.

Colonies epiphyllous, subdense, up to 6 mm in diameter, confluent. Hyphae substraight, branching opposite, closely reticulate, 5-8 μm wide. Hyphopodia alternate, 13-20 μm long; stalk cells cylindrical to truncate-obconical, 4-7 μm long; head cells ovoidal to ellipsoidal, rarely globose, entire, 9-14 x 11-13 μm. Phialides few, ampulliform, 14-18 x 5-6.5 μm. Mycelial setae numerous, geniculate, arcuate to irregularly curved, obtuse to dentate at the tip, up to 200 μm long. Perithecia loosely scattered, globose, up to 170 μm in diam.; ascospores oblong, 4-septate, slightly constricted at the septa, 27-36 x 10-15 μm.

On leaves of Buddleia asiatica (Loganiaceae), Philippines, March 1923, M.S. Clemens Nr. 2224.


Colonies hypophyllous, black, round, up to 2 mm in diameter. Hyphae opposite to alternately branched, cells 20-25 x 7-10 μm. Hyphopodia alternate, 25-30 μm long, head cells lobate. Phialides not seen. Mycelial setae straight, simple, up to 305 μm long. Perithecia scattered, up to 190 μm in diam.; ascospores oblong, 4-septate, 40-42.5 x 10-15 μm.

On leaves of Euphorbia papillosa (Euphorbiaceae), April 17, 1960, IMUR 19542.


Colonies hypophyllous, crustose, thin, up to 4 mm in diameter. Hyphae straight to substraight, branching opposite at acute to wide angles, loosely to closely reticulate, cells 18.5-23 x 6-8 μm. Hyphopodia alternate and about 10% opposite, antrorse to spreading, straight to curved, 18.5-22 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells ovate, clavate, cylindrical, entire to angulose, 12-15.5 x 9-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18.5-22 x 9-12.5 μm. Mycelial setae scattered, straight, simple, acute, obtuse, cristate to dentate, up to 575 μm long. Perithecia scattered,
verrucose, up to 171 in \(\mu m\) diam.; ascospores obovoidal to cylindrical, 4-septate, constricted, 31-45 x 12-15.5 \(\mu m\).


Colonies hypophyllous, sparse, up to 10 mm in diameter. Hyphae irregularly branched, cells 26-61.5 x 7-8.5 \(\mu m\). Hyphopodia opposite to unilateral, 12-24 \(\mu m\) long; stalk cells cylindrical, 3.5-7 \(\mu m\) long; head cells irregular, 9-17 x 7-9 \(\mu m\). Phialides few, conoid, 13-15 x 4.5-5.5 \(\mu m\). Mycelial setae simple, straight, erect, flexuous, 3-4 dentate at the apex, up to 580 \(\mu m\) long. Perithecia up to 125 \(\mu m\) in diam.; ascospores ellipsoidal to elongate, 4-septate, constricted, 43-59 x 13-15 \(\mu m\).

On leaves of *Cissampelos parreira* (Menispermaceae), Recife, April 15, 1958, O.S. Silva IMUR 13066.

298. *Meliola patileana* sp. nov.

Coloniae epiphyllae, densae, velutinae, ad 2 mm diam., confluentes. Hyphae rectae, plerumque opposite acuteque vel laxe ramosae, laxe vel dense reticulatae, cellulae 12-25 x 6-8 \(\mu m\). Hyphopodia opposita, raro solitaria, antrorsa vel subantrorsa, 15-18.5 \(\mu m\) longa; cellula basali cylindracea vel cuneata, 5-7 \(\mu m\) longa; cellula apicali ovata, globosa, integra, rotunda vel truncata ad apicem, 10-12.5 x 9-12.5 \(\mu m\). Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 18-22 x 9-11 \(\mu m\). Setae myceliales numerosae, dense dispersae, curvatae vel uncinatae, acutae, obtusae vel 2-4 dentatae ad apicem, ad 360 \(\mu m\) longae. Perithecia dispersa, verrucosa, ad 140 \(\mu m\) diam.; ascosporae obovoideae vel leniter ellipsoideae, 4-septatae, constrictae, 46-50 x 18-22 \(\mu m\).

On *Cryptocarya bourdilloni* (*C. wightiana*) (Lauraceae), Kolhapur, Maharashtra, India, March 30, 1977, M.S. Patil HCIO 32523 (type).

Opposite hyphopodia and uncinate mycelial setae distinguishes this species from the others reported on Lauraceae.
Colonies amphigenous, thin, up to 8 µm in diameter. Mycelium branched oppositely, alternately and irregularly, cells 32-59 x 8-11 µm. Hyphopodia alternate and opposite, straight to curved, 2-celled, 21-30 x 13-16 µm. Phialides few, mixed with hyphopodia, alternate, ampulliform, 19-27 x 9-11 µm. Mycelial setae simple, acute at the tip, up to 800 µm long. Perithecia up to 185 µm in diam.; ascospores cylindrical, 4-septate, constricted, 46-54 x 21-27 µm.

On leaves of Paullinia pinnata (Sapindaceae), Caruaru, Pernambuco, March 9, 1958, E.B. Correia IMUR 12748.

300. Meliola payakii sp. nov.
Colonies epiphyllae, dense, dispersae, ad 2 mm diam. Hyphae rectae, opposite laxe ramosae, dense reticulatae, cellulae 15-18.5 x 8-11 µm. Hyphopodia opposita, ad 3% alternata et solitaria, antrorsa vel subantrorsa, 15-18.5 um longa; cellula basali cylindracea vel cuneata, 3-6 um longa; cellula apicali ovata, cylindracea, integra, 9-12.5 x 9-11 µm. Phialides illis capitatis commixta, altrnata vel opposita, ampullacea, 17-19 x 11-13 µm. Setae myceliales dispersae, simplices, rectae, acutae ad apicem, ad 430 um longae. Perithecia immatura. Ascosporae ellipsoideae, 4-septatae, constrictae, 37-41 x 15-18.5 µm.

On Hedera helix (Araliaceae), Narkanda, Simla Hills, Arunachal Pradesh, India, Nov. 13, 1959, M.M. Payak HCIO 26879 (type).
Opposite hyphopodia bring the present new species close to Meliola fatseae Katumoto & Harada and M. pectinata Hoehnel but differs from both in having phialides with hyphopodia, ellipsoidal and smaller ascospores.

301. Meliola phaseoli Thite ex Hosagoudar, sp. nov.
Colonies epiphyllae, subdensae vel densae, ad 2 mm diam., confluentes. Hyphae anfractucae, plerumque opposite acutaeque ramosae, laxe reticulatae, cellula 21-31 x 5-6.5 µm. Hyphopodia alternata, ad 5% opposita, antrorsa, subantrorsa vel patentia, 9-
15.5 μm longa; cellula basali cylindracea vel cuneata, 3-6.5 μm longa; cellula apicali recta vel curvula, globosa, integra, 6-9.5 x 9-12.5 μm. Phialides illis capitatis commixta, opposita vel alternata, ampullacea, 12-22 x 6-8 μm. Setae myceliales circa perithecia aggregata, simplices, rectae, acutae ad apicem, ad 265 μm longa. Perithecia aggregata ad centre, leniter verrucose, ad 140 μm diam.; ascospores oblongae vel cylindraceae, 4-septatae, constrictae, 31-37.5 x 9-12.5 μm.

On Vigna khandalensis (Phaseolus khandalensis) (Fabaceae), Kolhapur, Maharashtra, India, Dec. 1971, A.N. Thite HCIO 31910 (type).

The present new species is close to Meliola nyanae Hansf. and M. erythrinae-micropterycis Hansf. However, it differs from the former species in not causing defoliation of the host plant and from the latter species in having only 5% opposite and not variously curved hyphopodia. Meliola cristata Stev. reported on Phaseolus sp. from British Guiana but the present new species differs from it in having acute mycelial setae.


Colonies amphigenous, dense, scattered, up to 11 mm in diameter. Hyphae flexuous to substraight, branching opposite to unilateral, cells 25-44 x 5-7.5 μm. Hyphopodia alternate to unilateral, rarely opposite, 15-20.5 μm long; stalk cells 4-7.5 μm long; head cells entire, 11-15.5 x 7-9 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 16-30 x 6-7.5 μm. Mycelial setae scattered, simple, uncinate, acute to obtuse at the tip, up to 208 μm long. Perithecia scattered, verrucose, up to 165 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 32-43.5 x 9-15 μm.

On leaves of Pithecellobium diversifolium (Mimosaceae), Brazil, IMUR 65553.

Colonies amphigenous, dense, velvety, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching opposite at acute angles, closely reticulate, cells 25-45 x 7-10 μm. Hyphopodia alternate to unilateral, antrorse, straight to curved, 33-46.5 μm long; stalk cells cylindrical to cuneate, 11-16 μm long; head cells clavate to ellipsoidal, entire, 22-25.5 x 16-19.5 μm. Phialides mixed with hyphopodia, alternate, rarely opposite, ampulliform, neck elongated, 20-35 x 7-9 μm. Mycelial setae grouped around perithecia, rarely scattered, simple, acute at the apex, up to 1020 μm long. Perithecia scattered, verrucose, up to 238 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 46-54.5 x 17-24 μm.

On leaves of Podocarpus nagi (Podocarpaceae), Xiaohu, Fujian Province, China, Sept. 9, 1987, Hu Yang-Xing GDIM 87116.


Colonies epiphyllous, dense, crustose, up to 2 mm in diameter. Hyphae closely reticulate, cells 20-25 x 5-7 μm. Hyphopodia alternate, antrorse to spreading, 15-19 μm long; stalk cells cylindrical to cuneate, 3-5.5 μm long; head cells globose to ovate, entire, 8-13.5 x 7-11.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 19-23 x 4-7.5 μm. Mycelial setae numerous, scattered, simple, straight, acute at the tip, up to 250 μm long. Perithecia scattered, verrucose, up to 120 μm in diam.; ascospores oblong, 4-septate, slightly constricted at the septa, 32-36 x 10-12 μm.

On leaves of Polygonum chinense (Polygonaceae), Castle rock, Maharashtra, India, Nov. 1966, B.V. Srinivasulu MUH 144.

305. Meliola polygonicola sp. nov.

Coloniae epiphyllae, densae, ad 2 mm diam., confluentes. Hyphae rectae vel subrectae, opposite acutaeque ramosae, valde reticulatae ex solidae, cellulae 12-15.5 x 5-7 μm. Hyphopodia opposita, pauca solitaria, dense posita, antrorsa, 12-15.5 um longa; cellula basali cuneata, 3-6.5 um longa; cellula apicali globosa vel leniter ovata, integra, 9-12 x 8-10 μm. Phialides
pauca, illis capitatis commixta, dispersa vel opposita, ampullacea, 15-18.5 x 7-9.5 μm. Setae myceliales paucae simplices, rectae, obtusae vel acutae ad apicem, ad 400 μm longae. Perithecia dispersa, ad 124 μm diam.; ascospores oblongae vel cylindraceae, 4-septatae, constrictae, 37-41 x 15-17 μm.


This species is allied to Meliola macrantha (Ciff.) Hansf. in having crowded and opposite hyphopodia but differs from it in having smaller and all opposite hyphopodia, shorter mycelial setae, smaller perithecia and ascospores.


Colonies epiphyllous, subdense, up to 5 mm in diameter, rarely confluent. Hyphae substraight to flexuous, branching opposite at acute angles, closely reticulate, cells 26-30 x 8-10 μm. Hyphopodia alternate, about 30% opposite, antrorse, 16-20 μm long; stalk cells cuneate, 4-6 μm long; head cells globose, ovate, entire, 12-14 x 10-12 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, neck elongated and twisted, 18-22 x 8-10 μm. Mycelial setae grouped around perithecia, straight, simple, variously dentate at the apex, up to 720 μm long. Perithecia scattered, verrucose, up to 170 μm in diam.; ascospores ellipsoidial, 4-septate, deeply constricted, 42-48 x 14-16 μm.

On leaves of Premna glaberrima (Verbenaceae), Idukki, Kerala, India, Feb. 18, 1983, V.B. Hosagoudar HCIO 40554.


Colonies epiphyllous, suborbicular, up to 3 mm in diameter. Hyphae flexuous, branching irregular, cells 20-30 x 5-6 μm. Hyphopodia alternate, antrorse, 13-17 μm long; stalk cells cuneate, 5-7 μm long; head cells subclavate, entire to sublobate, 10-12 x 7-10 μm. Phialides opposite, ampulliform, 17-21 x 6-8 μm. Mycelial setae grouped around perithecia, simple, subgeniculate at base and
dentate at the apex, up to 645 μm long. Perithecia scattered to grouped, up to 185 μm in diam.; ascospores ellipsoidal to subcylindrical, 4-septate, constricted at the septa, 37-42 x 12-16 μm.

On leaves of Protium sp. (Burseraceae), Brazil, April 16, 1960, O.S.A. Silva IMUR 20090.

308. Meliola psychotriae-nudiflorae sp. nov.

Coloniae hypophyllae, subdensae, patentiae, ad 8 mm diam. Hyphae flexuosae, opposite acuteque ramosae, laxe reticulatae, cellulæ 31-37.5 x 5-7 μm. Hyphopodia dispersa, alternata, antrorsa vel subantrorsa, 21-31 μm longa; cellula basali cylindracea vel cuneate, 6-12.5 μm longa; cellula apicali globosa, integra, angulosa vel irregulariter sublobata, 15-18.5 x 12-18.5 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 15-18.5 x 5-7 μm. Setae myceliales dispersae vel aggregatus circa peritheciae, simplices, rectae vel curvulæ, obtusae ad apicem, ad 600 μm longae. Perithecia dispersa, verrucosa, ad 130 μm diam.; ascosporæ cylindraceæ, plerumque curvulæ, 4-septatae, leniter constrictæ, cellulæ medietas leniter magnioræ, 27-34 x 9-12.5 μm.

On leaves of Psychotira nudiflora Wight & Arn. (Rubiaceae), Kudreveli, Tirunelveli dist., Tamil Nadu, India, Feb. 25, 1994, V.B. Hosagoudar HCTO 41604 (type).

Based on the morphology of the ascospores, the present collection is close to Meliola mephitidiae Yamam., M. eveae Stev. and M. imperspicua Deight. However, more scattered hyphopodia with an entire, angular to sublobate head cells and the longer middle cell of the ascospore distinguishes the present new species.


Colonies epiphyllous, dense, crustose to velvety, up to 2 mm in diameter, confluent. Hyphae mostly substraight, rarely crooked, branching opposite to irregular at acute to wide angles, closely reticulate, cells 18-22 x 6-8 μm. Hyphopodia alternate, 5-10% opposite, antorse, subantrorse to rarely recurved, 18-28 μm long;
stalk cells cylindrical to cuneate, 3-9.5 μm long; head cells ovate to globose, entire to angular in young colonies while irregularly sublobate in mature colonies, 15-18.5 x 12-18.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, rarely neck elongated, 15-25 x 6-9.5 μm. Mycelial setae scattered, straight, simple, acute to obtuse at the tip, up to 500 μm long. Perithecia scattered, verrucose, up to 155 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 37-40.5 x 15-18.5 μm.

On leaves of *Pterospermum reticulatum* (Sterculiaceae), Gersoppa, Karnataka, India, Oct. 21, 1992, P.A. Raghu HClO


Colonies epiphyllous, thin to subdense, up to 3 mm in diameter. Hyphae straight to crooked, branching opposite, alternate to irregular at wide angles, loosely reticulate, cells 37-46.5 x 9-12.5 μm. Hyphopodia alternate to unilateral, straight to curved, subantrorse to spreading, 21.5-28 μm long; stalk cells cylindrical to cuneate, 6-7 μm long; head cells ovate to globose, straight to curved, entire to slightly angulose, 15.5-21.5 x 9-12.5 μm. Phialides mixed with hyphopodia, mostly alternate, ampulliform, 21.5-25 x 9-12.5 μm. Mycelial setae scattered, simple, straight, acute to obtuse at the tip, up to 860 μm long. Perithecia scattered, verrucose, up to 186 μm in diam.; ascospores obovate, 4-septate, constricted, 49.5-52.5 x 18-21.5 μm.

On *Litsea* sp. (Lauraceae), Anamalai, Coimbatore, Tamil Nadu, India, Jan. 17, 1987, V.B. Hosagoudar HCIO.


Colonies epiphyllous, very thin, diffused. Hyphae substraight to flexuous, branching alternate to irregular at acute angles, loosely reticulate, cells 27-45 x 6-8 μm. Hyphopodia alternate, straight to curved, antrorse to recurved, rarely flexuous to crooked, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, globose, entire to slightly and irregularly sublobate, 15-18.5 x 9-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 21-28 x 9-12.5 μm.
Mycelial setae very few, straight, acute to obtuse at the apex, up to 300 \( \mu m \) long. Perithecia scattered, up to 170 \( \mu m \) in diam.; ascospores obovoidal to ellipsoidal, 3-septate, mostly curved, 43-50 x 15-17 \( \mu m \).

On leaves of *Syzygium laetum* (Myrtaceae), Coimbatore, Tamil Nadu, India, March 28, 1990, V.B. Hosagoudar HCIO 30558.

312. *Meliola radhanagariensis* sp. nov.

Coloniae hypophyllae, tenues, patentiae, ad 5 mm diam. Hyphae rectae vel leniter anfractucae, irregulariter acutaeque ramosae, laxe reticulatae, cellulae 27-31 x 4-5 \( \mu m \). Hyphopodia alternata, ad 2\% opposita, antrorsa vel subantrorsa, 12-15.5 \( \mu m \) longa; cellula basali cylindracea vel cuneata, 3-6.5 \( \mu m \) longa; cellula apicali globosa, integra, raro angularia, 9-11 x 9-10 \( \mu m \). Phialides illis capitatis commixta, alternata vel opposita, ampullacea, collum elongatus, 12-18.5 x 9-11 \( \mu m \). Setae myceliales dispersae, simplices, rectae vel leniter flexuose, obtusae ad apicem, ad 575 \( \mu m \) longae. Perithecia dispersa, verrucosa, ad 124 \( \mu m \) diam.; ascosporae oblongae, rectae vel leniter curvulae, 4-septatae, constrictae, 34-37.5 x 15-18.5 \( \mu m \).

On Euphorbiaceae member, Radhanagari, Maharashtra, India, Nov. 24, 1974, M.S. Patil HCIO 36748 (type).

This species is close to *Meliola luzonensis* Sydow but differs from it in having smaller hyphopodia; straight to flexuous, shorter and obtuse mycelial setae.


Colonies epiphyllous, on black leaf spots, subdense to dense, scattered, up to 2 mm in diameter. Hyphae straight to substraight, branching mostly opposite at wide angles, loosely reticulate, cells 21.5-28 x 9-12.5 \( \mu m \). Hyphopodia alternate, mostly antrorse, rarely spreading, straight to curved, 18.5-25 \( \mu m \) long; stalk cells cylindrical to cuneate, 3-6.5 \( \mu m \) long; head cells ovate, versiform to cylindrical, entire, straight to slightly curved, 15.5-18.5 x 12.5-15.5 \( \mu m \). Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15.5-31 x 7.5-9.5 \( \mu m \). Mycelial setae few, grouped around perithecia, straight, simple, acute to obtuse at the
tip, up to 500 μm long. Perithecia scattered, verrucose, up to 130 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted, 37-40.5 x 15.5-18.5 μm.

On *Persea macrantha* (Lauraceae), Anamalai, Coimbatore, Tamil Nadu, India, April 17, 1987, V.B. Hosagoudar HCIO

314. *Meliola rapaneae* Sydow var. *microspora* V.B. Hosagoudar et R. Ganesan, var. nov.

Differ a var. *rapaneae* hyphopodiis, setis myceliales et ascosporis brevioribus.

Colonies hypophyllous, dense, velvety, confluent and cover the entire lower surface of the leaves. Hyphae straight to substraight, branching irregular at acute to wide angles, loosely to closely reticulate, cells 18-25 x 6-8 μm. Hyphopodia alternate and about 10% opposite, straight to curved, subantrorse to antrorse, 15-18.5 μm long; stalk cells cylindrical to cuneate, 5-6.5 μm long; head cells ovate, obovate, cylindrical to globose, entire to angular, truncate at apex, 9-12 x 9-13 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, neck elongated, 15-18.5 x 6-7 μm. Mycelial setae scattered to grouped around perithecia, simple, acute to obtuse at apex, up to 520 μm long. Perithecia scattered, verrucose, up to 220 μm in diam.; ascospores obovoidal, rarely slightly curved, 4-septate, slightly constricted at the septa, 46-50 x 12-15.5 μm.

On leaves of *Rapanea wightiana* (Myrsinaceae), Kakachi Forest, Tirunelveli dist., Tamil Nadu, India, April 22, 1993, R. Ganesan HCIO 41126.

*Meliola australis* Hino & Katumo and *M. rapaneae* Sydow have been reported on this host genus. The present collection is close to *M. rapaneae* Sydow in having only hypophyllous colonies. However, the new variety differs from the var. *rapaneae* in having smaller capitate hyphopodia, shorter mycelial setae and smaller ascospores.


Colonies amphigenous, mostly epiphyllous, up to 3 mm in diameter. Hyphae straight to substraight, branching opposite to irregular at acute angles, loosely reticulate, cells 18-39 x 7-12
μm. Hyphopodia alternate, straight, antorse, 18-34 μm long; stalk cells cuneate, 3-9.5 μm long; head cells ovate, pyriform, entire, 15-25 x 12-15.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 21-25 x 12-15.5 μm. Mycelial setae mostly grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 650 μm long. Perithecia scattered, verrucose, up to 186 μm in diam.; ascospores oblong, cylindrical, 4-septate, constricted at septa, 42-51 x 18-24 μm.


316. *Meliola reinwardtiodendri* sp. nov.

Coloniae epiphyllae, densae, crustosae, ad 5 mm diam. Hyphae rectae, opposite vel irregulariter acuteque vel laxe ramosae, dense reticulatae, cellulae 15-18.5 x 7-9.5 μm. Hyphopodia opposita, raro solitaria, subantrorsa vel antrorsa, 18-22 μm longa; cellula basali cylindracea vel cuneata, 3-6.5 μm longa; cellula apicali ovata, cylindracea, rotunda vel truncata ad apicem, integra vel angulosa, plerumque recta, raro curvula, 14-16 x 12-14 μm. Phialides illis capitatis commixta, conoidea, 18-22 x 6-8 μm. Setae myceliales paucae, dispersae vel aggregatae circa peritheciae rectae, flexuosae, curvatae, uncinatae, obtusae ad apicem, ad 360 μm longae. Perithecia dispersa, verrucosa, ad 155 μm diam.; ascosporae obovoideae, 4-septatae, leniter constrictae, 42-45 x 18-22 μm.

On leaves of *Reinwardtiodendron anamallayanum* (Bedd.) Saldanha (Meliaceae), Varagaliar, Anamalai, Coimbatore, Tamil Nadu, India, March 12, 1994, V.B. Hosagoudar HClO 41583 (type).

The present collection is close to *Meliola obvallata* Sydow and *M. dysoxyli-nitidi* Huguenin var. major Huguenin (Hansford, 1961; Huguenin, 1969) in having straight to uncinate mycelial setae. However, the present new species differs from both in having opposite capitate hyphopodia.


Colonies epiphyllous, up to 3 mm in diameter. Hyphae irregularly branched, cells 8-11 μm. Hyphopodia opposite, 2-celled,
16-19 x 9-13.5 μm. Phialides mixed with hyphopodia, ampulliform, 13-19 x 8-11 μm. Mycelial setae simple, straight to curved, 1-5 dentate at the apex, up to 357 μm long. Perithecia up to 170 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 35-40 x 11-14 μm.

On leaves of Remirea martima (Cyperaceae), Galinopolis, Pernambuco, March 9, 1958, E.B. Carreia IMUR 12754.


Colonies amphigenous, mostly hypophyllous, subdense, up to 4 mm in diameter, confluent. Hyphae mostly straight, branching mostly opposite, rarely alternate at acute angles, closely reticulate, cells 12-22 x 8-10 μm. Hyphopodia alternate, about 10% opposite, straight to curved, antrorse to spreading, 20-22 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate, versiform; often angular, straight to curved, entire, 14-16 x 8-10 μm. Phialides mixed with hyphopodia, opposite to alternate, mostly ampulliform, 18-20 x 8-10 μm. Mycelial setae numerous, straight, acute to 2-3 dentate at the apex, up to 810 μm long. Perithecia mostly grouped, verrucose, up to 200 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted, 36-40 x 16-18 μm.

On leaves of Zanthoxylum ovata (Rutaceae), Lakshmi Estate, Idukki, Kerala, India, Aug. 12, 1983, V.B. Hosagoudar HCIO 40557.


Colonies epiphyllous, dense, crustose, up to 2 mm in diameter. Hyphae straight to substraight, branching opposite, alternate to irregular at acute angles, closely reticulate and solid at the centre, cells 15.5-18.5 x 9-12.5 μm. Hyphopodia opposite and alternate, antrorse, 18.5-21.5 μm long; stalk cells mostly cuneate, 6-9.5 μm long; head cells globose, ovate, entire, angular to rarely lobate, 12-15.5 μm. Phialides few, mixed with hyphopodia, alternate
to opposite, ampulliform, 18.5-21.5 x 9-12.5 μm. Mycelial setae densely scattered, straight, simple, acute to obtuse at the tip, up to 550 μm long. Perithecia scattered, verrucose, up to 200 μm in diam.; ascospores obovoidal to ellipsoidal, 4-septate, constricted at the septa, 46-55 x 15-19 μm.


320. Meliola rubiella Hansf. var. indica var. nov.
Differt a var. rubiella hyphis myceliales rectis, anfractus vel flexuosis et ascosporis longioribus.

On leaves of Rubus nivus Thunb. (Rosaceae), Veerapuli Reserve Forest, Kanniyakumari dist., Tamil Nadu, India, Feb. 22, 1994, V.B. Hosagoudar HCIO 41640 (type).

Colonies amphigenous, mostly epiphyllous, subdense, up to 4 mm in diameter, rarely confluent. Hyphae straight, branching opposite at acute angles, loosely to closely reticulate, cells 10-30 x 6-9 μm. Hyphopodia alternate, straight, antrorse, 18-32 μm long; stalk cells cuneate, 5-14 μm long; head cells ovate, bluntly pointed, entire, 12-16 x 8-12 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 18-28 x 8-12 μm. Mycelial setae mostly grouped around perithecia, straight, simple, acute at the apex, up to 855 μm long. Perithecia scattered, verrucose, up to 198 μm in diam.; ascospores obovoidal, 4-septate, constricted, 42-50 x 18-20 μm.

On leaves of Smilax zeylanica (Smilacaceae), Idukki, Kerala, India, Jan. 11, 1982, V.B. Hosagoudar HCIO 40558.

322. Meliola sansevieriicola nom. nov.

Colonies amphigenous, epiphyllous, black, orbicular, up to 2 mm in diameter. Hyphae prostrate, 8-12 μm broad, septate, branching
opposite to irregular. Hyphopodia alternate to irregular, stipitate, globose, 15-18 x 14-20 μm. Mycelial setae numerous, up to 300 μm long, apex slightly bifurcate to dichotomous. Perithecia globose, black, up to 200 μm in diam.; ascospores cylindrical, rounded at the apex, 4-septate, constricted, 46-60 x 15-22 μm.

On leaves of *Sansevieria laurenti* (Agavaceae), Prope Abidian, Cote-d’Ivoire, Africa Occidentalis.


Colonies epiphyllous, subdense, up to 5 mm in diameter, confluent. Hyphae straight to substraight, branching opposite at acute to wide angles, closely reticulate, cells 20-37.5 x 6-7.5 μm. Hyphopodia alternate, antrorse to spreading, straight to spreading, 17.5-27.5 μm long; stalk cells cylindrical, 5-10 μm long; head cells subglobose, oblong to clavate, entire, 12.5-17.5 x 10-12.5 μm. Phialides with hyphopodia, mostly opposite, ampulliform, 18-25 x 6-8.5 μm. Mycelial setae numerous, simple, straight, dentate to furcate at the tip, up to 300 μm long; primary branchlets up to 37.5 μm long; secondary up to 11 μm long, obtuse at the tip of branchlets. Perithecia scattered, verrucose, up to 200 μm in diam.; ascospores ellipsoid to oblong, 4-septate, constricted at the septa, 42.5-47.5 x 17.5-20 μm.


324. *Meliola sarcostigmatis* Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 246, 1990 (*sarcostigmas*).

Colonies hypophyllous, dense, velvety, up to 5 mm in diameter, rarely confluent. Hyphae straight to undulate, branching mostly opposite at wide angles, closely reticulate, cells 24-32 x 6-10 μm. Hyphopodia alternate, about 10% opposite, straight to curved, antrorse, spreading, 14-24 μm long; stalk cells cylindrical to cuneate, 4-10 μm long; head cells cylindrical to cuneate, 4-10 μm long; head cells ovate, globose, entire, 10-14 x 8-10 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 22-26 x 6-10 μm. Mycelial setae numerous, scattered, straight, simple,
acute to obtuse at the tip, up to 468 μm long. Perithecia scattered, surface cells projecting, up to 170 μm in diam.; ascospores obvoid, 4-septate, constricted, 38-44 x 14-16 μm.

On leaves of Sarcostigma kleinii (Icacinaceae), Idukki, Kerala, India, Feb. 18, 1983, V.B. Hosagoudar HCIO 40561.


Colonies amphigenous, mostly hypophyllous, dense, velvety, up to 4 mm in diameter, confluent. Hyphae substraight to slightly undulate, branching opposite to irregular at acute angles, loosely reticulate, cells 10-14 x 6-8 μm. Hyphopodia alternate to unilateral, subantrorse to antrorse, 22-28 μm long; stalk cells mostly cuneate, 8-13 μm long; head cells ovate, pyriform, entire, 13-18 x 12-14 μm. Phialides few, mixed with hyphopodia, alternate to opposite, ampulliform, 18-20 x 8-10 μm. Mycelial setae numerous, grouped around perithecia, straight, simple, acute to obtuse at the tip, up to 280 μm long. Perithecia scattered to grouped, verrucose, up to 153 μm in diam.; ascospores obvate, 4-septate, constricted, 32-36 x 11-12 μm.

On leaves of Scleropyrum pentandrum (Santalaceae), Calvary Mount, Idukki, Kerala, India, April 25, 1982, V.S. Raju HCIO 40563.

326. Meliola scolopiae Doidge var. indica var. nov.

Differt a var. scolopiae hyphopodiis 1% oppositis, dense positis et brevibus.

On Scolopia crenata (Flacourtiaceae), Veerapuli Reserve Forest, Kanniyakumari dist., Tamil Nadu, India, Feb. 22, 1994, V.B. Hosagoudar HCIO 41616 (type).


Colonies epiphyllous, dense, crustose, up to 3 mm in diameter. Hyphae straight, branching opposite at acute to wide angles, closely reticulate and form dense mycelial mat, cells 15-18.5 x 6-9.5 μm. Hyphopodia alternate, antrorse to subantrorse, 18-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells
ovoid to globose, entire to angular, 12.5-18.5 x 12-15.5 μm.
Phialides mixed with hyphopodia, alternate to opposite, 
ampulliform, 18-22 x 9-12.5 μm. Mycelial setae numerous, simple, 
straight, acute at the tip, up to 500 μm long. Perithecia scattered 
to loosely grouped, verrucose, up to 250 μm in diam.; ascospores 
obovoidal, 4-septate, deeply constricted at the septa, 49-56 x 21- 
25 μm.

On leaves of *Semecarpus anacardium* (Anacardiaceae), Dakhina 
Kannada, Mangalore, Karnataka, India, Nov. 24, 1992, P.A. Raghu 
HCIO 40877.

328. *Meliola sempeiensis* Yamam. var. *nicobarica* Lakshmanan, 
Colonies hypophyllous, dense, strongly appressed to the host 
surface, up to 4 mm in diameter. Hyphae straight to crooked, 
branching alternate to irregular at acute angles, loosely to 
closely reticulate, cells 27-31 x 7-9.5 μm. Hyphopodia alternate, 
straight to curved, antorse to spreading, 27-31 μm long; stalk 
cells cylindrical to cuneate, mostly straight, rarely curved, 9- 
12.5 μm long; head cells ovoid to globose, mostly straight, rarely 
curved, entire, 18-22 x 15-22 μm. Phialides mixed with hyphopodia, 
opposite to alternate, ampulliform, neck elongated, 27-31 x 12-15.5 
μm. Mycelial setae numerous, straight to curved, acute to dentate 
at the apex, up to 1050 μm long. Perithecia scattered, verrucose, 
up to 170 μm in diam.; ascospores ellipsoid to obovoid, 4-septate, 
constricted, 49-59 x 18-22 μm, middle cell larger than the 
remaining.

On leaves of *Litsea* sp. (Lauraceae), Great Nicobar Island, 
India, March 18, 1990, V. Lakshmanan HCIO

329. *Meliola shettyi* V.B. Hosagoudar, C.M. Pillai & P.A. Raghu 
sp. nov.

Coloniae hypophyllae, densae, ad 5 mm diam. Hyphae fortiter 
appressae ad hospes, anfractuae, irregulariter acuteque ramosae, 
laxe vel densae reticulatae, cellulae 12-28 x 6-8 μm. Hyphopodia 
remote posita, alternata, ad minusve 1% opposita, recta vel diverse 
curvula, 18-28 um longa; cellula basali cylindracea vel cuneata, 6-
12.5 μm longa; cellula apicali ovata, oblonga, globosa, piriformia, integra, angularia vel raro sublobata, 12-15.5 x 9-18.5 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 24-31 x 6-8 μm. Setae myceliales dispersae vel juxta perithecia aggregatae, simplices, rectae, setae myceliales juxta perithecia diverse dentatae et setae on myceliae obtusae, ad 730 μm longae. Perithecia dispsra, ad 155 μm diam.; ascosporae obovoideae vel ellipsoideae, 4-septatae, leniter vel profundae constrictae, 43-46.5 x 18-20 μm.

On *Actinodaphne* sp. (Lauraceae), Gerasoppa, Uttara Kannada, Karnataka, May 17, 1992, C.M. Pillai HCIO 30999 (type).

The present new species is close to *Meliola actinodaphnes* Hansf. in having crooked mycelia and in the morphology of the capitate hyphopodia. However, it differs from it in having only epiphyllous colonies, distantly placed hyphopodia, obtuse to dentate mycelial setae and smaller perithecia and ascospores.

This species is named in honour of Mr. B.V. Shetty who has done extensive studies on the Vitaceae of India.


Colonies epiphyllous, thin, up to 4 mm in diameter, confluent. Hyphae straight to sinuous, branching opposite at acute to wide angles, loosely reticulate, 5-7 μm wide. Hyphopodia alternate, 15-21 μm long; stalk cells cylindrical, 2-5 μm long; head cells subglobose to obovoidal, 10-15 x 8-10 μm. Phialides opposite to unilateral, ampulliform, 18-24 μm long. Mycelial setae straight to slightly curved, obtuse to dentate at the tip, up to 250 μm long. Perithecia aggregated; ascospores 4-septate, constricted at the septa, 42-48 x 15-18 μm.

On leaves of *sideroxylon foetidissimum* (Sapotaceae), Royal Palm State Park, Florida, Sept. 1917, W.E. Safford & C.C. Mosier BPI 71771.


Colonies amphigenous, dense, velvety, up to 3 mm in diameter, confluent. Hyphal branching irregular and closely reticulate, cells 5-8 μm wide. Hyphopodia alternate and opposite, 13-21 (-26) μm
long; stalk cells mostly cylindrical, 3-6 µm long; head cells ovoid
to elliptoidal, slightly globose, apex broadly rounded to truncate,
rarely angulose, 10-15 (-20) x 9-12.5 µm. Phialides opposite,
ampulliform, 12-20 x 6-7 µm. Mycelial setae numerous, simple,
straight, obtuse to hamate at the apex, up to 320 µm long.
Perithecia loosely to closely scattered, up to 220 µm in diam.;
ascospores oblong to cylindrical, straight to slightly curved, 4-
septate, more or less constricted at the septa, 36-47 x 14-16.5 µm.

On leaves of *Piper tucumani* (Piperaceae), Argentina, May 8,
1949, R. Singer

332. *Meliola sparsipoda* Hansf. var. *longiseta* Schmiedeknecht,
Colonies amphigenous, subvelvety, up to 10 mm in diameter,
confluent. Hyphae undulate, branching opposite to irregular at
acute angles, loosely reticulate, cells 28-38 x 6-6.5 µm.
Hyphopodia alternate, spreading, 25-29 µm long; stalk cells
cylindrical, 8-10 µm long; head cells angular to irregularly
lobate, 16-19 x 12-13 µm. Phialides borne on separate mycelial
branch, opposite, 25-35 x 9-10 µm. Mycelial setae scattered to
grouped around perithecia, straight to subarcuate, simple, acute at
the tip, up to 725 µm long. Perithecia scattered to grouped,
verrucose, up to 250 µm in diam.; ascospores oblong-elliptic, 4-
septate, constricted at the septa, 53-56 x 22-23 µm.

On leaves of *Copernicia pauciflora* (Arecaceae), Cuba, Jan. 2,

333. *Meliola spirobelia* Batista & Herrera in Batista, Cavalcanti &
Colonies amphigenous, black, up to 20 mm in diameter. Hyphae
straight to sinuous, branching opposite at acute angles, loosely
reticulate, cells 38-54 x 7-8 µm. Hyphopodia alternate, antorose,
subantorose to curved, 16-27 µm long; stalk cells cylindrical, 7-13
µm long; head cells ovate to globose, straight to curved, entire,
9-13.5 x 11-13.5 µm. Phialides opposite to alternate, ampulliform,
22-32.5 x 7-8 µm. Mycelial setae scattered, simple, straight,
flexuous to spirally twisted at the apex, up to 1117 μm long. Perithecia scattered, up to 245 μm in diam.; ascospores subcylindrical, straight to curved, 4-septate, not constricted at the septa, 38-60 x 11-14 μm.

On leaves of Rubiaceae member, Brazil, April 14, 1961, E.P. Peres IMUR 25589.

334. Meliola srinivasului nom. nov.


Colonies epiphyllous, subdense, crustose, up to 6 mm in diameter, confluent. Hyphae almost straight, branching opposite at wide angles, closely reticulate, cells 18-29 x 5-6 μm. Hyphopodia alternate, antrorse, 13-19 μm long; stalk cells cuneate, 4-6 μm long; head cells ovate to cylindrical, entire, 9-13 x 10-11 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 13-19 x 4-9 μm. Mycelial setae numerous, scattered, simple, straight, acute to obtuse, up to 500 μm long. Perithecia scattered, verrucose, up to 175 μm in diam.; ascospores oblong, 4-septate, constricted, 34-39 x 11-14 μm.

On leaves of Plumeria alba (Apocynaceae), Castle Rock, Maharashtra, India, Nov. 1967, B.V. Srinivasulu MUH 143.


Colonies epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae straight, branching opposite at acute angles, closely reticulate, cells 12-29 x 9-12.5 μm. Hyphopodia opposite, straight, subantrorse, 15-18.5 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovoid to versiform, entire, 16-18.5 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 18-31 x 9-12.5 μm. Mycelial setae scattered, simple, straight, flexuous to crooked at the upper portion, acute to obtuse at the tip, up to 250 μm long. Perithecia scattered, up to 100 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, 34-40.5 x 12-15.5 μm.
On leaves of *Turpinia sp.* (Staphyleaceae), Coimbatore, Tamil Nadu, India, March 23, 1990, V.B. Hosagoudar HCIO 30397.


Colonies amphigenous, caulicolous, dense, velvety, up to 3 mm in diameter, confluent. Hyphae straight to substraight, branching alternate to opposite at acute angles, closely reticulate, cells 22-28 x 10-14 μm. Hyphopodia alternate to unilateral, straight to curved, antrose to recurved, 24-32 μm long; stalk cells cylindrical to cuneate, 8-16 μm long; head cells globose, ovate, entire, 14-16 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 22-30 x 8-10 μm. Mycelial setae scattered and grouped around perithecia, simple, curved, acute to obtuse at the tip, up to 648 μm long. Perithecia scattered, verrucose, up to 198 μm in diam.; ascospores obovoidal, 4-septate, constricted, 54-60 x 16-24 μm.

On leaves, petioles and stems of *Stemonurus tetrandrus* (Icacinaceae), Idukki, Kerala, India, Dec. 21, 1983, V.B. Hosagoudar HCIO 40560.


Colonies amphigenous, dense, up to 2 mm in diameter. Hyphae straight to sinuous, branching irregular at acute angles, cells 21-31 x 7-11.5 μm. Hyphopodia alternate, 20-28.5 μm long; stalk cells elongated, more or less sinuous, 7-9.5 μm long; head cells globose, lobate, 13.5-19 x 15-23.5 μm. Phialides mixed with hyphopodia, alternate, ampulliform, 26-31 x 7-8.5 μm. Mycelial setae simple, sinuous, verrucose, obtuse at apex, up to 600 μm long. Perithecia scattered, globose, up to 260 μm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 41-63 x 15.5-24.5 μm.

On leaves of *Stenocarpus umbelliferus* (Proteaceae), New Caledonia, Aug. 7, 1966, NC 66061.


*Meliola stizolobii* Hansf. & Deight. var. *microspora* Batista

Coloniae epiphyllae densae, ad 1 mm diam., confluentes. Hyphae flexuosa, opposite vel irregolariter acuteque ramosae, laxe reticolatae, cellulae 10-20 x 5-7 μm. Hyphopodia alternata vel opposita, subantrorsa vel raro recurvata, cellula 10-13 x 5-8 μm (probabiliter cellula apicali). Phialides alternata, ampullacea, 10-17 x 6-7 μm. Setae myceliales simplices, rectae, acutae, obtusae vel dentatae et torulosae vel uncinate, ad 180 μm longae. Perithecia dispersa, ad 150 μm diam.; ascosporae cylindraceae, 4-septatae, constrictae, 25-30 x 9-11 μm.

Colonies epiphyllous, dense, up to 1 mm in diameter, confluent. Hyphae flexuous, branching opposite to irregular at acute angles, loosely reticulate, cells 10-20 x 5-7 μm. Hyphopodia alternate and opposite, subantrorse to rarely recurved, cells 10-13 x 5-8 μm (probably apical cells). Phialides alternate to opposite, ampulliform, 10-17 x 6-7 μm. Mycelial setae simple, straight, acute, obtuse to dentate and subtorulose to uncinate, up to 180 μm long. Perithecia scattered, up to 150 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 25-30 x 9-11 μm.

On leaves of Tephrosia toxicaria (Fabaceae), Brazil, June 1903, J. Huber 20375.


Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 3 mm in diameter, widely confluent. Hyphae straight to substraight, branching alternate to opposite at acute to wide angles, loosely reticulate, cells 15-22 x 6-8 μm. Hyphopodia alternate (rarely few opposite in young colonies), mostly antorse, 15-22 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovoid to globose, entire, 9-14 x 9-12.5 μm. Phialides mixed with hyphopodia, mostly opposite, ampulliform, 15-18.5 x 8-9.5 μm. Mycelial setae scattered, straight, mostly dentate and rarely but slightly furcate up to 10 μm at the tip, up to 286 μm long. Perithecia scattered, verrucose, up to 170 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa,
40-43.5 x 15-18.5 µm.

On leaves of *Swietenia mahagoni* (Meliaceae), Kaiga, Uttara Kannada, Karnataka, India, Nov. 21, 1992, K.M. Kaveriappa HCIO


Colonies hypophyllous, dense, crustose, up to 5 mm in diameter, confluent. Hyphae substrate to crooked, branching opposite at wide angles, closely reticulate, cells 16-28 x 4-6 µm. Hyphopodia alternate, straight to curved, subantrorse to spreading, 16-20 µm long; stalk cells cylindrical to cuneate, 5-6 µm long; head cells ovate to cylindrical, entire, 14-16 x 7-10 µm. Phialides mixed with hyphopodia, conoid to ampulliform, 20-22 x 5-6 µm. Mycelial setae scattered to grouped around perithecia, simple, straight, tortuous to uncinate, up to 350 µm long. Perithecia scattered, verrucose, up to 200 µm in diam.; ascospores oblong, 4-septate, slightly constricted at the septa, 40-46 x 18-20 µm.

On leaves of *Symingtonia populnea* [(Bucklandia populnea)] (Hamamelidaceae), Sikkim, India, April 1962, J.N. Kapoor HCIO 28361.


Colonies hypophyllous, round, up to 5 mm in diam. Hyphae alternate to unilaterally branched, cells 28-30 x 8-10 µm. Hyphopodia alternate, 18-22 µm long. Phialides alternate, ampulliform, 10-12 x 3-4 µm. Mycelial setae scattered, simple, straight, obtuse at apex, up to 600 µm long. Perithecia scattered to grouped, up to 350 µm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 45-48 x 15-16.5 µm.

On leaves of *Symphonia globulifera* (Clusiaceae), Brazil, IMUR 27559.

Colonies amphigenous, mostly hypophyllous, dense, up to 5 mm in diameter. Hyphae strongly appressed to the host, straight, flexuous to crooked, branching opposite at wide angles, loosely to closely reticulate, cells 15-22 x 3-6.5 μm. Hyphopodia alternate and about 5% opposite, antrorse to spreading, straight to curved, 12-15.5 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells globose to ovate, straight to curved, entire, 9-10 x 9-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 13-15.5 x 6-9.5 μm. Mycelial setae numerous, simple, predominantly straight, few uncinate to geniculate, acute at the tip, up to 375 μm long. Perithecia scattered to loosely grouped, up to 130 μm in diam.; ascospores obovoidal, 4-septate, slightly constricted, 34-40.5 x 12-18.5 μm.

On leaves of *Symphorema involucratum* (Symphoremaceae), Dhoni forest, Palghat, Kerala, India, March 1, 1993, V.B. Hosagoudar HCIO.


(*symponematis*).

Colonies epiphyllous, rarely hypophyllous, thin, scattered, up to 6 mm in diameter, confluent. Hyphae slightly undulate, branching opposite, loosely reticulate, cells 5-7 μm wide. Hyphopodia alternate, mostly antrorse to subspreading, 16-24 μm long; stalk cells cylindrical, 3-6 μm long; head cells ellipsoidal to oblong-ovoid, straight, entire, 10-14 x 8-10.5 μm. Phialides alternate, rarely opposite, ampulliform, 18-21 x 5-6.5 μm. Mycelial setae scattered, geniculate at the base, simple, subarcuate to curved, acute to obtuse at the tip, up to 350 μm long. Perithecia scattered, globose, up to 140 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, slightly constricted at the septa, 26-33 x 12-14 (8-10) μm.

On leaves of *Symphorema luzonicum* (Symphoremaceae), Philippines, Oct. 30, 1923, M.S. Clemens Nr. 4667.
Colonies hypophyllous, caulicolous, up to 10 mm in diameter. Hyphae undulate, branching opposite to irregular, loosely reticulate, cells 29-45.7 x 8-9 μm. Hyphopodia alternate, antorse to recurved, 25-32 μm long; stalk cells cylindrical to cuneate, 6-9 μm long; head cells oblong to ellipsoidal, straight to curved, entire, 19-23 x 8-10 μm. Phialides not seen. Mycelial setae grouped around perithecia, straight to slightly curved, simple, acute at apex, up to 550 μm long. Perithecia globose, up to 240 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 45-48.5 x 17-24 μm.
On leaves of Symplocos tanaka (Symplocaceae), Japan, Aug. 8, 1955, K. Katumoto

Colonies epiphyllous, thin, crustose, up to 1 mm in diameter, rarely confluent. Hyphae undulate, branching opposite at wide angles, loosely to closely reticulate, cells 21-31 x 6-9.5 μm. Hyphopodia alternate and about 5% opposite, mostly antorse, 15-18.5 μm long; stalk cells cylindrical to cuneate, 5-7 μm long; head cells globose, ovate, entire, 9-12.5 x 9-11 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15-18.5 x 9-12.5 μm. Mycelial setae few, straight, erect, acute to obtuse at the tip, up to 286 μm long. Perithecia scattered, up to 108 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 37-40.5 x 15-18.5 μm.
On leaves of Tylophora tenuis (Asclepiadaceae), Kolhapur, Maharashtra, India, Jan. 21, 1975, A.N. Thite HCIO 31946.

346. Meliola telosmae Rehm var. radhanagariensis var. nov.
Differt a var. telosmae phialides illis capitatis commixtis et differt a Meliola telosmae Rehm var. indica Hosag. et al. hyphopodiis alternatis.
On Asclepiadaceae member, Radhanagari, Kolhapur, Maharashtra, India, Nov. 1980, A.N. Thite HCIO 33670 (type).
The new variety differs from the var. telosmae in having phialides mixed with hyphopodia. It differs from M. telosmae Rehm var. indica Hosag. et al. in absence of 5% opposite hyphopodia.


Colonies amphigenous, mostly hypophyllous, dense, velvety on the upper surface while moderately dense on the lower surface, up to 2 mm in diameter, confluent. Hyphae substraight to undulate, branching opposite at wide angles, loosely reticulate in the hypophyllous colonies while closely reticulate in the epiphyllous colonies, cells 12.5-15.5 x 6-9.5 μm. Hyphopodia alternate, straight to curved, antrorse to spreading, 15-25 μm long; stalk cells cylindrical to cuneate, 6-6.5 μm long; head cells versiform, cylindrical, straight to bent, entire, 10-16.5 x 9-12.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 15.5-21.5 x 9-10 μm. Mycelial setae numerous, scattered, straight, dichotomously branched, 217 μm long up to first branching, first ray up to 50 μm long, second ray up to 46.5 μm long and the third ray up to 10 μm long, acute to obtuse at the tip, branches reflexed. Perithecia scattered, verrucose, up to 220 μm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted, 40-46.5 x 15.5-18.5 μm.

On leaves of Atalantia monophylla (Rutaceae), Tummalbailu, Nallamalai, Andhra Pradesh, India, April 19, 1986, V.B. Hosagoudar HCIO.


Colonies amphigenous, dense to subdense, crustose to velvety, up to 4 mm in diameter, confluent. Hyphae substraight to slightly crooked, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 21-28 x 6-8 μm. Hyphopodia alternate, antrorse, subantrorse to spreading, straight to curved, 18-22 μm long; stalk cells cuneate to cylindrical, 6-9.5 μm; head cells ovate, globose, rarely truncate at apex, entire, 12-15 x 10-15 μm. Phialides mixed with hyphopodia, opposite to alternate,
ampulliform, 15-18.5 x 9-12.5 μm. Mycelial setae very few, straight, simple, acute to bifid to rarely cristate at the apex, up to 790 μm long. Perithecia scattered, up to 140 μm in diam.; ascospores ellipsoidal to cylindrical, 4-septate, constricted at the septa, 37-40.5 x 12-15.5 μm.

On leaves of *Millettia rubiginosa* (Fabaceae), Coimbatore, Tamil Nadu, India, Dec. 27, 1990, V.B. Hosagoudar HCIO 30559.


Colonies amphigenous, subdense, velvety, up to 2 mm in diameter, confluent. Hyphae straight to tortuous, straight hyphae run along the veins and tortuous hyphae across the straight hyphae, branching mostly opposite at acute to wide angles, closely reticulate and form almost solid mycelial mat, cells 18-22 x 6-8 μm. Hyphopodia alternate, spreading, antrorse to recurved, straight to curved, 20-30 μm long; stalk cells cylindrical to cuneate, 8-14 μm long; head cells ovate, angular, entire to imperfectly and irregularly sublobate, 10-16 x 10-14 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 14-20 x 6-10 μm. Mycelial setae scattered to grouped around perithecia, straight, simple, acute to obtuse at the tip, up to 558 μm long. Perithecia scattered, verrucose, up to 130 μm in diam.; ascospores obovoidal, 4-septate, constricted, 40-48 x 14-18 μm.

On leaves of *Themeda cymbaria* (Poaceae), Clavary Mount, Idukki, Kerala, India, Jan. 8, 1982, V.B. Hosagoudar HCIO 40568.


Colonies foliicolous, amphigenous, dense, up to 2 mm in diameter, rarely confluent. Hyphae flexuous to crooked, branching alternate to irregular at acute angles, loosely reticulate, cells 24-90 x 7-9.5 μm. Hyphopodia alternate to unilateral, distantly placed, antrorse to spreading, 24-46.5 μm long; stalk cells cylindrical to cuneate, 6-28 μm long; head cells ovate, globose, angular to irregularly sublobate, 18-22 x 18-28 μm. Phialides numerous, borne on a separate mycelial branch, opposite to
alternate, ampulliform, 30-37 x 6-9.5 μm. Mycelial setae fairly numerous, scattered, simple, straight, obtuse at the tip, up to 615 μm long. Perithecia loosely grouped, verrucose, up to 200 μm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 52-56 x 22-28 μm.

On leaves of Microcos paniculata (Tiliaceae), Tamil Nadu, India, Dec. 15, 1987, A. Rajendran HCIO 39397.

351. Meliola thiteana sp. nov.

Colonies amphigenae, subdensae, ad 5 mm diam. Hyphae subrectae, opposite et laxe ramosae, laxe vel dense reticulatae, cellulae 18-31 x 6-7 μm. Hyphopodia alternata et ad 20% opposita, antrorsa vel subantrorsa, 12-18.5 um longa; cellula basali clindracea vel cuneata, 3-6.5 um longa; cellula apicali globosa, integra, 9-12.5 x 9-11 μm. Phialides illis capitatis commixa, alternata vel opposita, ampullacea, 15-18.5 x 6-7 μm. Setae myceliales dispersae, simplices, rectae, obtusae vel 2-4 cristatae ad apicem, ad 345 um longae. Perithecia dispersa, verrucosa, ad 110 um diam.; ascosporae leniter fusiformae, 4-septatae, constrictae, 40-43.5 x 15-18.5 um.

On Glochidion sp. (Euphorbiaceae), Radhanagari, Maharashtra, India, Dec. 1974, A.N. Thite HCIO 31904 (type).

This new species can be compared with Meliola jamaicensis Hansf. but differs from it in having smaller hyphopodia with globose head cells and shorter mycelial setae and smaller ascospores.

352. Meliola thitei nom. nov.


Colonies amphigenous, mostly epiphyllous, dense, confluent and cover the entire leaf surface. Hyphae straight to flexuous, branching mostly opposite at acute to wide angles, loosely reticulate, cells 18-28 x 6-8 μm. Hyphopodia alternate, antrorse, straight, 18-25 um long; stalk cells cylindrical to cuneate, 3-9.5 um long; head cells ovate, clavate, versiform, entire, 12-15.5 x 9-12.5 μm. Phialides numerous, mixed with hyphopodia, alternate to
opposite, conoid to ampulliform, 12-18.5 x 9-11 μm. Mycelial setae thinly scattered, straight, simple, rarely curved, up to 315 μm long. Perithecia scattered, immature, ascospores oblong to cylindrical, straight to slightly curved, 4-septate, slightly constricted, 30-34.5 x 12-15.5 μm.


Ovate and entire head cells of hyphopodia distinguishes this species from others. The name M. piperis Earle preoccupied and hence the new name proposed here.


Colonies hypophyllous, black, dense, up to 2 mm in diameter. Hyphae brown, sinuous, branching opposite to irregular at wide angles, closely reticulate, cells 18-23 x 9-10.5 μm. Hyphopodia alternate, antrorse, straight, 25-33.5 μm long; stalk cells cylindrical to cuneate, 5-13 μm long; head cells ovoid, entire to angulose to irregularly lobate, 18-26 x 11-18 μm. Phialides not seen. Mycelial setae few, simple, scattered to grouped around perithecia, flexuous, obtuse at the apex, up to 190 μm long. Perithecia scattered, globose, subverrucose, up to 220 μm in diam.; ascospores brown, cylindrical, 4-septate, constricted at the septa, 51-58 x 16-22 μm.

On leaves of Tieghemopanacis sp. (Araliaceae), New Caledonia, Oct. 5, 1966, NC 66123.

354. Meliola toreniae sp. nov.

Coloniae amphigenae, caulicolae, densae, velutinae, ad 2 mm diam., raro confluentes. Hyphae sinuosae, irregulariter acutaeque ramosae, laxe vel dense reticulatae, cellulae 15-25 x 6-8 μm. Hyphopodia alternata, antrorsa, 18-18.5 μm longa; cellula basali cuneata, 3-6 μm longa; cellula apicali ovata, integra, truncata vel leniter lobata ad apicem, 9-12.5 x 10-12 μm. Phialides illis capitatis commixta, alternata vel opposita, ampullacea, 15-18.5 x 6-8 μm. Setae myceliales moderatimnumeroseae, simplices, rectae, obtusae ad apicem, ad 345 μm longae. Perithecia dispersa, verrucosa, ad 110 μm diam.; ascosporae rectae vel leniter curvulae,
cylindraceae, 4-septatae, leniter constrictae, 27-31 x 12-15.5 μm.

On leaves of *Torenia travancorica* Gamble (Scrophulariaceae), Valve House, Kanniyakumari dist., Tamil Nadu, India, Feb. 28, 1994, S. Rajan HCIO 41566 (type).

Amphigenous dense colonies, truncate head cells of hyphopodia and straight mycelial setae distinguishes the present new species from its related *Meliola maurandiae* Hansf.


Colonies amphigenous, thin to subdense, up to 4 mm in diameter. Hyphae flexuous, branching opposite to irregular at acute angles, loosely reticulate, cells 19-33 x 6-7 μm. Hyphopodia alternate, antorse to spreading, straight to curved, 14-21.5 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells globose, ovate, entire to slightly angular, 9-13 μm. Phialides mixed with hyphopodia, ampulliform. Mycelial setae scattered to grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 700 μm long. Perithecia scattered to grouped, up to 198 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 36-44 x 11-15 μm.


Colonies epiphyllous, gregarious, up to 4 mm in diameter, confluent. Hyphae straight, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 8-10 μm wide. Hyphopodia alternate, 1-3 celled, antorse to retrorse to spreading, 24-36 μm long; stalk cells cuneate to cylindrical, 5-12 μm long; head cells subcylindric to subclavulate, straight to sinuous, often irregularly angular to sublobate, 16-24 x 12-14 μm. Phialides mixed with hyphopodia, unilateral to opposite, ampulliform, 20-26 x 9-11 μm. Mycelial setae grouped around perithecia, straight to slightly curved, acute to dentate at the tip, up to 480 μm long. Perithecia globose, up to 200 μm in diam.; peridial cells projected; ascospores ellipsoidal, 4-septate, constricted at the septa, 54-56 x 22-24 μm, middle cells largest.


Colonies amphigenous, mostly epiphyllous, dense, up to 2 mm in diam., confluent. Hyphae straight to substraight, branching alternate, opposite to irregular at acute angles, loosely to closely reticulate, cells 21-28 x 6-8 μm. Hyphopodia alternate, mostly antrorse, 21-31 μm long; stalk cells cylindrical to cuneate, 6-9 μm long; head cells ovate, globose, entire to angular, rarely slightly sublobate, 18-25 x 12-15.5 μm. Phialides mixed with hyphopodia, opposite to alternate, ampulliform, 18-25 x 6-9 μm. Mycelial setae scattered to grouped around perithecia, straight to curved, simple, acute, up to 544 μm long. Perithecia scattered, verrucose, up to 117 μm in diam.; ascospores obovoidal, 4-septate, constricted, 43-46.5 x 15-22 μm.

On Toxocarpus beddomei (Asclepiadaceae), Upper Godeyar, Kanyakumari, Tamil Nadu, March 14, 1979, A.N. Henry HCIO


Colonies epiphyllous, dense, crustose, up to 2 mm in diameter. Hyphae straight to substraight, branching mostly opposite at acute to wide angles, closely reticulate, cells 12-15.5 x 8-9.5 μm. Hyphopodia alternate, antrorse to spreading, straight to curved, 18-22 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells ovate, entire, 14-16 x 10-12.5 μm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 15-22 x 12-15.5 μm. Mycelial setae fairly numerous, simple, straight, acute to obtuse at the tip, up to 500 μm long. Perithecia scattered, globose, up to 200 μm in diam.; ascospores ellipsoidal, 4-septate, constricted at the septa, 43-46.5 x 18-22 μm.


Colonies epiphyllous, very thin, up to 4 mm in diameter, confluent. Hyphae flexuous, branching opposite to alternate at acute angles, loosely reticulate, cells 30-34 x 8-9.5 µm. Hyphopodia alternate, antrorse to subantrorse, 12-18.5 µm long; stalk cells cylindrical to cuneate, 3-6.5 µm long; head cells ovate to globose, entire, 9-12.5 x 10-12 µm. Phialides mixed with hyphopodia, alternate to opposite, ampulliform, 12-18.5 x 9-12.5 µm. Mycelial setae few, grouped around perithecia and also scattered, simple, straight, obtuse at the tip, up to 300 µm long. Perithecia scattered, verrucose, up to 124 µm in diam.; ascospores obovoidal, 4-septate, constricted at the septa, 31-34 x 12-15.5 µm.

On leaves of *Trewia polycarpa* (Euphorbiaceae), Coimbatore, Tamil Nadu, India, Dec. 26, 1990, V.B. Hosagoudar HCIO 30561.


Colonies hypophyllous, dense, velvety, up to 12 mm in diameter, confluent. Hyphae tortuous, irregularly branched at acute angles, cells 14-25 x 5-6 µm. Hyphopodia alternate, straight to curved, 15-27 µm long; stalk cells subcylindrical, 4-14 µm long; head cells subglobose to subclavate, 11-13 x 7-8 µm. Phialides not seen. Mycelial setae numerous, scattered to grouped around perithecia, straight, simple, acute to obtuse at the tip, up to 500 µm long. Perithecia scattered to grouped, up to 175 µm in diam.; ascospores subcylindrical, oblong-fusoid, 4-septate, constricted at the septa, 37-60 x 12-16 µm.

On leaves of *Psidium guajava* (Myrtaceae), Brazil, July 6, 1959, E.P. Peres IMUR 17100.


Colonies amphigenous, mostly hypophyllous, dense, velvety, up to 5 mm in diameter, confluent. Hyphae straight to slightly undulate, branching opposite at acute to wide angles, loosely to
closely reticulate, cells 12-30 x 6-8 μm. Hyphopodia alternate and about 60% opposite, antrorse, spreading, straight to curved, 16-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate, globose, entire, 10-14 x 8-10 μm. Phialides with hypophodia, opposite to alternate, ampulliform, 12-24 x 6-10 μm. Mycelia setae scattered to grouped around perithecia, simple, acute to obtuse at the tip, up to 468 μm long. Perithecia mostly grouped, verrucose, up to 252 μm in diam.; ascospores obovoidal, 4-septate, constricted, 34-42 x 14-18 μm.


Colonies on petioles and stems, thin, up to 2 mm in diameter. Hyphae oppositely branched, closely reticulate, cells 14-31 x 7-9 μm. Hyphopodia alternate, 17-20 μm long; stalk cell straight, cylindrical, 7-9 μm long; head cells ovate, 10-12.5 x 10-11.5 μm. Phialides numerous, mixed with hyphopodia, alternate to opposite, ampulliform, 15-27 x 8-12.5 μm. Mycelial setae scattered, simple, straight, up to 550 μm long. Perithecia scattered to aggregated, up to 200 μm in diam.; ascospores cylindrical, 4-septate, constricted at the septa, 35-40.5 x 11-13 μm.

On petiole and stems of *Mimosa invisa* (Mimosaceae), New Caledonia, July 10, 1965, NC 64395.


Colonies amphigenous, dense, crustose to velvety, up to 4 mm in diameter, rarely confluent. Hyphae straight to substraight, branching mostly opposite at wide angles, closely reticulate and form solid mycelial mat, cells 21-31 x 8-9.5 μm. Hyphopodia alternate, straight to curved, antrorse to recurved, 24-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells ovoid to globose, cylindrical, entire, angular to sublobate, often truncate at the apex, 15-18.5 x 14-17 μm. Phialides mixed with
hyphopodia, alternate to opposite, ampulliform, 18-22 x 11-12.5 μm. Mycelial setae fairly numerous, simple, straight, very few uncinate, acute at the apex, up to 930 μm long. Perithecia scattered, up to 186 μm in diameter; ascospores obovoidal to cylindrical, 4-septate, constricted, 46-56 x 20-22 μm.

On leaves of *Vepris bilocularis* (Rutaceae), Gersoppa, Uttara Kannada, Karnataka, India, Oct. 21, 1992, P.A. Raghu HCIO


Colonies amphigenous, subdense to dense, up to 3 mm in diameter, confluent. Hyphae substraight to undulate, branching opposite to alternate at acute angles, loosely reticulate, cells 22-30 x 6-8 μm. Hyphopodia alternate to unilateral, antrorse, spreading, 22-34 μm long; stalk cells cylindrical to cuneate, 8-14 μm long; head cells clavate, versiform, slightly angular, often curved, entire, 14-18 x 12-18 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 16-24 x 6-8 μm. Mycelial setae scattered to grouped around perithecia, simple, acute at the tip, up to 450 μm long. Perithecia scattered to grouped, verrucose, up to 176 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 46-48 x 18-20 μm.

On leaves of *Tarenna asiatica* (Rubiaceae), Bilikere, Karnataka, India, Sept. 19, 1903, E.J. Butler HCIO 1035.


Colonies amphigenous, mostly hypophyllous, subdense, subvelvety, up to 4 mm in diameter, confluent. Hyphae sinuous to crooked, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 18-32 x 6-10 μm. Hyphopodia alternate, spreading, antrorse, 20-30 μm long; stalk cells cuneate to cylindrical, 6-12 μm long; head cells ovate, narrowed towards apex, slightly angular, entire, 15-18 x 12-14 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulli-form, 14-20 x 8-10 μm. Mycelial setae few, grouped around perithecia, simple, straight, acute to subacute at apex, up to 344 μm long. Perithecia scattered, verrucose, up to 168 μm in diam.; ascospores
obovoidal, 4-septate, constricted, 36-46 x 12-18 μm.

On leaves of *Wendlandia notoniana* (Rubiaceae), Painavu, Idukki, Kerala, India, April 18, 1982, V.B. Hosagoudar HCIO 40571.


Colonies epiphyllous, black, thin, crustose, up to 3 mm in diameter. Hyphae substraight to crooked, branching 22-36 x 5-7.5 μm. Hyphopodia alternate to unilateral, straight to flexuous, antlorse to subantrorse, 17-25.5 μm long; stalk cells oblong to cuneate, 5-7.5 μm long; head cells subglobose, ovate to oblong, entire, 12-18 x 7-13 μm. Phialides borne on a separate mycelial branch, opposite, ampulliform, 21-24 x 5-8 μm. Mycelial setae scattered to grouped around perithecia, simple, acute to obtuse at the tip, up to 427 μm long. Perithecia scattered, verrucose, up to 160 μm in diam.; ascospores ellipsoidal, 4-septate, slightly constricted at the septa, 33-36.5 x 11-13 μm.

On leaves of *Bixa sp.* (Bixaceae), Prov. of Yunnan, China, Aug. 1938, C.C. Zhou HMAS 31703.


Colonies amphigenous, dense, velvety, up to 5 mm in diameter, confluent. Hyphae straight to undulate, branching opposite at acute angles, closely reticulate, cells 14-21 x 6-7 μm. Hyphopodia alternate, antlorse, 13-16 μm long; stalk cells cylindrical to cuneate, 3-4 μm long; head cells ovate, clavate, cylindrical, entire to rarely lobate, 10-12 x 8-15 μm. Phialides borne on separate mycelial branch, opposite to alternate, ampulliform, 17-19 x 4-7 μm. Mycelial setae numerous, scattered, simple, straight, obtuse, up to 350 μm long. Perithecia mostly in groups, verrucose, up to 200 μm in diam.; ascospores oblong, 4-septate, constricted at the septa, 30-36 x 10-12 μm.

On leaves of *Woodfordia fruticosa* (Lythraceae), Castle rock, Maharashtra, India, Nov. 1966, B.V. Srinivasulu MUH 145.

Colonies epiphyllous, thin, arachnoides, up to 4 mm in diameter. Hyphae undulate, branching alternate to irregular at acute to wide angles, loosely reticulate, 13-14 x 6-9 μm. Hyphopodia alternate to unilateral, antrorse, straight to curved, 11-16.5 μm long; stalk cells cylindrical to cuneate, 2-8 μm long; head cells globose to subglobose, entire, 9-11 x 6-10 μm. Phialides borne on a separate mycelial branch, opposite to unilateral, ampulliform, 13-18 x 6-9 μm. Mycelial setae loosely scattered, simple, straight, acute to subacute at the tip, up to 307 μm long. Perithecia loosely scattered, verrucose, up to 180 μm in diam.; ascospores oblong-elliptical to cylindrical, 4-septate, slightly constricted, 25-36 x 15-18.5 μm.

On leaves of *Triumfetta annua* (Tiliaceae), Prov. of Yunnan, China, Aug. 1975, S.J. Han et al. HMAS 44286.


Colonies epiphyllous, rarely hypophyllous, scattered, subdense, subvelvety, up to 3 mm in diameter. Hyphae straight to undulate, branching irregular at wide angles, loosely to closely reticulate, cells 7-13 μm wide. Hyphopodia alternate, antrorse, 32-40 μm long; stalk cells cylindrical to subconical, 5-13 μm long; head cells ovoid to pyriform, rarely ellipsoidal, broadly rounded at the apex, entire to slightly lobate, 19-27 x 15-20 μm. Phialides ampulliform, 16-23 x 8-10 μm. Mycelial setae scattered, straight, acuminate to broadly rounded and straight to curved at the apex, up to 500 μm long. Perithecia scattered, globose, up to 180 μm in diam.; ascospores oblong to ellipsoidal, 4-septate, constricted at the septa, 44-55 x 17-20 (-13-15) μm.

On leaves of *Dioscorea* sp. (Dioscoreaceae), Luzon, Philippines, March 1924, M.S. Clemens Nr. 2474.

370. *Meliola zanthoxyli-ovalifolii* sp. nov.

Coloniae amphigenae, tenues vel subdensae, ad 2 mm diam., raro confluentes. Hyphae subrectae vel flexuosae, plerumque opposite laxе ramosae, laxе reticulatae, cellulae 21-34 x 9-11 μm.
Hyphopodia alternata, antrorsa vel subantrorsa, recta, mostly curvula, 30-33 μm longa; cellula basali cylindracea vel cuneata, 9-12.5 μm longa; cellula apicali ovata vel elongato-ovata, integra, 18-22 x 9-12.5 μm. Phialides illis capitatis commixta, plerumque opposita vel opposita ad hyphopodia, ampullacea, 24-31 x 9-11 μm. Setae myceliales aggregatus circa peritheciae, simplices, rectae, acutae vel obtusae ad apicem, ad 460 μm longae. Perithecia dispersa, verrucosa, ad 140 μm diam.; ascosporae oblongae vel cylindraceae, 4-septatae, constrictae, 46-56 x 18-22 μm.

On leaves of Zanthoxylum ovalifolium (Rutaceae), Varagaliar, Anamalai, Coimbatore, Tamil Nadu, India, Feb. 13, 1994, V.B. Hosagoudar HCIO 41565 (type).

This new species is close to Meliola macropoda Sydow in having elongate ovate head cells of hyphopodia but differs from it in having smaller but characteristically bent head cells of the hyphopodia.

VII. PRATAPRAJELLA


Colonies foliicolous; hyphae foliicolous, superficial, hyphopodiate and setose; hyphopodia two celled, lower cylindrical to cuneate cells called stalk cell, apical or head cell globose, entire to lobate which produces haustorium from its lower surface into the host epidermis. Phialides single-celled, conical to ampulliform. Perithecial setae absent. Perithecia larviform appendages present. Mycelial setae arise from the subiculum or from mycelium, wavy, golden yellow, simple, prostrate, spreading on the host surface. Perithecia globose, with or without ostiole. Ascospores brown, straight to curved, 3-4 septate, constricted at the septa.

Type: P. turpiniicola (Hosagoudar) Hosagoudar


Colonies amphigenous, mostly hypophyllous, dense, up to 3 mm in diameter. Hyphae straight to substraight, branching alternate to opposite at wide angles, loosely to closely reticulate and form almost solid mycelial mat, cells 16-32 x 8-12 μm. Hyphopodia alternate, spreading, antorse, 26-30 μm long; stalk cells cylindrical to cuneate, 6-10 μm long; head cells globose, stellately sublobate to lobate, 18-20 x 16-24 μm. Phialides few, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 20-24 x 8-10 μm. Mycelial setae wavy, golden brown, simple, spreading, prostrate, up to 196 μm long and 7-8 μm wide, tip obtuse, simple, twisted, few appendages even longer than 1000 μm long; perithecia scattered to grouped, globose, up to 360 μm in diameter. Perithecial appendages larviform, straight to curved, twisted, acute to obtuse at the tip, up to 45 μm long; ascospores fusiform, predominantly curved, 3-septate, constricted at the septa, 46-56 x 16-20 μm.

On leaves of Turpinia malabarica (Staphyleaceae), Idukki, Kerala, India, April 4, 1982, V.B. Hosagoudar HCIO 40483.

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Meliola pinicola Dearn, Mycologia 18: 244, 1926.

A. angustispora (Stev. & Rold.) Hansf., Sydowia Beih. 2: 581, 1961 (nom. invalid.).

Asteridiella callicarpae (Stev. & Rold.) Hansf., Sydowia 10:
47, 1957; Sydowia Beih. 2: 684, 1961 (nom. invalid.).

   Both hosts and the fungi are the same. There is no report of meliolaceous fungi on Valerianaceae (Hansf., 1963).


   The publication of Batista & Maia (l.c.) antedates Hansford (l.c.).

   A. glabra (Berk. & Curt.) Hansf. var. major Hansf., Sydowia Beih. 2: 578, 1961 (nom. invalid.).


   The new name, *A. tetracericola* Hansf. & Deight, is not necessary (Hansford, 1963).

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   Rehm, 1913).
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22. Meliola ageleae Hansf. var. philippinensis Hansf., Sydowia 
   *M. agelaceae* Stev. & Rold., Philippine J. Sci. 56: 64, 1935;
   Hansf., Sydowia Beih. 2: 474, 1961 (*nom. invalid*).
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   304, 1963.
   *M. angusta* Stev. & Tehon var. minor Hansf., Sydowia Beih. 2: 
   87, 1961 (*nom. invalid*).
24. Meliola barringtoniicola Stev. & Rold. ex Hansf., Sydowia 16: 
   318, 1963.
   *M. barringtoniicola* Stev. & Rold., Philippine J. Sci. 56: 
   74, 1935 (*nom. invalid*).
25. Meliola bignoniacearum Stev. var. weigeltii Hansf., Sydowia 
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   Micol. Univ. Recife 218: 5, 1960 (syn. nov).
28. Meliola brideliae Stev. & Rold. ex Hansf., Sydowia 16: 319, 
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*M. ichtnocarpi* Stev. & Rold., Philippine J. Sci. 56: 72, 1935 (nom. invalid.).


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*M. kernii* Hansf., Sydowia Beih. 2: 119, 1961 (nom. invalid.).


*M. lagunensis* Hansf., Sydowia Beih. 2: 36, 1961 (nom. invalid.).


*M. mycetiae* Stev. in Stev. & Rold., Philippine J. Sci. 56: 70, 1935 (nom. invalid.).


*M. myrtacearum* Stev. & Rold., Philippine J. Sci. 56: 73, 1935 (nom. invalid.).


Subsequent collections revealed that the latter taxon is identical with the former (Hansford, 1963).
   M. otoroana Hansf., Sydowia Beih. 2: 259, 1961 (nom. invalid.).


    M. petiveriae Hansf., Sydowia Beih. 2: 89, 1961 (nom. invalid.).


    M. polydonta Sydow var. major Hansf., Sydowia Beih. 2: 278, 1961 (nom. invalid.).


    M. psychotriae Earle var. moreliae Hansf. & Deight. in Hansf., Sydowia Beih. 2: 597, 1961 (nom. invalid.).


    M. salleana Hansf., Sydowia Beih. 2: 713, 1961 (nom. invalid.).

    M. sandwicensis Ellis & Everh. var. major Hansf., Sydowia Beih. 2: 589, 1961 (nom. invalid.).

59. Meliola sclerochitonis Hansf., J. Linn. Soc. London 56: 544,
1938.

New name not necessary (Hansford, 1963).

New name not necessary (Hansford, 1963).

Subsequent collections revealed the latter taxon is synonym to former (Hansford, 1963).


*M. xylosmicola* Hansf., *Sydowia* 9: 50, 1955 (*xylosmaticola, non, Orejuela, 1944*).

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erythrophlei ... erythrophlei
meibomiaicol ... meibomiaecola
myriopoda ... miriapoda
olecrani ... olecranonis
trematis ... tremae

DOUBTFUL TAXA
   On leaves of Strausia sp. (Rubiaceae) from Brazil.
2. Chaetomeliola phoebes Batista & Maia in Batista, Maia & Farr,
   On leaves of Phoebe montana from Dominica.
3. Laeviomeliola cassiae Batista & Farr in Batista, Maia & Farr,
   On leaves of Psidium guajava from Brazil.
5. Meliola bidentata Cooke var. elongata Batista & Maia in
   On an unknown host from Brazil.

**SUMMARY**

The present work gives an account of nearly 400 Meliolaceae taxa. Of these: *Amazoia kakachiana*, *Asteridiella caseariicola*, *A. kapoorii*, *A. mastixiae*, *A. resinosi*, *Meliola beilschmiedicola*, *M. canthii-anguistifolii*, *M. celastracearum*, *M. ehretiicola*, *M. epiprini*, *M. filiciicola*, *M. henryi*, *M. kakachiana*, *M. kanniyakumariana*, *M. kapoorii*, *M. millettiae-racemosae*, *M. psychotriae-nudiflorae*, *M. reinwardtiodendri*, *M. toreniae* and *M. zanthoxyli-ovalifolii* are the new species; *Asteridiella eucleae* Hansf. var. *microspora*, *Meliola banosensis* Sydow var. *puerariicola*, *M. otophorae* Yates var. *indica*, *M. rapaneae* Sydow var. *microspora* and *M. rubiella* Hansf. var. *indica* are the new varieties; new combinations are: *Appendiculella alpina* (Togashi & Mentzer) comb. nov., *A. buxi* (Hino & Katumoto) comb. nov. and *Meliola neeae* (Bat. & Garnier) stat. et comb. nov.; *Irenopsis sawadai*, *Meliola malloticola*, *M. sansevieriicola* and *M. srinivalui* are new names proposed to the species which were later homonyms. Validated the taxon, *Meliola stizolobii* Hansf. & Deight. var. *microspora* Batista & Peres by providing Latin description. In addition, nomenclature, species endings and doubtful species are mentioned. Host index is provided at the end.

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COMMENTS ON SOME MELIOLACEOUS FUNGI EARLIER REPORTED FROM INDIA

V. B. Hosagoudar

Botanical Survey of India, Southern Circle, Coimbatore - 641 003

ABSTRACT

The recent list on the Fungi of India includes 100 species of Meliolaceous fungi. Comments on 15 of them are given. *Irene indica* Anahosur is transferred to *Irenopsis* with a new combination as *Irenopsis indica* (Anahosur) Hosagoudar.

Since the description of the genus *Meliola* Fr., the group Meliolincae has received considerable attention as evidenced by Hansford's (1961) monograph. However, Hansford (1961) remarks that "in view of the very large number of species and varieties of *Meliola* now known, it is essential to know at least the family of the host of each specimen, before any attempt can be made at accurate determination of the fungus; in practice it is now impossible to key out the species and varieties in any manner capable of rapid or accurate usage".

In India, very little attention has been paid to this group of fungi even though these fungi flourish well in the Tropical Forests of Western Ghats. Butler and Bisby (1931) made the first attempt to provide a complete list of fungi reported from India. After that, several other lists have appeared. Recently Birgami et al., (1979, 1981) published the taxonomic literature on Indian fungi till 1979. Their list contains 100 species of meliolaceous fungi which includes synonyms, basionyms and the species recorded on wrong hosts. There is a need to comment on some of these names in the light of Hansford's (1961) monograph.


Bose (1962) recorded *Irenopsis crataegi* Bose on *Rubus ellipticus* Sem. Kapoor (1967) collected the material from its type locality and found that it is *Appendiculella calostroma* (Desm.) Hohnel but not *I. crataegi* Bose. Unfortunately, the fungus name is still retained as *I. crataegi* Bose in the list on Fungi of India.


Hansford and Thirumalachar (1948) described *Irenina malloti* Hansf. & Thirum, on *Mallotus* sp, from South India. Hansford (1955, 1961) in collaboration with E. M. Doidge, re-examined wide range of specimens of the South African species and stated that this fungus possesses merely conoid projections of the perithecial wall and no such appendages were present as described by Stevens (1927. see also Kar and Maity, 1970). Hence, later, Hansford (1957) brought the genus *Irenina* under *Asteridiella*. But the name *Irenina malloti* Hansf. & Thirum. is still retained in the list on Fungi of India.

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Hansford and Thirumalchar (1948) published this species as *Ircinia pothodis*. This has been transferred to *Asteridiella pothodis* (Hansf. & Thirum.) Hansford in 1957. But the last on Fungi of India gives both the names.


Uppal *et al.* (1935) have enlisted this fungus on *Pavetta indica* (Rubiaceae) from Maharashtra, when it is to be recorded on Euphorbiaceous host. Later, Kar and Maity (1972) have correctly recorded this fungus on *Croton* sp.


Anahosur (1969) described *Irene indica* from Coorg on *Aphanamixis polystachya* (Wall.) Parker [= *Amoora rohiuka* (Roxb.) Wight & Arn.], Meliaceae, and stated “perithecia setose, setae, dark brown, septate, tapering at the tip up to 100 μm long . . .”. Re-examination of the type material [AMH 626] revealed the presence of 6-8 perithecial setae. Perithecial setae is the characteristic of the genus *Irenopsis*. Hence, this species is accommodated in the genus *Irenopsis* Stev.

*Irenopsis triumfettae* (Stev.) Hansf. & Deight. 

*Meliola amphitricha* Fr., *Syst. Mycol.* 2: 513. 1823. No type specimen or type host can be assigned to this ‘species’ and hence the epithet is discarded.

Hansford (1961) stated, “For many years *Meliola amphitricha* Fr., 1828, based on *Sphaeria amphitricha* Fr., 1823, was regarded as the type species of *Meliola*. It is now impossible to assign a type specimen to this name, or an identified host plant, and as all early accounts of this ‘species’ merely refer to a *Meliola* of formula 3111, 4222, belonging the group in which more than 100 species are now recognised as distinct.” Gaillard (1892) and Stevens (1927) have also rejected this species. Toro (1952) has discussed the validity of the genus *Meliola* and its type species and suggested to consider *Meliola trichostroma* (Kze.) Toro as the type species. Still the list on Fungi of India has retained this species.


Sydow and Sydow (1911) described this fungus on *Citrus* sp. from Chittagong in Bangladesh. Stevens (1927) considered this fungus synonymous to *Amazonia butleri* (Syd.) Stev. Hansford (1961) retained the name *Meliola butleri* Syd. because of the presence of the mycelial setae and globose perithecia. Even then, the list on Fungi of India contains both the names.


This species has been enlisted on *Citrus* spp. from various parts of India. Hansford (1961) has listed this under “species excludenda” and stated that it is a member of *Capnodiaceae*. The list on Fungi of India retained this species under *Meliolineae*. 

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This species is recorded on the members of Myrtaceae from Kerala, Tamil Nadu and other states of India. In fact, it is not Meliola cladotricha Lev. but Meliolina cladotricha (Lev.) Syd. which belongs to the family Perisporaceae. Hence, this fungus is excluded from Meliolineae by Hansford (1961).


Stevens (1927) recorded M. sakawensis P. Henn. on Vitex sp. and Clerodendrum. Hansford (1961) made this pathogen synonymous to M. clerodendricola P. Henn. The list on Fungi of India retained both the names.


The species has been enlisted on Ilex sp. (Bilgrami et al., 1979, 1981) from Khasi Hills, Assam. Ilex belongs to the family Aquifoliaceae but the original record of this pathogen is on Myrtaceae. There is a need to re-examine the pathogen and the host.


Earlier, this species was recorded on the members of Piperaceae, Bilgrami et al. (1979) have enlisted it on Strychnos nux-vomica (Loganiaceae).


This species was collected by Butler in 1903 from Karnataka and reported as M. asteroides Wint. var. major Gaill. (see Sydow & Sydow, 1911). On re-examination of the material, Kapoor (1967) found that it is distinct from other species of Meliola recorded on Rubiaceae and described it as M. weberae Kapoor. But the list on Fungi of India retained both the names.

Meliolina Syd.

Bilgrami et al. (1979) have placed this genus under the order Meliolales and have enlisted two species viz. M. arborescens (Syd.) Syd. and M. pulcherima (Syd.) Syd. The latter species is synonymous to M. mollis (Berk. & Br., Hohnel. In fact, this is the member of the family Perisporaceae. Hence, Hansford (1961) excluded this genus from Meliolineae (see also Pirozynski, 1974).

ACKNOWLEDGEMENTS

Author is grateful to Dr. N. C. Nair, Joint Director, Botanical Survey of India Southern Circle, Coimbatore for guidance; to Dr. A. N. Henry, Regional Botanist of the same organisation for his valuable suggestions on the nomenclature. My sincere thanks are also due to Prof. V. P. Bhide, Head, Department of Mycology and Plant Pathology M.A.C. S. Research Institute, Pune for generously lending the herbarium material for my study. Thanks are also due to the Department of Environment, New Delhi for financial assistance.

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MELIOLA PETRAKII STEV. & ROLD., A NEW RECORD TO INDIA

V. B. HOSAGOUĐAR

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ABSTRACT

Meliola petrakii Stev. & Rold. recorded here for the first time from India on a hitherto unrecorded host Dysoxylum imlubicicum Bedd.

During a survey of the pathogenic microfungi in Chandanathode forest, Kerala State, a plant, Dysoxylum malabaricum Bedd. (MELIACEAE) showed black, woolly spots on the stems, petioles and on the lower midrib of the leaves. Microscopic observation of the infected material revealed that it is Meliola petrakii Stev. & Rold. which is hitherto unrecorded from India and hence the note.


Infection spots mostly restricted to stems, petioles and lower midrib of the leaves but rarely on the lamina. Colonies dense, velvety, up to 10 mm in diameter, confluent. Hyphae sinuous to tortuous, branching irregular at acute angles, closely reticulate and forming solid mycelial mat, cells 20 - 30 x 10-13 µm. Capitate hyphopodia alternate, antorose to spreading, straight to slightly curved, 20-30 µm long; stalk cells cylindrical to cuneate, 6.5 - 10

Fig. Meliola petrakii Stev. & Rold.

M - Mycelium, Ch - Capitate hyphopodia, Mh - Mucronate hyphopodia, Sp - Ascospores Ms - Mycelial setae
Ilosagourfar

μm long; head cells ovate to globose, straight to curved, entire. 13-15 x 12-15 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform. 18-20 x 10-12 μm. Mycelial setae numerous, densely scattered straight, simple, acute to obtuse at the tip, up to 300 μm long. Perithecia scattered, verrucose, up to 244.5 μm; spores ellipsoidal, 4-septate, constricted, middle cell slightly larger 46-53 x 16-20 μm.


Petrek in Sydow & Petrek (1931) described this species as *M. petiolaris* on *Dysoxylum cunningianum* DC. from Philippines. This species name was pre-occupied. Hence, Stevens & Roldan (1935) proposed a new name for this species. Hansford (1961) has taken its description directly from Petrek (i.e.) and there is no Icone for this species in Hansford's (1963) *Iconographia Meliolinearum*. Hence the Icone and the detailed description of the species is provided herewith.

ACKNOWLEDGEMENTS

Thanks are due to Dr. N.C. Nair, ex-Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for encouragement.

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MEUOLACEAE OF SOUTH INDIA

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ABSTRACT

The paper gives an account of six taxa of the genus Meliola. Of these, Meliola drepanochaeta Syd. var. insignis, M. tenella Pat. var. atlanticola are the new varieties; M. eugeniae-jamboloidis Hansf. is reported here for the first time from India, while M. bicornis Wint., M. heudelotii Gaill. and M. optiae Syd. are reported here for the first time from Tamil Nadu and Andhra Pradesh.


Meliola drepanochaeta Syd. var. insignis Hosagoudar, var. nov.

Differs from M. drepanochaeta Syd. var. drepanochaeta in having smaller capitate hyphopodia, smaller and fusiform ascospores.

Colonies hypophyllous, dense, up to 4 mm in diameter. Hyphae crooked, branching irregular at acute angles, loosely to closely reticulate, cells 20-28 x 5-8 μm. Capitate hyphopodia distantly placed, alternate, spreading, 24-31 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, globose, angularly irregularly lobulate, straight to variously curved, 18.5-21.5 x 12.5-18.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate ampulliform, 15.5-25 x 6-9.5 μm. Mycelial setae numerous, mostly grouped around perithecia, simple, acute to obtuse at the tip, arcuate to hamate, up to 860 μm long. Perithecia scattered, verrucose, up to 264 μm; spores fusiform, 4-septate, constricted, 40-45 x 12.5-18.5 μm.

Type: On leaves of Litsea insignis Gamble, Pudukadu (Lower Sheikalmudi), Valparai (T.N.), January 17, 1987, V.B. Hosagoudar BSI/1SV/82671.

The new variety differs from M. drepanochaeta Syd. var. drepanochaeta in having smaller capitate hyphopodia, smaller and fusiform ascospores.

Meliola heudelotii Gaill., Le Genre Meliola : 1892, p. 49.

On leaves of Memecylon edule Roxb., Tummalabailu, Nallamalai (A.P.), April 16, 1986, V.B. Hosagoudar BSI/1SV/82644.

Colonies hypophyllous, subdense, up to 4 mm in diameter, rarely confluent. Hyphae strict to crooked, branching irregular at acute to wide angles, loosely to closely reticulate, cells 28-31 x 9-11 µm. Capitate hyphopodia alternate to unilateral, occasionally distantly placed, antorse to spreading, 18.5-25 µm long; stalk cells cylindrical to cuneate, rarely tortuous, 3-6.5 µm long; head cells ovate, globose, entire to angular,
variously bent, 12.5-18.5 x 12.5-15.5 µm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 18.5-28 x 9-12.5 µm. Mycelial setae straight, simple, very few curved, acute to obtuse, up to 687 µm long. Perithecia scattered, verrucose, up to 155 µm; spores obovoidal, 4-septate, constricted, 52-56 x 18.5-21.5 µm.


This species was reported on Eugenia jamboloides from Java and is recorded here for the first time from India.

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15.5-25 μm long: stalk cells cylindrical, to cuneate, 6-6.5 μm long; head cells versiform, cylindrical straight to bent, entire, 10-16.6 x 9.12.5 μm. Mucronate hyphopodia, mixed with capitate opposite to alternate, ampulliform, 15.5-21.5 x 9-10 μm. Mycelial setae numerous, scattered, straight, dichotomously branched, 217 μm long up to first branching, first ray up to 50 μm long, second ray up to 46.5 μm long and the third ray up to 10 μm long, acute to obtuse at the tip, branches reflexed. Perithecia scattered, verrucose, up to 220 μm; spores obovoidal to cylindrical, 4-septate, constricted, 40-46.5 x 15.5-18.6 μm.

Type: On leaves of *Atalantia monophylla* (L.) Correa, Tummolabailu, Nallamalai (A.P.), April 19, 1986, V.B. Hosagoudar BSI/ISV/82643.

*Meliola tenella* Pat. var. *atalantiae* (Pat.) Hansf. has been reported on the host genus *Atalantia* but the new variety differs from it in forming the amphigenous colonies and smaller ascospores.

ACKNOWLEDGEMENTS

Thanks are due to Dr. A.N. Henry, Scientist C, for encouragement and to Dr. V.J. Nair, Scientist ‘B’ B.S.I., Coimbatore for Latin translation.
Sonderdrucke aus SYDOWIA — Band 40/1987
Meliolaceae of South India. II

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Abstract. - The present paper gives an account of seven new taxa of the family Meliolaceae viz. Armatella katumotoi, Asteridiella vivekananthanii, Meliola ervatamiae, M. jayachandranii, M. pudukadensis, M. floridensis HANSF. var. pudukadensis and M. Litseae Syd. var. microspora.

1. Armatella katumotoi Hosagoudar sp. nov. - Pl. 1, fig. 1

Plagulae hypophyllae, tenues, ad 5 mm diam., dispersae, raro confluentes. Hyphae mycelii flexuosae vel anfractosae, alternatim vel irregulariter acuteque ramosae, laxe reticulatae, cellulis 15.5-46.5 x 4.5-6.5 μm. Hyphopodia capitata alternata, diverse curvula, 18.5-46.5 μm longa; cellula basali aseptata vel ad 3-septata, flexuosa vel anfractosa, 6.5-40.5 μm longa; cellula apicali ovata vel globosa, integra vel stellato sublobata, 6.5-12.5 x 12.5-15.5 μm. Hyphopodia mucronata non visa. Perithecia dispersa, in exhyphopodiatis hyphis, verrucosa, ad 217 μm; sporae brunneae, 1-septatae, 28-31 x 12.5-15.5 μm.

Colonies hypophyllous, thin, scattered, diffused, up to 5 mm in diameter. - Hyphae flexuosae vel crooked, branching alternately to irregularly at acute angles, loosely reticulate, cells 15.5-46.5 x 4.5-6.5 μm. - Capitate hyphopodia alternata, variously bent, 18.5-46.5 μm long; stalk cells aseptate to 3-septate, flexuous to crooked, 6.5-40.5 μm long; head cells ovate to globose, entire to stellately sublobate, 6.5-12.5 x 12.5-15.5 μm. - Mucronate hyphopodia not seen. - Perithecia scattered, seated on exhyphopodiatis mycelial mat, verrucose, up to 217 μm. - Spores brown, 1-septatae, 28-31 x 12.5-15.5 μm.

Type. - On leaves of Persea macrantha (NEES) KOSTERM., India, Tamil Nadu, Valparai, Pudukadu (Lower Sheikalmudi), January 17, 1987, V. B. Hosagoudar BSI/ISV/82683 (MH).

So far eight species and a variety of the genus Armatella are known on different members of the family Lauraceae. However, the present species differs from the rest in having aseptate to 3-septate, flexuous to crooked basal cells and entire to stellately sublobate head cells of the capitate hyphopodia. Further, there is no report of the genus Armatella on this host genus. Hence it is proposed here a new species.

The species is named in honour of Dr. K. Katumoto, Japan, for his notable contribution to the field of Mycology.
2. *Asteridiella vivekananthanii* HOSAGOUĐAR sp. nov. – Pl. 1, fig. 2

Plagulae epiphyllae, subdensae vel densae, ad 4 mm diam., confluentes. Hyphae mycelii flexuosae vel anfractosae, alternatim vel irregulariter acutaeque ramosae, densae reticulatae, cellulis 15.5–18.5 × 4–6.5 μm. Hyphopodia capitata alternata vel unilateralia, recta vel plerumque curvula, antrorsa vel patentia, 16.5–31 μm longa; cellula basali cylindracea vel cuneata, 3–12.5 μm longa; cellula apicali ovata, globosa, integra vel angulosa, 15.5–18.5 × 12–15.5 μm; raro hyphopodia capitata 46–50 μm longa et cellula basali 1-septata, 15.5–18.6 μm longa. Hyphopodia mucronata pauca,
illis capitatis commixta, opposita vel alternata, conoidea vel ampullacea, 15.5–31 × 6–12.5 μm. Perithecia dispersa, ad 280 μm; cellulis parietis conoideis vel mammillatis, ad 22 μm longis; sporae obovoidae, 4-septatae, leniter curvulae, 31–37 × 12.5–18.5 μm.

Colonies epiphyllous, subdense to dense, up to 4 mm in diameter, confluent. – Hyphae flexuous to crooked, branching alternately to irregularly at acute angles, very closely reticulate, cells 15.5–18.5 × 4–6.5 μm. – Capitata hyphopodia alternate to unilateral, straight to mostly curved, antrorse to spreading, usually 16.5–31 μm long; stalk cells cylindrical to cuneate, 3–12.5 μm long; head cells ovate, globose, entire to angulose, 15.5–18.5 × 12–15.5 μm. Few hyphopodia 46–50 μm long and stalk cells 1-septate, 15.5–18.5 μm long. – Mucronate hyphopodia few, mixed with capitata hyphopodia, opposite to alternate, conoid to ampulliform, 15.5–31 × 6–12.5 μm. – Perithecia scattered, up to 280 μm; perithecial cells conoid to mammilliform, up to 22 μm long. – Spores obovoidal, 4-septate, slightly curved, 31–37 × 12.5–18.5 μm.

Type. – On leaves of Clerodendrum viscosum Vent, India, Tamil Nadu, Valparai, Pudukadu (Lower Sheikalmudi), January 17, 1987, V. B. Hosagoudar BSI/ISV/82663 (MH).

The present species differs from rest of the Asteridiella species reported on members of the family Verbenaceae in having epiphyllous colonies and tortuous mycelia. Further, there is no report of the genus Asteridiella on this host genus. Hence it is proposed here as a new species.

The species is named in honour of Shri K. Vivekananthan for his notable contribution to the angiosperm flora of Idukki district.

3. Meliola ervatamiae Hosagoudar sp. nov. – Pl. 2, fig. 3

Plagulae epiphyllae, raro hypophyllae, tenues, ad 4 mm diam., confluentes. Hyphae mycelii undulatae, opposite lateque ramosae; laxe reticulatae, cellulis 24–31 × 4.5–6 μm. Hyphopodia capitata alternata, recta vel curvula, antrorsa, reflexa, patentia, 12–18 μm longa; cellula basali cuneata vel cylindracea, 2–3 μm longa; cellula apicali ovata, globosa, leniter angulosa vel sublobata, recta vel curvula, 13.5–15.5 × 9–10.5 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 12–16.5 × 6–8 μm. Setae myceliales paucae, etiam juxta perithecia aggregatae, rectae, simplices, acutae vel obtusae ad apices, ad 208 μm longae. Perithecia dispersa, verrucosa, ad 93 μm; sporae obovoidae, 4-septatae, leniter constrictae, 27–31 × 11–12.5 μm.

Colonies epiphyllous, rarely hypophyllous, thin, up to 4 mm in diameter, confluent. – Hyphae undulating, branching mostly oppositely at wide angles, loosely reticulate, cells 24–31 × 4.5–6 μm. – Capitata hyphopodia alternate, straight to curved, antrorse, reflexed, spreading, 12–18 μm long; stalk cells cuneate to cylindrical, 2–3 μm long; head cells ovate, globose, slightly angular to sublob-
Plate 2: Fig. 3. Meliola ervatamiae sp. nov. - Fig. 4. Meliola floridensis Hansf. var. pudukadensis var. nov.

bate, straight to curved, 13.5–15.5 × 9–10.5 μm. - Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 12–16.5 × 6–8 μm. - Mycelial setae few, grouped around perithecia, straight, simple, acute to obtuse, up to 208 μm long. - Perithecia scattered, verrucose, up to 93 μm. - Spores obovoidal, 4-septate, slightly constricted, 27–31 × 11–12.5 μm.

Type. – On leaves of Erovatamia heyneana T. Cooke (Tabernaemontana heyneana Wall.), India, Tamil Nadu, Valparai, Pudukadu (Lower Sheikalmudi), January 17, 1987, V. B. Hosagoudar BSI/ISV/82672 (MH).

So far eight taxa of the genus Meliola have been reported on the host genus Tabernaemontana. However, the present new species differs from them in formation of the epiphyllous and thin colonies, undulating and loosely reticulate mycelia, smaller capitate hyphopodia, mycelial setae, perithecia and ascospores.
4. *Meliola floridensis* Hansf. var. *pudukadensis* Hosagoudar var. nov. – Pl. 2, fig. 4

Differt a *M. floridensis* Hansf. var. *floridensis* plagulis epiphyllis, hyphopodiis capitatis longioribus et hyphopodiis mucronatis illis capitatis commixtis.

Colonies epiphyllous, crustose to slightly dense, up to 3 mm in diameter. – Hyphae straight, branching mostly oppositely at acute angles, loosely reticulate, cells 21–33 × 7–12.5 µm. – Capitate hyphopodia alternate, mostly straight, antrorse, 18.5–31 µm long; stalk cells cuneate, 6–9.5 µm; head cells ovate to globose, entire, 12.5–21.5 × 12.5–15.5 µm. – Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, conoid to ampulliform, 21.5–28 × 9–12.5 µm. – Mycelial setae scattered, simple, straight, acute to obtuse, up to 500 µm long. – Perithecia immature. – Spores obvoidal, 4-septate, slightly constricted, 49.5–53 × 18.5–22 µm.

Type. – On leaves of *Persea macrantha* (Nees) Kosterm., India, Tamil Nadu, Valparai, Pudukadu (Lower Sheikalmudi), January 17, 1987, V. B. Hosagoudar (BSI/ISV/82678 (MH)).

The new variety *pudukadensis* differs from var. *floridensis* in formation of the epiphyllous colonies, longer capitate hyphopodia and the mucronate hyphopodia mixed with capitate hyphopodia.

5. *Meliola jayaehandranii* Hosagoudar sp. nov. – Pl. 3, fig. 5

Plagulae epiphyllae, raro amphigenae, subdensae, ad 3 mm diam., dispersae. Hyphae mycelii rectae, opposite vel irregulariter lateque ramosae, laxe reticulatae, cellulis 15.5–18.5 × 7–10 µm. Hyphopodia capitata alternata, unilateralia vel ad 5% opposita, recta vel curvula, antrorsa vel reflexa, 15.5–22 µm longa; cellula basali cylindracea vel cuneata, 3–6 µm longa; cellula apicali ovata, plerumque curvula, integra, 12.5–15.5 × 9–12.5 µm. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 22–28 × 9–12.5 µm. Setae myceliales rare, etiam juxta perithecia aggregatae, simplices, rectae, acutae, obtusae vel raro dentatæ, ad 545 µm longae. Perithecia dispersa, verrucosa, ad 165 µm; sporae obovatae, 4-septatae, leniter constrictae, leniter curvulae, 40–43.5 × 21–25 µm.

Colonies epiphyllous, rarely amphigenous, subdense, up to 3 mm in diameter, scattered. – Hyphae straight, branching oppositely to irregularly at wide angles, loosely reticulate, cells 15.5–18.5 × 7–10 µm. – Capitate hyphopodia alternate, unilateral, about 5% opposite, straight to curved, antrorse to reflexed, 15.5–22 µm long; stalk cells cylindrical to cuneate, 3–6 µm long; head cells ovate, mostly curved, entire, 12.5–15.5 × 9–12.5 µm. – Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 22–28 × 9–12.5 µm. – Mycelial setae few, grouped around perithecia, simple, straight, rarely dentate at the tip, up to 545 µm long. – Perithecia scattered, verrucose, up to
Plate 3: Fig. 5. *Meliola jayachandrani* sp. nov. – Fig. 6. *Meliola litsea* SYD. var. *microspora* var. nov.
165 μm. – Spores obovate, 4-septate, slightly constricted, slightly curved, 40–43.5 x 21–25 μm.

Type. – On leaves of Isonandra lanceolata Wickr. var. anfrac-tuosa Cl., India, Tamil Nadu, Valparai, Pudukadu (Lower Sheikalmudi), January 17, 1987, V. B. Hosagoudar BSIS/ISV/82676 (MH).

The present species differs from rest of the Meliola species reported on members of the family Sapotaceae in all the essential morphological characters. Further, there is no report of the genus Meliola on this host genus. Hence is proposed here as a new species.

The species is named in honour of Dr. V. Jayachandran Nair for his notable contribution to the knowledge of the Poaceae of Kerala.

6. Meliola litsea Syd. var. microspora Hosagoudar var. nov. – Pl. 3, fig. 6

Differt a var. litsea peritheciis magnioribus et ascosporis brevioribus.

Colonies epiphyllous, subdense, up to 3 mm in diameter, rarely confluent. – Hyphae straight to substraight, branching oppositely at wide angles, loosely reticulate, cells 15–31 x 6–9.5 μm. – Capitate hyphodia alternate, straight to slightly curved, antrorse to reflexed, 21–30 μm long; stalk cells cylindrical to cuneate, 6–12.5 μm long; head cells straight to slightly bent, ovate, bluntly pointed towards the apex, entire, 15.5–21.5 x 9–12.5 μm. – Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 21.5–31 x 9–12.5 μm. – Mycelial setae numerous, mostly grouped around perithecia, simple, straight, acute to obtuse, up to 715 μm long. – Perithecia scattered, verrucose, up to 211 μm. – Spores obovoidal, 4-septate, 35–40 x 12–18.5 μm.

Type. – On leaves of Litsea foribunda (Bl.) Gamble, India, Tamil Nadu, Valparai, Pudukadu (Lower Sheikalmudi), January 17, 1987, V. B. Hosagoudar BSIS/ISV/82668 (MH).

The new variety microspora differs from var. litsea in having larger perithecia and smaller ascospores.

7. Meliola pudukadensis Hosagoudar sp. nov. Pl. 4, fig. 7

Plagulae epiphyllae, tenues vel subdenses, ad 3 mm diam. Hyphae mycelii subrectae vel anfractosae, opposite, alternatim vel irregulariter laxe ramosae, laxe reticulatae, cellulis 37–46.5 x 9–12.5 μm. Hyphopodia capitata alternata vel unilateralia, recta vel curvula, subantrorsa vel patens, 21.5–28 μm longa; cellula basali cylindracea vel cuneata, 6–7 μm longa; cellula apicali ovata vel globosa, recta vel curvula, integra vel linder angulosa, 15.5–21.5 x 9–12.5 μm. Hyphopodia mucronata illis capitatis commixta, plerumque alternata, ampullacea, 21.5–25 x 9–12.5 μm. Setae myceliales dispersae, simplices, rectae, acutae vel obtusae, ad 860 μm longae. Perithecia dispersa, verrucosa, ad 186 μm; sporae obovatae, 4-septatae, constrictae, 49.5–52.5 x 18–21.5 μm.
Colonies epiphyllous, thin to subdense, up to 3 mm in diameter. – Hyphae substraight to crooked, branching oppositely, alternately to irregularly at wide angles, loosely reticulate, cells 37–46.5 × 9–12.5 μm. – Capitate hyphopodia alternate to unilateral, straight to curved, subantrorse to spreading, 21.5–28 μm long; stalk cells cylindrical to cuneate, 6–7 μm long; head cells straight to curved, ovate to globose, entire to slightly angulose, 15.5–21.5 × 9–12.5 μm. – Mucronate hyphopodia mixed with capitate hyphopodia, predominantly alternate, ampulliform, 21.5–25 × 9–12.5 μm. – Mycelial setae scattered, simple, straight, acute to obtuse at the tip, up to 860 μm long. – Perithecia scattered, verrucose, up to 186 μm. – Spores obovate, 4-septate, constricted, 49.5–52.5 × 18–21.5 μm.

Type. – On leaves of *Litsea* sp., India, Tamil Nadu, Valparai, Pudukadu (Lower Sheikalmudi), January 17, 1987, V. B. Hosagoudar BSI/ISV/82679 (MH).

The present species can be compared with *Meliola saccardi* Syd. reported on *Litsea mollis* from Chile but differs from it in having epiphyllous and subdense colonies, loosely reticulate mycelia, longer setae, smaller capitate hyphopodia, perithecia, and ascospores. Further, mucronate hyphopodia mixed with capitate hyphopodia.

**Acknowledgements**

I am grateful to Shri K. Vivekananthan, Scientist B, Dr. V. J. Nair, Scientist B, Botanical Survey of India, Southern Circle, Coimbatore for their help in identifying the host plants and Latin translation respectively. Thanks are also due to Shri N. Somasundaram and Shri K. S. Santhanam for their help during field work.
References

Meliola ramacharii sp. nov. from Tamil Nadu, India

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Accepted 15 September 1966

ABSTRACT

Meliola ramacharii sp. nov. is described and illustrated.

During a mycological survey in the forests of Pudukadu, near Lower Sheikalmudi of Coimbatore district, minute black spots were observed on the leaves of Persia macrantha (Nees) Kosterm. Microscopic examination of these spots revealed the presence of Meliola species on the dark spots and it was different from rest of the Meliola species reported on members of the family Lauraceae. Hence, it is described here as a new species.

Meliola ramacharii Hosagoudar, sp. nov.

Plagulae epiphyllae, omnis in peliger folium maculicolae, subdensae vel densae, ad 2 mm diam., dispersae. Hyphae rectae vel subrectae, plerumque opposite ramosae, laxe reticulatae; cellulis 21.5-28×9-12.5 μm. Hyphopodia capitata alternata, plerumque antrorsa, raro patensia, recta vel curvula, 18.5-25 μm; cellula basali cylindracea vel cuneata, 3-6.5 μm; cellula apicali ovata, versiformia vel cylindracea, integra, recta vel leniter curvula, 15.5-18.5×12.5-15.5 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15.5-31×7.5-9.5 μm. Setae myceliales paucae, juxta perithecia aggregatae, rectae, simplices, acutae vel obtusae, ad 500 μm. Perithecia dispersa, atra, verrucosa, ad 130 μm; sporae obvoidae, 4-septatae, leniter constrictae, 37-40.5×15.5-18.5 μm.

Fig. 1 Meliola ramacharii Hosagoudar, sp. nov.
Ch — Capitate hyphopodium M — Mycelium Ms — Mucronate hyphopodium Ms — Mycelial setae
Sp. — Ascospores.
Colonies epiphyllous, each on black leaf spots, subdense to dense, up to 2 mm in diameter, scattered. Hyphae straight to substraight, branching mostly opposite at wide angles, loosely reticulate, cells 21.5–28×9–12.5 μm. Capitate hyphopodia alternate, mostly antroce, rarely spreading, straight to curved, 18.5–25 μm long; stalk cells cylindrical to conic, 3–6.5 μm; head cells ovate, versusiform to cylindrical, entire, straight to slightly curved, 15.5–18.5×12.5–15.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 15.5–31×7.5–9.5 μm. Mycelial setae few, aggregated around perithecia, straight, simple, acute to obtuse, up to 500 μm. Perithecia scattered, black, verrucose, up to 130 μm; spores ovoidal, 1-septate, slightly constricted, 37–40.5×15.5–18.5 μm.

**Type:** On leaves of *Persea macrantha* (Nees) Kosterm. (Lauraceae), April 17, 1987, Pudukadu (Lower Sheikahmid), Valparai, (T.N.), V. B. Hosagoudar, deposited in Botanical Survey of India, Southern Circle, Coimbatore (MH) under BSI/ISV/82683.

The present species can be compared with *Meliola misanitaensis* Hansf., reported on *Misanteca triandra* from San Domingo, in which colonies are formed on brown leaf spots surrounded by a darker brown marginal zone (Hansford, 1961). However, the present species differs from it in forming epiphyllous colonies on black spots, loosely reticulate mycelium, absence of opposite capitate hyphopodia, larger mycelial setae, smaller perithecia and ascospores.

This species is named in honour of Dr. P. Ramachar for his notable contributions to the field of Mycology.

**ACKNOWLEDGEMENTS**

The author is grateful to Dr. A. N. Henry, Scientist G, Botanical Survey of India, Southern Circle, Coimbatore for encouragement; to Shri N. Somasundaram and Shri K. S. Santanam for their help during the field exploration.

**REFERENCES**

MELIOLACEAE OF SOUTH INDIA-IV

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ABSTRACT: Three Meliola species have been reported here. M. paramignyae is the new species, M. tenella pat. var. atalantiae (pat.) Hansf. is the first report from India while, M. agumbensis (Subhedar & Rao) is the new combination.

Key words: Meliolaceae, India

Introduction

During an examination of Exsiccatae of Ajrekar Mycological Herbarium (AMH), Pune and Madras Herbarium MH), Coimbatore, author came across three interesting Meliola species parasitizing the members of the host family Connaraceae and Rutaceae. The materials have been deposited in the Botanical survey of India southern circle, coimbatore (MH).

Observations


Colonies hypophyllous, scattered, subdense to dense, up to 3 mm in diam. Hyphae substraight, undulating to (torutous) branching opposite at wide angles, loosely reticulate, cells 31-40.5 x 6-9.5 μm. Capsulate hyphopodia alternate or ad 10% opposite, antrorse to spreading, 18.5-25 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long, head cell ovate to globose, entire to angular, 12-15.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate, ampulliform, 15.5-18.5 x 9-12 μm. Mycelial setae few, scattered, straight, simple, acut to obtuse, up to 430 μm long.

Perithecia few, scattered, up to 155 μm; spores obovoidal to cylindrical, 4-septate, slightly constricted, 40-46.5 x 12-15.5 μm.

On leaves of Rourea praineana Talbot (Connaraceae), Agumbe, Karnataka, Dec. 16, 1974, A.W. Subhedar AMH 2730 (Type).

Subhedar and Rao (1977) have described a new species, Irenopsis agumbensis, from Agumbe, Karnataka. The type material was severely hyperparasitized by a hyphomycetes member. The reexamination of the type material revealed that the ascospores are 4-septate and setae are borne on the mycelia. Hence, the new combination is effected here.

Meliola paramignyae Hosagoudar, SP. nnv.

Plagulae hypophyllae, crustosae, tenues, ad 4 mm diam. Hyphae rectae vel subrectae, opposite acutae vel lateque ramosae, laxae vel acutae reticulatae, cellulæ 18.5-28 - 6-8 μm. Hyphopodia capitata alternata vel ad 10% opposita, antorsa vel patentia, recta vel curvula, 18.5-22 μm longa; cellulæ basali cylindracea vel cuneata, 4-6 μm longa; cellulæ apicali ovata, clavata, cylindracea integra vel leniter angulosa, 12-15.5 x 9-12.5 μm. Hyphopodia mucronata illis capitatis commixa, alternata vel opposita, ampullacea, 8.5-22 x 9-12.5 μm setae myceliales disperseae, rectae, simplices, acutae, obtusae, cristateae vel dentatae, ad 575 μm longae. Perithecia dispersa.
Meliola paramignyae sp. nov.

Fig 1. Meliola paramignyae sp. nov.

Meliola paramignyae Hosagoudar, sp. nov.

(Ch-Capitate hyphopodia, Mh-Mucronate hyphopodia, Ms-Mycelial Setae, Sp-Ascosposes

verrucosa, ad 171 μm; sporae obovoideae vel cylindraceae, 4-septae, constrictae, 31-40.5 x 12-15.5 μm.

Colonies hypophyllous, crustose, thin, up to 4 mm in diam. Hyphae straight to substraight, branching opposite at acute to wide angles, loosely to closely reticulate, cells 18.5-23 x 6-8 μm. Capitate hyphopodia alternate and about 10% opposite, an throso to spreading, straight to curved, 18.5-22 μm. Long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells ovate, clavate, cylindrical, entire to angulose, 12-15 x 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18.5-22 x 9-14.5 μm. Mycelial setae scattered, straight, simple, acute, obtuse, cristate to dentate, up to 575 μm long. Perithecia scattered, verrucose, up to 171 μm; spores obovoidal to cylindrical, 4-septate, constricted, 31-45 x 0.12-15.5 μm.

Holotype: on leaves of Paramignya armata olive, Poochippura shola, Palghat district, Kerala, May 1, 1980, V. J. Nair MH 67419.

This species is close to M. citricola syd. (Hansford, 1964) but differs from it in having hypophyllous and crustose colonies. Further, there is no report of the genus Meliola on this host. Hence, it is proposed here as a new species.


Colonies strictly epiphyllous, scattered, dense, velvety, up to 2 mm in diam. Hyphae straight to substraight, branching opposite at wide angles, closely reticulate and almost solid at the centre, cells 18-5-22 x 3-4 μm.
Capitate hyphopodia alternate, antrorse to reflexed, straight to curved, 24-31 µm long; stalk cells cylindrical to cuneate, 6-12.5 µm long; head cells mostly cylindrical, entire, 15.5-18.5 × 9-12.5 µm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15.2-25 × 9-12.5 µm. Mycelial setae scattered, straight, 2-3 times dichotomously branched, branches reflexed, up to 100 µm long till branching, first ray up to 50 µm and the secondary up to 20 µm long, acute to obtuse at the tip. Pseudopodia scattered, verrucose, up to 180 µm; spores obovoidal to cylindrical, 4-septate, constricted, 40-50 × 15.5-18.5 µm.

On leaves of Atalantia monophylla Correa (Rutaceae), in the forest near Athikadu, Nilgiris, Tamil Nadu, Aug. 2, 1975, E. Vajravelu MH 46418.

This species was recorded on Atalantia spp. from Tonkin, Ceylon, Formosa and Philippines (Hansford, 1961). It is reported here for the first time from India (Bilgrami et al. 1978, 1981 and Sarbhoy et al. 1986).

Acknowledgements

Thanks are due to Dr. N. P. Balakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore, for permitting to use the duplicate materials of MH and to Prof. V. P. Bhide, M. A. C. S. Research Institute for generously sending the type material for the present study.

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Meliolaceae of South India - V

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With 7 figures


Abstract: The paper gives an account of five taxa of which Amazonia cinnamomi, A. gomphandrae, Meliola linueriae-malabaricae are new species, Meliola affinis var. indica and M. mayapeicola var. indica are new varieties while Asteridiella americana and Meliola carissae var. indica are reported here for the first time from India.

Amazonia cinnamomi Hosagoudar sp. nov.

Plagulae epiphyllae, densae, crustoseae, ad 2 mm diam., confluentes. Hyphae mycelii rectae vel subrectae, opposite lateque ramosae, laxe vel densae reticulate vel solidae ad centro, cellulis 15.5-19 × 6-9.5 μm. Hyphopodia capitata opposita, raro solitaria, densa, antrorsa, plerumque recta, 18-22 μm longa; cellula basali cuneata, 4-6 μm longa; cellula apicali ovata, versiformia, integra, 12-15.5 × 9-12.5 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 21-25 × 9-12.5 μm. Perithecia dispersa, globosa, ad 162 μm; sporae ellipsoidae, 4-septatae, constrictae, 40-44 × 15-19 μm.

Colonics epiphyllous, dense, crustose, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching opposite at wide angles, loosely to closely reticulate and almost solid in the centre, cells 15.5-19 × 6-9.5 μm. Capitate hyphopodia opposite, few solitary, crowded, antrorse, mostly straight, 18-22 μm long; stalk cells cuneate, 4-6 μm long; head cells ovate, versiform, entire, 12-15.5 × 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 21-25 × 9-12.5 μm. Perithecia scattered, globose, up to 162 μm; spore ellipsoidal, 4-septate, constricted, 40-44 × 15-19 μm.


Amazonia philippinensis Theiss. is the only species reported on members of the family Lauraceae (Hansford 1961). The present species differs from it in having opposite and smaller capitate hyphopodia and smaller ascospores.

0029-5035/88/0047-0535 $2.00
Amazonia gomphandrae Hosagoudar sp. nov.

Colonies hypophyllous, dense, crustose, up to 2 mm in diameter. Hyphae straight to substraight, branching alternate at acute angles, closely reticulate and thalloid, cells 9-12.5 × 6-9.5 µm. Capitate hyphopodia alternate, crowded, very closely antorse, 21.5-25 µm long; stalk cells cuneate, 6-9.5 µm long; head cells ovate, mostly globose, entire, 12-18.5 × 9-12.5 µm. Mucronata hyphopodia not seen. Perithecia few, scattered, up to 160 µm; spores obovoidal, 4-septate, strongly constricted, 56-59 × 21.5-25 µm.


There is no report of the genus Amazonia on the members of the family Icacinaceae (Hansford 1961). Hence it is proposed here as a new species.

Colonoies epiphyllous, dense, crustose, up to 2 mm in diameter. Hyphae substraight to undulating, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 15-34 × 6-9 μm. Capitate hyphopodia alternate, mostly antrose, rarely recurved, 30-37 μm long; stalk cells cylindrical to cuneate, 6-9 μm long; head cells ovate, globose, deeply and irregularly lobate, 24-28 × 18-24 μm. Mucronate hyphopodia mixed with capitate hyphopodia, conoid to ampulliform, 18-31 × 9-12.5 μm. Perithecia scattered to loosely aggregated, up to 155 μm; perithecial cells conoid to mamilliform, up to 22 μm high; spores obovoidal, 4-septate, constricted, 40-43.5 × 15-18.5 μm.

On leaves of Linociera malabarica (Oleaceae), in the forest along the road from Painavu to Kulamavu, Idukki, Kerala, Dec. 28, 1983, V.B. Hosagoudar HCIO 39391; MH 80318 proparte.

The ascospores in the present collection are considerably smaller as against 43-49 × 20-23 μm reported for the species by Hansford (1957, 1961).

This species was reported from U.S.A. on Osmanthus americanus (Hansford, l.c.) and is reported here for the first time from India on a hitherto unreported host genus.
Meliola affinis Syd. var. indica Hosagoudar var. nov.

Colonies hypophyllous, very thin, up to 5 mm in diameter, confluent. Hyphae sub-straight to undulating, branching opposite to irregular at wide angles, loosely reticulate, cells 21-30 × 6-8 μm. Capitate hyphopodia alternate, rather distantly arranged, straight to curved, mostly antorse, 15-22 μm long; stalk cells cuneate, 9-12.5 μm long; head cells ovate, pointed towards the apex with broadly rounded ends, entire, 9-12.5 × 6-9.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 21-25 × 6-9 μm. Mycelial setae grouped around perithecia, straight, simple, acute, up to 630 μm long. Perithecia scattered, verrucose, up to 120 μm; spores obovoidal, 4-septate, constricted, 37-40.5 × 15-18.5 μm.


The present collection can be well assigned to M. affinis Syd. in the formation of very thin hypophyllous colonies and distantly arranged capitate hyphopodia. However, the new variety differs from var. affinis in having smaller ascospores (37-40.5 × 15-18.5 μm) as against 44-51 × 16-20 μm reported for the species (Hansford, 1961).

Colonies foliicolous, amphigenous, dense, scattered, up to 2 mm in diameter. Hyphae substraight to crooked, branching opposite to irregular at acute angles, closely reticulate, cells 9-15.5 × 6-8 μm. Capitate hyphopodia alternate, straight to curved, closely antrorse, 18-28 μm long; stalk cells cuneate, 6-12.5 μm long; head cells ovate to globose, irregularly lobate, 12-15.5 × 9-15.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, opposite to alternate, ampulliform, 12-15.5 × 9-12.5 μm. Mycelial setae densely scattered, straight, simple, acute, up to 500 μm long. Perithecia scattered, verrucose, up to 175 μm; spores obovoidal, 4-septate, constricted, 34-40.5 × 15-18.5 μm.

On leaves of *Carissa carandas* L. (Apocynaceae), in the forest along the road from Painavu to Kulamavu, Idukki, Kerala, October 8, 1983, V.B. Hosagoudar HCIO 39393; MH 78903.

Of the *Meliola* taxa reported on the host genus *Carissa*, this variety can be easily distinguished by the irregularly lobate head cells of the capitate hyphopodia.
However, the present collection slightly varies from the type in having substraight to crooked mycelia and smaller mycelial setae.

This variety was recorded from Burma and is reported here for the first time from India.

**Meliola linociera-malabaricae** Hosagoudar sp. nov.

Colonies hypophyllous, caulicolous, dense, velvety, up to 10 mm in diameter, confluent. Hyphae straight to undulating, branching mostly opposite at wide angles, loosely to closely reticulate, cells 18-22 × 4-6 μm. Capitate hyphopodia alternate, straight, flexuous, crooked, antorse to recurved, 18-22 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells ovate, truncate, angulose, straight to variously bent, mostly entire, rarely sublobate, 15-17 × 6-9 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 27-31 ×
8-9 μm. Mycelial setae numerous, densely scattered, simple, acute, up to 272 μm long. Perithecia scattered, verrucose, up to 140 μm; spores obovoidal, 4-septate, constricted, 40-46 × 15-19 μm.

**Holotype:** On leaves of *Linociera malabarica* Wall., in the forest along the road from Painavu to Kulamavu, Idukki, Kerala, Dec. 28, 1983, V.B. Hosagoudar HCIO 39394; **Isotype:** MH 80318.

This species is distinct from other *Meliola* species reported on members of the family Oleaceae in having the distinct morphological character of capitate hyphopodia.

**Meliola mayapeicola** Stev. var. *indica* Hosagoudar var. nov.

Colonies epiphyllous, rarely hypophyllous, dense, crustose to velvety, up to 2 mm in diameter. Hyphae substraight, branching mostly opposite at acute to wide angles, closely reticulate, cells 15-34 × 7-9.5 μm. Capitate hyphopodia alternate, antorse to recurved, 18-25 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, cylindrical, entire, rarely angular to sublobate, 12-15.5 × 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 12-18.5 × 9-12.5 μm. Mycelial setae grouped around perithecia, straight to curved, simple, acute, up to 500 μm long. Perithecia scattered, verrucose, up to 125 μm; spores obovoidal, 4-septate, constricted, 40-46.5 × 12-18 μm.
Fig. 7: *Meliola mayapeicola* Stev. var. *indica* var. nov. — Ch - Capitate hyphopodia, Mh - Mucronate hyphopodia, Ms - Mycelial setae, Pc - Perithecial cells, Sp - Ascospores.

**HOLOTYPE:** On leaves of *Linociera malabarica* Wall. (Oleaceae), in the forest along the road from Painavu to Kulamavu, Idukki, Kerala, Dec. 28, 1983, V.B. Hosagoudar HCIO 39395; ISOTYPE: MH 80318 pro parte.

The new variety differs from var. *mayapeicola* in having longer and acute mycelial setae (Stevens 1916).

This species was mixed with *M. linociera-malabaricae* sp. nov. and can be easily distinguished by its smaller epiphyllous colonies.

**Acknowledgements**

The author expresses his sincere thanks to Dr. N.P. Balakrishnan, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

**References**

A NEW SPECIES OF "BLACK MILDEW" FROM ANDHRA PRADESH, INDIA

V.B. Hosagoudar

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Herbarium sheet of *Combretum decan-drum* Roxb. in Madras Herbarium (MH, Field No. *Henry 15929*), showed black lesions on the leaves. Microscopic examination of these lesions revealed presence of a fungus belonging to Meliolaceae. Perithecial development below the mycelia and presence of flattened globose matured perithecia are the characteristic of the genus *Amazonia* Theiss. & H. Sydow. So far there is no report of the genus *Amazonia* on any members of the family Combretaceae (Hansford, 1961). Hence it is described here as a new species.

*Amazonia henryi* Hosagoudar, *sp. nov.*

Plagulae folicolae, amphigenae, densae, ad 2 mm diam., raro confluentes. Hyphae mycelii rectae vel tenueter undulatae, plerumque oppositae, vel raro alternatae lateque ramosae, laxe reticulatae, cellulis 18.5-25 x 8-12.5 μm. Hyphopodia, capitata recta vel curvula, antrosera vel patentia, 18.5-21 μm longa; cellula basali cylindracea vel cuneata, 6-9.5 μm longa; cellula apicali globosa, truncata, raro angularis, integra, 12-15.5 μm. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel opposita, conoidea vel ampullacea, 15-25 x 12-15.5 μm.

Setae myceliales vel peritheciales nullae. Perithecia dispersa, applanate-globosa, glabra, atra, ad 124 μm; sporae late-ovatae, 4-septatae, constrictae, 31-40.5 x 13-15.5 μm.
Colonies foliicolous, amphigenous dense up to 2 mm in diameter, rarely confluent. Hyphae straight to undulating, branching mostly opposite, rarely alternate at wide angles, loosely reticulate, cells 18.5-25 x 8-12.5 \( \mu \text{m} \). Capitate hyphopodia alternate, straight to curved, antorse to spreading, 18.5-21 \( \mu \text{m} \) long; stalk cells cylindrical to cuneate, 6-9.5 \( \mu \text{m} \) long; head cells globose, truncate, rarely angular, entire, 12-15.5 \( \mu \text{m} \). Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, conoid to ampulliform, 15-25 x 12-15.5 \( \mu \text{m} \). Mycelial and perithecial setae absent. Perithecia scattered, flattened-globose, up to 124 \( \mu \text{m} \); spores broadly ovate, 4-septate, constricted, 31-40.5 x 13-15.5 \( \mu \text{m} \).


The species is named in honour of Dr. A.N. Henry, who collected this material.

**ACKNOWLEDGEMENTS**

Thanks are due to Dr. V.J. Nair, Scientist, B, for Latin diagnosis; Dr. M. Chandrabose Scientist B and Mr. R. Gopalan, Scientific Assistant, Botanical Survey of India, Southern Circle, Coimbatore for help in providing the duplicate material of Madras Herbarium for my study.

**REFERENCES**

A NEW VARIETY OF MELIOLA CARISSAE DOIDGE FROM INDIA

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During the study of Indian Meliolaceae, the author examined several Indian collections deposited in the Commonwealth Mycological Institute, Kew, England. Of them, the herbarium material named as Meliola carissae Doidge needs change in its taxonomic status.

Meliola carissae Doidge var. spinuli Hosagoudar, var. nov. (figure 1).

Different a M. carissae Doidge var. indica Hansf. hyphis laxe reticulatis, hyphopodis capitatis antorsus et recurvis, cellulis apiculis do hyphopodis capitatis plerumque integris et raro sublobatis.

Colonies epiphyllous, subdense, up to 3 mm in diameter, rarely confluent. Hyphae substraight to undulating, branching opposite to irregular at acute angles, loosely reticulate, cells 24-40 × 6-9.5 μm. Capitate hyphopodia alternate, straight to curved, antorse to recurved, 21-38 μm long; stalk cells cylindrical to coniculate, 6-9.5 μm long; head cells ovate, boot-shaped, entire, angular to shallowly lobate, 15.5-19.5 × 12.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, opposite to alternate, conoid to ampulliform, 15.5-21 × 9-12.5 μm. Mycelial setae scattered, straight, simple, acute, up to 860 μm long. Perithecia scattered, verrucose, up to 155 μm; spores obovoidal, straight to slightly curved, 4-septate, constricted, 34-37 × 12-15.5 μm.


Of the Meliola taxa reported on the host genus Carissa, the present variety is closer to M. carissae Doidge var. indica Hansf. in having the mucronate hyphopodia borne on a separate mycelial branch. However, the new variety differs from it in having subdense colonies, loosely reticulate mycelia, antorse to recurved capitulate hyphopodia and mostly entire but rarely angular to sublobate head cells of the capitate hyphopodia.

Kamal et al. have published this taxon as M. carissae Doidge and the herbarium material (IMI 200122) was with the host name as Carissa opaca. It appears that Carissa spinarum L. (as published by Kamal et al.) is the correct name of the host plant.

The author is grateful to the Director, CMI, Kew, England, for generously sending the Indian collections. Thanks are due to Dr N. P. Balakrishnan for encouragement.

25 January 1988

Ascospore germination in meliolaceous fungi

by

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Botanical Survey of India, Southern Circle, Coimbatore 641 003, India

With 10 figures and 1 table


Abstract: Ten taxa of the family Meliolaceae representing the genera Amazonia, Armateella, Asteridiella, Irenopsis and Meliola were selected for the study of ascospore germination on their host material under natural conditions. The opposite cells of the ascospores in Armateella lineae empty their contents into the germinal cells and collapse in the latter stage.

Introduction

The genus Meliola Fr. and its associated genera have been placed in the family Meliolaceae of the order Meliolales. Because of the evanescent asci, this family was earlier placed in the order Perisporiales (Yarwood 1973) and thought to belong to the Unisporatae (Muller & Arx 1973) but Eriksson & Hawksworth (1986) transferred it to the Bitunicatae and found it to have an affinity with the Microthyriales. Luttlel (1989) stated that Meliolaceae constitute a small, homogeneous group of the order Meliolales of Pyrenomycetes.

Taxonomically, considerable attention has been paid to these fungi as is evidenced by the work of Hansford (1961), who included about 1814 species collected throughout the world. However, very little is known about their biology. Bal (1919) was the first to make an attempt to culture the ascospores of Meliola species on host extract, cow dung, beef broth, beef agar, peptone, etc. He managed to germinate the ascospores of Meliola spp. growing on Citrus sp. and Phoenix sylvestris on a laboratory medium containing KNO3, Na2HPO4 and (NH4)2SO4 with 0.5 g of each prepared in 100 ml distilled water. The ascospores germinated within 72 hours by producing a single capitulate hyphopodium, but on the eleventh day the ascospores produced 4 capitulate hyphopodia from their terminal cells. Further growth is not known.

Hansford (1961) did not succeed in germinating the ascospores of Meliola spp. and Asteridiella spp. either on the laboratory media or on their natural hosts in the field.

Goos (1974) cultured ascospores of Meliola growing on Serenoa repens on laboratory media like Difco corn meal agar, P.D.A., Rabbit food agar, Blakeslee’s malt extract agar (DME), etc. These ascospores produced black, sterile mycelia but no...
hyphopodia or fruit bodies. These spores were also inoculated on tender banana leaves but growth soon ceased. Hence, Goos (l.c.) came to the conclusion that Meliola species are unable to decompose carbohydrates and are also host specific. However, Goos (1978) stated that the fungus could not be identified positively as Meliola.

Thite (1975) attempted to germinate the ascospores of Meliola jasminicola P. Henn. in sterile water drops placed on microscope slides. The ascospores readily germinated by producing 1-6 capitate hyphopodia from their terminal cells. Goos (1978) attempted to germinate the ascospores of Meliola argentina Speg. and M. palmicola Wint. on several types ofagar media and in sterile water drops placed on the microscope slides. Ascospores germinated on culture media by producing one or rarely two germ tubes approximately equal to the length of the ascospores and later growth ceased. However, the ascospores placed on microscope slides near the periphery of the water drops produced capitate hyphopodia. This shows that adequate aeration and contact with a solid, hard surface are needed to produce capitate hyphopodia. On their natural host surfaces, the ascospores of Meliola palmicola Wint. and M. peleae Stev., produced 1-2 capitate hyphopodia from their terminal cells and subsequent growth was from their middle cells (Goos & Palm 1979).

Further, Thite & Patil (1985) treated the ascospores of Meliola holigarnae Stev. with freezing, desiccation and several chemicals. These ascospores placed in sterile water drops produced one or rarely two germ tubes (devoid of hyphopodia) from their terminal cells. Hansford (1961) stated that ascospores of the Meliolineae always germinate by producing capitate hyphopodia from their end cells but subsequent growth will originate from the remaining cells. To know the exact germinating procedure of the ascospores of Meliolaceae, an attempt has been made here to study the germinating ascospores of ten meliolaceous members on their hosts under natural conditions.

Material and methods

The meliolaceous fungi were collected from the Hydroelectric Project Area of Kerala State, India, during the years 1981-84. The material was dried between blotters (Jain & Rao 1977; Hosagoudar 1987). Natural coloured nail polish was used in making 'Hips', and permanent slides were prepared by using D.P.X. (Hosagoudar & Kapur 1985; Hosagoudar & Mohanan 1985). Five germinating spores were randomly selected in ten taxa representing the genera Anamonea, Armatella, Asteridiella, Irenopus and Meliola.

Observations

In all the selected ten taxa the germination of the ascospores was initiated by producing 1-2 capitate hyphopodia from their terminal cells, middle cells and also from both.

The number of capitate hyphopodia production from the different cells of the ascospores of Meliolaceae during their germination is shown in Table 1.
Table I: The number of ascospores of Meliolaceae produced capitate hyphopodia from their cells during germination (~ = 5).

<table>
<thead>
<tr>
<th>Name of species</th>
<th>One capitate hyphopodium</th>
<th>Two capitate hyphopodia</th>
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<tr>
<td></td>
<td>From terminal cells</td>
<td>From middle cells</td>
</tr>
<tr>
<td>A. <em>Amazonia peregrina</em> Sydow</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>B. <em>Armatella litsea</em> (P. Henn.) Thieiss. &amp; Sydow</td>
<td>5</td>
<td>--</td>
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<tr>
<td>C. <em>Asperidiella concreti</em> (Siev.) Hansf. var. <em>leucaena</em> Hansf.</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>D. <em>Asperidiella concreti</em> (Sydow) Hansf.</td>
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<tr>
<td>E. <em>Asperidiella fumosorufescens</em> (Yamam.) Hansf.</td>
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<tr>
<td>F. <em>Irenopsis benguetensis</em> Strev. &amp; Rold. ex Hansf.</td>
<td>--</td>
<td>4</td>
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<tr>
<td>G. <em>Irenopsis triumfettii</em> (Siev.) Hansf. &amp; Deight.</td>
<td>4</td>
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<tr>
<td>H. <em>Meliola aglaicola</em> Hansf.</td>
<td>1</td>
<td>2</td>
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<tr>
<td>I. <em>Meliola erythraeicellii</em> Bartola &amp; Vital</td>
<td>4</td>
<td>--</td>
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<tr>
<td>J. <em>Meliola mangiferae</em> Earle</td>
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</table>

In contrast to the other species, the ascospores of *Armatella litsea* (P. Henn.) Thieiss. & Sydow germinated by producing a single capitate hyphopodium from one cell. The contents of the opposite cell flowed into the germinating cell, became paler, collapsed ultimately leaving the deep brown germinating cell with a single capitate hyphopodium.

**Discussion and conclusions**

Ascospore germination in the Meliolaceae is initiated by the production of capitate hyphopodium either from terminal cells or middle cells. It is certain that some species regularly germinate by producing a single capitate hyphopodium from their terminal cells (Fig. C, 1) and some from their subterminal cells (Fig. F). Germination thus begins by the production of a capitate hyphopodium, which may in turn
produce a haustorium into the host epidermis. This appears to be the stage where the pathogen establishes its relation with its host. It can also be predicted that when a single capitate hyphopodium is unable to establish itself on the host or is incapable of absorbing nutrients required for its further growth, a second capitate hyphopodium may occur. It is also noticed that spores on incompatible hosts (Fig. 15) produce sterile germ tubes rather than the usual capitate hyphopodia. In some colonies, morphologically similar spores produce small germ tubes (Fig. A5 & J5) but their further development is not known. The ascospores of the Meliolaceae studied germinated by producing capitate hyphopodia in sterile water drops, but subsequent growth ceased. When they were chemically treated or cultured on laboratory media abnormal and sterile mycelia were produced (Goos 1974, 1978; Goos & Palm 1979; Thite 1978). There is no evidence that the ascospores of these fungi produced mucronate hyphopodia rather than capitate hyphopodia. It is known in all the species that the colonies are formed from the ascospores but there is no evidence that the colonies are formed from phialoconidia produced from the phialides (Hughes 1979, 1981). The phialides are also known as mucronate hyphopodia.

Acknowledgements

I thank Dr. N.C. Nair, Joint Director (Retd.) and Dr. N.P. Halakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore for their valuable suggestions. Thanks are due to Mr. K. Sivanandan, Senior Artist of the same organisation for preparing the line drawings.

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11:211-213.

Meliolaceae of South India – VIII

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SUMMARY

This paper gives an account of 13 species and infraspecific taxa of the family Meliolaceae. Of these: Amazonia abutili, Asteridiella elaeocarpi-tuberculati, Irenopsis belicercis, I. mudumalaiensis, Meliola goasi are new species. Meliola cadigenesi Yates var. glycosmidis (Kapoor) Stat. et comb. nov. is proposed, based on Meliola glycosmidis Kapoor. Irenopsis sidae (Rehm) Hughes, Meliola stephanieae Hansf., are new records to India, while Armatella cinnamomica Hansf., Meliola malabaricensis Hansf., M. malacotricha Speg. var. major Beeli, M. mangiferae Earle and M. ziziphi Hansf. & Thirum. are reported for the first time from the state of Tamil Nadu.

Abbreviations used:

Ch = Capitate hyphopodia
Mh = Mucronate hyphopodia
Ms = Mycelial setae
Pc = Perithecial cells
Ps = Perithecial setae

Results and Discussion

1. Amazonia abutili Hosagoudar, sp. nov. (Fig. 1)

Plagulac epiphyllac, stibdensae, ad 2 mm dia. Hyphae rectae vel leniter flexuosae, alternate lateque ramosae, laxe reticulatae, cellulis 24—50 x 6—9.5 μm. Hyphopodia capitata alternata et 10% opposita, recta vel curvula, antorsa vel reflexa, 12—19 μm longa; cellula basali cylindracea vel cuneata, 3—6.5 μm longa; cellula apicali ovata, globosa, integra vel leniter truncata ad apicem, 9—12.5 x 8—12.5 μm. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacae, 9—25 x 6—8 μm. Perithecia flattened-globose, ad 120 μm; ascospores mostly cylindrical, 4-septate, 37—40.5 x 15—18.5 μm.


So far there is no report of the genus Amazonia on members of the family Malvaceae (1, 5).

2. Armatella cinnamomica Hansf.


On leaves of Cinnamomum malabaricum (Burm. f.) Blume (Lauraceae), Sri Madura, Nilgiris, Tamil Nadu, Jan. 25, 1990, V.B. Hosagoudar HCIO, New Delhi.

3. Asteridiella elaeocarpi-tuberculati Hosagoudar, sp. nov. (Fig. 2).

Plagulac epiphyllac, subdeusae, ad 2 mm diam., confluentes. Hyphae subrectae vel undulatae, opposite lateque ramosae, laxe reticulatae, cellulis 31—36 x 4—6.5 μm. Hyphopodia capitata alternata, recta vel curvula, antorsa, 18—28 μm longa; cellula basali cunearea vel...


$\text{Cryptogamie Botany}$
cuneata, 6–9.5 μm; cellula apicali globosa, ovata, truncata, integra, 16–18.5 × 12–15.5 μm. Hyphopodia mucronata in hyphis distinctis evoluta, pleurique opposita, ampullacea, 18–25 × 6–9.5 μm. Perithecia dispersa, positus in hyphi exphypopodiata, globosa, ad 124 μm; cellula peritheciales conoidea, acuta, curvula, ad 15 μm longa; ascosporeae obovoidae, 4–septatae, 40–46.5 × 15–18.5 μm.

Coloni hypopodi, subdense, up to 2 mm in diam., confluent. Hyphae substraight to undulating, branching opposite at wide angles, loosely reticulate, cells 31–36 × 4–6.5 μm. Capitate hypopodia alternata, straight to curved, antrorse, 18–28 μm long; stalk cells cylindrical to cuneata, 6–9.5 μm long; head cells globose, ovate, truncate, entire, 16–18.5 × 12–15.5 μm. Mucronate hypopodia borne on a separate mycellial branch, mostly opposite, ampullacea, 18–25 × 6–9.5 μm. Perithecium scattered, placed on exphypopodia, hyphopodia, globose, up to 124 μm; perithecial cells conoidae, acuta, curvula, up to 15 μm long; ascosporeae obovoidae, 4–septatae, 40–46.5 × 15–18.5 μm.

Holotypus: On leaves of Elaeocarpus tuberculatus Roxb. (ELAECARPAEAE), Thopapalli, Nilgiris, Tamil Nadu, Jan. 29, 1990, V.B. Hosagoudar HCIO, New Delhi. Asteridella elaeocarpicae Hansf. has been reported on Elaeocarpus monocrates from the Philippines (1). The present new species differs from it in having the mucronate hypopodia borne on a separate mycellial branch, perithecia seated on exphypopodia, smaller perithecial cells, and smaller ascospores.

4. Irenopsis heliceredis Hosagoudar, sp. nov. (Fig. 3)

Plagulae epiphyllae, dense, ad 2 mm diam., Hyphaceae tortuosae, irregulariter acuteque vel laeteque ramoseae, den-sae vel laxe reticulatae, cellulae 24–40 × 6–9 μm. Hyphopodia capitata recta vel curvula, antrorsa, subantrorsa vel reflexa, 18–29 μm longa; cellulae basali cylindricalae vel cuneata, 3–15.5 μm longa; cellulae apicali ovata, globosa, versiformia, angulosa, truncata vel lentic lobata, 17–18.5 × 15.5–19 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 40–46.5 × 12–15.5 μm. Perithecium dispersa, globosa, ad 175 μm; setae peritheciales 4–10, rectae vel curvulae, obtusae, ad 120 μm longae; ascosporeae obovoidae, 4–septatae, constricteae, 31–40 μm × 12–15.5 μm.

Coloni hypopodi, dense, up to 2 mm in diam. Hyphaceae tortuosae, branching irregular at acute angles, densely to loosely reticulatae, cells 24–40 × 6–9 μm. Capitate hypopodia alternata, straight to curved, antrorsa, subantrorsa to reflected, 18–29 μm long; stalk cells cylindrical to cuneata, 3–15.5 μm long; head cells ovata, globosa, versiform, angular, truncate to slightly lobata, 12–15.5 × 15.5–19 μm. Mucronate hypopodia mixed with capitata hypopodia, opposite to alternate, ampullacea, 40–46.5 × 12–15.5 μm. Perithecium scattered, globosum, up to 175 μm; perithecial setae 4–10, straight to curved, obtusae, up to 120 μm long; ascosporeae obovoidae, 4–septatae, constricteae, 31–40 μm × 12–15.5 μm.


Irenopsis triangularis (Stev.) Hansf. & Deight. has been reported on the members of the family Tiliaceae. However, (1) assigned Irenopsis species on Helicteres to I. triangularis (Stev.) Hansf. & Deight. It is not correct because the host Helicteres belongs to the family Sterculi-aceae (3, 6, 7).

5. Irenopsis maduvaliensis Hosagoudar, sp. nov. (Fig. 4)

Plagulae epiphyllae, subdense, ad 3 mm diam., confluent. Hyphaceae flexuosae vel tortuosae, alternate vel irregulariter acuteque ramoseae, laxe reticulatae, cellulae 34–47 × 6–9.5 μm. Hyphopodia capitata alternata, dispersa, pleurique antorsa, 15–28 μm longa; cellulae basali cylindricalae vel cuneata, 6–9.5 μm longa; cellulae apicali globosa, ovata, integra vel lentic angulosa, 9–15.5 × 12–15.5 μm. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 18–28 × 6–9.5 μm. Perithecium dispersa, verrucosa, ad 140 μm; setae peritheciales 4–10, rectae vel curvulae, obtusae, ad 110 μm longae; ascosporae pleurique cylindricalae, 4–septatae, 37–40 μm × 15–18.5 μm.

Coloni hypopodi, subdense, up to 3 mm in diam., confluent. Hyphaceae flexuosae vel tortuosae, branching alternate to irregular at acute angles, loosely reticulatae, cells 34–47 × 6–9.5 μm. Capitate hypopodia alternata, scattered, mostly antrorsa, 15–28 μm long; stalk cells cylindrical to cuneata, 6–9.5 μm long; head cells globose, ovata, entire to slightly angulose, 9–15.5 × 12–15.5 μm. Mucronate hypopodia borne on a separate mycellial branch, alternate to opposite, ampullacea, 18–28 × 6–9.5 μm. Perithecium scattered, verrucosa, up to 140 μm; perithecial setae 4–10, straight to curved, dark, obtuse at apex, up to 110 μm long; ascosporeae obovoidae, mostly cylindrical, 4–septatae, 37–40 μm × 15–18.5 μm.


According to the Beet formula (3401.3220), and having entire to angular head cells of the capitata hypopodia, the present species is closer to I. basterdiopsis (Spog.) Stev. and I. thesperaeae Hansf. (1). However, it differs from the former in having dense colonies, mucronate hypopodia borne on a separate mycellial branch, dark perithecial setae and larger ascospores; it also differs from the latter species in absence of opposite and larger capitata hypopodia, mucronate hypopodia borne on a separate mycellial branch, smaller perithecial setae and larger ascospores.

This species is named after its collection locality, Mudumalai Wildlife Sanctuary.

6. Irenopsis sidae (Rehm) Hughes


Melioda sidae Rehm, Philipp, J. Sci. 8: 391, 1913. (Fig. 5).
Figs. 1–7: Fig. 1. Amazonia amazonica, sp. nov. Fig. 2. Asteciella elaeocarpi-tuberculata, sp. nov. Fig. 3. Irenopsis helicoides, sp. nov. Fig. 4. Irenopsis madanakoraense, sp. nov. Fig. 5. Irenopsis sidae (Rehm) Hughes Fig. 6. Meliola goessii, sp. nov. Fig. 7. Meliola stephaniae Handl.
Colonies epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae substraight to flexuous, branching irregular at acute angles, closely reticulate, cells 15–46.5 × 6–9 μm. Capitate hyphopodia alternate, about 5%, opposite, antrorse to spreading, straight to curved, 15–22 μm long; stalk cells cylindrical to cuneate, 6–9.5 μm long; head cells ovate, globose, angular, straight to curved, 9–12.5 × 8–12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, 15–19 × 6–9.5 μm. Perithecia scattered, verrucose, up to 125 μm; perithecial setae 6–10, straight, acute to obtuse at the apex, black, up to 110 μm long; ascospores cylindrical, 4–6–9.5 μm, 1 perithecia scattered, verrucose, up to 120 μm; ascospores obovoidal to cylindrical, 4-septate, slightly constricted, 40–44 × 15–19 μm.

Hypotypes: On leaves of Viburnum punctatum Buch.-Ham. (CAPRIFOLIACEAE), Benne forest, Nilgiris, Tamil Nadu, Jan. 24, 1990, V.B. Hosagoudar HCIO, New Delhi.

Of the four species known on the family members of Caprifoliaceae, M. acaputaevisennes Petrak and M. sambuci Hansf. have alternate capitate hyphopodia. However, the present new species is distinguished by its straight to flexuous hyphae, stellately and irregularly sublobate head cells of the capitate hyphopodia.

This species is named in honour of Prof. R. D. Goos for his notable contributions to the field of Mycology.

7. Meliola cadigensis Yates var. glycosinidis (Kapoor) Hosagoudar, stat. et comb. nov.


The variety differs from the species in having dentate mycelial setae.

8. Meliola gosii Hosagoudar, sp. nov. (Fig. 6)

Plagulae epiphyllae, densae, ad 2 mm diam. Hyphae substraight vel flexuose, alternatae vel oppositae, ramosae. Larve vel densae reticulatae, cellularae inflatae vel curvatae, 21–28 × 6–9.5 μm. Hyphopodia capitata alternata, antorse, recta vel curvata, 21–28 μm longa; cellula basalis cylindraceae vel cuneata, 6–9.5 μm longa; cellula apicalis ovata, globosa, irregulariter et stellata sublobata, 12–28 × 12–15.5 μm. Hyphopodia mucronata in hyphis distinctis evoluta, opposita vel alternata, amplulifera, 21–28 × 9–12.5 μm. Setae myceliales dispersae, rectae, simplices, acutae vel obtuse ad apicem, ad 450 μm longae. Perithecia dispersa, ad 120 μm; ascospores obovoidal vel cylindraceae, 4-septatae, lente constrictae, 40–44 × 15–19 μm.

Colonies epiphyllous, dense, up to 2 mm in diameter. Hyphae straight to flexuous, branching; alternate to opposite at acute angles, loosely to closely reticulate, cells 15–28 × 6–9.5 μm. Capitate hyphopodia alternate, antorse, straight to curved, 21–28 μm long; stalk cells cylindrical to cuneate, 6–9.5 μm long; head cells ovate, globose, irregularly and stellately sublobate, 12–28 × 12–15.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, opposite to alternate, ampulliform, 21–28 × 9–12.5 μm. Mycelial setae scattered, straight, simple, acute to obtuse at tip, up to 450 μm long. Perithecia scattered, up to 120 μm; ascospores obovoidal to cylindrical, 4-septate, slightly constricted, 40–44 × 15–19 μm.

Holotype: On leaves of Viburnum punctatum Buch.-Ham. (CAPRIFOLIACEAE), Benne forest, Nilgiris, Tamil Nadu, Jan. 24, 1990, V.B. Hosagoudar HCIO, New Delhi.

9. Meliola malacotricha Speg. var. major Beeli


On leaves of Argyroxiphium elliptica Choisy (CONVOLVULACEAE), Benne forest, Nilgiris, Tamil Nadu, Jan. 24, 1990, V.B. Hosagoudar HCIO, New Delhi.

10. Meliola malabarensis Hansf.


On leaves of Olea dioica Roxb. (OLACEAE), Benne forest, Nilgiris, Tamil Nadu, Jan. 24, 1990, V.B. Hosagoudar HCIO, New Delhi.

11. Meliola mangiferae Earle


On leaves of Mangifera indica L. (ANACARDIACEAE), Benne forest, Nilgiris, Tamil Nadu, Jan. 24, 1990, V.B. Hosagoudar HCIO, New Delhi.

12. Meliola stephaniae Hansf.

Reiwardtia 3: 93, 1954 and Sydowia Beih. 2: 64, 1961 (Fig. 7).

Colonies epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae straight to flexuous, branching mostly opposite at acute angles, loosely to closely reticulate, cells 24–37 × 9–12.5 μm. Capitate hyphopodia alternate, antorse, straight to slightly curved, 24–31 μm long; stalk cells cylindrical to cuneate, 9–12.5 μm long; head cells globose, ovate, entire, 15–18.5 × 12–15.5 μm. Mucronate
hyphopodia borne on a separate mycelial branch, mostly opposite, ampulliform, 15–22 × 9–12.5 μm. Mycelial setae numerous, densely scattered, straight, simple, acute to obtuse, up to 500 μm long. Perithecia scattered, globose, up to 125 μm; ascospores obovoidal, 4-septate, constricted, 37–40.5 – 15–18.5 μm.

On leaves of *Stephania japonica* (Thunb.) Miers (MENISPERMACEAE), Bence forest, Nilgiris, Tamil Nadu, Jan. 24, 1990, V.B. Hosagoudar HCIO, New Delhi.

13. *Meliola ziziphi* Hansf. & Thirum


On leaves of *Ziziphus xylopyrus* (Retz.) Willd. (RHAMNACEAE), Thorepalli, Nilgiris, Tamil Nadu, Jan. 29, 1990, V.B. Hosagoudar HCIO, New Delhi.

Acknowledgements

I am grateful to Dr. N. P. Balakrishnan, Deputy Director and Dr. A. N. Henry, Scientist SF, Botanical Survey of India, Southern Circle, Coimbatore for their encouragement.

References


**Key words:** Ascomycetes, Meliolaceae, Armatella, Amazonia, Asteridiella, Irenopsis, Meliola
**Meliolaceae of South India - IX**

by

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With 3 figures


**Abstract:** The present paper gives an account of eight species and infra-specific taxa of the family Meliolaceae collected from Coimbatore and Kanyakumari districts of Tamil Nadu and Idukki district of Kerala State. Of these, Asteridiella websterii, Meliola filicii and *M. staphylacearum* are encountered as new species while *Asteridiella entebbeensis* (Hansf. & Stev.) Hansf., *Irenopsis leeae* Hansf. var. *javensis* Hansf., *I. palensis* Hansf., *Meliola aequatoriensis* Petrak, *M. roureae* Sydow var. *major* Hansf. & Deight. are reported here for the first time from India.


Colonies epiphyllous, dense, up to 2 mm in diam., rarely confluent. Hyphae flexuous, branching alternate to opposite at acute to wide angles, loosely to closely reticulate, cells 30-40.5 × 6-9.5 μm. Capitate hyphopodia alternate, straight to curved, antorse to spreading, 15-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm; head cells ovate, globose, angular to slightly lobate, 9-21.5 × 15-18.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-25 × 6-9.5 μm. Perithecia scattered to grouped, up to 210 μm; perithecial cells conoid, up to 25 μm long; ascospores obovoidal, 4-septate, constricted, 43-53 × 18-21.5 μm.


This species has been reported on several hosts of the family Euphorbiaceae from Congo, Congo Beige, Uganda, Sierra Leone and Gold Coast and is reported here for the first time from India on a hitherto unrecorded host.

0029-5035/91/0052-0497 $ 1.75
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2. Asteridiella websterii Hosagoudar, sp. nov.

Plagulae epiphyllae, densae, crustosae, ad 4 mm diam., confluentes. Hyphae rectae, subrectae vel leniter anfractuæ, oppositae vel irregulariter laxe ramosae, laxe vel densae reticulatae, cellulis 27-31 × 4.5-6.5 μm. Hyphopodia capitata alternata, pleurostomæ anfracta vel raro recurvata, 15-22 μm longa; cellula basali æquilatera vel laxe latus, 12-15.5 x 9-12.5 μm. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 12-15.5 x 9-12.5 μm. Perithecia dispersa, initialia applanata vel globosa ad maturata, ad 115 μm; cellula perithecia conoida, ad 10 μm longa; ascospores obovoidea, 4-septatae, leniter constrictae ad septa, 37-40.5 x 15-18.5 μm.

Colonies epiphyllous, dense crustose, up to 4 mm in diameter, confluent. Hyphae straight, substraight to slightly crooked, branching opposite to irregular at wide angles, loosely to closely reticulate, cells 27-31 × 4.5-6.5 μm. Capitate hyphopodia alternate, mostly antrorse to rarely recurved, 15-22 μm long; stalk cells cylindrical to cuneate, 3-8 μm long, head cells straight to rarely curved, ovoid, entire, rarely angular, 12-15.5 x 9-12.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, ampulliform, 12-15.5 x 9-12.5 μm. Perithecia scattered, initially flattened but globose at maturity, up to 115 μm; perithecial cells conoid, up to 10 μm long; ascospores obovoid, 4-septate, slightly constricted at septa, 37-40.5 x 15-18.5 μm.


1. Asteridiella websterii Hosagoudar, sp. nov.

So far *Asteridiella americana* Hansf., *A. linocieriae* (Sydow) Hansf. and *A. hispaniolensis* (Cif.) Hansf. have been reported on members of the family Oleaceae (Hansford, 1961). However, the present new species differs from them in having strictly epiphyllous crustose colonies, smaller mycelial cells, entire to angular head cells of the capitate hyphopodia and the mucronate hyphopodia borne on a separate mycelial branch.

This species is named in honour of Prof. John Webster, England, for his notable contributions to the field of mycology.


Colonies epiphyllous, rarely amphigenous, up to 2 mm in diam., confluent. Hyphae straight, flexuous to slightly tortuous, branching alternate to irregular at acute angles, loosely reticulate, cells 18-25 × 6-9.5 μm. Capitate hyphopodia alternate, mostly unilateral, about 1% opposite, antorse, subantorse to rarely reflexed, 18-25 μm long; stalk cells cylindrical to cuneate, 3-9.5 μm long; head cells globose, slightly and irregularly lobate, 13-15 × 12-15.5 μm. Mucronate hyphopodia numerous, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-22 × 9-12.5 μm. Perithecia scattered, up to 95 μm; perithecial setae straight to tortuous, often perpendicular to the host, obtuse at the tip, up to 80 μm long; spores obovoidal, 4-septate, 30-37 × 13-15.5 μm.


This variety has been reported from Java and the Philippine islands on *Leea* species and is reported here for the first time from India on a hitherto unrecorded host.


Colonies epiphyllous, thin, minute, up to 3 mm in diameter. Hyphae straight to flexuous, branching alternate to opposite at wide angles, loosely reticulate, cells 33-43.5 × 4.5-6.5 μm. Capitate hyphopodia alternate, distantly arranged, straight, antorse to subantorse, 12-18.5 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells globose, entire, 9-12.5 × 12-15.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 21-28 × 6-9 μm. Perithecia scattered, verrucose, up to 110 μm; perithecial setae 4-6, straight, obtuse at the apex, up to 80 μm long; ascospores obovoidal, 4-septate, 27-43.5 × 12-22 μm.

On leaves of *Croton* sp. (Euphorbiaceae), on the way to Nooradi Settlement, Valparai, Coimbatore, Tamil Nadu, March 24, 1990, V.B. Hosagoudar HCIO 30385.

The present collection matches well with *I. paulensis* Hansf. except for smaller capitate hyphopodia. Hansford (1955, 1961) stated that the mucronate hyphopodia are
separate and mixed with capitate hyphopodia but in the present collection mucronate hyphopodia are mixed with capitate hyphopodia. This species has been reported from Brazil on *Acalypha* sp. and is reported here for the first time from India on a hitherto unrecorded host.


Colonies epiphyllous, dense, confluent. Hyphae straight, flexuous to slightly crooked, branching irregular at acute angles, loosely to closely reticulate, cells 34-43.5 × 4-6.5 μm. Capitate hyphopodia alternate, closely antorse to antorse, straight to curved, 21-25 μm long; stalk cells cylindrical to cuneate, 5-6.5 μm long; head cells ovate, versiform, globose, entire to angular to slightly lobate, 15-18.5 × 12-15.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, ampulliform, 18-25 × 12-15.5 μm. Mycelial setae few, grouped around perithecia, straight to curved at the tip, acute to obtuse, up to 260 μm long. Perithecia scattered, globose, up to 125 μm; ascospores obovoidal, 4-septate, slightly constricted, 34-40.5 × 15-18.5 μm.

On leaves of *Viburnum punctatum* Buch.-Ham. ex D. Don (Caprifoliaceae), M.K. Vayal, Kanyakumari, Tamil Nadu, Aug. 6, 1977, A.N. Henry HCIO 30386.

Petrak (1948) reported this species on *Virburnum tinoides* from Ecuador and Malay (Hansford, 1961) and it is reported here for the first time from India on a hitherto unrecorded host.

6. *Meliola filicii* Hosagoudar, sp. nov. Fig. 2

Plagulae amphigenae; plagulae epiphyllae densae, ad 2 mm diam., plagulae hypophyllae confluentes. Hyphae rectae, flexuae vel tortuose, plerumque opposita vel laxae ramose, densae reticulatae, cellulis 15.5-31 × 3.5-6.5 μm. In hyphae epiphyllae hyphopodia capitata opposita vel densa disposita, in hyphae hypophyllae sparse et opposita vel alternata, antorse, reflexa vel patens, 15-18.5 μm longa; cellula basali cuneata vel cuneata, 3-6 μm longa; cellula apicali recta vel curvata, ovata, globosa, integra vel truncata ad apicem, 12-14 × 6-9.5 μm. Hyphopodia mucronata paucia, illis capitatis commixta, opposita vel alternata, ampullacea, 12-28 × 12-15.5 μm. Setae myceliales densae disseminatae, rectae, simplex, obtusa vel dentata ad apicem, ad 300 μm longae. Perithecia disseminata vel aggregata, ad 160 μm; ascosporae obovoidae, 4-septatae, levis constructae, 30-33.5 × 12-15.5 μm.

Colonies amphigenous; epiphyllous colonies dense, up to 2 mm in diameter; hypophyllous colonies confluent. Hyphae straight to flexuous to tortuous, branching mostly opposite at wide angles, closely reticulate, cells 15.5-31 × 3.5-6.5 μm. Capitate hyphopodia densely arranged and regularly opposite on epiphyllous colonies, sparse and opposite to alternate on hypophyllous colonies, antorse, reflexed to spreading, 15-18.5 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells straight to curved, ovate, globose, entire to truncate at apex, 12-14 × 6-9.5 μm. Mucronate hyphopodia few, mixed with capitate hyphopodia, opposite to alternate, ampulliform, 12-28 × 12-15.5 μm. Mycelial setae densely scattered, straight, simple, obtuse to dentate at apex, up to 300 μm long; perithecia scattered to grouped,
2. **Mcitola jillcii** Hosagoudar, sp. nov.

up to 160 μm; ascospores obovoidal, 4-septate, slightly constricted, 30-33.5 × 12-15.5 μm.

Holotype: On leaves of **Filiticum decipiens** (Wight & Arn.) Thw. (Sapindaceae), Churakkotta, near Thannikudi, Idukki, Kerala, Feb. 8, 1981, N.C. Nair HCIO 30391.

The present new species is distinct from the rest of the known *Meliola* species recorded on the members of the family Sapindaceae in having straight to tortuous mycelia, loosely to closely arranged and antorse to reflexed capitate hyphopodia. Further, the host is endemic to Western Ghats of peninsular India (Hansford, 1961; Stevenson, 1968 and Santapau & Henry, 1973).


Colonies epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae straight, substraight to tortuous, branching opposite to irregular at wide angles, loosely reticulate, cells 12-33 × 8-9.5 μm. Capitate hyphopodia alternate, often distantly arranged, antrose to reflexed, 27-31 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells straight to curved, ovate, globose, entire to angular, 18-21 × 10-15.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-31 × 9-12.5 μm. Mycelial setae numerous, simple, straight, acute to obtuse at the tip, up to 930 μm long. Perithecia scattered, up to 200 μm; ascospores obovoidal, 4-septate, constricted, 43-53 × 18-21.5 μm.
On leaves of *Connarus wightii* Hook. f. (Connaraceae), on the way to Nooradi Settlement, Valparai, Coimbatore, Tamil Nadu, March 23, 1990, V:B: Hosagoudar HCIO 30395.

8. *Melioia staphyleacearum* Hosagoudar, sp. nov. Fig. 3

Colonies epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae straight, branching opposite at acute angles, closely reticulate, cells 12-29 x 9-12.5 μm. Capitate hyphopodia opposite, straight, subantrorse, 15-18.5 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovoid or versiform, entire, 16-18.5 x 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 18-31 x 9-12.5 μm. Setae myceliales dispersae, simple, straight to flexuous, crooked at the upper portion, acute to obtuse at the tip, up to 250 μm long. Perithecia scattered, up to 100 μm; ascospores obovoidal to cylindrical, 4-septate, 34-40.5 x 12-15.5 μm.

Holotype: On leaves of *Turpinia* sp. (Staphyleaceae), on the way to Nooradi Settlement, Valparai, Coimbatore, Tamil Nadu, March 23, 1990, V.B. Hosagoudar HCIO 30397.

So far there is no report of the genus *Melioia* on any members of the family Staphyleaceae (Hansford, 1961; Stevenson, 1968). Hence, the present collection has been proposed as a new species.
Acknowledgements

The author is grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for their encouragement.

References

THE GENUS ARMATELLA (P. HENN.) THEISS. & SYDOW (MELIOLACEAE) IN INDIA

V. B. Hosagoudar

Botanical Survey of India, Southern Circle, Coimbatore-641 003

The genus Armatella was established by Theissen & Sydow (1915) based on Dimerosporium litseae P. Henn. However, it was classified under the family Polystigmellaceae of the order Dothideales. Hansford (1946) re-examined the type and brought it under the family Meliolaceae.

Batista & Maia (Atas Inst. Micol. Recife 1: 221, 1960) described the genus Arxallendea with the type A. cinnamomi Bat. & Maia. Later, Katumoto (1962) compared the genus Arxallendea with Armatella and stated that the genus Arxallendea was based on the immature and aseptate ascospores. Hence, he treated the genus Arxallendea synonymous to Armatella. Further, he stated that the genus Armatella Yaman seems to be taxonomically closely related to the genus Armatella Theiss. & Sydow.

The genus Armatella is represented by nine species and a variety restricting its parasitism to the members of the host family Lauraceae. In India, this genus was known to be represented by only two species, namely, A. cinnamomi Hans. & Thirum. and A. litseae (P. Henn.) Theiss. & Sydow (Hansf. & Thirum., 1948). However, the recent sporadic collections from a few areas of Western Ghats, resulted in the present work giving an account of eight species of this genus from India.


Mycelium superficial, brown septate, branched, hyphodiate. Perithecia globose, non-ostiolate, thick walled verrucose. Mycelial setae, perithecial setae and perithecial appendages lacking. Ascii usually 4-8 spored; ascospores typically brown, one septate (immature spores remain hyaline and aseptate).

Type: A. litseae (P. Henn.) Theiss. and Sydow

KEY TO THE SPECIES

1a. Outer surface of the mycelial wall and or capitate hyphopodia crenulated
1b. Outer surface of the mycelial and capitale hyphopodia smooth
2a. Outer surface of both mycelia and capitate hyphopodia crenulated
2b. Outer surface of capitate hyphopodia only crenulated
3a. Capitate hyphopodia 5% opposite
3b. Capitate hyphopodia alternate only

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Armatella balakrishnanii Hosagoudar, sp. nov.

Plagulae hypophyllae, tenuis, patentiae, ad 8 mm diam. parietibus hypharum laevigatus, hyphis anfractus, alternatim vel irregulariter acuteque ramosis, dense reticulatis, cellulis 9-25 x 4.5-6.5 μm. Hyphopodia capitata alternata, antrorsa vel reflexa, 15.5-115 μm longa; cellula basali aseptata vel multisepata, recta vel tortuosa, 3-102.5 μm longa; cellula apicaii globosa, angulosa integra, 9-12.5 x 10-12 μm. Perithecia dispersa, globosa, verrucosa, ad 115 μm; sporaellipsoidae, plerumque indivisae atque uniseptatae, cellulis inequalis, 48.5-49.5 x 18.5-21.5 μm.

Colonies hypophyllous, thin spreading, up to 8 mm in diameter. Hyphae smooth-walled, crooked, branching alternate to irregular at acute angles, closely reticulate, cells 9-25 x 4.5-6.5 μm, capitate hyphopodia alternate, antrorse to reflexed, 15.5-115 μm long; stalk cells aseptate to several septate, straight to tortuous, 3-102.5 μm long; head cells globose, narrowly ovate, angular, entire, 9-12.5 x 10-12 μm. Perithecia scattered, globose, verrucose, up to 115 μm; spores ellipsoidal, mostly remain aseptate but few spores single septate, cells unequal, 43.5-49.5 x 18.5-21.5 μm.

Holotype: On leaves of Cinnamomum malabatrum (Burm. f.) Blume, in the forest along the road from Painavu to Kulamavu, Idukki, Kerala, April 18, 1982. V. B. Hosagoudar MII 72696.

Host range: Cinnamomum malabatrum (Burm. f.) Blume.

Distribution: India: Kerala, Idukki.
This species is named in honour of Dr. N. P. Balakrishnan, for his valuable contributions to the Flora of India.

**Armatella cinnamomi** Hansf. & Thirum. in *Farlowia* 3: 286, 1948.

Colonies hypophyllous, thin confluent. Hyphae smooth-walled, undulating to crooked, branching irregular at acute angles, loosely reticulate, cells 20-30 x 4-5 μm. Capitate hyphopodia alternate, unilateral, straight to curved, spreading, 10-20 μm long; stalk cells mostly cylindrical, 2-5 μm long; head cells globose, cylindrical, narrowly ovate, occasionally subglobose, 6-15 x 5-10 μm. Capitate hyphopodia alternate, unilateral, straight to curved, spreading, 10-20 μm long; stalk cells mostly cylindrical, 2-5 μm long; head cells globose, cylindrical, narrowly ovate, occasionally subglobose, 6-15 x 5-10 μm.

**Materials examined:** Material was not available for the present study.

**Host range:** *Cinnamomum zeylanicum* L.

**Distribution:** India: Karnataka, Balehonnur.

The description and figure based on Hansf. and Thirum. (1948).

**Armatella cinnamonicola** Hansf. in *Reinwardtia* 3: 87, 1954.

Colonies epiphyllous, thin to subdense, crustaceous, up to 4 mm in diameter, confluent. Hyphae crenulated, straight to substraight, branching alternate to irregular at acute angles, loosely reticulate, cells 15-40 x 6.5-9 μm, outer wall crenulated except the growing tips. Capitate hyphopodia alternate, antrose to spreading, straight to curved, 16.5-23 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells ovate, broadly conoid, rarely globose, 13-20 x 8-13 μm, outer wall crenulated. Mucronate hyphopodia not seen. Perithecia seated on tortuous exhyphopodiate mycelia, scattered, globose, verrucose, up to 215 μm; spores initially hyaline, continuous, oblong with rounded ends, dumb-bell shaped,

![Fig. 2. Armatella cinnamomi Hansf. & Thirum.](image-url)

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while mature spores 1-septate with equal cells, cinnamon brown to dark-brown, 23-30 × 10-13 μm, the germinating cell enlarges to form capitate hyphopodia and the other one empties and collapses.

**Materials examined**: On leaves of *Cinnamomum malabaricum* (Burm. f.) Blume, in the forest along the road from Painavu to Kulamavu, April 18, 1982, V.B. Hosagoudar.

**Host range**: *Cinnamomum malabaricum* (Burm. f.) Blume

**Distribution**: India Kerala, Idukki.

**Armatella cryptocaryae** Hosagoudar, *sp. nov.*

Plagulae epiphyllae, tenuis, crustosae, ad 2 mm diam. Parietibus hypharum laevigatus, hyphis rectis vel subtectis, alternatim vel irregulariter acute ramosis, laxe reticulatis, cellulie 12-18.5 × 4.5-6.5 μm. Hyphopodia capitata alternata, antrorsa vel patentia, 15.5-25 μm longa; cellula basali aseptata, cylindracea vel cuneata, 3-6.5 μm; cellula apicalis ovata, cuneata, 12-18 μm. Hyphopodia capitata alternata, antrorsa vel patentia, 15.5-25 μm longa; cellula basali aseptata, cylindracea vel cuneata, 3-6.5 μm; cellula apicalis ovata, cuneata, 12-18 μm. Hyphopodia capitata alternata, antrorsa vel patentia, 15.5-25 μm longa; cellula basali aseptata, cylindracea vel cuneata, 3-6.5 μm; cellula apicalis ovata, cuneata, 12-18 μm. Perithecia dispersa, in exohyphopodiate mycelium, ad 140 μm; spores ellipsoidae, unisegmentae, 31-37 x 12-15.5 μm.


**Host range**: *Cryptocarya bourdillonii* Gamble.

**Distribution**: India: Kerala, Pamba

Colonies epiphyllous, thin, crustose, up to 2 mm in diameter. Hyphae smooth walled, straight to substraight, branching alternate to irregular at acute angles, loosely reticulate, cells 12-18.5 × 4.5-6.5 μm. Capitate hyphopodia alternate, antrorsa to spreading, 15.5-25 μm long; stalk cells single celled, cylindrical to cuneate, 3-6.5 μm; head cells ovoid, conoid, slightly angular, entire, outer wall crenulated, 12-18.5 × 9-12.5 μm. Perithecia scattered, seated on exohyphopodiate mycelium up to 140 μm; spores ellipsoidal, 1-septate, 31-37 x 12-15.5 μm.

![Fig. 3. Armatella cinnamomicolae Hansf.](image-url)
Armatella indica Hosagoudar, sp. nov.

Plagulae hypophyllae, carbonaceus nigrae densae, velutinae, ad 5 mm diam. Parietibus hypharum laevigatus, hyphis anfractus, alternatim vel irregulariter acuteque ramosis, dense reticulatis, cellulis 12.5-31 x 6-9.5 μm. Hyphopodia capitata alternata et ad 5% opposita, antrorsa vel patentia, 15.5-21.5 μm longa; cellula basali aseptata, cylindracea vel cuneata, 6-9.5 μm longa; cellula apicali ovata, globosa angulata et raro lobata, 9-12.5 x 12.5-15.5 μm. Perithecia dispersa, verrucosa, ad 310 μm; spores aseptatae vel septatae, brunnea, 46.5-52.5 x 18.5-21.5 μm.


Colonies hypophyllous, carbonaceous black, dense, velvety, up to 5 mm in diameter. Hyphae smooth walled, crooked, branching alternate to irregular at acute angles, closely reticulate, cells 12.5-31 x 6-9.5 μm. Capitate hyphopodia alternate, about 5% opposite, antrorse to spreading, 15.5-21.5 μm long; stalk cells single celled, cylindrical to cuneate, 6-9.5 μm long; head cells ovate, globose, angular, rarely lobate, 9-12.5 x 12.5-15.5 μm. Perithecia scattered verrucose, up to 310 μm; spores initially aseptate while one septate at maturity brown, 46.5-52.5 x 18.5-21.5 μm.

Holotype: On leaves of Cinnamomum malabatrum (Burm. f.) Blume.

Host range: Cinnamomum malabatrum (Burm. f.) Blume.

Distribution: India: Kerala, Idukki.

Materials examined: On leaves of Persea macrantha (Nees) Kosterm., Pudukadu (Lower Sheikalmudy), Coimbatore, Tamil Nadu, Jan. 17, 1987, V.B. Hosagoudar HCIO 39303 (Type)

Fig. 5. Armatella indica sp. nov.
**Host range**: *Persea macrantha* (Nees)  
**Distribution**: India: Tamil Nadu, Costerm.

*Host range*: *Persea macrantha* (Nees)  
**Distribution**: India: Tamil Nadu, Costerm.

*Himerosporium litsea* P. Henn. in Bot. Jahrb. Syst. 32: 42, 1903.  

Colonies hypophyllous, thin, crustaceous, up to 6 mm in diameter, rarely confluent. Hyphae smooth walled, substraight to undulating, branching mostly alternate at wide angles, loosely reticulate, cells 16-30 x 6-8 μm. Capitate hyphopodia alternate, about 5% opposite, antrore, straight to curved, 15-20 μm long; stalk cells single celled, cylindrical to cuneate,

**Fig. 6. Armarella katamotai** Hosagounder

**Fig. 7. Armarella litsea** (P. Henn.) Theiss. & Sydow
3-6.5 μm long; head cells globose, ovate, stellately sublobate, 11-13.5 x 15-16 μm. Perithecia seated on tortuous exhyphopodiate mycelia, scattered, verrucose, up to 300 μm; spores initially hyaline and continuous, oblong with rounded ends, dumb-bell shaped, while matured spores 1-septate with unequal cells, 30-36.5 x 11.5-13 μm. During germination one of the spores enlarges to produce capitate hyphopodia and the other empties and collapses.


Host range: Neolitsea zeylanica Merr., Daphnidium pulcherrima Nees.

Distribution: India: Karnataka, Balehonnur; Kerala, Idukki; Tamil Nadu, Pudukadu; West Bengal, Darjeeling, Aligarh forest

Armatella phoebeola Hosagoudar, sp. nov.

Plagulae hypophyllae, subdense vel dense, ad 5 mm diam. Parietibus hyphaearum leavigatus, hyphis suberectis vel anfractus, alternatim vel irregulariter lateque ramosis, laxe vel dense reticulatis, cellulis 12-31 x 3-6.5 μm. Hyphopodia capitata alternata, ad 5% opposita, antrosera, patentia, tortuosa, 12-40 μm longa; cellula basali aseptata vel multisepata, recta vel tortuosa, 3-28 μm longa; cellula apicali globosa, angulata vel leniter lobata, recte vel curvula, 9-12.5 x 9-11 μm. Perithecia dispersa, verrucose, in dense reticulatis mycelii ad 186 μm; spores cinnamon brown, aseptate vel 1-septatae, 40-43.5 x 15.5-18.5 μm.

Colonies hypophyllous, subdense to dense, up to 5 mm in diameter. Hyphae smooth walled, substraight to crooked, branching alternate to irregular at wide angles, loosely to closely reticulate, cells 12-31 x 3-6.5 μm. Capitate hyphopodia alternate, about 5% opposite, antrose, spreading, tortuous, 12-40.5 μm long; stalk cells aseptate to several septate, straight to tortuous, 3-28 μm long; head cells globose, angular to slightly lobate, straight to curved, 9-12.5 x 9-11 μm. Perithecia scattered, verrucose, seated on densely reticulate mycelia, up to 186 μm; spores cinnamon brown, aseptate to 1-septate, 40-53.5 x 15.5-18.5 μm.

Holotype: On leaves of Phoebe lanceolata

Fig. 8. Armatella phoebeola sp. nov.

Host range: Phoebe lanceolata Nees

Distribution: India: Kerala, Idukki.

ACKNOWLEDGEMENTS

I am grateful to Dr. N. C. Nair, former Joint Director and Dr. N. P. Balakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

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Prataprajella, a new genus of the family Meliolaceae

by

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With 1 figure


Abstract: Prataprajella, a new genus of the family Meliolaceae, is described and illustrated with P. turpuniicola (Hosagoudar) comb. nov. (Asteridiella turpuniicola Hosagoudar as type species). Prataprajella turpuniicola (Yamam.) comb. nov., based on Irenina turpuniicola Yamam., is recognized as a second species in the genus.

Key words: Prataprajella, new genus, Meliolaceae, black mildews.

Fries (1823) proposed the genus Meliola based on Sprengel's (1820) three collections. Bornet (1851) emended the generic description, including the six species then known. Gaillard (1892), in his monograph, recognized 111 species, excluding about 30 names. Arnaud (1918) was the first to raise doubt about the type species of the genus Meliola. After considering the nomenclatural aspects, Toro (1952) selected Meliola trichostroma (Fr.) Toro as the lectotype.

The chatacters of the genus Meliola are as follows: "foliicolous; hyphae brown, septate, branched, hyphopodiate, hyphopodia of two types, capitate and mucronate; capitate hyphopodia two celled, the lower stalk cell cylindrical, and the upper head cell globose, entire to lobate. Mucronate hyphopodia (phialides) conical to ampulliform, single celled. Mycelial setae arising from the hyphae, straight to flexuous, simple to branched, perpendicular to the host surface. Perithecia globose, usually non-osiolate; asci borne in a hymenium, clavate, gelatinous and early evanescent; ascospores brown, 3-4 septate, obovoidal, cylindrical to fusiform".

Theissen and Sydow (1917) restricted the circumscription of the genus Meliola by proposing a new genus Irene with I. inermis (Kalch. & Cooke) Theiss. & Sydow as type, to accommodate species lacking mycelial and perithecial setae. von Höhnel (1919) proposed Appendiculella, with A. calostrona (Desm.) Höhnel as type, to accommodate those species of Irene having larviform perithecial appendages. Theissen (1913) proposed the genus Amazonia with A. asterinoides (Wint.) Theiss. Because of its radial, circular perithecia, this genus was placed under the family Microthyriaceae. von Höhnel (1918) showed the existence of thin walled, completely...
closed perithecia under the brown shield. Hence, *Amazonia* was brought under the group Meliolineae. Stevens (1927) made further division of the genus *Irene* by proposing the genus *Irenopsis* with *I. tortuosa* (Wint.) Stev. as type. Hansford (1961) discovered that McAlpine's (1897) genus *Asteridiella* with *A. solani* McAlpine as the type had the characters of *Irene* Theiss. & Sydow. Hence, McAlpine's genus *Asteridiella* has priority.

Hansford (1961), in his monumental work of Meliolineae, recognized all the above genera as having unique characters. Müller & von Arx (1973) added two more genera, namely *Armatella* and *Diporotheca*. The former genus agrees well with the characters of the Meliolaceae but has one septate ascospores, while the latter genus is rhizophylous and lacks the typical characters of this group. Eriksson & Hawksworth (1986) included 21 genera along with three doubtful genera in the family Meliolaceae of the order Meliolales. However, only the genera *Armatella*, *Amazonia*, *Appendiculella*, *Asteridiella*, *Irenopsis* and *Meliola* have the unique characters of the family Meliolaceae. The status of the genus *Amazoniella* Bat. & Maia is yet to be evaluated.

During a survey of these meliolaceous fungi in the tropical forests of southern India, Idukki District of Kerala state, the author came across the host *Turpinia malabarica* Gamble (Staphyleaceae) infected by a meliolaceous fungus. This appeared to be a species of the genus *Asteridiella* and was named *A. turpinicola* Hosagoudar (Hosagoudar and Goos 1989). On further study, it is concluded that the repent and non-hyphopodial setae arising from the mycelium just below the perithecia distinguishes it from the genus *Asteridiella*, and that it merits recognition as a new genus. Hence, it is proposed to accommodate this fungus in the new genus *Prataprajella*.

**Prataprajella** gen. nov.

*Plagulae foliicolaes, amphigenae; hyphae foliicolae, superficiae, hyphopodiateae; hyphopodia bi-typa:* hyphopodia capitata vel hyphopodia mucronata; hyphopodia capitata bi-cellulata, cellula apical et cellula basali; cellula basali clyndrica vel cuneata; cellula apicali globosa, integra vel lobata et haustoria in. Hyphopodia mucronata unicellula, conica vel ampullacea, illis capitatis commixta vel in hyphis distinctis evoluta. Setae peritheciales et appendicis nullae. Setae myceliales nullae. Appendices myceliales exorior a mycelia sursum peritheciales repentibus, larvalibus, flexuosus, aureus, simplicibus, dispersus, non-hyphopodiatus; perithecia globosa, plus et minus ostiolata; ascii non-persistentibus; ascospores brunnea, 3-4 septate, constrictae, rectae vel curvulae.

Colonies foliicolous; hyphae foliicolous, superficial, hyphopodiatae; capitata hyphopodia two celled, the lower cylindrical to cuneate cell is called the stalk cell, apical or head cell globose, entire to lobate which produces a haustorium from its lower surface into the host epidermis; mucronate hyphopodia single-celled, conical to ampulliform. Perithecial setae and appendages lacking. Mycelial appendages arise from mycelia just below the perithecia, wavy, golden yellow, simple, spreading, lacking hyphopodia. Perithecia globose, with or without ostiole. Ascospores brown, 3-4 septate, constricted, straight to curved.
Type species

Prutaprajella turpiniicola (Hosagoudar) comb. nov.


Colonies amphigenous, mostly hypophyllous, dense, up to 3 mm in diameter. Hyphae straight to substraight, branching alternate to opposite at wide angles, loosely to closely reticulate and forming an almost solid mass of mycelium, cells 16-32 × 8-12 μm. Capitate hyphopodia alternate, spreading, antrobose, 26-30 μm long; stalk cells cylindrical to cuneate, 6-10 μm long; head cells globose, stellately lobed, 18-20 × 16-24 μm. Mucronate hyphopodia few, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 20-24 × 8-10 μm. Mycelial appendages larviform, wavy, golden brown, simple, spreading, up to 196 μm long and 7-8 μm broad, tip obtuse, simple to twisted, a few appendages were even longer than 1000 μm; ascospores fusiform, predominantly curved, 3-septate, constricted, 46-56 × 16-20 μm.

Material examined: On leaves of Turpinia malabarica Gamble (Staphyleaceae), Idukki, Kerala, India, April 4, 1982, V.B. Hosagoudar HCIO 40483 (Type), MH 73701 (isotype).

Paratypes: MH 73623, 74630, 78930, 78928, 78961.

This genus is named in honour of Dr. Pratapraj B. Chavan, who introduced the author to the field of mycology.
Prataprajella turpiniae (Yamam.) comb. nov.


On leaves of Turpinia formosana from Formosa, Yamamoto (type), Paratype: On T. pomifera, Philippines PBS 30109 (FLS).

Hansford (1961), while placing this species under Appendiculella, commented that no species of Meliola hitherto known possesses perithecial appendages like those in Irenopsis. In the material examined, the appendages are not mycelial setae, as found in the genus Meliola, but are similar to those of the perithecia of Irenopsis. They differ in being produced on mycelial hyphae, around the base of the perithecia and in being repend as well as far longer than any hitherto discovered in that genus.

Acknowledgements

I am grateful to Prof. Roger D. Goos, University of Rhode Island, U.S.A. and Prof. John Webster, University of Exeter, England for reviewing the manuscript.

References

MELIOLALES OF INDIA

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ABSTRACT

The paper gives a list of 277 meliolaceous fungi reported from India representing the genera Amazonia, Appendiculella, Armatella, Asteridiella, Diporotheca, Irenopsis and Meliola. Species are arranged under their host families alphabetically and their distribution is also mentioned. New names, Meliola srinivasulu and M. malloticola have been given to M. plumeriae Srinivasulu and M. malloti Srinivasulu, respectively.

The single family Meliolaceae (Hansford, 1946), of the order Meliolales (Eriksson & Hawksworth, 1986), is based on the genus Meliola Fries (1925). The description of the genus was emended by Bornet (1951), and Toro (1952) selected the lectotype for the genus, M. trichostroma (Kunze) Toro. Subsequently, Amazonia, Appendiculella, Armatella, Asteridiella, Diporotheca and Irenopsis were added to this family having the common characters as that of Meliola (Muller & Arx, 1973). All these genera can be distinguished by the morphology of the perithecia, presence or absence of the perithecial or mycelial setae and appendages. However, inclusion of the genus Diporotheca Gorodon & Shaw (1960) in this group is rather controversial because of its saprophytic and rhizophyllous nature.

The first report of the genus Meliola from India was by Cooke (1880, 1884), M. densa Cooke and M. zigzag Berk. & Br., collected from Belgaum, Karnataka. Hansford & Thirumalachar (1948), Thite & Kulkarni (1973, 1978), Patil & Thite (1974), Thite & Patil (1982, 1983), Srinivasulu (1974), Hosagoudar 1985, 1986, 1987 a, b, c, 1988 a, b, c, 1989, Hosagoudar & Raju (1985), Hosagoudar & Antony (1988), Hosagoudar & Braun (1989) Hosagoudar & Goos (1989, 1990), Hosagoudar & Manian (1984), Hosagoudar & Rajendran (1989), Hosagoudar et al. (1988, 1989) have collected considerable number of meliolaceous fungi mostly from the Western Ghats regions of the Peninsular India. Kar & Maity (1970, a, b, 1971, 1972), Kar & Bhattacharya (1982), Maity (1978) have collected these fungi from west Bengal, while, Kapoor (1967) reported some of these species from Sikkim. Few more scattered reports of these fungi have been published from the other parts of India. An attempt has been made here to give the consolidated checklist of the meliolaceous

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fungi reported from India. All the fungal species are arranged alphabetically under their respective host families, which are also arranged alphabetically. The abbreviations used after the host names regarding their distribution are: A—Assam, A.P.—Andhra Pradesh, C—Karnataka, H.P.—Himachal Pradesh, I—India (exact locality not known), K—Kerala, M—Maharashtra, O—Orissa, S—Sikkim, T.N.—Tamil Nadu U.P.—Uttar Pradesh.

**ACANTHACEAE**

*Meliola acanthacearum* Hansf.
On *Dicliptera foetida* (M).

*Meliola acanthacearum* Hansf. var. *occidentalis* Hansf.
On *Rutgii sisparensis* (K)

*Meliola barleriae* Srinivasulu
On *Barleria strigosa* (M)

*Meliola blepharidis* Thitc & C.R. Patil
On *Blepharis asperrima* (M)

*Meliola culebrensis* Hansf.
On *Strobilanthes reticulatus* (M)

*Meliola geniculata* Sydow & Butler
On *Lannea coromandelica* (K)

*Meliola semecarpicola* Hansf.
On *Semecarpus travancorica* (K)

**ANCistroCLADACEAE**

*Meliola ancistrocladi* Hosagoudar
On *Ancistrocladus heyneanus* (K)

**ANGIOPTERIDACEAE**

*Meliola angiopteridis* Hansf. var. *indica* Hosagoudar
On *Angiopteris evecta* (K)

**ANNONACEAE**

*Meliola mitrephorae* Hosagoudar & Rajendran
On *Mitrephora heyneana* (T.N.)

**APOCYNACEAE**

*Meliola alstoniae* Koord.
On *Alstonia scholaris* (M, K)

*Meliola carissae* Doidge
On *Carissa sp.* (C)

*Meliola carissae* Doidge var. *indica* Hansf.
On *Carissa carandas* (K)

*Meliola carissae* Doidge var. spinari Hosagoudar
On *Carissa spinarum* (U.P.)

*Meliola ervatamiae* Hosagoudar
On *Ervatamia heyneana* (T.N.)

*Meliola holarrhenae* Hansf. & Thirum.
On *Holarrhena antidysenterica* (C)

*Meliola ichnocarpi* Hansf. & Thirum.
On *Ichnocarpus frutescens* (C, M)

*Meliola hunteriae* Hosagoudar
On *Hunteria zeylanica* (K)

*Meliola srinivasului* Hosagoudar, nom. nov.
On *Plumeria alba* (M)
Meliola tabernaemontanica Hansf. & Thirum.
On Tabernaemontana sp. (K)

AQUIFOLIACEAE

Meliola khasiensis Hansf.
On Ilex sp. (I)

ARACEAE

Asteridiella pothodis (Hansf. & Thirum.) Hansf.
On Pothos scandens (K)

ARALIACEAE

Meliola dichotoma Berk. & Curt. var. kusanoi Hansf.
On Hedera helix (H.P.)

ARECACEAE (PALMAE)

Meliola palmicola Wint. var. africana Hansf.
On Phoenix spp. (A.P., A, C, W.B.)

Meliola caryotae Srinivasulu
On Caryota urens (M)

ASCLEPIADACEAE

Meliola asclepiadacearum Hansf.
On Asclepias sp. (M)

Meliola secamonis Hansf.
On Asclepiadaceous host (M)

Meliola telosmae Rehm var. tylophorae Hansf.
On Tylophora tenuis (M)

Meliola tylophorae Hosagoudar
On Tylophora capparidifolia (K)

Meliola taxacarpi Hosagoudar & Antony
On Taxacarpus beddomei (T.N.)

ASTERACEAE (COMPOSITAE)

Asteridiella cyclopoda (Stev.) Hansf.
On Vernonia arborea (K)

Meliola coreopsidis Thite & Kulkarni

On Coreopsis aristosa (M)

BIGNONIACEAE

Meliola crescentiae Stev.
On Crescentia sp. and Heterophragma roxburghii (C)

CAESALPINIACEAE

Meliola aethiops Sacc. var. cassiae Rao
On Cassia fistula (A.P.)

Meliola bauhinicola Yamam.
On Bauhinia racemosa (A.P.)

Meliola tararindii Sydow & Sydow
On Tamarindus indica (C, K)

CAPPARACEAE

Meliola balakrishnani Nair & Kaul
On Capparis rotundifolia (M)

Meliola capparidis Hansf.
On Capparis divaricata (M)

CAPRIFOLIACEAE

Meliola goosii Hosagoudar
On Viburnum punctatum (T.N.)

Meliola leycesterae Kar & Maity
On Leycesteria glaucophylle (W.B.)

CELASTRACEAE

Asteridiella gymnosporiae (Sydow) Hansf.
On Maytenus emarginata (M)

Asteridiella perrottetiae (Stev.) Hansf.
On Gymnosporia rothiana (M)

Meliola euonymi Stev. ex. Hansf.
On Euonymus sp. (M)

CLUASIACEAE (GUTTIFERAE)

Meliola ochrocarpi Thite & S.D. Patil
On Mannia suriga (M)

COMBRETACEAE

Amazonia henryi Hosagoudar
On Combretum decandrum (A.P.)

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Hosagoudar

Asteridiella combreti (Stev.) Hansf. var. leonensis Hansf.
  On Terminalia paniculata (K)
Meliola buchenaviae Bat. var. terminaliae
  Nair & Kaul
  On Terminalia tomentosa (M)

CONNARACEAE
Meliola agumbensis (Subhedar & Rao)
  Hosagoudar
  On Roura praineana (C)
Meliola connari Yates
  Connarus sclerocarpus (K)
Meliola connaricola Hansf.
  On Connarus monocarpus (M)

CONVOLVULACEAE
Meliola argyriae M.S. Patil & Thite
  On Argyria hookeri (M)
Meliola clavulata Wingh.
  On Ipomoea sp. and Argyria spp.
  (C, K)
Meliola erycibes-paniculatis Hosagoudar
  On Erycibe paniculata (K)
Meliola malacotricha Speg.
  On Porana paniculata (U.P.)
Meliola malacotricha Speg. var. major Beeli
  On Merremia umbellata and Argyria spp. (K, T.N.)
Meliola quadrispina Rac.
  On Argyria spp. (K, M)

CUCURBITACEAE
Asteridiella confragosa (Sydow & Sydow) Hansf.
  On Trichosanthes tricuspidata (K)

DAPHNIPHYLACEAE
Amazonia daphniphylli M.S. Patil
  On Daphniphyllum neilgherrense (T.N.)

DICAPETALACEAE
Meliola dicipetalae Hansf. & Thirum.
  On Dicipetala gelonioides (C)

EBENACEAE
Meliola diospyri Sydow & Sydow
  On Diospyros spp. (C, K, M)
Meliola diospyricola Hansf.
  On Diospyros montana (M)

ELAEGNACEAE
Meliola elaegni Hansf. & Thirum.
  On Elaegnus kologa (C)

ELAEOCARPACEAE
Asteridiella elaecarpita-tuberculati Hosagoudar
  On Elaeocarpus tuberculatus (T.N.)

ERICACEAE
Amazonia karii Hosagoudar & Balakrishnan
  On Agapetes sp. (W.B.)
Asteridiella pentapterygi Kar & Maity
  On Pentapterygium serpens (W.B.)

ERYTHROPALACEAE
Meliola erythropali Hosagoudar
  Erythropalium populifolium (K, T.N.)

ERYTHROXYLACEAE
Meliola erythroxylifoli Batista & Vital
  On Erythroxylum obtusifolium (K)

EUPHORBIACEAE
Asteridiella crotonis Hosagoudar
  On Croton zeylanicus (K)
Asteridiella macarangicola Hosagoudar
  On Macaranga peltata (K)
Asteridiella malloti (Hansf. & Thirum.) Hansf.
  On Mallotus spp. (K, M)
Meliola bridellae Stev. & Rold.
  On Bridellia tomentosa (M)

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Meliola chandleri Hansf.
On Excoecaria crenulata (K)

Meliola chandleri Hansf. var. excoecartae
Hosagoudar, Lakshmanan & Viswanathan
On Excoecaria crenulata (T.N.)

Meliola drypeticola Hosagoudar
On Drypetes macrophylla (K)

Meliola glochidii Stev. & Rold. ex. Hansf.
var. velutini Hosagoudar
On Glouchidion velutinum (K)

Meliola glochidiicola Yamam.
On Glochidion spp (K, M)

Meliola himalayensis Kapoor
On Bridelia montana (S)

Meliola jatrophae Stev.
On Jatropha glandulifera (M)

Meliola longispora (Gaill.) Stev.
On Euphorbiaceae host (M)

Meliola malloticola, nom. nov.
Basionym: Meliola mallotii Srinivasulu,
Nova Hedwigia Beih. 47: 430. 1974
(non Ciferri, 1954).
On Mallotus philippensis (C)

Meliola ostodis Kapoor
On Ostodes paniculata (S)

Meliola ramosii Sydow & Sydow
On Homonoia riparia (K)

FABACEAE

Meliola atylosiae Hosagoudar
On Atylosia lineata (K)

Meliola bataanensis Hansf. var. keralensis
Hosagoudar
On Desmodium gyrans (K)

Meliola bataanensis Sydow & Sydow
On Miletia rubiginosa (K)

Meliola bicornis Wint.

On Desmodium trequetrum and Dolichos trilobus (C, K)

Meliola buteae Hafiz, Azmatulla & Kafi
On Butea spp. (K, M)

Meliola clitoriae Hosagoudar
On Clitoria ternatea (K)

Meliola erythrinae Sydow
On Erythrina variegata (M)

Meliola mucunae Hansf. var. hirsutae Hosagoudar
On Mucuna hirsuta (K, M)

Meliola matatanensis Hansf.
On Mucuna imbricata (W.B.)

FAGACEAE

Amazonia balakrishmanii Hosagoudar
On Castanopsis armata (A)

Asteridiella quercina Hansf.
On Quercus spp. (U.P., W.B.)

Meliola hystricis Kar & Maity
On Castanopsis hystrix (W.B.)

Meliola manii Hosagoudar
On Castanopsis armata (A)

Meliola melanochaeta Sydow
On Quercus spp. (W.B., S)

GNETACEAE

Meliola gneti Hansf.
On Gnetum ula (C, K, M)

HAMAMALIDACEAE

Meliola symingtoniae Kapoor
On Symingtonia populnea (S, W.B.)

HYPOCRATACEAE

Meliola salaciae Hansf.
On Salacia sp. (S)

ICACINACEAE

Amazonia gomphandrae Hosagoudar
On Gomphandra coriacea (K)
Hosagoudar

Meliola chandrasekharanii Hosagoudar
  On Apodytes dimidiata (K)
Meliola dimidiatae Hosagoudar
  On Apodytes dimidiata (K)
Meliola sarcostigmae Hosagoudar
  On Sarcostigma kleinii (K)
Meliola stemoni i Hosagoudar
  On Gomphandra tetrandra (K)

LAMIACEAE (LABIATAE)
Meliola pogostemonis Hansf.
  On Pogostemon pubescens (K)

LAURACEAE
Amazonia actinodaphnis Hosagoudar
  On Actinodaphne hookeri (K)
Amazonia cinnamomum Hosagoudar
  On Cinnamomum rendah (K)
Armatella balakrishnanii Hosagoudar
  On Cinnamomum malabatrum (K)
Armatella cinnamommi Hansf. & Thirum.
  On Cinnamomum verum (C)
Armatella cinnamomicola Hansf.
  On Cinnamomum malabatrum (K)
Armatella cryptocaryae Hosagoudar
  On Cryptocarya bourdillonii (K)
Armatella indica Hosagoudar
  On Cinnamomum malabatrum (K)
Armatella katumotoi Hosagoudar
  On Persea macrantha (T.N.)
Armatella litsea (P. Henn.) Theiss. & Sydow
  On Neolitsea zeylanica (C, K, T.N., W.B.)
Armatella phoebecola Hosagoudar
  On Phoebe lanceolata (K)
Diporotheca litsea Patil
  On Litsea sp. (T.N.)
Meliola beilschmiediae Yamam. var. cinnamomica Hosagoudar
  On Cinnamomum malabatrum (K)
Meliola drepanochaeta Sydow var. insignis
  Hosagoudar
  On Litsea insignis (T.N.)
Meliola floridensis Hansf.
  On Persea macrantha (T.N.)
Meliola floridensis Hansf. var. pudukadensis
  Hosagoudar
  On Persea macrantha (T.N.)
Meliola linderae Yamam.
  On Actinodaphne hookeri (K)
Meliola litsea Sydow & Sydow var. floribunda
  Hosagoudar
  On Litsea floribunda (K, T.N.)
Meliola litsea Sydow & Sydow var. insignis
  Hosagoudar
  On Litsea insignis (K)
Meliola litsea Sydow & Sydow var. keralense
  Hosagoudar
  On Litsea stocksii var. glabrescens (K)
Meliola litsea Sydow & Sydow var. microspora
  Hosagoudar
  On Litsea floribunda (T.N.)
Meliola litsea Sydow & Sydow var. rotundipoda
  Hansf.
  On Litsea coriacea (K)
Meliola machili Yamam.
  On Persea macrantha (K)
Meliola neolitsea Yamam.
  On Neolitsea scorobiculata (K, T.N.)
Meliola pudukadensis Hosagoudar
  On Litsea sp. (T.N.)
Meliola ramacharii Hosagoudar
  On Persea macrantha (T.N.)

LECYTHIDACEAE
Meliola indica Sydow & Sydow
  On Barringtonia acutangula and Careya
  arborea (A, K, M)

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Meliola indica Sydow & Sydow var. careyae Stev.
  On Carey a arborea (K)
LEEACEAE

Amazonia leuea Hansf. & Thirum.
  On Leea macrophylla (K)

Irenopsis leuea Hansf. var. indica Hosagoudar
  On Leea indica (K)

Meliola bakari Sydow
  On Leea sp. (K, M)

Meliola furcata Lev.
  On Leea macrophylla (M)

LILIACEAE

Meliola gregoriana Hansf.
  On Draceana turniflora (M)

LOBELIACEAE

Meliola lobeliae Stev.
  On Lobelia nicotianaefolia (K)

LOGANIACEAE

Meliola gardneriae Hansf. & Thirum.
  On Gardneria spp. (C)

Meliola petchi Hansf.
  On Strychnos nux-vomica (K)

LYTHRACEAE

Meliola woodfordia Srinivasulu
  On Woodfordia fruticosa (C)

MALVACEAE

Amazonia abutili Hosagoudar
  On Abutilon ranosum (T.N.)

Irenopsis m adalaiense Hosagoudar
  On Kydia calycina (T.N.)

Irenopsis sidae (Rchm) Hughes
  On Sida cordata (T.N.)

Meliola kydiae-calycinae Hansf. & Thirum.
  On Kydia calycina (C)

MELASTOMATACEAE

Meliola a finis Sydow var. indica Hosagoudar
  On Memecylon edule (C)

Meliola heudeletii Gaill.
  On Memecylon edule (A, C, O)

Meliola memecyli Sydow & Sydow
  On Memecylon depressum (K, M)

MELIACEAE

Irenopsis indica (Anahosur) Hosagoudar
  On Aphanamixis polystachya (K)

Meliola aglaicola Hansf.
  On Aglaia minutiflora (K)

Meliola aphanamixidis Hosagoudar
  On Aphanamixis polystachya (T.N.)

Meliola heyniae Hansf. & Thirum.
  On Heynia trijuga (C)

Meliola nairii Hosagoudar
  On Aphanamixis polystachya (K)

Meliola petrakii Stev. & Rold.
  On Dysoxylum malabaricum (K)

MENISPERMACEAE

Meliola cissampelicola Hansf. & Thirum.
  On Cissampelos convolvulaceae (C, K)

Meliola cycleae Hosagoudar
  On Cyclea peltata (K)

Meliola stephaniae Hansf.
  On Stephania japonica, Cyclea peltata (K, T.N.)

MIMOSACEAE

Meliola aethiops Sacc. var. longiseta Deight.
  On Mimosa inis (W.B.)

Meliola albiziae Hansf. & Deight. var. odoratissimae Kapoor
  On Albizia odoratissima (A)
Meliola entadae Hansf.
On Entada scandens (M)

Amazonia abaremae Hosagoudar & Antony
On Abarema bigenina (K)

MORACEAE

Irenopsis benguetensis Stev. & Rold. ex Hansf.
On Ficus spp. (K)

Meliola bangalorensis Hansf. & Thirum.
On Ficus sp. (C)

Meliola ficicola Hansf. & Thirum.
On Ficus sp. C

Meliola ovatifoda Hansf. & Thirum.
On Ficus sp. (C)

MYRSINACEAE

Amazonia peregrina Sydow & Sydow
On Maesa indica (K)

Amazonia suttoniae (Stev.) Hansf.
On Embelia viridi flora (M)

Meliola groteana Sydow & Sydow
On Embelia viridi flora and Maesa indica (C, M)

Meliola transvaalensis Doidge
On Myrsina africana (S)

MYRTACEAE

Amazonia syzygii Hosagoudar
On Syzygium cumini (K)

Asteridiella ohiana (Stev.) Hansf.
On Syzygium claviflora (W.B.)

Meliola densa Cooke
On Syzygium munronii and S. lactum (K)

Meliola Eugeniae-jamboloidis Hansf.
On Syzygium munronii (T.N.)

Meliola eugeniaco/a Hansf. var. amphigena Kar & Maity

On Syzygium jambos (W.B.)

Meliola eugeniicola Stev.
On Eugenia eucalpytoides (C)

Meliola ranganathii Hansf.
On Eugenia sp. (C)

Meliola trichostrona (Kunze) Toro
On Psidium pomifera (M)

OLACACEAE

Meliola olacis Deight.
On Olax wightiana (W)

OLEACEAE

Asteridiella americana Hansf.
On Linociera malabarica and Olea dioica (K, M)

Asteridiella linocieriae (Sydow) Hansf.
On Olea dioica (M)

Meliola deviesii Hansf.
On Jasminum sp. (P)

Meliola gamellipoda Doidge
On Jasminum spp. (K)

Meliola jasmini Hansf. & Stev.
On Jasminum sambac (K)

Meliola jasminicola P. Henn. var. indica Kapoor
On Jasminum spp. (K, W.B.)

Meliola ligustri Hosagoudar
On Ligustrum robustum sp. walker (K)

Meliola linocieriae-malabaricae Hosagoudar
On Linociera malabarica (K)

Meliola malabarensis Hansf.
On Olea sp. (K, T.N.)

Meliola mayapeicola Stev. var. indica Hosagoudar
On Chionanthus mala-elegni (K)

OPILIACEAE

Meliola cansjerae Hansf. & Thirum.
On *Cansjera rhe-di* (C)
*Meliola cansjerinda* Hosagoudar

On *Cansjera ihi1 t'ilii* (K)
*Meliola opiliae* Sydow

**PANDANACEAE**
*Meliola juttingi* Hansf.
On *Pandanus odoratissimus* (K)

**PINACEAE**
*Asterisella-pitya* (Sacc.) Hansf.
On *Taxus baccata* spp. *wallichianii* (U.P.)

**PIPERACEAE**
*Meliola stenospora* Wint. var. *major* Hansf.
On *Piper nigrum* (M)

**PITTOSPORACEAE**
*Meliola polytricha* Kalch. & Cooke
On *Pittosporum dusycaulon* (C)

**POACEAE**
*Meliola arundinis* Pat.
On *Piragmites karka* (A)
*Meliola cymbopogonis* Kapoor
On *Cymbopogon* spp. (K)
*Meliola panici Earle*
On *Ischaemum zeylanicum* and *Desmocysta bipinnata* (K)
*Meliola panicul Earle var. *laciacidis* Hansf.
On *Desmocysta bipinnata* (U.P.)
*Meliola phyllastachydus* Yamamota
On *Bamboo* sp. (T.N.)
*Meliola sacchari* Sydow
On *Saccharum officinarum* (M)
*Meliola them.dae* Stev. & Rol. ex Hansf.
var. *indica* Hosagoudar
On *Themeda cumbaria* (K)

**POLYGONACEAE**
*Meliola polygoni* Srinivasulu
On *Polygonum chinense* (C)

**RHAMNACEAE**
*Appendiculella hoveniae* Kar & Maity
On *Hovenia dulcis* (W.B.)
*Irenopsis tenuissima* (Stev.) Stev. var. *major* Kar & Maity
On *Gouania leptostachya* (W.B.)
*Meliola zizyphi* Hansf. & Thirum.
*Ziziphus* spp. (C, K, M, T.N.)

**ROSACEAE**
*Appendiculella calastronum* (Desm.) Hohnei
On *Rubus* spp. and *Crataegus* sp. (S, W.B.)
*Meliola rubiella* Hansf.
On *Rubus* sp. (S)
*Meliola rubi* Stev. & Rold. ex Hansf. var. *garhwalensis* (Srivastava & Topal)
Hosagoudar & Balakrishnan
On *Pyracantha crenulata* (U.P.)

**RUBIACEAE**
*Meliola anceps* Sydow & Sydow
On *Mussaenda belilla* (K)
*Meliola canthi* Hansf.
On *Canthium* spp.
*Meliola ixorae* Yates
On *Ixora polyantha* (M)
*Meliola ixorae* Yates var. *macrospera* Hosagoudar
On *Ixora* spp. (K)
*Meliola mitragynae* Sydow
On *Mitragyna parviflora* (U.P.)
*Meliola plectroniae* Hansf.
On *Plectronia umbellata* (M)

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Meliola psychotriae Earle
On Pavetta indica (K)

Meliola tawaoensis Hansf.
On Ixora arborea (T.N., W.B.)

Meliola thwaitesiana Hansf.
On Ixora spp. (M)

Meliola weberae Kapoor
On Tarenna asiatica (C, K)

Meliola wendlandiae Hosagoudar
On Wendlandia notoniana (K, M)

RUTACEAE

Amazonia acronychiae Hosagoudar
On Acronychia pedunculata (K)

Meliola atalantiae Hosagoudar
On Atalantia spp. (K)

Meliola bu fieri Sydow
On Citrus aurantifolia (W.B.)

Meliola cadigensis Yates var. glycosmidis
(Kapoor) Hosagoudar
On Glycosmis spp. (K, M, T.N.)

Meliola citricola Sydow & Sydow
On Citrus spp. (K)

Meliola clausenae Hosagoudar
On Clausena indica (K)

Meliola evodiicola Hansf.
On Evodia roxburghiana (M)

Meliola luvungae Hosagoudar
On Luvunga sermentoasa (K)

Meliola paramignyae Hosagoudar
On Paramignya armuta (K)

Meliola rickiana Hansf var. zanthoxyli Hosagoudar
On Zanthoxylum ovata (K)

Meliola tecleae Hansf var. toddaliae-asiaticae Hansf.
On Toddalia asiatica (C, K)

Meliola tenella Pat.

On Atalantia monophylla (C)
Meliola tenella Pat. atalantiae (Pat.) Hansf.
On Atalantia monophylla (T.N.)
Meliola tenella Pat. var. atalantitica Hosagoudar
On Atalantia monophylla (A.P.)
Meliola toddaliicola Hansf. var. indica Hansf.
On Toddalia asiatica (C)
Meliola zanthoxyli Hansf.

SABIACEAE

Asteridiella meliosmae Kar & Maity
On Meliosma simplicifolia (W.B.)

SANTALACEAE

Meliola osyridicola Hansf.
On Osyris arborea (M)

Meliola osyridicola Hansf. var. indica Hosagoudar
On Osyris quadripartita (T.N.)

Meliola scleropyri Hosagoudar
On Scleropyrum pentandrum (K)

SAPINDACEAE

Meliola allophylli Doidge
On Allophylus cobbe (M)

Meliola capensis (K & C) Theiss. var. allophyllicola Hansf.
On Allophylux cobbe (W.B.)

Meliola capensis (K & C) Theiss. var. malyens Hansf.
On Nephelium longan (K, W B)

Meliola commixta Sydow
On Nephelium longan (K)

Meliola nephelii Sacc. var. singalensis Hansf.
On Allophylus serrulatus (K)

Meliola otonephelii Hosagoudar
On Otonephelium stipulaceum (K)
**SAPOTACEAE**

*Meliola jayachandranii* Hosagoudar

On *Isonandra lanceolata* (T.N.)

**SIMAROUBACEAE**

*Meliola ailanthi* Sharma, Mohanan & Florence

On *Ailanthus triphysa* (K)

**SIMARACEAE**

*Meliola salleana* Hansf. var. *smilacis* Hosagoudar

On *Smilax zeylanica* (K)

**SOLANACEAE**

*Meliola mahabaleshwarensis* Srinivasulu

On *Solanum giganteum* (M)

**STAPHYLEACEAE**

*Asteridiella turpinicola* Hosagoudar

On *Turpinia malabarica* (K)

**SYRINGACEAE**

*Irenopsis erio/aenae* Hosagoudar

On *Eriotaenae quinquelocularis* (K)

*Irenopsis helicteridis* Hosagoudar

On *Helicteres isora* (T.N.)

*Meliola heritirolicola* Thite & Kulkarni

On *Heritiera littoralis* (G)

**THYMELAEACEAE**

*Irenopsis mysorensis* Hansf. & Thirum.

On *Gnidia glauca* (C)

**TILIACEAE**

*Irenopsis triumfettae* (Stev.) Hansf. & Deight.

On *Triumfetta* spp. (K)

*Meliola grewiae* Hansf. var. *longispora* Hosagoudar & Raju

On *Grewia tiliaefolia* (M)

*Meliola thirumalchari* Hosagoudar & Rajendran

On *Microcos paniculata* (T.N.)

**TORICELLIACEAE**

*Meliola toricelliae* Kar & Maity

On *Toricellia tiliaefolia* (W.B.)

**VERBENACEAE**

*Asteridiella clerodendricola* Hosagoudar

On *Clerodendrum viscosum* (K)

*Asteridiella formosensis* (Yamam.) Hansf.

On *Callicarpa tomentosa* (K)

*Asteridiella vivekananthanii* Hosagoudar

On *Clerodendrum viscosum* (T.N.)

*Meliola ambigua* Pat. & Guill.

On *Stachytarpheta indica* (M)

*Meliola callicarpae* Sydow

On *Callicarpa tomentosa* (C, M)

*Meliola callicarpica* Yamam.

On *Clerodendrum viscosum* (W.B., C)

*Meliola castlerockensis* Srinivasulu

On *Clerodendrum serratum* (C)

*Meliola clerodendricola* P. Henn.

On *Vitex leucoxylon and Clerodendrum viscosum* (C, K)

*Meliola clerodendricola* P. Henn. var. *micromera* (Sydow & Sydow) Hansf.
Hostgoudar

On Gmelina spp. (C, K)
Meliola premnicola Hosagoudar
On Premna glaberrima (K)

ACKNOWLEDGEMENTS

The author is grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for their valuable suggestions and encouragements.

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SUPPLEMENT TO HANSFORD'S 'THE MELIOLINEAE MONOGRAPH'—II

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ABSTRACT

This is the second list of 112 taxa which are additions to Hansford's "The Meliolineae Monograph". All the taxa listed are distributed among five genera namely, Amazonia, Armateila, Asteridiella, Irenopsis and Meliola.

INTRODUCTION

The recent available Monograph on Meliaceae is of Hansford (1961) and Hansford in 1962, validated some of the taxa included in his Monograph. Hansford (1963) also supplemented his work with icons. Deighton (1967) corrected the nomenclature of some species of Meliaceae. The first supplementary list of 169 taxa (including 5 doubtful taxa) to the Hansford's Monograph was provided by Katumoto & Hosagoudar (1989). This is the second supplementary list of 112 taxa.

ACANTHACEAE

On Nilgirianthus heyneanus from India.

AGAVACEAE

On Agave shaferi from Cuba

ANACARDIACEAE

On Buchanania lanzan from India.

ANCISTROCLADACEAE

Meliola ancistrocladi Hosagoudar in Hosagoudar & Goos, Mycotaxon 37 : 218. 1990 (as ancistrocladii)
On Ancistrocladus heyneanus from India.

ANGIOPTERIDACEAE

On Angiopteris evecta from India.

ANNELONACEAE

On Mitrepbora heyneana from India.
On Carissa spinarum from India.

On Ervatamia heyneana from India.

On Hunteria corymbosa var. roxburghiana from India.

On Copernicia pauciflora from Cuba.

On Lyonia calycosa from Cuba.

Meliola hemidesmi Kamal & Gupta, Indian J. Mycol. Pl. Pathol. 16 : 245. 1986 (as hemidesmiae)
On Hemidesmus indicus from India.

On Toxocarpus beddomei from India

Meliola tylophorae Hosagoudar in Hosagoudar & Goos, Mycotonax 37 : 250. 1990.
On Tylophora capparidifolia from India.

On Eupotorium sinuatum from Cuba.

On Tabebuia lepidophylla from Cuba.

On Burseraceae member from Amazonia.

On Bauhinia sp. from Amazonia.

On Labelia sp. from Cuba.

On Viburnum sp. from China.

On Chrysobalanaceae member from Amazonia.
COMBRETACEAE

On Combretum decardium from India.

CONNARACEAE

On Rourea praineana from India.

CONVOLVULACEAE

Meliola erycibis-paniculatis Hosagoudar in Hosagoudar & Goos, Mycotaxon 37 : 231. 1990. (as erycibis-paniculatae)
On Erycibe paniculata from India.

CYRILLACEAE

On Purdiaea ophitecotl from Cuba.

DAPHNIPHYLACEAE

On Daphniphyllum neilgherrense from India.

EUPHORBIACEAE

On Croton reticulatus from India.

On Euphorbiaceae member from Amazonia.

On Macaranga peltata from India.

Meliola acunae Schmiedeknecht, Beitrage zur Phytotaxonomie 38 : 192. 1989 (as acunai).
On Leucoeroton wrightii from Cuba.

On Excoecaria crenulata from India.

On Drypetes macrophyllus from India.

On Glochidion velutimum from India.


ERYTHROPALACEAE

Meliola erythropali Hosagoudar in Hosagoudar & Goos, Mycotaxon 37 : 232. 1990 (as erythropali).
On Erythropalum populifolium from India.
On Castenopsis armata from India.

Meliola dimidiatae Hosagoudar in Hosagoudar & Goos, Mycotaxon 37 : 229. 1990.
On Apodytes dimidiata from India.

On Mappianthus iodoides from China.

Meliola sarcostigmæ Hosagoudar in Hosagoudar & Goos, Mycotaxon 37 : 246. 1990.
On Sarcostigma kleinii from India.

On Stemonurus tetrandrus from India.

LAURACEAE

On Actinodaphne hookeri from India.

On Cinnamomum riparium from India.

On Persea macrantha from India.

Meliola beilschmeidiae Hansf. var. cinnamomica Hosagoudar in Hosagoudar & Goos, Mycotaxon 37 : 222. 1990.
On Cinnamomum malabatrum from India.

On Litsea insignis from India.


On Persea macrantha from India.

Meliola litsea Sydow var. floribunda Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 237. 1990.

On Litsea floribunda from India.

Meliola litsea Sydow var. insignidis Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 237. 1990 (as insignis)

On Litsea insignis from India.

Meliola litsea Sydow var. keralense Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 238. 1990.

On Litsea stocksii var. glabrescense from India.


On Litsea floribunda from India.


On Litsea sp. from India.


On Persea macrantha from India.

LEEACEAE

Irenopsis lecæ Hansf. var. indica Hosagoudar in Hosagoudar & Goos, Mycotaxon 36:

On Leça indica from India.

MAGNOLIACEAE

Appendiculella michelicola Yang, Acta

Mycologica Sinica 8:2. 1989 (as michelica).

On Michelia maudia from China.

MALPIGHIACEAE


On Triopterys jamacensis from Cuba.

MELASTOMATAEAE


On Memecylon edule from India.

MENISPERMACEAE

Meliola cyclææ Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 228. 1990.

On Cylcea peltata from India.


On Cissampelos pareira from Cuba.

MELIACEAE

Meliola aphanamixidis Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 404. 1990.

On Aphanamixis polystachya from India.

Meliola nairii Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 409. 1990.

On Aphanamixis polystachya from India.

MIMOSACEAE


On Abarema bigemina from India.

MYRTACEAE

Amazonia syzygioides Hosagoudar in Hosagoudar & Goos, Mycotaxon 36: 236. 1990.
Hosagoudar

**OLEACEAE**


On Linociera sp. from Cuba.

Meliola ligustri Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 236. 1990.

On Liguistrum wakeri from India.


On Linociera malabarica from India.

Meliola mayapelicola Stev. var. indica Hosagoudar, Nova Hedwigia

On Linociera malabarica from India.


On Cansjera rheedi from India.

**POACEAE**

Meliola themedae Stev. & Rold. ex Hansf. var. indica Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 249. 1990.

On Themeda cymbaria from India.

**RHAMNACEAE**


On Gouania microcarpa from India.

**ROSACEAE**


On Pyracantha crenulata from India.

**RUBIACEAE**


On Antirhea lucida from Cuba.


On Ixora elongata from India.


On Wendlandia notoniana from India.

**RUTACEAE**


On Acronychia pedunculata from India.


On Acronychia pedunculata from China.


On Atalantia wightii from India.

Meliola clausenae Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 227. 1990.

On Clausena indica from India.

Meliola luvungae Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 239. 1990.

On Luvungia eleutherandra from India.


On Paramignya armata from India.

Meliola rickiana Hansf. var. zanthoxyli Hosagoudar in Hosagoudar & Goos Mycotaxon 37: 245. 1990.

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On Zanthoxylum ovata from India.
Meliola tenella Pat. var. atlantiicola Hosagoudar, J. Econ. Tax. Bot. 11 : 159. 1987
(as atlantiicola)
On Atilantia monophylla from India.

SANTALACEAE
On Dendrotrophe frutescens from China.
On Scleropyrum wallichianum from China.
On Osyris quadrirpartita from India.
On Scleropyrum pentandrum from India.

SAPINDACEAE
On Sapindaceae member from Amazonia.
On Otonphelium stipulacearum from India.

SAPOTACEAE

On Isonandra lanceolata from India.
On Mastichodendron foetidissimus from Cuba.

SCHISANDRACEAE
On Kadsura coccinea from China.

SIMAROBACEAE
On Ailanthus triphysa from India.

SMILACACEAE
Meliola salleana Hansf. var. smilacis Hosagoudar in Hosagoudar & Goos, Mycotaxon 37 : 245. 1990.
On Smilax zeylanica from India.

STAPHYLEACEAE
On Turpinia malabarica from India.

STERCULIACEAE
On Eriolaena quinquelocularis from India.

STYRACACEAE
On Lithocarpus sp. from China.
Hosagoudar

On Lithocarpus sp. from China.

SYMPLOCACEAE

On Symplocos sp. from India.

On Symplocos sp. from Cuba.

On Microcospaniculata from India.

TILIACEAE

On Clerodendrum viscosum from India.

On Clerodendrum viscosum from India.

On Callicarpa sp. from Cuba.

On Premna glaberrima from India.

ACKNOWLEDGEMENTS

The author is grateful to Dr N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

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New technique of mounting Meliolaceous fungi

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The Meliolaceous fungi commonly known as the “Black Mildews” are grouped under Meliolineae. These fungi generally occur on leaves and occasionally infect green and tender stems. They are ectoparasites possessing superficial mycelia and ascocarps. There is a no record of these fungi being grown on culture media, hence they can appropriately be termed “obligate ecto-parasites”. Hansford has taken into account, the nature of the colony, arrangement of the hyphopodia, setae, etc. for distinguishing genera and species. To facilitate the study of these vital taxonomic characters in their natural condition, several mounting techniques have been used. It appears that Gaillard was the first to use the collodion solution for the study of this group with the following composition: collodion 4g., alcohol 10 ml, ether 32 ml, castor oil 2 ml, lactic acid 2 ml. The collodion was dissolved in ether-alcohol solution (alcohol 10 ml and ether 32 ml) to free the colony from it. Stevans modified this collodion solution by omitting oil and acid. Hansford used “collodion-acetone drops”. Many other mycologists suggested the use of “Necol” for mounting Meliolineae, Microthyriales and other ectoparasites. The peeled ‘flips’ were mounted in lactophenol and the slides were sealed with nail liquor or araldite cement. There are some drawbacks in using lactophenol as a mounting medium. While sealing the slide, a trace of lactophenol on the slide or on coverslip will not allow proper sealing resulting in the spoilage of the mounted materials. To overcome this difficulty, the authors have worked out another method which is as follows:

A drop of natural coloured or transparent nail polish is applied to the selected colonies and thinned down with the help of a fine brush carefully so that the colonies are not disturbed. The treated colonies are left to dry in a dust free atmosphere. The nail polish film is completely dry in about half an hour. When dry, a thin colourless apple-rose coloured film or ‘flip’ is formed with the colony firmly embedded in it. Slight pressure on the opposite surface of the leaf and just below the colony lifts the ‘flip’ or it may be eased off with the help of a razor blade or scalpel. The peeled ‘flips’ are spread on the slide and a drop or two of D.P.X. mountant put on them. A coverslip is placed over the mounted material and the slide is gently heated to remove air bubbles. Gentle pressure on the coverslip reduces the thickness of the D.P.X. and the excess can be removed easily after drying. Canada balsam can be substituted for the D.P.X. This method is also applicable to Dematiaceous hyphomycetes, Microthyriales and other ectoparasites which are not hyaline.

Authors are thankful to Dr. N. C. Nair, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore, for encouragement and the senior author is grateful to the Department of Environment, New Delhi, for financial assistance.

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Received for publication August 14, 1984.
A NEW MEDIUM FOR MOUNTING MELIOLACEOUS FUNGI

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MELIOLACEOUS fungi are commonly known as 'Black Mildews' and are often erroneously called 'sooty moulds'. These are epiphyllous fungi possessing superficial, deep brown to dark mycelia, globose perithecia and straight to flexuous mycelial or perithecial setae.

Hansford, in his monograph, used characters like the nature of the colony, arrangement of the hyphopodia, setae, etc to distinguish the genera and species of meliolales. To study such characters in their natural condition, various mounting media like ncel\(^3\) collodion-acetone drops\(^2\) and quick-fix\(^4\) have been suggested by different mycologists. The present authors found another equally good mountant for Meliolales, Microthyriales, Dematiaceous Hyphomycetes and other epiphyllous dematiaceous fungi, the details of which are discussed here.

Clean and bright-white thermocol (a material used for packing fragile or delicate articles) was cut into small slices (2-3 mm in diameter) and 2.5 g of these slices were added to 10 ml of isobutyl methyl ketone. The thermocol readily dissolved producing vigorous effervescence. The solution was stirred and kept open for a while to eliminate air bubbles. The transparent solution was stored in an airtight bottle.

A thin layer of this solution was applied on selected fungus colonies and was allowed to dry up for about 20-30 min. A thin hyaline 'flip' was then formed with the colonies firmly embedded in it. These flips were removed with a razor. A drop of D.P.X. was put on a clean slide and the flip spread on it. A little of D.P.X. was again added on the flip and a clean cover-glass was placed over it. A gentle pressure on the cover-glass brought out the excess D.P.X. which can be removed after drying.

This solution can be used for taking stomatal impressions of the leaves even without detaching the leaves from the plants.

One of the authors (Vmt) is grateful to the Department of Environment, New Delhi for financial assistance.

15 February 1985; Revised 29 April 1985

TAXONOMIC NOTES ON TWO SPECIES OF MELIOLA FR. DESCRIBED FROM MAHARASHTRA, INDIA

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ABSTRACT

The names, Meliola grewiae and M. lobeliae, used by Srinivasulu (1974) to describe new species from Maharashtra were turned out to be later homonyms and hence illegitimate. While the former is a variety (Meliola grewiae Hansf. var. longispora V.B. Hosagoudar & V.S. Raju), the latter forms a mere synonym under Meliola lobeliae Stevens.

Srinivasulu (1974) reported 20 species of Meliola Fr. from Maharashtra State. Two of the ten names proposed by him to describe the new species were found to be later homonyms. Of these, one of them is conspecific while the other needs change of status. This has been effected here.

1. Hansford (1957) described Meliola grewiae on Grewia stylocarpa from Philippines. With the same name, Srinivasulu (1974) described another species from Maharashtra. Obviously, the former name gets priority. Since the species described by Srinivasulu differs from that of Meliola grewiae of Hansford both in the length and breadth of the ascospores, it is treated here as a new variety: Meliola grewiae Hansf. in Sydowia 10: 74. 1957. var. grewiae.

Meliola grewiae Hansf. var. longispora var. nov.


Type: On the leaves of Grewia tiliaefolia Heyne, Maharashtra, Nov. 1967, Srinivasulu s.n. (Marathwada Univ. Herb. no. 136, n.v.), A variateas grewiae differt latus et longus (41-46.5 x 14 - 16 μm) ascosporii.

2. Stevens (1925) described the taxon Meliola lobeliae on the species of Clermontia and Lobelia from Hawaii. Unknowingly, Srinivasulu (1974) used the same specific epithet for his new species found on Lobelia nicotinaefolia Heyne. Although Hansford (1961) questioned the identity of the host Lobelia reported by Stevens, the species described by Srinivasala perfectly matches with that of Stevens. Therefore, no new name is advanced here.

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**ACKNOWLEDGEMENTS**

The authors are grateful to Dr. N.C. Nair, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore, for encouragement and to the Department of Environment, New Delhi, for financial assistance.

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TWO NEW SPECIES OF MELIOLACEAE FROM SOUTH INDIA

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Abstract

The two new species, viz. *Amazonia abaremae* Hosagoudar et Antony and *Meliola taxocarpi* Hosagoudar et Antony are described and illustrated.

While examining the south Indian angiosperm collections at Madras Herbarium, Coimbatore, two plants, *Abarema bigemina* (L.) Kosterm. (Mimosaceae) and *Taxocarpus beddomei* Gamble (Asclepiadaceae) collected from Kerala and Tamil Nadu respectively were found infected with meliolaceous fungi. Critical microscopic study of these fungi revealed that they are hitherto undescribed species of the genera *Amazonia* Theiss. and *Meliola* Fr. emend Bornet.

The two new species viz. *Amazonia abaremae* Hosagoudar et Antony and *Meliola taxocarpi* Hosagoudar et Antony are described and illustrated. The type materials of both the species have been deposited in Herbarium Cryptogamae Indiae Orientalis, IARI, New Delhi (HCIO).

*Amazonia abaremae* Hosagoudar et Antony, sp. nov.

Plagulae epiphyllae, densae, ad 2 mm diam. Hyphae rectae vel subrectae, oppositae acute ramosae, plurumque densae reticulatae et subsolidae. Cellulis 12-15.5 x 4-6 μm. Hyphopodia capitata alternata, dense disposita, dense antorsa, 15-18.5 μm longa; cellulae basali cuneatae, 3-6 μm longa; cellulae apicali ovatae, globosa, integra, 9-12.5 x 9-11 μm. Hyphopodia mucronata paucà, illis capitatis commixa, opposita vel alternata, ampullacea, 15-18.5 x 6-9.5 μm. Setae myceliales et setae peritheciales nolae. Perithecia dispersa vel aggregata, flattened-globosa, ad 202 μm; sporae cylindraceae, 4-septatae, leniter constrictae, 34-37 x 12.5—15.5 μm.

Colonies epiphyllous, dense, up to 2 mm in diameter. Hyphae straight to substraight, branching opposite at acute angles, closely reticulate and form solid mycelial mat, cells 12-15.5 x 4-6 μm. Capitate hyphopodia alternate, closely arranged, closely antorse, 15-18.5 μm long; stalk cells cuneate, 3-6 μm long; head cells ovate, globose, entire, 9-12.5 x 9-11 μm. Mucronate hyphopodia few, mixed with capitate hyphopodia, opposite to alternate, ampulliform, 15-18.5 x 6-9.5 μm. Perithecial and mycelial setae absent. Perithecia scattered to grouped, flattened-globose, up to 202 μm; spores cylindrical, 4-septate, slightly constricted, 34-37 x 12.5-15.5 μm; spores cylindrical, 4-septate, slightly constricted, 34-37 x 12.5-15.5 μm.

Holotype: On leaves of *Abarema bigemina* (L.) Kosterm. (Mimosaceae), Changanacherry, Kerala, Dec. 1986, Antony HCIO.

1. Received for publication, May 4, 1988
2. Regional Herbarium, St. Joseph’s College, Changanacherry - 686 101 (Kerala) India.

We are grateful to Dr. N.C. Nair, Joint Director (Rtd.) and Dr. N.P. Balakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore for their encouragements and suggestions on the work.
There is only one species so far described, *Amazonia acaciae* Frag. & Cif., reported on *Acacia riparia* Bert. ex Spreng. of the host family Mimosaceae from San Domingo. The present species differs from it in having straight to substraight mycelia, longer capitate hyphopodia, ovate to globose and entire head cells of the capitate hyphopodia. Hence, it is proposed here as a new species.

**Fig. 1.** *Amazonia abacraeae* sp. nov.; **Fig. 2.** *Meliola taxocarpi* sp. nov. (Ch. - Capitate hyphopodia; Mh. - Mucronate hyphopodia; Ms. - Mycelial setae; Sp. - Ascospores.)
Meliola taxocarpi Hosagoudar et Antony, sp. nov.

Plagulae amphigenae, plerumque epi-phyliae, densae, ad 2 mm diam, confluentes. Hyphae rectae vel subrectae, alternate, oppositae vel irregulariter acuteque ramosae, laxae vel densae reticulatae, cellulis 21-28 X 6-8 μ.m. Hyphopodia capitata alternata, 21-31 μ.m longa; cellula basali cuneata, 6-9 μ.m. longa; cellula apicali ovata, globosa, integra vel leniter angulosa, raro leniter sublobata, 18-25 X 12-15.5 μ.m. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 18-25 X 6-9 μ.m. Setae myceliales dispersae vel juxta perithecia aggregatae, rectae vel curvulae, simplices, acute, ad 554 μ.m longae. Perithecia dispersa, verrucosa, ad 17 μ.m; sporoæ obovoidae, 4-septae, constrictæ, 43-46.5 X 15.5-22 μ.m.

Colonies amphigenous mostly epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching alternate, opposite to irregular at acute angles, loosely to closely reticulatæ, cells 21-28 X 6-8 μ.m. Capitata hyphopodia alternata, mostly antorsose, 21-31 μ.m long; stalk cells cylindrical to cuneatæ, 6-9 μ.m long; head cells ovata, globose, entire to angular, rarely slightly sublobata, 18-25 X 12-15.5 μ.m. Mucronata hyphopodia mixed with capitata hyphopodia, opposite to alternating, ampulliform, 18-25 X 6-9 μ.m. Mycelial setae scattered to grouped around perithecia, straight to curv'd, simple, acute, up to 544 μ.m long. Perithecia scattered, verrucose, up to 17 μ.m; spores obovoidal, 4-septate, constricted, 43 46.6 X 15.5-22 μ.m.

Holotype: On leaves of Taxocarpus beddomei Gamble (Asclepiadaceae), Upper Godayar, Kanyakumari District, Tamil Nadu, March 14, 1979, A.N. Henry, HCIO.

This species can be compared with Meliola asclepiadacearum Hansf. reported on Cynanchum sp. from Uganda (Hansford, 1961) but differs from it in having amphigenous colonies and in the morphology of the head cells of the capitata hyphopodia. Hence it is proposed here as a new species.

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A New Black Mildew from India

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SUMMARY

The new black mildew *Amazonia gouaniae* on *Gouania microcarpa* is described from India.

*Amazonia gouaniae* V. B. Hosagoudar & U. Braun spec. nov. Plagulae epiphyllae, subdensae, ad 2 mm diam. Hyphae mycelii rectae vel undulatae, opposite vel irregulare at acute angles, laxe reticulatae, cellulis 27–30 × 7–9.5 \( \mu \)m. Hyphopodia capitata alternata, recta vel curva, antrose vel patentia, 18.5–25 \( \mu \)m longa; cellula basali cylindrica vel truncata, 6–9.5 \( \mu \)m longa; cellula apicali ovata, globosa, integra, 12–15.5 \( \mu \)m. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15.5–18.5 × 9–12.5 \( \mu \)m. Perithecia dispersa, globosa-applanata, ad 161 \( \mu \)m diam.; sporae obovoideae, 4-septatae, constrictae, 31–40.5 × 12–15 \( \mu \)m.

Colonies epiphyllous, subdense, up to 2 mm in diam. Hyphae straight to undulate, branchings opposite to irregular at acute angles, loosely reticulate, cells 27–30 × 7–9.5 \( \mu \)m. Capitate hyphopodia alternate, straight to curved, antrose to spreading, 18.5–25 \( \mu \)m long; basal cells cylindrical to truncate, 6–9.5 \( \mu \)m long; head cells ovate, globose, entire, 12–15.5 \( \mu \)m. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 15.5–18.5 × 9–12.5 \( \mu \)m. Perithecia scattered, flattened, globose, up to 161 \( \mu \)m diam.; spores subovoidae, 4-septate, constricted, 31–40.5 × 12–15 \( \mu \)m.


Kar & Maity [2] reported *Iremopsis tenissima* (Stev.) Stev. var. major Kar & Maity on *Gouania leptostachya* DC. from India. The present collection differs from it in the absence of perithecial appendages but having a flattened-globose perithecium which is the characteristic of the genus *Amazonia*. There is no report of the genus *Amazonia* on members of the host family Rhamnaceae [1]. Hence, the present fungus is proposed here as a new species.

Acknowledgements

We are grateful to Dr. N. P. Balakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore, for generously providing us the duplicate material from Madras Herbarium (MH) for our study.

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Fig. 1. *Amazonia gounttiae* sp. nov., Ch – capitulate hyphopodia, Mh – macronate hyphopodia, Sp – ascospores. V. R. Hosagoudar del.

**Key words:** Ascomycetes, black mildew, *Amazonia gounttiae*, new species

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MELIOLACEOUS FUNGI FROM THE STATE OF KERALA, INDIA I.

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SUMMARY

This paper reports in part the results of a survey undertaken during 1981-1984 of the meliolaceous fungi found in the Idukki Hydroelectric Project Area in the State of Kerala, India. Two hundred fifty eight collections were made, resulting in the identification of 103 species and infra-specific taxa. Of these, 32 are undescribed species, and 13 have been determined to be new varieties. These fungi will be described in subsequent papers.

Twenty-seven taxa were recorded from India for the first time. The taxa were distributed in five genera, as follows: Amazonia (4), Armatella (2), Asteridiella (9), Irenopsis (4), and Meliola (84).

Species belonging to genera other than Meliola are treated in this paper, and include four species of Amazonia, with three new species: A. acronychiae, A. actinodaphnis and A. synyptos; two species of Armatella, nine species of Asteridiella, including the four new species: A. clerodendricola, A. crotonis, A. macarangicola, and A. turpinicolae; four species of Irenopsis, including the new species I. eriolaeanae, and a new variety I. leaeae Hansford var. indica.

Keywords: Meliolaceae, Amazonia, Armatella, Asteridiella, Irenopsis, India, Kerala, black mildews.

The Meliolaceae (Order Meliolales), commonly known as the 'black mildews' or 'dark mildews', are epiphyllous parasites on a broad range of host plants. As a group, they show many parallels with the 'powdery mildews' (Order Erysiphales) (Alexopoulos & Mims, 1979) and have been considered by some authors (Wellman, 1972) to be a tropical
counterpart of that group. They are sometimes erroneously referred to as "sooty moulds", which are saprobic fungi associated with scale insects or honey dew producers and which are placed in another order of fungi (Stevens, 1931; Hughes, 1976). In contrast to the sooty moulds, the black mildews are parasites, penetrating their hosts by means of haustoria that arise from the characteristic superficial hyphopodiaceous mycelium. The production of the bulbous haustoria from the lower surface of the head cells of the capitate hyphopodia has been schematically illustrated by Doidge (1921) Roger (1953) and Luttrell (1989). The black mildews are most abundant in the tropics, although some species occur in temperate regions.

As with Erysiphales and the Uredinales, the Meliolales show a high level of host specialization, making it essential to know the host species before any attempt is made to identify these fungi to the species level. The probability of accurately identifying these fungi to the species level or of recognizing a new taxon without first identifying the host are remote. Although attempts have been made to culture these fungi, both in the laboratory and on host plants (Bal, 1919; Hansford, 1961; Thite, 1975; Goos, 1978), no one has yet succeeded in doing so.

Hansford's (1961) monumental monograph of the group gives an account of 1814 taxa, known from throughout the world. About 100 taxa, including homonyms and synonyms, have been reported from India (Bilgrami et al., 1979, 1981; Hosagoudar, 1985).

To learn more about the occurrence of the Meliolaceae in India, a survey was made in the region of the Idukki Hydroelectric Project Area in Kerala. This study was carried out during the period 1981-84, when twenty well-planned collecting trips, covering all seasons, were conducted. These surveys resulted in 256 collections. There are no prior collection records for this region, and several of the collections are new records for India.

THE STUDY AREA

Idukki, the largest hilly district in Kerala State, is located in the Western Ghats, between 9° 15' and 10° 21' of north latitude and 76° 37' and 77° 25' of east longitude. The district extends 115 km north to south and 67 km east to west (Fig. 1). The important feature of this district is the Idukki Hydroelectric Project. The reservoir combines the courses of the Cheruthoni and Periyar rivers and is spread over an area of 59.8 sq km. The catchment area of the reservoir is 649.3 sq km and is situated at an altitude of 695 m.
The estimated reservoir, an area estimated to contain 57,312 hectares including the reservoir and the catchment area, was chosen for study. (see Fig. 1). Climatological data for the area are summarized in Fig. 2.

The following types of forests, as classified by Chandrasekharan (1962), Champion and Seth (1962) and Mohanan (1985), are found in the study area: (1) West Coast Tropical Evergreen Forests, (2) West Coast Semi-Evergreen Forests, (3) Southern Most Mixed Deciduous Forests, and (4) South Indian Subtropical Hill Savanna (grassland with exposed rocks and scattered trees). The under-story of the evergreen forests has been cleared and cash crops such as cardamom, coffee, and ginger are now grown.

METHODS AND MATERIALS

Identification of the host plant is an essential step in the identification of these fungi; hence, it was necessary to collect specimens of the host, preferably with reproductive parts, when making collections of the fungi. Each specimen collected was assigned a collection number, and data regarding pathogenicity, nature of the colonies, nearby infected host plants and other relevant information was recorded. Following collection, the leaf material was dried between blotters, changed daily for several days (Jain and Rao, 1977). Host identity was confirmed with the help of experts and through comparison with specimens deposited in the Madras Herbarium, Coimbatore, (M.H.). For rapid temporary mounts, cellophane tape worked well. For permanent mounts, use of clear nail polish, which is both cheap and readily available, was preferred. With this method, a drop of the nail polish was applied to the fungal colonies, spread carefully with the tip of a fine brush so as not to disturb the colonies, and allowed to dry in a dust free chamber for about half an hour. A "flip" was formed, with the fungal colonies firmly embedded in it. This was easily eased off the leaf with the help of a razor blade or scalpel. A drop of mounting medium, such as Canada balsam or D.P.X. was spread on a clean slide, and the flip carefully placed upon it so as to avoid air bubbles. Two more drops of the mounting medium were placed over the flip, and a clean cover glass gently applied. The slides were allowed to dry for 2 to 3 days in a dust free chamber, after which the excess mounting medium was removed.

In some fungi, septa may not be visible because of the heavy pigmentation. In such cases, fungal material was scraped from the leaf and mounted in 10% KOH solution. After 30 minutes, the KOH was removed and replaced with clear lacto-phenol (prepared according to Rangaswamy,
Both KOH and lacto-phenol are good clearing agents, making the septa visible for study. Camera lucida drawings were made of all specimens.

TAXONOMIC REVIEW

Meliola and its associated genera were formerly considered under the tribe Meliolinae (Stevens, 1927, 1928; Hansford, 1961). Martin (1941) proposed the family Meliolaceae in the Order Meliolales; the description of the family was amended and validated by Hansford (1946). Alexopoulos and Mims (1979) followed this arrangement. Yarwood (1973), however, considered all of the genera of the family Meliolaceae under the Perisporaceae of the Order Erysiphales. Müller and van Arx (1973) considered the Meliolaceae under the unilunicatae of the Order Meliolales. Hawksworth et al. (1983) and Eriksson (1982) placed the Meliolaceae under a broadly conceived Order Dothideales. Hawksworth and Eriksson, in Eriksson and Hawksworth (1986), revised the description of the Order Meliolales proposed by Caumann (1964), treating it under the bitunicatae, and compared the group with the Microthryriales. Luttrell (1989) concluded that the Meliolales belong in the Pyrenomycetes (in the narrow sense) and should not be placed with the Loculoascomycetes, thus essentially agreeing with Müller and van Arx (1973).

For many years, Meliola amphitricha Fries was considered to be the type species of the genus. Arnaud (1918) was the first to question its validity, and subsequent study has shown it to be a nomen confusum. The situation was reviewed by Toro (1952) who resolved the problem by selecting M. trichostroma (Fr.) Toro as the lectotype species. Hansford (1961) accepted Toro's views and segregated from the "catch-all" species, M. amphitricha Fr., more than 100 species, relegating the name M. amphitricha to his list of Species Excludendae, with the comment: "the epithet is discarded".

The number of genera assigned to the family Meliolaceae varies from 5 to 50, depending on the limits established for the family. Stevens (1927, 1928) considered seven genera; Hansford (1961) gave an account of five genera; Ainsworth (1971) recognized about fifty genera; Müller and van Arx (1973) included seven genera, while Eriksson and Hawksworth (1986) included twenty-two genera, three of which were doubtful. To keep the group homogeneous, we are following Müller and van Arx (1973) in treating six genera, namely: Amazonia, Appendiculella, Armatella, Asteroecia, Irenopsis, and Meliola. The saprobic, rhizophyllous, monotypic genus Diporotheca Gordon and Shaw is excluded.
Fig. 1. A map of the Idukki Hydroelectric project area.
Fig. 2. Climatological data for the Idukki Project Area, based on the average of five years (1978-1982).

- Maximum temperature
- Minimum temperature
- Rainfall
- Humidity

Legend:
- Circle: Maximum temperature
- Circle with dot: Minimum temperature
- Triangle: Rainfall
- Triangle with dot: Humidity
We are following Hansford (1961) and Luttrell (1989) in using the term mucronate hyphopodia for the phialide-like branches found on the mycelium of many members of the Meliolaceae. Hughes (1981), following the examination of several species, concluded that these structures do indeed function as phialides, but Luttrell (1989) did not find this to be the case in Meliola floridensis Hansf. Until further evidence is brought forth, it seems advisable to continue use of the established terminology.


Follicolous ectoparasites; mycelium superficial, brown, septate, branched, hyphopodiate; thin, penetration hyphae arising from the apical (head) cells of the capitate hyphopodia penetrating the underlying host epidermis and forming haustoria within the epidermal cells; mucronate hyphopodia often present, mycelial setae present or absent; ascomata superficial, globose, dark, with parenchymatous wall of one or more layers, usually without ostioles, setae and appendages often present on ascomatal wall; ascii borne in hymenium, 2 to 8 spored, evanescent; ascospores 1, 3, or 4 septate, brown at maturity.

KEY TO THE GENERA OF THE MELIOLACEAE: (Sensu Müller & von Arx, 1973)

1. Ascospores 0-1 septate ....... Aminella
2. Ascospores 3-4 septate ....... 2
   2. Mycelial setae present .... Meliola
   3. Mycelial setae absent ...... 3
5. Setae not present on ascomata ...... 4
4. Appendages present on ascomata .......
   4. Appendages not found on ascomata .... 5
6. Ascomata below a shield of radiating mycelium .............. Amazonia
6. Ascomata lacking shield .... Asteridiella

Description of the genera


Type species: *A. psychotriae* (P. Henn.) Theissen, based on *Meliola asterinoides* Winter var. *psychotriae* P. Henn.

   Mycelium superficial, brown, septate, branched, hyphopodiate, without setae. Ascomata superficial, globose, perithecioid, bearing larviform appendages, setae lacking. **Asci** 2-4 spored, evanescent. **Ascospores** 3-4 septate, brown.
   Type species: *A. calostroma* (Desm.) Hoehnel, based on *Sphaeria calostroma* Desm.

   Mycelium superficial, brown, septate, branched, hyphopodiate, lacking setae. Ascomata superficial, globose, lacking appendages and/or setae. **Asci** 4-8 spored, evanescent. **Ascospores** initially non-septate and hyaline, becoming brown and 1 septate at maturity. On germination, the upper cell enlarges to from a capitulate hyphopodium; the other empties and collapses.
   Type species: *A. liliaceae* (P. Henn.) Theiss. & Sydow.

   Mycelium superficial, brown, septate, branched, hyphopodiate, lacking setae. Ascomata superficial, globose, lacking appendages and/or setae, cells protruding. **Asci** 2-4 spored, evanescent. **Ascospores** 3-4 septate, brown.
   Type species: *A. solani* McAlpine.

   Mycelium superficial, brown, septate, branched, hyphopodiate, setose. Ascomata superficial, globose, perithecioid. **Asci** 2-4 spored, evanescent. **Ascospores** 3-4 septate, brown.
   Type species: *I. tortuosa* (Winter) Stevens, based on *Meliola tortuosa* Winter.

   = Amphitrichum Nees ex Spring, Pl. Crypt. Trop. 1820. p. 46, ex Lally
Meliolaceous fungi collected and identified in this survey include 103 taxa, distributed among five genera, as follows: Amazonia (4), Armillaria (2), Asteridiella (9), Irenopsis (4), and Meliola (84). Of these taxa, 32 are new species, 13 are new varieties, and 27 taxa are reported from India for the first time (Hosagoudar, 1987). Formal descriptions of new taxa will be presented in subsequent papers. The highest incidence of meliolaceous fungi occurred at the end of the rainy season.

Twenty-four of the host plants are endemic to the Western Ghats (Ahmedullah & Nayar, 1977). Of these, Apodytes benthamiana (Icacinaceae), Attylocia lineata (Papilionaceae), Cinnamomum malabathicum (Lauraceae), Luma elongata (Rubiaceae), Litsea coriacea, L. stockii var. glaucescens (Lauraceae), Mucuna hirsuta (Papilionaceae), Mischocentrus hirsus (Acanthaceae), Millettia stipulacea (Apocynaceae), Premna ulabena (Verbenaceae), Wendlandia notoniana (Rubiaceae) are the hosts of undescribed taxa. The remainder of the endemic species are hosts of meliolaceous fungi previously unrecorded from India, but known from other tropical countries.

The large number of taxa of meliolaceous fungi found in the small area included in this study illustrates their abundance in the tropics. About one-third of the total taxa encountered have proven to be new. Is this due to a general lack of exploration in the tropics for the meliolaceous fungi, or is it due to the exploration of an area that has previously been totally unstudied? The answer can only be determined by further collecting in unexplored areas.

Results of the present study reveal the affinity of the meliolaceous fungi of India with those of North and South America, tropical Africa, China, and the islands of
Santa Domingo, Puerto Rico, Trinidad, Sri Lanka, Sumatra, Java, The Philippines, New Guinea, New Caledonia and Taiwan. In a paper on an Indian species of Meliolina, Hughes and Pirozynski (1985) stated: "To students of Indian fungi . . . puzzled by consistent similarities of the mycota of India, intertropical Africa and Australo-Papua/New Zealand, we offer a reminder: the mycological road from Ootacamund winds its way to Mysore through Gudalur, Brisbane and Entebbe."

The Genera Amazonia, Armastella, Asteridiella and Ireneopsis

1. Amazonia acronychiae Hosagoudar, sp. nov. Fig. 3

Plagulae amphigenous, pleurophyllae, subdensae, ad 3 mm diam., confluentes. Hyphae brunneae, subrectae, opposite lateaque ramosae, dense reticulatae, cellulis 22-30 x 8-10 μm. Hyphopodia capitata alternata, antrorsa, recta vel curvula, 24-44 μm longa; cellula basali cuneata, 10-22 μm longa; cellula apicali ovata, clavata, angulosa vel irregulariter sublobata, 18-22 x 14-18 μm. Mucronate hyphopodia numerosa, illis capitatis commixta, alternata vel opposita, conoidea vel ampullacea, 22-30 x 8-10 μm. Perithecia dispersa, applanate-globosa, ad 110 μm; sporeae obovoidae, 4-septaeae, constrictae, 42-46 x 20-22 μm.

Colonies amphigenous, mostly epiphyllous, subdense, up to 3 mm in diameter, confluent. Hyphae substraight, branching opposite at wide angles, closely reticulate, cells 22-30 x 8-10 μm. Capitate hyphopodia alternate, closely antrorse, straight to curved, 24-44 μm long; stalk cells cuneate, 10-22 μm long; head cells ovate, clavate, angular to irregularly sublobate, 19-22 x 14-18 μm. Mucronate hyphopodia numerosa, mixed with capitate hyphopodia, conoid to ampulliform, 22-30 x 8-10 μm. Perithecia scattered, flattened globose, up to 110 μm; spores obovoid, 4-septate, constricted, 42-46 x 20-22 μm.

Holotype: On leaves of Acronychia pedunculata (L.) Miq. (Rutaceae), Lakshmi Estate, June 12, 1983, V.B. Hosagoudar HC10 40463.

There is no record of the genus Amazonia on the members of the family Rutaceae (Handford, 1961).

2. Amazonia actinodaphnis Hosagoudar, sp. nov. Fig. 4

Plagulae epiphyllae, densae, ad 5 mm diam., confluentes. Hyphae subrectae vel leniter undulatae, alternatim acutaeque vel lateaque ramosae, laxe reticulatae, cellulis 26-36 x 3-5 μm. Hyphopodia capitata alternata,

Fig. 3 Amazonia acronychiae Hosagoudar. Fig. 4 Amazonia actinodaphnis Hosagoudar.
Fig. 5. *Amazonia syzygi* Hosagoudar. Fig. 6. *Asteridiella clericendricola* Hosagoudar.
Fig. 7. Asteridiella crotonis Hosagoudar. Fig. 8. Asteridiella macarangicola Hosagoudar (drawn to the same scale as Fig. 7).
Fig. 9. Asteridiella turpinicola Bonagoudar. Fig. 10. Irenopsis erioleucae Bonagoudar.
Fig. 11. *Trenopsis leae* Hansford var. *indica* Hosagoudar.
dispersa, antorsa, patentia, recta vel curvula, 16.5-20 um longa; cellula basali cylindracea vel cuneata, 3-8 um longa; cellula apicali ovata, globosa, piriformia, stellate lobata, apice rotundata, 10-15 x 10-16.5 um. Mucronate hyphopodia pausa, illis capitatis commixa, alternata, ampullacea, 13-26.5 x 6-10 um. Perithecia acutoque dispersa, applanate-globosa, verrucosa, ad 165 um; sporae cylindraceae, 4-septatae, constrictae, 43-46 x 15-16.5 um.

Colonies epiphyllous, dense, up to 5 mm in diameter, confluent. Hyphae straight to slightly undulating, branching alternate at acute to wide angles, loosely reticulate, cells 26-36 x 3-5 um. Capitate hyphopodia alternate, scattered, antorse, spreading, straight to curved, 16.5-20 um long. Stalk cells cylindrical to cuneate, 3-8 um long; head cells ovate, globose, piriform, stellately lobate, rounded at the apex, 10-15 x 10-16.5 um. Mucronate hyphopodia few, mixed with capitate hyphopodia, alternate, ampulliform, 13-26.5 x 6-10 um. Perithecia closely scattered, flattened-globose, up to 165 um; spores cylindrical, 4-septate, constricted, 43-46 x 15-16.5 um.


A single species of *Amazonia*, viz. *A. philippinensis* Theiss. has been recorded on *Ulolitsea villosa* from the Philippines (Hansford, 1961). The present species differs from it in having straight to undulating mycelia, stellately lobed head cells of the capitate hyphopodia, smaller perithecia and ascospores. Further, there is no record of the genus *Amazonia* on *Actinodaphne hookeri*.


On leaves of *Maesa indica* (Roxb.) DC. (Myrsinaceae), Idukki, Jan. 10, 1982, V.B. Hosagoudar MH 72647; HCIO 40467.

This species occurs mostly on the leaves also infected with *Meliola oroteana* Syd. but *A. peregrina* can be easily distinguished by its crustose colonies.

4. *Amazonia syzygii* Hosagoudar, sp. nov. Fig. 5

Plagulae amphigenae, subdense, crustosae vel leniter velutinae, ad 2 mm diam., raro confluentes. Hyphae subrectae vel leniter undulatae, plicumque opposite lateque ramosae, densae reticulatae, cellulis 16-20 x 6-8 um. Hyphopodia capitata alternata, recta, antorsa vel patentia, 18-20 um longa, cellula basali cylindracea vel
cuneata, 4-8 μm longa; cellula apicali ovata vel subglobosa, integra, 10-14 x 8-10 μm. Mucronate hyphopodia illis capitatis commixa, opposita vel alternata, conoidea vel ampullacea, 20-24 x 8-10 μm. Perithecia applanate-globoza, dispersa vel aggregata, ad 180 μm; sporae obovatae, 4-septatae, leniter constrictae, 44-48 x 16-20 μm.

Colonies amphigenous, subdense, crustose to slightly velvety, up to 2 mm in diameter, rarely confluent. Hyphae substraight to slightly undulating, branching mostly opposite at wide angles, closely reticulate, cells 16-20 x 6-8 μm. Capitate hyphopodia alternate, straight, antrorse to spreading, 18-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate to subglobose, entire, 10-14 x 8-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, conoid to ampulliform, 20-24 x 8-10 μm. Perithecia flattened-globose, scattered to grouped, up to 180 μm; spores obovate, 4-septate, slightly constricted, 44-48 x 16-20 μm.


So far there is no record of the genus Amazonia on members of the family Myrtaceae (Hansf., 1961).

On leaves of Cinnamomum malabatrum (Burm.f.) Blume (Lauraceae), Idukki, April 18, 1982, V.B. Hosagoudar MH 72696.

Hansford (1954) described this species from Indonesia. The present collection shows variations in having smaller capitate hyphopodia, larger perithecia and smaller ascospores.

On leaves of Neolitsea zeylanica Merr. (Lauraceae), Lakshmi Estate, Dec. 6, 1983, V.B. Hosagoudar MH 78177, 78190; HCIO 40474.

7. Asteridiella clerodendricola Hosagoudar, sp. nov.
Fig. 6

Plagulae amphigenae, plerumque epiphyllae, densae, ad 10 mm diam., raro confluentes, maculae halonate, folia infecta corrugata. Hyphae mycelii tortuosae, alternatae vel oppositae lateque ramosae, densae reticulatae, cellulis 18-38 x 6-8 μm. Hyphopodia capitata alternata vel
unilateralia, recta vel curvula, patentia vel antorsa, 22-30 μm longa; cellula basali cylindracea vel cuneata, 8-16 μm longa; cellula apicali globosa, angulosa, integra vel sublobata, 14-18 x 12-16 μm. Mucronate hyphopodia pausa, illis capitatis commixta, opposita vel alternata, ampullacea, 20-22 x 8-10 μm. Perithecia plerunque aggregata, ad 245 μm; cellulis parietis irregulariter protrudo, 30-36 μm longis; spora ellipsoidae, 4-septatae, recta vel leniter curvulae, 36-42 x 14-18 μm.

Colonies amphigenous, mostly epiphyllous, dense, scattered, up to 10 mm diameter, rarely confluent, causing stretching of the surrounding leaf surface with a yellow halo surrounding the spots. Hyphae strongly adpressed to the leaf surface, not easily separable, tortuous, branching alternate to opposite at wide angles, strongly reticulate, cells 18-38 x 6-8 μm. Capitate hyphopodia alternate to unilateral, straight to curved, untrorse to spreading, 22-30 μm long; stalk cells cylindrical to cuneate, 8-16 μm long; head cells globose, angulose, entire to sublobate, 14-18 x 12-16 μm. Mucronate hyphopodia few, mixed with capitate hyphopodia, opposite to alternate, ampulliform, 20-22 x 8-10 μm. Perithecia mostly aggregated, up to 245 μm; perithecial surface cells irregularly protruded, 30-36 μm long; spores ellipsoidal, 4-septate, straight to slightly curved, 36-42 x 14-18 μm.


The infection was restricted to the young growing leaves. Two to many such infected spots on the leaves resulted in hypertrophy of the leaf, giving a peculiar appearance to the growing plant parts.

Twelve species of the genus Asteridiella have been recorded on various members of the family Verbenaceae. The present species differs in producing a pathogenic effect on the host plant.


10. *Asteridiella crotonis* Hosagoudar, sp. nov.

Fig. 7

Plagulae hypophyllae, densae, ad 5 mm diam. Hyphae subrectae vel undulatae, opposite laxe ramosae, laxe vel densae reticulate et solidae, cellulis 18-24 x 6-8 μm. Hyphopodia capitata alternata vel unilateralia, patentia, antcrosa vel reflexa, 22-26 μm longa; cellula basali cylindracea vel cuneata, 6-8 μm longa; cellula apicali ovata, integra vel sublobata, 16-20 x 12-18 μm. Mucronate hyphopodia pausa, illis capitatis commixa, opposita vel alternata, ampullacea, 16-18 x 6-8 μm. Perithecia dispersa, ad 196 μm; cellulae parietis conoidae, 20-26 μm longae; sporae ellipsoideae, 4-septatae, constrictae, rectae vel curvulæ, 44-48 x 16-20 μm.

Colonies hypophyllous, dense, up to 5 mm in diameter. Hyphae substraight to undulating, branching opposite side angles, loosely to closely reticulate and forming a mass of mycelia, cells 18-24 x 6-8 μm. Capitata hyphopodia alternate and unilateral, spreading, antcrosa to reflexed, 22-26 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells ovate, entire to imperfectly lobate, 16-20 x 12-18 μm. Mucronate hyphopodia few, mixed with capitata hyphopodia, opposite to alternate, ampulliform, 16-18 x 6-8 μm. Perithecia scattered, up to 196 μm; perithecial cells conoid, 20-26 μm long; spores ellipsoideal, 4-septate, constricted, straight to slightly curved, 44-48 x 16-20 μm.


*Note*: Six species of *Asteridiella* have been reported on members of the family Euphorbiaceae, having the Beeli formula 3101.4220 (Hansford, 1961). Of these, *A. antidesmatis* Hansf. and *A. drypeticola* Hansf. are closest to the present species. However, *A. crotonis* differs from *A. antidesmatis* in having dense hypophyllous colonies and larger capitata hyphopodia. It differs from *A. drypeticola* in the morphology and arrangement of the capitata hyphopodia, and in having larger ascospores. Further, there is no record of the genus *Asteridiella* on this host genus.

On leaves of *Vernonia monosis* Clarke (Asteraceae), Idukki, Oct. 6, 1983, V.B. Hosagoudar HCIO 40479; MH 78174.

The present collection varies slightly from the species description (Hansford, 1961) in forming hypophyllous colonies, and in having larger capitate hyphopodia and smaller perithecial cells.


13. **Asteridiella macarangiocola** Hosagoudar, sp. nov.  

*Fig. 8*

Plagulae epiphyllae, tenues, indistinctae, ad 2 mm diam. Hyphae tortuosae, opposite vel alternate ramosae, laxe reticulatae, cellulis 38-44 x 6-8 μm. Hyphopodia capitata alternata, recta vel curvula, patentia, plerumque antrorsa, 20-28 μm longa; cellula basali cylindracea vel cuneata, 8-12 μm longa; cellula apicali globosa, ovata, integra, raro leniter angulosa, 12-16 x 6-10 μm. Perithecia dispersa, ad 180 μm; cellulis parietis conoid, usque ad 14 μm longis; sporae ellipsoidae, 4-septatae, constrictae, 38-40 x 16-18 μm.

Colonies epiphyllous, thin, indistinct, up to 2 mm diameter. Hyphae tortuosi, branching opposite to alternate, loosely reticulate, cells 38-44 x 6-8 μm. Capitate hyphopodia alternate, straight to curved, spreading, mostly antrorsae, 20-28 μm long; stalk cells cylindrical to cuneate, 8-12 μm long; head cells globose, ovate, entire, rarely slightly angulose, 12-16 x 6-10 μm. Perithecia scattered, up to 140 μm; perithecial cells conoid, up to 14 μm long; ascospores ellipsoid, 4-septate, constricted, 38-40 x 16-18 μm.


The present species is similar to *A. erythroccae* Hansf. and *A. hansfordii* (Stev.) Hansf. but differs from both in forming inconspicuous colonies, tortuous mycelia, larger capitate hyphopodia, and in having entire head cells of the capitate hyphopodia and distinctly broader ascospores. Further, there is no record of the genus *Asteridiella* on this host genus.


15. Asteridiella turpiniiicola Hosagoudar, sp. nov.

Fig. 9

Plagulae amphigenae, plerumque hypophyllae, densae, ad 3 mm diam. Hyphae rectae vel subrectae, alternate vel oppositae, vel ramosae, vel densae reticulatae vel reticulato-intertextae, cellulis 16-32 x 8-12 pm. Hyphopodia capitata alternata, patentia, antorsea, 26-30 pm longa; cellula basali cylindracea vel cuneata, 6-10 pm longa; cellula apicali globosa, stellate sublobata, 18-20 x 16-24 pm. Macronate hyphopodia paucae, illis capitatis commixta, opposita vel alternata, 20-24 x 8-10 pm. Perithecia aggregata vel dispersa, ad 360 pm; appendiculae peritheciales larviformae, flexuoseae, fulvus, simplices, patentiae, ad 196 pm longae et 7-8 pm crassae, rotundae ad apicem, rectae vel tortuosae ad apicem; sporae fusiformes, plerumque curvulae, 3-septatae, constrictae, 46-56 x 16-20 pm.

Colonies amphigenous, mostly hypophyllous, dense, up to 3 mm in diameter. Hyphae straight to substraight, branching alternate to opposite at wide angles, loosely to closely reticulate and forming an almost solid mass of mycelia; cells 16-32 x 8-12 pm. Capitate hyphopodia alternate, spreading, antrorse, 26-30 pm long; stalk cells cylindrical to cuneate, 6-10 pm long; head cells globose, stellately sublobate, 18-20 x 16-24 pm. Macronate hyphopodia few, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 20-24 x 8-10 pm. Perithecia aggregated to scattered, up to 360 pm; perithecial appendages larviformae, wavy, golden-brown, simple, spreading, up to 196 pm long and 7-8 pm broad, tip obtuse, straight to twisted; spores fusiformae, predominantely curved, 3-septatae, constrictae, 46-56 x 16-20 pm.


Note: Appendiculella turnpijiae (Yamam.) Hansf. has been recorded on Turpinia formosana Nakai and T. pomi fe ta DC. from Formosa and the Philippines (Hansford, 1961).
having repent, abnormal mycelial setae and the perithecial appendages. The present collection differs from it in lacking the perithecial appendages, and in having smaller capitate hyphopodia, perithecia and ascospores.

Yamamoto (1941) described *Irenina turpiniiae*. Later, Hansford (1961) transferred this species to *Appendiculella* as *A. turpiniiae* (Yaman.) Hansford, noting two characteristics:

1. No species of *Meliola* is hitherto known with perithecial appendages.

2. The "mycelial setae" are quite different from those commonly found in the species of *Meliola*, where they are erect, but are closer to those found on the perithecia of species of *Irenopsis*. They differ in being produced around the base of the perithecium, on mycelial hyphae, and in being repent, as well as being longer than in the so far known species.

In the present material, also, the repent appendages (termed here as perithecial) arise from the subicle just below the perithecia. Such appendages have also been seen on the mycelia where there were no perithecia. These repent setae/appendages are neither perithecial nor mycelial setae. Hence the present material has been placed under the genus *Asteridiella*.


17. *Irenopsis eriolaenae* Hosagoudar, sp. nov. Fig. 10

Plagulae epiphyllae, tenues, dispersae, ad 3 mm diam., confluentes. Hyphae subrectae vel undulatae, alternatae vel oppositae lateque ramosae, laxe reticulatae, cellulis 30-34 x 6-8 μm. Hyphopodia capitata alternata vel unilateralia, recta, antrorsa vel patens, 14-16 μm longa; cellula basali cylindraceae vel cuneata, 4-5 μm longa; cellula apicali ovata, clavata, integræ vel lentiter angulosa, 10-12 x 8-10 μm. Mucronate hyphopodia illis capitatis commixta vel in hyphis distinctis evoluta,
Alternata vel opposita, ampullacea, 12-20 x 6-8 μm. Perithecia dispersa, verrucosa, ad 110 μm; setae peritheciales 8-12, rectae, simplices, olivaceo-brunneae, septatae, ad apices acuta vel obtusa, ad 72 μm longae et 6-8 μm crassae; sporaee obovoidae, 4-septatae, constrictae, 32-38 x 10-14 μm.

Colonies epiphyllous, thin, scattered, up to 3 mm in diameter, confluent. Hyphae substraight to undulating, branching alternate to opposite at wide angles, loosely reticulate, cells 30-34 x 6-8 μm. Capitate hyphopodia alternate to unilateral, straight, antorse to spreading, 14-16 μm long; stalk cells cylindrical to cuneate, 4-5 μm long; head cells ovate, clavate, entire to slightly angular, 10-12 x 6-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia and borne on a separate mycelial branch, alternate to opposite, ampulliform, 12-20 x 6-8 μm. Perithecia scattered, verrucose, up to 110 μm; perithecial setae 8-12, straight, simple, septate, olivaceous brown, acute to obtuse at the tip, up to 72 μm long and 6-8 μm broad; spores obovoidal, 4-septate, constricted, 32-38 x 10-14 μm.


The present species is close to I. tiibodense Hansf., recorded on Pterospermum javanicum Fung., and P. niveus Vidal from Java and the Philippines (Hansford, 1961), but differs in having smaller capitate hyphopodia, perithecia and perithecial setae; absence of radiate exhyphopodiate mycelia below the perithecia, in having mucronate hyphopodia mixed with capitate hyphopodia which are also borne on separate mycelial branches. Further, there is no record of meliolaceous fungi on this host genus.

18. Irenopsis leeae Hansf. var. indica Hosagoudar, var. nov. Fig. 11

Differt a I. leeae Hansf. var. leea hyphopodiis capitatis alternatis et myceliis subrectis ad undulatis. Differt a I. leeae Hansf. var. javensis Hansf. Plagulis tenuibus, hyphis subrectis ad undulatis lateque ramificantibus.

Colonies epiphyllous, very thin, up to 3 mm in diameter. Hyphae straight to undulating, branching opposite to alternate at wide angles, loosely reticulate, cells 18-28 x 6-8 μm. Capitate hyphopodia scattered, alternate to unilateral, closely antorse, 10-24 μm long; stalk cells cuneate, 6-10 μm long; head cells ovate, globose, entire to irregularly sublobate, 10-18 x 16-20 μm. Mucronate hyphopodia numerous, mixed with capitate...
hyphopodia, alternate to opposite, ampulliform, 16-22 \times 8-10 \mu m. Perithecia scattered to grouped, verrucose, up to 150 \mu m; perithecial setae 3-8, straight to flexuous, spreading, dark at the base and paler towards the apex, tip obtuse, 84-150 \times 8-10 \mu m; spores obovoidal, 4-septate, constricted, 30-36 \times 12-16 \mu m.


The new variety *indica* differs from var. *leea* in having alternate capitate hyphopodia and substraight to undulating mycelia. It also differs from *I. leea* Hansf. var. *javensis* Hansf. in having thin colonies, substraight to undulating mycelia and branching at wide angles.


ACKNOWLEDGEMENTS

We are grateful to Drs. N.C. Nair, Joint Director (Retd.) and N.P. Balakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore, for their valuable suggestions. We sincerely acknowledge the help of Mr. V. Sivanandan of the Botanical Survey of India for his help in preparing the drawings. We are grateful to Drs. K.A. Pirozyynuki and Dr. F.A. Becker for reviewing the manuscript and for helpful suggestions, and to Dr. R.P. Korf for editorial assistance.

LITERATURE CITED


Sydowia Beih. 2:1-806.


A NEW SPECIES OF *AMAZONIA THEISS.* FROM KARNATAKA, INDIA

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During a survey of the Meliolaceous fungi in the Western Ghats forests of Karnataka, the plants *Symplocos* sp. (Symplocaceae) were found infected with a black mildew disease. Microscopic examinations of the infected plants revealed that it is hitherto undescribed species of the genus *Amazonia* Theiss. and hence, this note.

*Amazonia karnatakensis* Hosagoudar et Manian, *sp. nov.*

Plagulae amphigenae, subdensae vel densae, ad 3 mm in diametro, confluentes. Hyphae mycelii rectae vel subrectae, oppositae vel irregulariter acutae ramosae, laxe reticulatae, cellulis 12-22 x 9-12.5 μm. Hyphopodia capitata alternata, plerumque

*Amazonia karnatakensis* sp. nov.

Ch—Capitate hyphopodia

Mh—Mucronate hyphopodia

Sp—Spores
Hosagoudar & Manian

antrorsa, 21-28 μm longa; cellula basali ciliandracea vel cuneata, 6-9 μm longa; cellula apicali recta vel curvula, ovata vel globosa, stellato-lobata, 15-19 x 15-22 μm. Hyphopodia mucronata illis capitatis commixa, plurumque opposita, ampullacea, 15-22 x 9-12 μm. Setae myceliales et setae peritheciales nullae. Perithecia dispersa, depresso-globosa, ad 155 μm; spores obovoida, 4-septatae, constrictae, 31-34 x 12-15.5 μm.

Colonies amphigenous, subdense to dense, up to 3 mm in diameter, confluent. Hyphae straight to substraight, branching opposite to irregular at acute angles, loosely reticulate, cells 12.22 x 9-12.5 μm. Capitate hyphopodia alternate, mainly antrorse, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9 μm long; head cells straight to curved, ovate to globose, stellately lobate, 15-19 x 15-22 μm. Mucronate hyphopodia mixed with capitate hyphopodia, mostly opposite, ampulliform, 15-22 x 9-12 μm. Mycelial and perithecial setae absent. Perithecia scattered, depressed-globose, up to 155 μm; spores obovoidal, 4-septate, constricted, 31-34 x 12-15.5 μm.

Holotype: On leaves of Symplocos sp. (Symplocaceae), Madikeri, Karnataka, Sept. 18, 1987, S. Manian IMI 321578.

Isotype: MH 82158.

Two species of the genus Asteridiella and four species of the genus Mellola are reported on the host genus Symplocos. But the genus Amazonia is not reported on any member of the family Symplocaceae (Hansford, 1961) and hence it warrants to place it under a new species.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Scientist ‘SE’ Botanical Survey of India, Southern Circle, Coimbatore for encouragement.

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MELIOLACEAE OF SOUTH INDIA—VI

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During a survey of the Meliolaceous fungi in the forests of Western Ghats of Tamil Nadu, the leaves of Mitrephora heyneana Thw. (Annonaceae) and Microcos paniculata L. (Tiliaceae) were found infected with black mildew diseases and were collected. Critical study of these pathogens revealed that they were two hitherto undescribed species of the genus Meliola Fr. emend Bornet.

Meliola mitrephorae sp. nov.

Plagulae foliicolae, amphigenae plerumque epiphyllae, subdensae vel densae, ad 2 mm diam. Hyphae mycelii rectae vel subrectae, plerumque opposite, acuteque ramosae, densae reticulatae et solidae, cellulis 6-31 x 6-9.5 μm. Hyphopodia capitata alternata, antrosa, 27-31 μm longa; cellula basali cuneata, 6-9.5 μm longa; cellula apicali ovata, globosa, irregulariter sublobata, 18-22 x 18-20 μm. Hyphopodta mucronata numerosa illis capitatis commixta, opposita vel alternata, ampullacea, 24-34 x 6-9.5 μm. Setae myceliales numerosae, simplices, rectae, flexuosae, geniculatae, raro uncinatae et circinatae, acutae ad apices, ad 365 μm longae. Perithecia densa dispersa, ad 186

Fig. 1. Meliola mitrephorae sp. nov.

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Mn- sporae obovoidae, 4 septatae, constri ctae, 49-52 x 21-25 \( \mu \)m.

Colonies foliicolous, amphigenous, mostly epiphyllous, subdense to dense, up to 2 mm in diameter. Hyphae straight to straigt, branching mostly opposite at acute angles, closely reticulate and form solid mycelial mat, cells 6-31 x 6-9.5 \( \mu \)m. Capitate hyphopodia alternate, antrorse, 27-31 \( \mu \)m long; stalk cells cuneate, 5-9.5 \( \mu \)m long; head cells ovate, globose, irregularly sublobate, 18-22 x 18-20 \( \mu \)m. Mucronate hyphopodia numerous, mixed with capitate hyphopodia, opposite to alternate, ampulliform, 24-34 x 6-9.5 \( \mu \)m. Mycelial setae numerous, simple, straight, flexuous, geniculate, rarely unicnate to coiled, acute, up to 365 \( \mu \)m long. Perithecia closely scattered, up to 186 \( \mu \)m; spores obovoidal, 4-septate, constricted, 49-52 x 21-25 \( \mu \)m.


Of the reported Meliola species on the members of the host family Annonaceae, the present species is closer to M. lagunensis Hansf., reported on Uvaria sp. from Philippines, in having sublobate head cells of the capitate hyphopodia. However, the present species differs from it in having smaller capitate hyphopodia mucronate, hyphopodia mixed with capitate hyphopodia, scattered and flexuous to uncinate mycelial setae. Further, there is no report of the genus Meliola on this host genus (Hansford, 1961).

Meliola thirumalacharii sp. nov.

Plagulae foliicolae, amphigenae, sub- densae vel densae, ad 2 mm diam., raro confluentes. Hyphae mycelli flexuosae vel anfractuosae, alternate et irregulariter acute ramosae. laxe reticulate, cellulis 24-90 x 7-9.5 \( \mu \)m. Hyphopodia capitata alternata vel unilateralia, plurumque remote disposita, antrorsa vel patentia, 24-46.5 \( \mu \)m longa; cellula basali cylindracea vel cuneata, 6-28 \( \mu \)m longa; cellula apicali ovata vel globosa, angulosa vel irregulariter sublobata, 18-22 x 18-28 \( \mu \)m. Hyphopodia mucronata numerosa, in hyphis distinctis evoluta, opposita vel alternata, ampuellae. 30-37 x 6-9.5 \( \mu \)m. Setae, myceliales subnumerosae, dispersae simplices, rectae, obtusae, ad 0.15 \( \mu \)m longae. Perithecia laxe aggregata, verrucosa, ad 200 \( \mu \)m; spores obovoidal, 4-septate, constrictae, 52-56 x 22-28 \( \mu \)m.

Colonies foliicolous, amphigenous, subdense to dense, up to 2 mm in diameter, rarely confluent. Hyphae flexuous to crooked, branching alternate to irregular at acute angles, loosely reticulate. cells 24-90 x 7-9.5 \( \mu \)m. Capitate hyphopodia alternate to unilateral, mostly distantly arranged, antrorse to spreading, 24-46.5 \( \mu \)m long; stalk cells cylindrical to cuneate, 6-28 \( \mu \)m long; head cells oval to globose, angular to irregularly sublobate, 18-28 \( \mu \)m. Mucronate hyphopodia numerous, borne on a separate mycelial branch, opposite to alternate, ampulliform, 30-37 x 6-9.5 \( \mu \)m. Mycelial setae fairly numerous, scattered, simple, straight, obtuse, up to 615 \( \mu \)m long. Perithecia loosely grouped, verrucose, up to 200 \( \mu \)m; spores obovoidal, 4-septate, constricted, 52-56 x 22-28 \( \mu \)m.

So far three taxa of the genus *Meliola* viz. *M. grewia* Hansf., *M. grewia* Hansf. var. *longispora* Hosagoudar & Raju and *M. grewicolae* Hansf. have been reported on the host genus *Grewia* (Hansford, 1961 and Hosagoudar & Raju, 1985). However, the present species differs from them in having flexuous to crooked mycelia, angular to sublobate head cells of the capitate hyphopodia, mucronate hyphopodia borne on a separate mycelial branch and in the measurements.

The species is named in honour of the eminent Indian Mycologist, Dr. M.J. Thirumalachar.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

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TAXONOMIC NOTES ON INDIAN MELIOLACEAE

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ABSTRACT

The paper gives an account of 7 meliolaceae taxa. Of these, Amazonia daphniphylli, A. karii, Diporothecia litsea are the new species; Meliola rubi Stev. & Rold. ex Hansf. var. garhwalensis (Srivastava & Topal) Stat. et Comb. nov.; Meliola parvifoliae Singh & Kamal made synonym to M. mitragynae Syd. while, Asteridiella perrotetiaca (Stev.) Hansf., Meliola ambigua Pat. & Gail. are reported for the first time from India.

Amazonia daphniphylli Patil, sp. nov.

Plagulae epiphyllae, crustosae, ad 2 mm diam. Hyphae mycelii subrectae vel anfractusae, alternate vel irregulariter acutae ramosae et solidae ad centre, cellulis 20-30 x 6-7 μm. Hyphopodia capitata alternata vel unilateralia, antorse vel patentia, 15-18 μm longa; cellula basali cylindracea vel cuneata, 6-7 μm longa; cellula apicali ovata vel globosa, integra, 9-12.5 x 9-15.5 μm. Hyphopodia mucronata illis capitatis commixta, opposita vela iterata, ampullacea, 15.5-22 x 6-7 μm. Perithecia paucia. aggregata ad centre, flatterted-globosa, ad 313 μm; spores obovoidae, 4-septatae, constrictae, 30-37.5 x 9-15.5 μm.

Colonies epiphyllous, crustose, up to 2 mm in diameter. Hyphae substraight to crooked, branching. alternate to irregular at acute angles, closely reticulate and forming solid mycelial mat at the centre, cells 20-30 x 6-7 μm. Capitate hyphopodia alternate to unilateral, antorse to spreading, 15-18 μm long; stalk cells cylindrical to cuneate, 6-7 μm long; head cells ovate to globose, entire, 9-15.5 x 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia opposite to alternate, ampulliform, 15.5-22 x 6-7 μm. Perithecia few, grouped at the centre, flattered-globose, up to 313 μm; spores obovoidal, 4-septate, constricted, 30-37.5 x 9-15.5 μm.

Holotype: On leaves of Daphniphyllum neilgherrense (Wight) Rosenth (Daphniphyllaceae), Kodaikanal, T.N., Nov. 29, 1987, R.S. Sawant, deposited in HCIO, New Delhi.

There is no report of Meliolaceous fungi on the members of the family Daphniphyllaceae. Hence, it is proposed here a new species.

Amazonia karii Hosagoudar & Balakrishnan sp. nov.
MELIOLACEOUS FUNGI FROM THE STATE OF KERALA, INDIA

II. The genus Meliola

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SUMMARY

This paper is the second on the meliolaceous fungi of Kerala, and gives an account of members of the genus Meliola collected in the Idukki Hydroelectric Project Area. Eighty-four species or infra-specific taxa collected in this study are listed; twenty-four of these were found to be undescribed species. These are described and illustrated. Twelve new varieties are recognized; these are also described and illustrated. New species described include the following: M. ancistrocladii, M. atalantiae, M. atylosiae, M. buchananicola, M. cancnericola, M. chundacukharanii, M. clausenae, M. clitoriae, M. cyclee, M. dimidiatae, M. drypetica, M. erucis-paniculatae, M. erythropalii, M. hunteriae, M. ligustri, M. luvungae, M. nilgirianthii, M. otonephelii, M. prennicola, M. sarcostigmae, M. scolopiferi, M. steenonii, M. tylophorae, and M. wendlandiae. New varieties include the following: M. angiopteridis var. indica, M. bantamensis var. keralensis, M. beilschmiediae var. cinnamomicola, M. bigchidii var. velutina, M. eurora var. macrospora, M. littae var. floribunda, M. littae var. insignis, M. littae var. keralense, M. mucuna var. hirsuta, M. tickianae var. zanthoxyl, M. salleana var. smilacis, and M. themedae var. indica.

Key words: Meliola, Kerala, meliolaceous fungi, black mildews.
This is the second paper on the meliolaceous fungi found in the Idukki Hydroelectric Project Area of Kerala State, India, and reports, in part, the results of a systematic survey of meliolaceous fungi conducted during the years 1981-84 (Hosagoudar, 1987). A description of the study area was presented earlier and collections belonging to the genera Amazonia, Armatefla, Asteridiella and Irenopsis were described or listed (Hosagoudar and Goes, 1989). This paper reports on members of the genus Meliola. Twenty-four collections were found to be undescribed species. These fungi are named, described and illustrated in this report. An additional twelve specimens were considered to represent new varieties; these are also described and illustrated. Collection and host records are given for all of the eighty-four taxa discussed. Types and representative materials are deposited in HCIO, New Delhi.


5. **Meliola ancistrocladii** Hosagoudar, sp. nov. Fig. 1.

   Plagulae hypophyllae raro epiphyllae, densae, usque 10 mm diam., confluentes. Hyphae subrectae vel undulatae, plerumque opposite acuteque vel lateque ramosae, laxe reticulatae, cellulis 16-20 x 4-7 μm. Hyphopodia capitata alternata vel usque 10% opposita, recta vel curvula, antorsa vel patentia, 12-20 μm longa; cellula basali cylindracea vel cuneata, 3-6.5 μm longa; cellula apicali ovata vel globosa, integra, 10-13 μm. Hyphopodia mucronata et capitatis commixta, opposita vel alternata, ampullacea, 16.5-26.5 x 10-13 μm. Setae myceliales tenuiter dispersae, rectae vel flexuosae, simplices, acutae vel obtusae usque
Colonies hypophyllous, rarely epiphyllous, dense, up to 10 mm in diameter, confluent. Hyphae substraight to undulating, branching mostly opposite at acute to wide angles, loosely reticulate, cells 16-20 x 4-7 μm. Capitate hyphopodia alternate to about 10% opposite, straight to curved, antrorse to spreading, 12-20 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells ovate to globose, entire, 10-13 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 16.5-26.5 x 10-13 μm. Mycelial setae fairly numerous, equally scattered, straight to flexuous, simple, acute to obtuse at the tip, up to 291 μm long. Perithecia few, scattered, up to 165 μm; spores obovate, 4-septate, constricted, 33-36.5 x 13-15 μm.


To date, there is no record of meliolaceous fungi on members of the family Ancistrocladaceae (Stevenson, 1963).

6. Meliola angioperidis Hansf. var. indica Hosagoudar, var. nov. Fig. 2.

Differ from M. angioperidis Hansf. var. angioperidis plagialis hypophyllis tenuibus, hyphis subrectis usque undulatis, hyphopodis capitatis oppositis nullis.

Colonies hypophyllous, thin, up to 5 mm in diameter, confluent. Hyphae straight to undulating, branching opposite to irregular at wide angles, loosely reticulate, cells 20-30 x 6-8 μm. Capitate hyphopodia alternate to unilateral, scattered, antrorse to reflexed, straight to curved, 14-20 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate, entire, often curved, 10-14 x 10-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 20-26 x 6-8 μm. Mycelial setae straight, simple, acute at the tip, up to 460 μm long. Perithecia scattered, verrucose, up to 200 μm; spores ellipsoidal, 4-septate, constricted, 36-40 x 14-16 μm.


Bannister (1954) described M. angioperidis from Java on Angiopteris evecta (Forst.) Hoffm. The current variety differs from the type variety in forming hypophyllous colonies, having substraight to
undulating hyphae and in the absence of opposite capitate hyphopodia.

7. **Meliola atalantiae** Hosagoudar, sp. nov. Fig. 3.

Plagulae amphigenae, plerumque hypophyllae, crustoseae, usque 8 mm diam., raro confluentes. Hyphae brunnea, rectae vel subrectae vel anfractae, opposite vel irregulariter acuteque ramosae, laxe reticulatae, cellulis 20-28 x 6-8 μm. Hyphopodia capitata alternata vel usque ad 20% opposita, recta vel curvula, subantrorsa vel patentia, 20-30 μm longa; cellula basali cuneata vel cylindracea, 4-10 μm longa; cellula apicali ovata, conoidea, apice rotundata, integra, 14-20 x 8-10 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 20-26 x 8-12 μm. Setae myceliales dispersae, rectae, raro curvulae, simplices, acute vel 2-3 dentata vel cristata, usque 765 μm longae. Perithecia dispersae, usque 160 μm; spores oblongae, 4-septatae, constrictae, 40-44 x 14-16 μm.


Uppal et al. (1935) listed an unidentified species of *Meliola* on Atalantia racemosa Wight & Arn. from Maharashtra. *Meliola tenella* var. *atalantiae* (Pat.) Hansf. has been recorded on *Atalantia* from Tonkin, Ceylon, Formosa and the Philippines (Hansf., 1961). The present species differs from it mainly in having simple setae in contrast to dichotomously branched ones, and in having smaller ascospores.

8. **Meliola stylogiae** Hosagoudar, sp. nov. Fig. 4.

Plagulae epiphyllae, subdensae vel densae, ad 2 mm diam. Hyphae undulatae, opposita vel alternatae acuteque ramosae, laxe reticulatae, cellulis 12-22 x 4-8 μm. Hyphopodia capitata opposita vel alternata (3:1), recta,
patentia, antrorsa, 12-16 μm longa; cellula basali 
cylindracea vel cuneata, 4-6 μm longa; cellula apicali 
globosa, integra, apice leniter late rotundata, 8-10 x 
10-12 μm. Hyphopodia mucronata illis capitatis commixta, 
alternata vel opposita, ampullacea, 16-20 x 6-10 μm. Setae 
myceliales pauae, dispersae, simplices, dentatae, ad 270 
μm longae. Perithecia dispersa vel aggregata, verrucosa, 
ad 140 μm; sporiae oblongae vel obovoidae, 4-septatae, 
constrictae, 34-40 x 10-14 μm.

Colonies epiphyllous, subdense to dense, up to 2 mm in 
diameter. Hyphae undulating, branching opposite to 
alternate at acute angles, loosely reticulate, cells 12-22 
x 4-8 μm. Capitate hyphopodia opposite and alternate 
(3:1), straight, spreading, antrorse, 12-16 μm long; stalk 
cells cylindrical to cuneate, 4-6 μm long; head cells 
globose, entire, slightly and bluntly pointed towards the 
apex, 8-10 x 10-12 μm. Mucronate hyphopodia mixed with 
capitate hyphopodia, alternate to opposite, ampulliform, 
16-20 x 6-10 μm. Mycelial setae few, scattered, simple, 
variously dentate at the apex, up to 270 μm long. 
Perithecia scattered to grouped, verrucose, up to 140 μm; 
spores oblong to obovoidal, 4-septate, constricted, 34-40 x 
10-14 μm.

On leaves of Attylosia lineata Wight & Arn. 
(Idukki, Dec. 23, 1983, V.B. Hosagoudar., 
MH 79035, Isotype.

This species is close to Meliola bicornis Wint. but 
differs from it in the infection pattern, and in the 
morphology of the mycelium and capitate hyphopodia. 
Further, there is no record of meiolaceous fungi on this 
host genus.

9. Meliola bantamensis Hansf. var. keralensis Hosagoudar, 
var. nov. Fig. 5

Differt a M. bantamensis Hansf. var. bantamensis setis 
myceliorum brevioribus et ascosporis magnioribus.

Colonies epiphyllous, rarely caulicolous and 
amphigenous, thin to subvelvety, up to 3 mm in diameter, 
confluent. Hyphae tortuous, branching opposite to 
irregular at acute to wide angles, loosely to closely 
reticulate, cells 18-36 x 6-8 μm. Capitate hyphopodia 
alternate to unilateral (very few opposite), spreading, 
antrorse, 14-20 μm long; stalk cells cylindrical to 
cuneate, 4-8 μm long; head cells globose to subglobose, 
anguloae to shallowly lobate, often curved, 8-12 x 10-12 
μm. Mucronate hyphopodia mixed with capitate hyphopodia, 
alternate to opposite, ampulliform, 10-22 x 4-8 μm. 
Mycelial setae scattered, straight, simple, acute at the 
tip, up to 288 μm long. Perithecia scattered, verrucose, 
up to 166 μm; spores oblong, 4-septate, 34-50 x 12-18 μm.
So far, 12 species of the genus Meliola have been recorded on the host genus Desmodium (Hansford, 1961). Based on the nature of the hyphae, capitate hyphopodia and ascospore measurements, the cited collections are closer to M. bantamensis Hansf., but differ from the var. bantamensis in having shorter mycelial setae and larger ascospores.


11. **Meliola beilschmiediae** Yamam. var. cinnamomicola Hosagoudar, var. nov. Fig. 6.

**Differt a M. beilschmiediae** Yamam. var. beilschmiediae. Plagulis densis, hyphopodia capitatis brevibus, setis mycelii brevibus et dentatis.

Colonies hypophylous, dense, velvety, up to 5 mm in diameter, rarely confluent. Hyphae flexuous, branching alternate to irregular at acute angles, closely reticulate, forming an almost solid mycelial mat, cells 20-30 x 6-8 µm. Capitate hyphopodia alternate, straight to variously curved, antorse to reflexed, 20-24 µm long; stalk cells cylindrical to cuneate, 6-10 µm long; head cells globose, ovate, angular, entire, 14-16 x 12-14 µm. Mucronate hyphopodia few, mixed with capitate hyphopodia, opposite to alternate, ampulliform, 16-22 x 8-10 µm. Mycelial setae numerous, evenly scattered, straight, simple, acute to variously dentate at the tip, up to 684 µm long. Perithecia closely scattered, verrucose, up to 216 µm; spores obovoidal, 4-septate, slightly constricted, 54-60 x 12-20 µm.

**Holotype:** On leaves of *Cinnamomum malabatrum* (Burm. f.) Blume (Lauraceae), Calvary Mount, Oct. 5, 1983, V.B. Hosagoudar MH 78160. **Isotype:** In HCIO No. 34973.


Hansford (1954) described *Meliola beilschmiediae* Yamam. var. cinnamomi Hansf. on *Cinnamomum iners* Reinw. ex
Bl. from Java. The new variety differs from *M. beiischmiediae* Yamam. var. *cinnamomi* Hansf. in forming dense colonies, and in having shorter capitate hyphopodia, and shorter, dentate, mycelial setae.

This variety was mostly found with *Armatella cinnamomicola* Hansf.

12. *Meliola buchananiicola* Hosagoudar, sp. nov. Fig. 7.

Plagulae hypophyllae, subdensae vel densae, ad 8 mm diam., confluentes. Hyphae mycelii tortuosae, opposite vel irregulariter acuteque vel laxe ramosae, densae reticulatae et solidae, cellulis 20-38 x 6-10 µm. Hyphopodia capitata alternata, recta vel curvula, patentia, antrorsa, reflexa, 36-50 µm longa; cellula basali cylindracea, cuneata vel tortuosa, 14-22 µm longa; cellula apicali ovala, globosa, angulosa, integra vel sublobata, recta vel curvula, 22-30 x 12-16 µm. Hyphopodia mucronata paucae, illis capitatis empties, opposita vel alternata, conoidea vel ampullacea, 14-22 x 6-8 µm. Setae myceliales numerosae, simplices, acuto vel obtusae, ad 954 µm longae. Perithecia dispersa, verrucosa, ad 234 µm; spores obovoidae vel cylindraceae, 4-septatae, constrictae, 42-50 x 14-18 µm.

Colonies hypophyllum, subdense to dense, up to 8 mm in diam., confluent. Hyphae tortuous, branching opposite to irregular at acute to wide angles, closely reticulate and form almost solid mycelial mat, cells 20-38 x 6-10 µm. Capitate hyphopodia alternate, straight to variously curved, antrorse to reflexed, 36-50 µm long; stalk cells cylindrical to cuneate, often tortuous, 14-22 µm long; head cells ovate, globose, angulose, sublobate, straight to variously curved, 22-30 x 12-16 µm. Mucronate hyphopodia few, mixed with capitate hyphopodia, opposite to alternate, conoid to ampulliform, 14-22 x 6-8 µm. Mycelial setae numerous, simple, acute to obtuse at the tip, up to 954 µm long. Perithecia scattered, verrucose, up to 234 µm; spores obovoidal to cylindrical, 4-septate, constricted, 42-50 x 14-18 µm.


The present species can be compared with *M. buchananii* ex Hansf. and *M. hamata* H. Sydow & P. Sydow (Hansf., 1961). It differs from the former in having flexuous stalk cells of the capitate hyphopodia, longer mycelial setae and smaller ascospores. It differs from the latter species in having larger capitate hyphopodia, flexuous stalk cells of the capitate hyphopodia, and larger mycelial setae.


14. **Meliola cansiericola** Hosagoudar, sp. nov. Fig. 8.

Plagulae amphigenae, subdensae vel densae, velutinae, ad 4 mm diam., confluentes. Hyphae rectae vel subrectae vel leniter undulatae, alternate acutaeque ramoseae, laxae vel densae reticulatae, cellulis 24-32 x 7-8 μm. Hyphopodia capitata alternata, antorosae, patentia, 30-42 μm longa; cellula basali cylindracea vel cuneata, 10-12 μm longa; cellula apicali ovata, globosa, sublobata vel stellatamente lobata, 12-24 x 20-26 μm. Hyphopodia mucronata paucae, illis capitatis commixtæ, alternata, ampullacea, 18-20 x 8-10 μm. Setae myceliales juxta perithecia aggregatae, simplices, acutæ, ad 835 μm longæ. Perithecia dispersæ, verrucosa, ad 324 μm; sporae fusiformes, rectae vel curvæae, 3-septatae, cellulae terminalis subconicae, 48-60 x 18-22 μm.

Colonies amphigenous, subdense to dense, velvety, up to 4 mm in diameter, confluent. Hyphae straight to slightly undulating, branching alternate at acute angles, loosely to closely reticulate, cells 24-32 x 7-8 μm. Capitate hyphopodia alternate, antorose, spreading, 30-42 μm long; stalk cells cylindrical to cuneate, 10-12 μm long; head cells ovate, globose, sublobate to stellately lobata, 12-24 x 20-26 μm. Mucronata hyphopodia few, mixed with capitate hyphopodia, alternate, ampulliform, 18-20 x 8-10 μm. Mycelial setae mostly grouped around perithecia, simple, acute at the tip, up to 835 μm long. Perithecia scattered, verrucose, up to 324 μm; spores fusiform, straight to curved, 3-septate, end cells conoid, 48-60 x 18-22 μm.

**Holotype:** On leaves of *Cansiera rheedii* Gamble (Opiliaceae), Calvary Mount, Jan. 8, 1982, V.B. Hosagoudar, HCIO 40503; MH 72606, Isotype.

Hansfords & Thirumalachar (1948) described *Meliola cansierae* on *Cansiera rheedii* Gamble from Karnataka, India. This species differs from it in having 3-septate ascospores, strictly alternate capitate hyphopodia, stellately lobed head cells of the capitate hyphopodia, simple and acute mycelial setae.


17. **Meliola chandrasekharanii** Hosagoudar, sp. nov. Fig. 9.

Plagulae amphigenae, caulicolae, plerumque hypophyllae, subdensae, velutinae, ad 3 mm diam., confluentes. Hyphae undulatae, opposita acuteque ramosae, utque densae reticulatae et solidae, cellulis 16-30 x 6-8 μm. Hyphopodia capitata alternata (rarissime opposita), recta vel curvula, patentia, plerumque antrorsa, 16-24 μm longa; cellula basali cuneata vel cylindracea, 4-10 μm longa; cellula apicali subglobosa, ovata, angulosa, sublobata, 12-16 x 12-14 μm. Hyphopodia mucronata in hyphis distinctis evoluta, paucis capitatis commixa, alternata, plerumque opposita, ampullacea, 12-20 x 6-10 μm. Setae myceliales subnumeroseae, rectae, simplices, acutae vel subacutae, ad 477 μm longae. Perithecia dispersa, verrucosa, ad 153 μm; sporae obovoidae vel cylindraceae, 4-septatae, constrictae, 32-42 x 10-16 μm.

Colonies amphigenous, caulicolous, mostly hypophyllous, subdense, velvety, up to 3 mm diameter, confluent. Hyphae undulating, branching opposite at acute angles, loosely to closely reticulate and form almost solid mycelial mat, cells 16-30 x 6-8 μm. Capitate hyphopodia alternate (few opposite), straight to curved, spreading, mostly antrorse, 16-24 μm long; stalk cells cuneate to cylindrical, 4-10 μm long; head cells subglobose, ovate, angular to sublobate, 12-14 x 12-16 μm. Mucronate hyphopodia borne on a separate mycelial branch, few mixed with capitate hyphopodia, alternate, mostly opposite, ampulliform, 12-20 x 6-10 μm. Mycelial setae fairly numerous, straight, simple, acute to subacute at the tip, up to 477 μm long. Perithecia scattered, verrucose, up to 153 μm; spores obovoidal to cylindrical, 4-septate, constricted, 32-42 x 10-16 μm.


So far three species of Meliola have been recorded on Apodites (Hansf., 1961). This species differs from them in having straight and subacute mycelial setae, and entire to sublobate head cells of the capitate hyphopodia. It also differs from M. dimidiatae sp. nov. in formation of the amphigenous and caulicolous colonies, and entire to sublobate head cells of the capitate hyphopodia.

The species is named in honour of my (V.B.H.) teacher, Dr. Chandrasekharan Nair.


19. **Meliola clausenae** Hosagoudar, sp. nov. Fig. 10.

Plagulae epiphyllae, tenues, ad 2 mm diam. Hyphae brunneae, rectae vel leniter undulatae, oppositae lateque ramosae, 1-6 reticulatae, cellulis 10-16 x 6-8 μm. Hyphopodia capitata alternata vel 20% opposita, recta vel curvula, plus minuave antrorsa, 16-24 μm longa; cellula basali cuneata vel cylindracea, 6-8 μm longa; cellula apicali cylindracea, ovata, integra, 10-16 x 8-10 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 12-20 x 6-8 μm. Setae myceliales dispersae, rectae, simplices, acutae vel 2-3 dentatae, ad 747 μm longae. Perithecia dispersa, verrucosa, ad 180 μm; sporae obovoidae, 4-septatae, constrictae, 36-42 x 14-16 μm.

Colonies epiphyllous, thin, up to 2 mm in diameter. Hyphae straight to slightly undulating, branching opposite at wide angles, loosely reticulate, cells 10-16 x 6-8 μm. Capitate hyphopodia alternate, 20% opposite, straight to curved, subantrorse to antrorse, 16-24 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells cylindrical, ovate, entire, 10-16 x 8-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 12-20 x 6-8 μm. Mycelial setae scattered, straight, simple, acute to 2-3 dentate, up to 747 μm long. Perithecia scattered, verrucose, up to 180 μm; spores obovoid, 4-septate, constricted, 36-42 x 14-16 μm.

Holotye: On leaves of *Clausena indica* (Dalz.) Oliver (Rutaceae), Kanchiar forest, Feb. 23, 1983, V.B. Hosagoudar, HCIO 40508; MH 75009, Isotype.

This species is close to *M. citricola* H. Sydow & Sydow but mainly differs from it in the pattern of infection. There is no earlier record of the genus *Meliola* on this host genus, hence it is proposed here as a new species.


On leaves of *Argyveria populifolia* Chois. (Convolvulaceae), Vazhathope, Jan. 7, 1982, V.B. Hosagoudar, HCIO 40509; MH 71582.

This species was mixed with the colonies of *Meliola malacotricha* Spec. var. *major* Beeli.

21. **Meliola clerodendricola** P. Henn., Hedwigia 37: 288, 1895.
On leaves of **Clerodendrum viscosum** Vent.
(Verbenaceae), Idukki, Dec. 21, 1983, V. B. Hosagoudar,
HCIO 40510; MH 78959; Feb. 18, 1983, V. B. Hosagoudar, MH

22. *Meliola clerodendricola* P. Henn. var. **micromera** (Syd.)

On leaves of **Gmelina arborea** oxb. (Verbenaceae),
Calvary Mount, Dec. 12, 1982, V.B. Hosagoudar, HCIO 40511;
MH 73690; Painavu, Dec. 12, 1983, V. B. Hosagoudar MH

23. *Meliola clitoriae* Hosagoudar, sp. nov. Fig. 11.

Plaques amphigenous, plerumque epiphyllae, ad 2 mm
diam., confluentes. Hyphae subrectae vel leniter
undulatae, opposite acuteque ramosae, laxe reticulatae,
cellulis 24-38 x 6-8 μm. Hyphopodia capitata alternata,
unilateralia vel ad 5% opposita, recta vel curvula,
patentia, antrorsa vel reflexa, 12-20 μm longa; cellula
basali cylindracea vel cuneata, 4-8 μm longa; cellula
apicali globosa, recta vel curvula, 8-12 μm. Hyphododia
mucronata illis capitatis commixa vel in hyphis distinctis
evoluta, alternata vel opposita, ampullacea, 16-24 x 8-12
μm. Setae myceliales dispersae vel juxta perithecia
aggregatae, simplices, rectae, acutae, ad 450 μm longae.
Perithecia dispersa, verrucosa, ad 180 μm; spores oblongae,
4-septatae, constrictae, 36-42 x 12-14 μm.

Colonies amphigenous, mostly epiphyllous, subdense, up
to 2 mm in diameter, confluent. Hyphae substraight to
slightly undulating, branching opposite at acute angles,
loosely reticulate, cells 24-38 x 6-8 μm. Capitate
hyphopodia alternate, unilateral to 5% opposite, straight
to curved, spreading, antrorse to reflexed, 12-20 μm long;
stalk cells cylindrical to cuneate, 4-8 μm long; head cells
globose, entire, straight to curved, 8-12 μm. Mucronate
hyphopodia mixed with capitata hyphopodia and borne on a
separate mycelial branch, alternate to opposite,
ampulliform, 16-24 x 8-12 μm. Mycelial setae scattered to
grouped around perithecia, simple, straight, acute at the
tip, up to 450 μm long. Perithecia scattered, verrucose,
up to 180 μm; spores oblong, 4-septate, constricted, 36-42
x 12-14 μm.

Holotype: On leaves, stems and petioles of **Clitoria
turnatea** L. (Papilionaceae), Puliyanmala Tea Estate, Dec.
15, 1983, V. B. Hosagoudar, HCIO 40512; MH 79093, Isotype.

*Meliola bicornis* Wint. has been recorded on **Clitoria
cubiformis** A. Juss. ex Pers. from Jamaica (Hansf., 1961).
*Meliola clitoriae* differs in size and in having mucronate
hyphopodia mixed with the capitata hyphopodia, borne on a
separate mycelial branches.

On leaves of *Canthium dicoccum* (Gaertn.) Teys & Benn. (Rubiaceae), Idukki, Feb. 18, 1983, V.B. Hosagoudar, HCIO 40513; MH 75846.


On leaves of *Nephelium longan* Lour. (Sapindaceae), Idukki, Oct. 9, 1982, V. B. Hosagoudar, HCIO 40514; MH 73601.


This collection differs slightly from the description in having hypophyllous colonies, smaller capitate hyphopodia, and mycelial setae.

27. **Meliola cyclicae** Hosagoudar, sp. nov. Fig. 12.

Plagulae amphigenae, plerumque epiphyllae, subdensae vel densae, ad 3 mm diam., confluentes. Hyphae subrectae vel undulatae, opposite vel irregulariter acutaeque ramosae, laxe vel dense reticulatae, cellulis 16-28 x 6-8 μm. Hyphopodia capitata alternata vel unilateralia, recta, antorosa, 20-28 μm longa; cellula basal cuneata, 6-12 μm longa; cellula apicali ovalis, versiformis, apice lati rotundata, integera, 14-18 x 12-14 μm. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel opposita, conoida vel ampullacea, 14-22 x 6-8 μm. Setae myceliales dispersae et juxta perithecia aggregatae, simplices, acutae, ad 432 μm longae. Perithecia dispersa, verrucosa, ad 160 μm; spora oblonga, 4-septatae, leniter constrictae, 34-40 x 16-20 μm.

Colonies amphigenous, mostly epiphyllous, subdense to dense, up to 3 mm in diameter, confluent. Hyphae substraight to slightly undulating, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 16-28 x 6-8 μm. Capitata hyphopodia alternate to unilateral, straight to antorose, 20-28 μm long; stalk cells cuneate, 6-12 μm long; head cells ovate, versiform, slightly and bluntly pointed at the apex, entire, 14-18 x 12-14 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, conoid to ampulliform, 14-22 x 6-8 μm. Mycelial setae scattered to grouped around the perithecia, simple, acute at the tip, up to 432 μm long. Perithecia scattered, verrucose, up to 160 μm; spores oblong, 4-septate, slightly constricted, 34-40 x 16-20 μm.
Holotype: On leaves, stem and petioles of \textit{Cyclea peltata} Cooke (Menispermaceae), Meenumutty, Dec. 12, 1982, V. B. Hosagoudar, HCIO 40516; MH 73696, Isotype.

\textit{Meliola cyclea} is close to \textit{M. cissampelicola} Hansf. & Thirum., but differs in the infection pattern, in having dense colonies, and longer mycelial setae. Further, there is no record of the genus \textit{Meliola} on this host genus.


31. \textit{Meliola dimidiatae} Hosagoudar, sp. nov. Fig. 13.

Plagulae epiphyllae, subdensae, subvelutinae, dispersae, ad 3 mm diam., raro confluentes. Hyphae brunneae, flexuosae, opposite vel irregulariter acuteque ramosae, laxe reticulatae, cellulis 16-24 x 6-8 μm. Hyphopodia capitata alternata vel unilateralia (raro opposita), recta vel curvula, antorsa vel reflexa, patentia, 16-20 μm longa; cellula basali cuneata vel ovata, integra, 12-14 x 10-12 μm. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 20-26 x 8-10 μm. Setae myceliales numerosae, dispersae vel usque juxta perithecia aggregatae, rectae, simplices, acutae, ad 540 μm. Perithecia dispersa, verrucosa, ad 160 μm; sporae cylindraceae, 4-septatae, constrictae, 42-44 x 16-18 μm.

Colonies epiphyllous, subdense, subvelvety, scattered, up to 3 mm in diameter, rarely confluent. Hyphae flexuosus, branching opposite to irregular at acute angles, loosely reticulate, cells 16-24 x 6-8 μm. Capitate hyphopodia alternate and unilaterally (few opposite), straight to curved, antrorse to reflexed, spreading, 16-20 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells mostly globose, ovate, curved, entire 12-14 x 10-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 20-26 x 8-10 μm. Mycelial setae numerous, scattered, often grouped around perithecia, straight, simple, acute, up to 540 μm long.
Spores cylindrical, 4-septate, constricted, 42-44 x 16-18 μm.


So far three species of *Meliola*, namely *M. apodytes* van der Bijl., *M. campylotricha* Syd. and *M. cladophila* Syd., have been recorded on this host genus (Hansf., 1961). The present species differs from all others in having globose head cells of the capitate hyphopodia, straight mycelial setae and 4-septate ascospores. It also differs from *M. chandrakehrarani* sp. nov. (this paper) in the formation of epiphyllous colonies, and in the entire and globose head cells of the capitate hyphopodia.


The collection cited varies slightly from the description in having larger capitate hyphopodia, mycelial setae and ascospores.

32. *Meliola drypetecola* Hosagoudar, sp. nov. Fig. 14.

Plagulae hypophyllae, dispersae, densae, velutinae, ad 10 mm diam., confluentes. Hyphae mycelii rectae vel undulatae, brunneae, opposite vel irregulariter lateque ramosae, laxe reticulatae, cellulis plerumque 24-30 x 6-8 μm. Hyphopodia capitata alternata vel usque ad 10% opposita, recta, patentia, antorsa vel reflexa, 12-16 μm longa; cellula basali cylindracea vel cuneata, 2-6 μm longa; cellula apicali globosa, clavata, integra, curvula, 10-12 x 8-10 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 18-20 x 8-10 μm. Setae myceliales numerosae, dispersae, rectae, simplices, acutae, ad 315 μm longae. Perithecia dispersa, verrucosa, ad 160 μm; sporae obovoidae, 4-septatae, constrictae, 36-40 x 14-16 μm.

Colonies hypophyllous, scattered, dense, velvety up to 10 mm in diameter, confluent. Hyphae substraight to undulating, branching opposite to irregular at wide angles, loosely reticulate, cells 24-30 x 6-8 μm. Capitate hyphopodia alternate, unilateral to 10% opposite, straight, spreading, antorse to reflexed, 12-16 μm long; stalk cells cylindrical to cuneate, 2-6 μm long; head cells globose, entire, curved, 10-12 x 8-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 18-20 x 8-10 μm. Mycelial setae numerous, scattered, straight, simple, acute at the tip, up to 315 μm.
Meliola hymenocardiae Hansf. can be compared with the present species (Hansf., 1961) but it differs in forming hypophyllous colonies, and in having 10% opposite and crowded capitate hypopodia and smaller setae. There is no record of the genus Meliola on this host genus.

33. Meliola erva-cibis-paniculatae Hosagoudar, sp. nov

Plagulae amphigenae, plerumque hypophyllae, saepe halonibus luteis cinctae, subdensae, ad 4 mm diam., confluences. Hyphae mycelii subrectae, plerumque oppositae acutaeque ramosae, cellulis 16-24 x 6-10 μm. Hyphopodia capitata densa, plerumque opposita, antrorsa, recta vel curvula, 20-26 μm longa; cellula basali cuneata, 6-10 μm longa; cellula apicali ovata vel obovata, integra, 12-18 x 10-12 μm. Hyphopodia mucronata et capitata commixa, opposita vel alternata, ampullacea, 16-22 x 8-10 μm. Setae myceliales dispersae vel etiam juxta perithecia, acutae vel obtusae ad apicem, ad 378 μm longae. Perithecia dispersa, verrucosa, ad 225 μm; spora oblongae, constrictae, 45-52 x 14-20 μm.

Colonies amphigenous, mostly hypophyllous, often show yellow haloes around the colonies, subdense, up to 4 mm in diameter, rarely confluent. Hyphae substraight, branching mostly opposite at acute angles, closely reticulate, cells 16-24 x 6-10 μm. Capitate hyphopodia closely arranged, mostly opposite, closely antrorse, straight to curved, 20-26 μm long; stalk cells cuneate, 6-10 μm long; head cells ovate to obovate, entire, 12-18 x 10-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 16-22 x 8-10 μm. Mycelial setae scattered to grouped around perithecia, simple, acute to obtuse at the tip, up to 378 μm long. Perithecia scattered, verrucose, up to 225 μm; spores oblongae, constrictae, 45-52 x 14-20 μm.


Two species of Meliola, namely Meliola erva-cibis Hansf. and M. erva-cibicolata Sawada & Yaman, have been recorded on Erycibe rheedia Bl. and E. henryi Prain from Java and Taiwan (Sawada, 1959; Hansf., 1961). The new species differs from these in having alternate and opposite capitate hyphopodia, mucronate hyphopodia mixed with the capitate hyphopodia, smaller and arcuate mycelial setae and smaller ascospores.
34. Meliola erythropalii Hosagoudar, sp. nov. Fig. 16.
Plagulae amphigenae, plectumque epiphyllae, densae, velutinae, ad 4 mm diam., confluentes. Hyphae leniter undulatae, opposite vel irregulariter acutae et ramosae, laxae reticulatae, cells 12-32 x 5-8 μm. Hyphopodia capitata alternata vel unilateralia, recta, antrorsa vel patentia, 18-20 μm longa; cellula basali cylindracea vel cuneata, 4-6 μm longa; cellula apicali ovata, globosa, integra, 12-14 x 10-12 μm. Hyphopodia mucronata paucae, illis capitatis commixtæ, dispersæ, alternata vel opposite, ampullaceae, 14-20 x 8-10 μm. Setae mycelliales dispersae, simplices, rectæ, acutæ, ad 315 μm longæ. Perithecia dispersa, verrucosa, ad 180 μm; spores oblongae, 4-septatae, leniter constrictæ, 38-44 x 10-16 μm.

Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 4 mm in diameter, confluent. Hyphae slightly undulating, branching opposite or irregular at acute angles, loosely reticulate, cells 12-32 x 5-8 μm. Capitate hyphopodia alternate to unilateral, straight, antrorsa, spreading, 18-20 μm long; stalk cells cylindrical to cuneate, 4-6 μm long; head cells ovate, globose, entire, 12-14 x 10-12 μm. Mucronate hyphopodia few, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 14-20 x 8-10 μm. Mycelial setae scattered, simple, straight, acute at the tip, up to 315 μm long. Perithecia scattered, verrucose, up to 180 μm; spores oblong, 4-septate, slightly constricted, 38-44 x 10-16 μm.


Earlier, Erythropalum was classified in the Olacaceae (Bentham & Hooker, 1862-1888), but, it is now placed in a monotypic separate family, the Erythropalaceae (Willis 1973, Santapau & Henry, 1973). The new species is close to M. anacolosae Hansf., on Anacolosa frutescens Bl. from Java (Hansf., 1961), but differs from it in having longer, straight, simple setae. There is no earlier record of meliolaceous fungi on this host genus; hence a new species is proposed.


This collection varies slightly from the description in having longer mycelial setae, smaller perithecia and slight variation in the ascospore size.


37. *Meliola glochidioid* Stev. & Rold. ex Hansf. var. *velutinii* Hosagoudar, var. nov. Fig. 17.

Differt a *M. glochidioid* Stev. & Rold. ex Hansf. var. *glochidioid* hyphopodia capitatis oppositis et alternatis, setis myceliorum longioribus.

Colonies amphigenous, dense, velvety, up to 6 mm in diameter, confluent. Hyphae straight to undulating, branching opposite to alternate at acute angles, loosely reticulate, cells 24-30 x 6-8 μm. Capitate hyphopodia opposite, about 30% alternate, straight, antrorse, 12-16 μm long; stalk cells cuneate, 4-6 μm long; head cells globose, versiform, entire, 8-12 x 8-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, 12-18 x 6-8 μm. Mycelial setae fairly numerous, scattered, simple, acute at the tip, up to 630 μm long. Perithecia scattered, up to 184 μm; spores ellipsoidal, 4-septate, constricted, 42-50 x 16-18 μm.

Holotype: On leaves of *Glochidion velutinum* Wight (Euphorbiaceae), Kanchiar forest, Dec. 29, 1983, V.B. Hosagoudar, HCIO 40526; MH 80343, Isotype.

Three species of *Meliola* are known on *Glochidion*, namely *M. kansierioid* Hansf., *M. glochidioid* Yamam., and *M. glochidioid* Stev. & Rold. ex Hansf. (Hansf., 1961). The present material differs from *M. kansierioid* Hansf. in having smaller capitate hyphopodia, setae, perithecia and ascospores. It differs from *M. glochidioid* Yamam. in having opposite and alternate capitate hyphopodia and entire head cells on the capitate hyphopodia. It is closer to *M. glochidioid* Stev. & Rold. ex Hansf. in having entire head cells of the capitate hyphopodia, but it differs from the var. *glochidioid* in having opposite and alternate capitate hyphopodia, and longer mycelial setae.


The collections cited vary slightly from published descriptions (Hansf. 1961) in having smaller capitate hyphopodia, perithecia and longer mycelial setae.


On leaves of *Maesa indica* (Roxb.) DC. (Myrsinaceae), Calvary Mount, Jan. 8, 1982, V.B. Hosagoudar, MH 72647; Idukki, April 19, 1982, V.B. Hosagoudar, HCIO 40530; MH 757919.


43. *Meliola hunteriae* Hosagoudar, sp. nov. Fig. 18.

Plagulae hypophyllae, densae, ad 5 mm diam., raro confluentes, maculae luteohalonatae, postremo foramenascentes. Hyphae subrectae vel leniter undulatae, alternatae vel oppositae acuteque ramosae, laxe retiae, cellulis 12-26 x 6-8 μm. Hyphopodia capitata alternae, rectae vel curvulae, antrorsa, 22-30 μm longae; cellula basali cuneata, 6-10 μm longa; cellula apicalis late ovalis, integra vel irregulariter sublobata, 14-22 x 10-14 μm. Hyphopodia mucronata plerumque in hyphis distinctis evoluta, alternata, unilateralia vel rare opposita, ampullacea, 16-22 x 6-8 μm. Setae myceliales numerosae, dispersae et etiam juxta perithecia aggregatae, simplices, acuta, ad 522 μm longae. Perithecia dispersa, verrucosa, ad 76 μm; sporiae oblongae, 4-septatae, constrictae, 38-42 x 14-20 μm.

Colonies hypophyllous, dense, up to 5 mm in diameter, often confluent, cause leaf spots and yellow haloes around the infected spots, corresponding upper surface of the leaf turned yellow and resulted in the shot holes. Hyphae subrectae to slightly undulating, branching alternate to opposite at acute angles, loosely reticulate, cells 12-26 x 6-8 μm. Capitate hyphopodia alternate, straight to curved, antrorsa, 22-30 μm long; stalk cells cuneate, 6-10 μm long;
head cells broadly ovate, entire to irregularly sublobate, 14-22 x 10-14 μm. Mucronate hyphopodia mostly borne on a separate mycelial branch, alternate, unilateral, rarely opposite, ampulliform, 16-22 x 6-8 μm. Mycelial setae numerous, scattered to grouped around perithecia, simple, acute at the tip, up to 522 μm long. Perithecia scattered, verrucose, up to 76 μm; spores oblong, 4-septate, constricted, 38-42 x 14-20 μm.


This species is distinct from the other Meliola species recorded on the members of the family Apocynaceae in producing a pathogenic effect on the host. There is no earlier report of a Meliola species on this host genus and the host is supposed to be endemic to peninsular India.


45. Meliola ixorae Yates var. macrosora Hosagoudar, var. nov. Fig. 19.

Differt a M. ixorae Yates var. ixorae setis myceliorum longioribus et ascosporis magioribus.

Colonies hypophyllous, thin, up to 10 mm in diameter. Hyphae tortuous, branching opposite to irregular at wide to acute angles, loosely reticulate, cells 28-32 x 6-10 μm. Capitate hyphopodia alternate to unilateral, distantly placed, spreading, antrorse, straight to curved, 22-34 μm long; stalk cells cuneate to cylindrical, 6-12 μm long; head cells ovate, angular to slightly lobate, 14-20 x 12-16 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate, rarely opposite, ampulliform, 12-20 x 6-12 μm. Mycelial setae scattered, mostly grouped around perithecia, simple, acute to obtuse at the tip, up to 1035 μm long. Perithecia scattered, verrucose, up to 170 μm; spores obovoidal to cylindrical, terminal cells broadly conoid, 42-48 x 12-14 μm.


Five species of Meliola have been recorded on Ixora. Kar & Maity (1972) recorded M. tawaoensis Hansf. on Ixora.
undulata Roxb. from West Bengal. The new variety differs in having hypophyllous colonies, with only alternate capitate hyphopodia and in having longer setae. It is very close to M. ixorae Yates but differs from the type variety in having longer mycelial setae and larger ascospores.


47. Meliola ligustrri Hosagoudar, sp. nov. Fig. 20.

Plagulae amphigenae, subdensae, usque ad 4 mm diam. vel confluentes. Hyphae mycelii flexuosae, opposite vel irregulariter lateque ramosae, laxe reticulatae, cellulis 20-30 x 6-8 μm. Hyphopodia capitata alternata, patentia, antorsa, recta vel curvula, 20-24 μm longa; cellula basali cylindracea vel cuneata, 6-8 μm longa; cellula apicali globosa, cylindrical, versiforme, angulosa, integra, 12-18 x 8-10 μm. Hyphopodia mucronata et capitata commixta, alternata vel opposita, ampullacea, 16-20 x 6-8 μm. Setae myceliales subnumeroseae, dispersae, simplices, acutae vel obtusae ad apices, ad 270 μm longae. Perithecia dispersae, ad 160 μm; sporae obovoidae, 4-septatae, constrictae, 36-40 x 14-16 μm.

Colonies amphigenous, subdense, up to 4 mm in diameter, confluent. Hyphae flexuous, branching opposite to irregular at wide angles, loosely reticulate, cells 20-30 x 6-8 μm. Capitate hyphopodia alternate, spreading, antorse, straight to curved, 20-24 μm long; stalk cells cylindrical to cuneate, 6-8 long; head cells globose, cylindrical, versiform, angulose, entire, 12-18 x 8-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, tip twisted and elongated, 16-20 x 6-8 μm. Mycelial setae fairly numerous, scattered, simple, acute to obtuse at the tip, up to 270 μm long. Perithecia scattered, verrucose, up to 160 μm; spores obovoidal, 4-septate, constricted, 36-40 x 14-16 μm.


These collections cannot be assigned to any species of Meliola recorded on Oleaceae. Thite & Kulkarni (1973) recorded M. malabarensis Hansf. on Liqustrum neligherrense Wight var. obovata Clerke from Maharashtra. The present species differs from it in having longer capitate hyphopodia, shorter mycelial setae, and larger ascospores.


50. **Meliola litseae** H. Sydow & P. Sydow var. *floribundae* Hosagoudar, var. nov. Fig. 21.

Differt a *M. litseae* H. Sydow & P. Sydow var. *litseae* hyphopodiis capitatis oppositis (5%), hyphopodiis mucronatis in hyphis distinctis evolutis et setis myceliis longioribus.

Colonies hypophyllous, subdense, velvety, up to 12 mm in diameter, confluent. Hyphae tortuous to crooked, branching opposite to irregular at wide angles, loosely reticulate, cells 36 - 42 x 6-10 μm. Capitate hyphopodia alternate, unilateral, 5% opposite, antorse, spreading, straight to curved, 26-34 μm long; stalk cells cylindrical to cuneate, 8-12 μm long; head cells ovate to globose, truncate, slightly angulate to sublobate, straight to curved, 16-24 x 14-18 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, ampulliform, 20-26 x 8-10 μm. Mycelial setae fairly numerous, grouped around perithecia, simple, acute at the tip, up to 1089 μm long. Perithecia scattered to grouped, up to 342 μm; spores ellipsoidal, 4-septate, 46-58 x 16-20 μm.


The new variety differs from the type variety in having 5% opposite capitate hyphopodia, mucronate hyphopodia borne on a separate mycelial branch and having longer mycelial setae.

51. **Meliola litseae** H. Sydow & P. Sydow var. *insignis* Hosagoudar, var. nov. Fig. 22.
Differt a M. litseae H. Sydow & P. Sydow var. litseae plagulis hypophyllis, tenuibus, myceliis anfractis, peritheciis et ascosporis magnioribus.

Colonies hypophyllous, thin, up to 10 mm in diameter, confluent. Hyphae tortuous to crooked, branching alternate to irregular at acute angles, loosely reticulate, cells 18-22 x 6-8 µm. Capitate hyphopodia alternate to unilateral, straight to curved, antrorse, spreading, 14-20 µm long; stalk cells cuneate to cylindrical, 6-8 µm long; head cells ovate, clavate, globose, slightly angular, entire, 10-12 µm. Mucronate hyphopodia few, mixed with capitate hyphopodia, alternate, ampulliform, 16-22 x 8-10 µm. Mycelial setae fairly numerous, scattered, simple, acute to obtuse at the tip, up to 927 µm long. Perithecia scattered, verrucose, up to 200 µm; spores obovoidal, 4-septate, constricted, 42-50 x 14-18 µm.


The new variety differs from the type variety in having hypophyllous, thin colonies, crooked mycelia, and larger perithecia and ascospores.

52. Meliola litseae H. Sydow & P. Sydow var. keralense Hosagoudar, var. nov. Fig. 23.

Differt a M. litseae H. Sydow & P. Sydow var. litseae plagulis epiphyllis, hyphopodis capitatis parvioribus, setis myceliorum brevioribus et acutis, peritheciis mycelii exhyphopodiatis insidentibus et ascosporis parvioribus.

Colonies epiphyllous, subdense, up to 3 mm in diameter, rarely confluent. Hyphae substraight, branching opposite at wide angles, loosely reticulate, cells 14-20 x 8-10 µm. Capitate hyphopodia alternate, antrorse, 26-28 µm long; stalk cells cuneate, 6-8 µm long; head cells ovate, versiform, entire, 18-20 x 12-14 µm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, 18-26 x 8-10 µm. Mycelial setae few, mostly grouped around perithecia, simple, acute, up to 578 µm long. Perithecia mostly scattered, seated on exhyphopodiad hyphae, up to 186 µm; spores obovoidal, 4-septate, slightly constricted, 36-38 x 16-20 µm.


The new variety differs from the type variety in having epiphyllous colonies, smaller capitate hyphopodia, shorter and acute mycelial setae, perithecia seated on the exhyphopodiad mycelia and smaller ascospores.


The collections cited vary slightly from published descriptions in having larger capitate hyphopodia, presence of few mycelial setae and larger ascospores.

54. **Meliola luvunqae** Hosagoudar, sp. nov. Fig. 24.

Colonies hypophyllous, dense, velvety, up to 6 mm in diameter, confluent. Hyphae straight, branching mostly opposite and rarely alternate at acute angles, loosely reticulate, cells 12-14 x 6-8 μm. Capitate hyphopodia alternate, straight to slightly curved, subantrorse to antrorse, 16-20 μm long; stalk cells cuneate, 4-6 μm long; head cells ovate to cylindrical, entire, 10-14 x 8-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 16-20 x 6-8 μm. Mycelial setae scattered, straight, simple, acute at the tip, up to 351 μm long. Perithecia scattered, verrucose, up to 166 μm; spores obovoidal, 4-septate, constricted, 40-42 x 14-18 μm.


The new species differs from other *Meliola* species on Rutaceae in all of the principal morphological characters (Hansf., 1961). Further, there is no record of the genus *Meliola* on Luvunga.


On leaves of **Persea macrantha** (Pees) Kosterm. (*Machili macrantha* Nees) (Lauraceae), Idukki, Jan. 12,

The collections cited vary slightly from the description in forming hypophyllous colonies, smaller setae, and smaller ascospores.


On leaves of *Olea dioica* Roxb. (Oleaceae), Idukki, Jan. 10, 1982, V.B. Hosagoudar, HCIO 40544; MH 72646.

The collection cited varies from the description in having longer capitate hyphopodia and absence of 5% opposite capitate hyphopodia.


60. **Meliola mucunae** Hansf. var. *hirsutae* Hosagoudar, var. nov. Fig. 25.

Differ from *M. mucunae* Hansf. var. *mucunae* plagulis epiphyllis, hyphopodiis 40% oppositis et setis myceliorum longioribus.
Colonies epiphyllous, thin, up to 3 mm in diameter, confluent. Hyphae undulating, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 16-34 x 6-8 µm. Capitate hyphopodia alternate and about 40% opposite, straight, antrorse, spreading, 14-20 µm long; stalk cells cylindrical to cuneate, 4-8 µm long; head cells globose, entire, 10-12 µm. Mucronate hyphopodia mixed with capitate hyphopodia, scattered, opposite to alternate, ampulliform, 16-20 x 8-10 µm. Mycelial setae few, grouped around perithecia, straight to curved, simple, acute at the tip, up to 324 µm long. Perithecia scattered, verrucose, up to 176 µm; spores ellipsoidal, 4-septate, constricted, 30-36 x 12-14 µm.


Two species of the genus Meliola, namely M. mucuna-acuminatae Hansf. and M. mucunae Hansf., have been recorded on Mucuna from Java and Sierra Leone (Hansford, 1961). The new variety is closer to M. mucunae Hansf., in that it has alternate and opposite capitate hyphopodia and the mucronate hyphopodia are mixed with the capitate hyphopodia. However, the new variety differs from the var. mucunae in having only epiphyllous colonies, 40% opposite capitate hyphopodia and longer mycelial setae.


In the present collections, the mycelial setae are simple and the capitate hyphopodia are alternate only.


63. Meliola nilgirianthii Hosagoudar, sp. nov. Fig. 26.

Plagulae hypophyllae, densae, ad 2 mm diam., raro confluentes. Hyphae mycelii subrectae vel undulatae, plurumque opposite acutaeque ramosae, cellulis 16-18 x 6-8 µm. Hyphopodia capitata alternata vel unilateralia, recta
vel curvula, antrorsa vel patentia, 22-30 μm longa, cellula basali cylindracea vel cuneata, 8-12 μm longa; cellula apicali ovata, globosa, leniter angulosa, integra, 14-18 x 10-16 μm. Hyphopodia mucronata et capitata commixa, alternata vel opposita, ampullacea, 14-22 x 6-8 μm. Setae myceliales paucae, dispersae vel etiam juxta perithecia aggregatae, simplices, curvulae, acutae vel obtusae ad apicem, ad 270 μm longae. Perithecia aggregata, verrucosa, ad 180 μm; spores obovoidae, 4-septatae, constrictae, 30-38 x 10-12 μm.

Colonies hypophyllous, dense, up to 2 mm in diam., rarely confluent. Hyphae substraight to undulating, branching mostly opposite at acute angles, loosely reticulate, cells 16-18 x 6-8 μm. Capitate hyphopodia alternate to unilateral, straight to curved, antrorse to spreading, 22-30 μm long; stalk cells cylindrical to cuneate, 8-12 μm long; head cells ovate, globose, slightly angular, entire, 14-18 x 10-16 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 14-22 x 6-8 μm. Mycelial setae few, scattered to grouped around perithecia, curved, acute to obtuse to weavy at the apex, up to 270 μm long. Perithecia aggregated, verrucose, up to 180 μm; spores obovoida, 4-septate, constricted, 30-38 x 10-12 μm.


This species can be compared with M. cladacantha Ciff. (Hansford, 1961), but differs from it in forming hypophyllous and dense colonies, larger perithecia and smaller ascospores. There is no species of Meliola recorded on this host.


65. Meliola otonephelii Hosagoudar, sp. nov. Fig. 27.

Plagulae amphigenae, atrae, plerumque epiphyllae, subdensae vel densae, dispersae, ad 4 mm diam. Hyphae mycelii brunneae, rectae vel subrectae, plerumque opposite lateque ramosae, laxe reticulatae, cellulis 12-18 x 6-8 μm. Hyphopodia capitata alternatae vel ad 40% opposita, recta vel curvula, antrorsa vel reflexa, 16-22 μm longa; cellula basali cylindracea vel cuneata, 4-8 μm longa; cellula apicali plerumque conoidae, cylindracea, versiformis, piriformis, recta vel curvula, integra, 12-14 x 6-8 μm. Hyphopodia mucronata et capitata commixa, opposita vel
alternata, ampullacea, 16-26 x 8-10 \( \mu \text{m} \). Setae myceliales paucae, plerumque juxta perithecia aggregatae, atrae, simplices, rectae, obtusae vel dentatae, ad 225 \( \mu \text{m} \) longae. Perithecia pauca, verrucosa, ad 170 \( \mu \text{m} \); sporeae brunneae, obovoidae vel cylindraceae, 4-septatae, leniter constrictae, 44-48 x 16-18 \( \mu \text{m} \).

Colonies amphigenous, mostly epiphyllous, subdense to dense, scattered, up to 4 mm in diameter. Hyphae straight to substraight, branching mostly opposite at wide angles, loosely reticulate, cells 12-18 x 6-8 \( \mu \text{m} \). Capitate hyphopodia alternate to about 40% opposite, spreading, straight to curved, antrosoe to reflexed, 16-22 \( \mu \text{m} \) long; stalk cells cylindrical to cuneate, 4-8 \( \mu \text{m} \) long; head cells mostly conoid, cylindrical, versiform, pyriform, straight to curved, entire, 12-14 x 6-8 \( \mu \text{m} \). Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 16-26 x 8-10 \( \mu \text{m} \). Mycelial setae few, grouped around perithecia, straight, simple, obtuse to variously dentate at the tip, up to 225 \( \mu \text{m} \) long. Perithecia few, verrucose, up to 170 \( \mu \text{m} \); spores obovoidal to cylindrical, 4-septate, slightly constricted, 44-48 x 16-18 \( \mu \text{m} \).


The *Meliola* species with head cells more or less conoid or cylindro-clavate recorded on the members of the family Sapindaceae have been treated as varieties of *M. caoensis* (K. & C.) Theiss. (Hansf., 1961). The new species differs in all the principal morphological characters from the recorded species. Further, there is no record of any meliolaceous fungus on this host.


67. *Meliola prenicola* Hosagoudar, sp. nov. Fig. 28.

Plagulae epiphyllae, subdensae, usque ad 5 mm diam., raro confluentes. Hyphae mycelli subrectae vel flexuosae, brunneae, opposite lateque ramosae, densae reticulatae, cellulis 26-30 x 8-10 \( \mu \text{m} \). Hyphopodia capitata alternata vel usque ad 30% opposita, antrosoe, 16-20 \( \mu \text{m} \) longae; cellula basali cuneata, 4-6 \( \mu \text{m} \) longa; cellula apicali globosa, ovata, integra, 12-14 x 10-12 \( \mu \text{m} \). Hyphopodia mucronata et capitata commixa, opposita vel alternata, ampullacea, 18-22 x 8-10 \( \mu \text{m} \). Setae myceliales dispersae, plerumque juxta perithecia aggregatae, rectae, simplices, obtusae vel dentatae, ad 720 \( \mu \text{m} \) longae. Perithecia
dispersa, verrucosa, ad 170 μm; sporae ellipsoidae, 4-septatae, constrictae, 42-48 x 14-16 μm.

- Colonies epiphyllous, subdense, up to 5 mm in diameter, rarely confluent. Hyphae substraight to flexuous, branching opposite at acute angles, closely reticulate, cells 26-30 x 8-10 μm. Capitate hyphopodia alternate, about 30% opposite, antrorse, 16-20 μm long; stalk cells cuneate, 4-6 μm long; head cells globose, ovate, entire, 12-14 x 10-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, neck elongated and twisted, 18-22 x 8-10 μm. Mycelial setae grouped around perithecia, straight, simple, variously dentate at the apex, up to 720 μm long. Perithecia scattered, verrucose, up to 170 μm; spores ellipsoidal, 4-septate, deeply constricted, 42-48 x 14-16 μm.


Three species of Meliola, M. premnae Hansf., M. cookeana Spec. and M. callicarpae Sydow & Sydow have been recorded on Premna. The new species differs from M. premnae Hansf. in lacking the crooked mycelial setae, from M. cookeana Spec. in having substraight to flexuous mycelia and 30% opposite capitate hyphopodia, and from M. callicarpae H. Sydow & Sydow in having longer capitate hyphopodia, longer and dentate mycelial setae, larger perithecia and ascospores.


71. Meliola rickiana Hansf. var. zanthoxyli Hosagoudar, var. nov. Fig. 29.

Differt a M. rickiana Hansf. var. rickiana setis myceliorum rectis et longioribus, peritheciis et ascosporis parvioribus.

Colonies amphigenous, mostly hypophyllous, subdense, up to 4 mm in diameter, confluent. Hyphae mostly straight, branching mostly opposite, rarely alternate at acute angles, closely reticulate, cells 12-22 x 8-10 μm. Capitata hyphopodia alternate, about 10% opposite, straight to curved, antorse to spreading, 20-22 μm long; stalk cells cylindrical to cuneate, 4-8 μm long; head cells ovate, versiform; often angular, straight to curved, entire, 14-16 x 8-10 μm. Mucronate hyphopodia mixed with capitata hyphopodia, opposite to alternate, mostly ampulliform, 18-20 x 8-10 μm. Mycelia setae numerous, straight, acute to 2-3 dentate at the apex, up to 810 μm long. Perithecia mostly grouped, verrucose, up to 200 μm; spores obovoidal, 4-septate, slightly constricted, 36-40 x 16-18 μm.


Kapoor (1967) recorded M. zanthoxyli Hansf. on Zanthoxylum ovalifolium Wight from Karnataka. The new variety differs from M. zanthoxyli in having alternate and opposite, as well as smaller capitata hyphopodia, entire head cells of the capitata hyphopodia, smaller and straight mycelial setae and smaller ascospores.

Zanthoxylum ovata Wight is synonymous with Fagara ovata. Nine species of Meliola have been recorded on these hosts. Of these, M. rickiana Hansf. is closest to the present collection, in having alternate and opposite capitata hyphopodia, acute to dentate mycelial setae. The new variety differs from var. rickiana in having straight and larger mycelial setae, smaller perithecia and ascospores.

72. Meliola saleana Hansf. var. smilacis Hosagoudar, var. nov. Fig. 30.

Differt a M. saleana Hansf. var. saleana hyphis rectis, capitibus hyphopodiorum integris, hyphopodis mucronatis et hyphopodis capitatis mixtis, ascosporis et setis myceliorum magnioribus. A M. gregorianae Stev. var. confusa Cif. hyphis rectis, capitatis hyphopodiorum capitatorum ovatis vel integris, setis parvioribus et ascosporis magnieribus differt.

Colonies amphigenous, mostly epiphyllous, subdense, up to 4 mm in diameter, rarely confluent. Hyphae straight,
branching opposite at acute angles, loosely to closely reticulate, cells 10-30 x 6-9 μm. Capitate hyphopodia alternate, straight, antrorse, 16-24 μm long; stalk cells cuneate, 5-14 μm long; head cells ovate, bluntly pointed, entire, 12-16 x 8-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-28 x 8-12 μm. Mycelial setae mostly grouped around perithecia, straight, simple, acute at the apex, up to 855 μm long. Perithecia scattered, verrucose, up to 198 μm; spores obovoidal, 4-septate, constricted, 42-50 x 18-20 μm.


Five taxa of the genus *Meliola* have been recorded on *Smilax* (Hansf., 1961), of which *M. gregoriana* Stev. var. *confusa* Cif. and *M. gregoriana* var. *salleana* Hansf. have alternate capitate hyphopodia. The new variety differs from *M. gregoriana* var. *confusa* in having straight hyphae, entire head cells of the capitate hyphopodia, smaller setae and larger ascospores. The new variety differs from the var. *salleana* in having ovate and entire head cells of the capitate hyphopodia, mucronate hyphopodia mixed with capitate hyphopodia, larger ascospores and mycelial setae.

73. *Meliola sarcostigmae* Hosagoudar, sp. nov. Fig. 31.

Plagulae hypophyllae, densae, velutinae, usque ad 5 mm diam., raro confluentes. Hyphae mycelli subrectae vel undulatae, brunneae, plerumque opposite lateque ramosae, densae reticulatae, cellulis 24-32 x 6-10 μm. Hyphopodia capitata alternata vel 10% opposita, recta vel curvula, patentia, antrorsa, 14-24 μm longa; cellula basali cylindracea vel cuneata, 4-10 μm longa; cellula apicali ovata, globosa, integra, 10-14 x 8-10 μm. Hyphopodia mucronata et capitata commixta, opposita vel alternata, ampullacea, 22-26 x 6-10 μm. Setae mycelliales numerosae, dispersae, rectae, simplices, obtusae vel acutae, ad 468 μm longae. Perithecia dispersa, verrucosa, ad 170 μm; spores obovoidae, 4-septatae, constrictae, 38-44 x 14-16 μm.

Colonies hypophyllous, dense, velvety, up to 5 mm in diameter, rarely confluent. Hyphae substraight to undulating, branching mostly opposite at wide angles, closely reticulate, cells 24-32 x 6-10 μm. Capitate hyphopodia alternate, about 10% opposite, straight to curved, antrorse, spreading, 14-24 μm long; stalk cells cylindrical to cuneate, 4-10 μm long; head cells ovate, globose, entire, 10-14 x 8-10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 22-26 x 6-10 μm. Mycelial setae numerous, scattered, straight, simple, acute to obtuse at the tip, up to 468 μm long. Perithecia scattered, surface cells
projecting, up to 170 μm; spores obovoid, 4-septate, constricted, 38-44 x 14-16 μm.

**Holotype:** On leaves of *Sarcostigma kleinii* Wight & Arn. (Icacinaceae), Idukki, Kerala, Feb. 18, 1983, V.B. Hosagoudar, HCIO 40561; MH 75835, Isotype.

Eight species of *Meliola* have been recorded on members of the Icacinaceae but none is close to new species (Hansf., 1961). Further, there is no record of *Meliola* on *Sarcostigma*.

74. *Meliola scleropvri* Hosagoudar, sp. nov. Fig. 32.

Colonies amphigenous, mostly hypophyllous, dense, velvety, up to 4 mm in diameter, confluent. Hyphae substraight to slightly undulating, branching opposite to irregular at acute angles, loosely reticulate, cells 10-14 x 6-8 μm. Capitate hyphopodia alternate to unilateral, subantrorse to antrorse, 22-28 μm long; stalk cells mostly cuneate, 8-13 μm long; head cells ovate, pyriform, entire, 13-18 x 12-14 μm. Mucronate hyphopodia few, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-20 x 8-10 μm. Mycelial setae numerous, grouped around perithecia, straight, simple, acute to obtuse at the tip, up to 280 μm long. Perithecia scattered to grouped, verrucose, up to 153 μm; spores obovate, 4-septate, constricted, 32-36 x 11-12 μm.


Five species and a variety of the genus *Meliola* have been recorded on the members of the family Santalaceae (Hansf., 1961). None of them is comparable to the present species. Further, there is no record of any meliolaceous fungi on the host genus *Scleropyrum*. 


The present collection varies slightly in having dentate setae and larger ascospores. However, the fungus did not show the pathogenic effect on the host noted by Hansford (1961).

76. *Meliola stemonuri* Hosagoudar, sp. nov. Fig. 33.

Plagulae amphigenous, caulicolae, densae, velutinae, ad 3 mm diam., confluentes. Hyphae rectae vel subrectae, alternatae vel oppositae acute angulate ramoseae, densae reticulatae, cellulis 22-28 x 10-14 μm. Hyphopodia capitata alternata vel unilateralia, recta vel curvula, antrorsa vel reflexa, 24-32 μm longa; cellula basali cylindraceae vel cuneata, 8-16 μm longa; cellula apicali globosa, ovata, integra, 14-16 μm. Hyphopodia mucronata et capitata commixta, dispersa, opposita vel alternata, ampullacea, 22-30 x 8-10 μm. Setae myceliales dispersae et etiam juxta perithecia aggregatae, simplices, curvulae, acutae vel obtusae, ad 648 μm longae. Perithecia dispersa, verrucosa, ad 198 μm; sporeae obovoidae, 4-septatae, constrictae, 54-60 x 16-24 μm.

Colonies amphigenous, caulicolous, dense, velvety, up to 3 mm in diameter, confluent. Hyphae straight to substraight, branching alternate to opposite at acute angles, closely reticulatae, cells 22-28 x 10-14 μm. Capitata hyphopodia alternate to unilateral, straight to curved, antrorse to reflexed, 24-32 μm long; stalk cells cylindrical to cuneate, 8-16 long; head cells globose, ovate, entire, 14-16 μm. Mucronate hyphopodia mixed with capitata hyphopodia, opposite to alternate, ampulliform, 22-30 x 8-10 μm. Mycelial setae scattered and grouped around perithecia, simple, curved, acute to obtuse at the tip, up to 648 μm long. Perithecia scattered, verrucose, up to 198 μm; spores obovoidal, 4-septate, constricted, 54-60 x 16-24 μm.


Eight species of *Meliola* have been recorded on the members of the family Icacinaceae (Hansf., 1961). Of these, only *M. citronellae* Hansf., recorded on *Citronella* sp. from New South Wales, is comparable with the present
species. *M. stemonuri* differs in having shorter capitate hyphopodia, smaller perithecia, larger mycelial setae and ascospores. Further, there is no record of the genus *Meliola* on this host.


On leaves of *Tamarindus indica* L. (Caesalpiniaceae), Tanikandam, Dec. 16, 1982, V.B. Hosagoudar, HCIO 40565; MH 75785.

Sydow & Sydow (1912) described this species from the Philippines. Later, Hansford & Deighton (1948) reexamined the material. The present collection matches it well.


80. *Meliola themedae* Stev. & Rold. ex Hansf. var. *indica* Hosagoudar, var. nov. Fig. 34.

Differt a *M. themedae* Stev. & Rold. ex Hansf. var. *themedae* hyphopodiis capitatis magnioribus et setis myceliorum longioribus, simplicibus, acutis et obtusis.

Colonies amphigenous, subdense, velvety, up to 2 mm in diameter, confluent. Hyphae straight to tortuous, straight hyphae run along the veins and tortuous hyphae across the straight hyphae, branching mostly opposite at acute to wide angles, closely reticulate and form almost solid mycelial mat. Capitate hyphopodia alternate, spreading, antorse to reflexed, straight to curved, 20-30 μm long; stalk cells cylindrical to cuneate, 8-14 μm long; head cells ovate, angular, entire to imperfectly and irregularly sublobate, 10-15 x 10-15 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 14-20 x 6-10 μm. Mycelial setae scattered to grouped around perithecia, straight, simple, acute to obtuse at the tip, up to 558 μm long. Perithecia scattered, verrucose, up to 130 μm; spores obvoidal, 4-septate, constricted, 40-48 x 14-18 μm.

Holotype: On leaves of *Themeda cymbaria* Hack. (Gramineae), Calvary Mount, Jan. 8, 1982, V.B. Hosagoudar,
Stevens and Roldan (1935) described *Meliola themedae* on *Themeda gigantea* (Cav.) Hack. from the Philippines. The new variety differs from the var. *themedae* in having larger capitate hyphopodia, and longer, simple, acute to obtuse mycelial setae.

81. *Meliola tvlophorae* Hosagoudar, sp. nov. Fig. 35.

Plagulae amphigenae, plerumque hypophyllae, densae, velutinae, ad 5 mm diam., confluentes. Hyphae rectae vel leniter undulatae, oppositae acuteque vel laxe ramosae, densae vel laxe reticulatae, cellulis 12–30 x 6–8 μm. Hyphopodia capitata alternata vel ad 60% opposita, antorsa, patentia, recta vel curvula, 16–20 μm longa; cellula basali cylindracea vel cuneata, 4–8 μm longa; cellula apicali ovata, globosa, integra, 10–14 x 8–10 μm. Hyphopodia mucronata et capitata commixta, opposita vel alternata, ampullacea, 12–24 x 6–10 μm. Setae myceliales dispersae vel etiam juxta perithecia aggregatae, simplices, acutae vel obtusae, ad 468 μm. Perithecia plerumque aggregata, verrucosa, ad 252 μm; sporae obovoidae, 4-septatae, constrictae, 34–42 x 14–18 μm.

Colonies amphigenous, mostly hypophyllous, dense, velvety, up to 5 mm in diameter, confluent. Hyphae straight to slightly undulating, branching opposite at acute to wide angles, loosely to closely reticulate, cells 12–30 x 6–8 μm. Capitate hyphopodia alternate and about 60% opposite, antorsa, spreading, straight to curved, 16–20 μm long; stalk cells cylindrical to cuneate, 4–8 μm long; head cells ovate, globose, entire, 10–14 x 8–10 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 12–24 x 6–10 μm. Mycelial setae scattered to grouped around perithecia, simple, acute to obtuse at the tip, up to 468 μm long. Perithecia mostly grouped, verrucose, up to 252 μm; spores obovoidal, 4-septate, constricted, 34–42 x 14–18 μm.


The new species is very close to *M. hoyae* Sacc. but differs from it in larger perithecia, smaller ascospores and longer mycelial setae. Thite & Patil (1982) recorded *M. telosmae* Rehm var. *tylophorae* Hansf. on *Tylophora* sp. from Maharashtra. The present species differs from it in having larger, opposite and alternate capitate hyphopodia, larger setae, larger perithecia and ascospores.


83. **Meliola wendlandiae** Hosagoudar, sp. nov. Fig. 36.

Plagulae amphigenae, plerumque hypophyllae, subdensae, subvelutinae, ad 4 mm diam., confluentes. Hyphae sinuosae vel anfractae, oppositae vel irregulariter acutae, ramosae, densae vel laxe reticulatae, cellulis 18-32 x 6-10 μm. Hyphopodia capitata alternata, antorsa, patentia, 20-30 μm longa; cellula basali cuneata vel cylindracea, 6-12 μm longa; cellula apicali ovata, ad apices subrotunda, leniter angulosa, integra, 15-18 x 12-14 μm. Hyphopodia mucronata plerumque in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 14-20 x 8-10 μm. Setae myceliales paucae, etiam juxta perithecia aggregatae, simplices, rectae, subacutae vel acutae ad apices, ad 344 μm longae. Perithecia, dispersa, verrucosa, ad 168 μm; sporae obovoidae, 4-septatae, constrictae, 36-46 x 12-18 μm.

Colonies amphigenous, mostly hypophyllous, subdense, subvelvety, up to 4 mm in diameter, confluent. Hyphae sinuous to crooked, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 18-32 x 6-10 μm; stalk cells cuneate to cylindrical, 6-12 μm long; head cells ovate, narrow towards apex, slightly angular, entire, 15-18 x 12-14 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, ampulliform, 14-20 x 8-10 μm. Mycelial setae few, grouped around perithecia, simple, straight, acute to subacute at apex, up to 344 μm long. Perithecia scattered, verrucose, up to 168 μm; spores obovoidal, 4-septate, constricted, 36-46 x 12-18 μm.


Thite & Kulkarni (1973) recorded *M. canthi* Hansf. on *W. notoniana* Wall, from Maharashtra. The new species differs in having hypophyllous colonies, crooked mycelia, entire, straight head cells of the capitata hyphae, mucronata hyphopodia borne on separate mycelial branches, and in having smaller ascospores.


The collections cited differ slightly from the description in having smaller, dentate mycelial setae and smaller ascospores.

ACKNOWLEDGEMENTS

We are grateful to the following Scientists of Botanical Survey of India, Southern Circle, Coimbatore for their help in various ways: Drs. N.C. Nair, N.P. Balakrishnan, V.J. Nair andMesra, B.V. Shetty, K. Vivekanathan and K. Sivanandand. We extend our sincere thanks to Drs. U. Braun (Germany), K. Katumoto (Japan) and W.A. Cavalcanti (Brazil) for their valuable suggestions and also for providing the literature on the topic. We are especially grateful to Dr. F. A. Becker, Dr. K. Pirozynski and Dr. S.J. Hughes for reviewing the manuscript and for many helpful suggestions, and to Dr. K.P. Korf for editorial assistance.

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Fig. 1. *Meliola anistrocladii* Hosagoudar. Fig. 2 *Meliola angiopteridis* Hansf. var. *indica* Hosagoudar.
Fig. 3. *Meliola atalantiae* Hosagoudar. Fig. 4. *Meliola atviosiae* Hosagoudar.
Fig. 5. *Meliola bantamensis* Hansf. var. *keralensis* Hosagoudar. Fig. 6. *Meliola beilschmiediae* Yamam. var. *cinnamomicola* Hosagoudar.
Fig. 7. *Meliola buchananiicola* Hosagoudar. Fig. 8. *Meliola cansiericola* Hosagoudar.
Fig. 9. Meliola chandrasekharanii Hosagoudar. Fig. 10. Meliola clausenae Hosagoudar.
Fig. 11. *Meliola clitoriae* Hosagoudar. Fig. 12. *Meliola cyclica* Hosagoudar.
Fig. 13. *Meliola dimidiatae* Hosagoudar. Fig. 14. *Meliola drypetica* Hosagoudar.
Fig. 15. *Meliola erycibis-paniculatae* Hosagoudar. Fig. 16. *Meliola erythropallii* Hosagoudar.
Fig. 17. *Meliola glochidii* Stev. & Rold. ex Hansf. var. *velutini* Hosagoudar. Fig. 18. *Meliola hunteriae* Hosagoudar.
Fig. 19. *Meliola ixoreae* Yates var. *macrospora* Hosagoudar.
Fig. 20. *Meliola ligustri* Hosagoudar.
Fig. 21. Meliola litsea Sydow & Sydow var. floribundae Hosagoudar.

Fig. 22. Meliola litsea Sydow & Sydow var. insignis Hosagoudar.
Fig. 23. *Meliola litsea* Sydow & Sydow var. *keralensis*.
Fig. 24. *Meliola luvungue* Hosagoudar.
Fig. 25. *Meliola mucunae* Hansf. var *hirsutae* Hosagoudar.

Fig. 26. *Meliola nilgirianthii* Hosagoudar.
Fig. 27. *Meliola otonephelli* Houagoudar. Fig. 28. *Meliola premnicola* Houagoudar.
Fig. 29. *Meliola rickiana* Hansf. var. *zanthyoxyl* Hosagoudar. Fig. 30. *Meliola salicina* Hansf. var. *smilacis* Hosagoudar.
Fig. 31. *Meliola sarcostigiae* Houayoudar. Fig. 32. *Meliola sclerogryri* Houayoudar.
Fig. 33. *Melicyca gynsamuri* Meig. Fig. 34. *Melicyca thermochore* Stev. & Hold var. *indica* Meig.
Fig. 35. *Meliola tylophorae* Hosagoudar. Fig. 36. *Meliola wendlandiae* Hosagoudar.
MELIOLACEAE OF SOUTH INDIA - VII

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SUMMARY

This paper gives an account of six meliolaceous fungi recently encountered in South India. *Amazonia balakrishnani*, *Meliola aphanamixidis*, *M. manni*, and *M. nairii* are described as new species; *M. osyridicola* Hansf. var. *indica* is described as a new variety. *Meliola floridensis* is reported from India for the first time.

Key words: Meliolaceae, Amazonia, Meliola, black mildews, India
This paper gives an account of six taxa of meliolaceous fungi found in South India which have not been previously reported from this region. Four are considered to be new species, and one is a new variety. The sixth is a new record for India. The materials on which these taxa are based have been deposited in the HCO, New Delhi.

1. **Amazonia balakrishnanii** Hosagoudar, sp. nov.

   Plagulae epiphyllae, subdensae, ad 3 mm diam. Hyphae plerumque rectae, opposite vel alternate acuteque vel laxe ramosae, dense reticulatae, cellulis 15-18.5 x 9-12.5 um. Hyphopodia capitata alternata, antorsa, 24-28 um longa; cellula basali cuneata, 6-9.5 um longa; cellula apicali versiformia vel cylindracea, integra, 15-18.5 x 12-15.5 um. Hyphopodia mucronata illis capitis commixta, oppostra vel alternata, ampullacea, 18-25 x 9-12.5 um. Perithecia mycelio exhyphopodiati inadentia, dispersa, depressa-globosa, ad 118 um; sporae obovoidae vel cylindraceae, 4-septatae, constrictae, 24-43.5 x 21-25 um.

   Colonies epiphyllous, subdense, up to 3 mm in diameter. Hyphae mostly straight, branching opposite to alternate at acute to wide angles, closely reticulate, cells 15-18.5 x 9-12.5 um. Capitate hyphopodia alternate, antorsa, 24-28 um long; stalk cells cuneate, 6-9.5 um long; head cells versiform to cylindrical, entire, 15-18.5 x 12-15.5 um. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 18-25 x 9-12.5 um. Perithecia seated on exhyphopodiate mycelium, scattered, flattened globose, up to 118 um; spores obovoidal to cylindrical, 4-septate, constricted, 34-43.5 x 21-25 um.

   **Holotype**: On leaves of *Castanopsis armata* Spach (Fagaceae), Assam, Jan., 1987, G. Munn HCO 39434a.

   The colonies of both *Meliola mannii* and *M. balakrishnanii* were found on the same leaf. The latter can be easily distinguished from *M. mannii* by its subdense colonies, robust mycelia, densely arranged capitate hyphopodia and its cylindrical to versiform head cells of the capitate hyphopodia.

   There are no prior reports of the genus *Amazonia* on the members of the family Fagaceae. The species is named in honour of Dr. N.P. Balakrishnan for his valuable contributions to knowledge of the angiosperm family Euphorbiaceae.

2. **Meliola aphanamixidis** Hosagoudar, sp. nov.

   Plagulae epiphyllae, densae, velutinae, ad 2 mm diam., raro confluentes. Hyphae subrectae vel leniter anfractuosa, opposite vel irregulariter lateque ramosae,
Figs. 1 - 5. New taxa of meliolaceous fungi.
Key to abbreviations: Ch = capitate hyphopodia. Mh = mucronate hyphopodia. Ms = mycelial setae. Sp = ascospores.

Fig. 1. Amazonia balakrishnani Hosagoudar.
Fig. 2. *Meliola aphanamixidis* Hosagoudar.

Fig. 3. *Meliola manuli* Hosagoudar
Fig. 4. Meliola nairii Hosagoudar. Fig. 5. Meliola osyridicola Hansf. var. indica Hosagoudar.
laxe vel densae recticulatae, cellulis 12-28 x 9-12.5 um. Hyphopodia capitata opposita, post spatium dense disposita, rare solitaria, antoris, subantrorsa vel recurva, 21-31 um longa; cellula basali cylindracea vel cuneata, 6-12.5 um longa; cellula apicali ovata, angulosa, truncata, recta vel curvala, integra, 15-18.5 x 9-15.5 um. Hyphopodia mucronata illis capitulis commixta, opposita vel alternata, ampullacea, 18-25 x 9-12.5 um. Setae mycelium interumque aggregatae ad peritheciae, simplicia, rectae, acuta vel obtusa, ad 572 um longae. Perithecia mycelio exhyphopodiata incidentia, dispersa, verrucosa, ad 232 um; spores obovoidae, 4-septate, constrictae, 52-56 x 18-22 um.

Colonies epiphyllous, dense, velvety, up to 2 mm in diameter, rarely confluent. Hyphae substraight to slightly crooked, branching opposite to irregular at wide angles, loosely to closely reticulate, cells 12-28 x 9-12.5 um. Capitate hyphopodia opposite, crowded after intervals, rarely solitary, antoris, subantrorsae, recurved, 21-31 um long; stalk cells cylindrica vel cuneata, 6-12.5 um long; head cells ovate, globosa, angular, truncata, straight to curved, entire, 15-18.5 x 9-15.5 um. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 18-25 x 9-12.5 um. Mycelial setae mostly grouped around perithecia, simple, straight, acute to obtuse, up to 572 um long. Perithecia seated on exhyphopodiata mycelia, scattered, verrucosa, up to 232 um; spores obovoidal, 4-septate, constrictae, 52-56 x 18-22 um.


One species of Meliola, M. amoorae Yates, has been reported on Amoora (Hansford, 1961). This collection differs from M. amoorae in having larger capitate hyphopodia. It can be compared with M. opposita Syd. but differs in the morphology of the capitate hyphopodia and in having larger ascospores.


4. Meliola manus Hosagoudar, sp. nov.

Plagulae epiphyllae, tenues, ad 2 mm diam., confluentes. Hyphae mycelii rectae vel subrectae, opposite lateque ramose, laxa reticulatae, cellulis 31-56 x 7-9.5 um. Hyphopodia capitata alternata, antorsa, recta, raro
curvata, 15-22 um longa; cellula basali cuneata, 3-6 um longa; cellula apicali conoidea, rotundata ad apicum, plerumque recta vel raro curvata, integra, 12-15.5 x 9-12.5 um. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 18-25 x 9-12.5 um. Setae myceliales paucae, ad juxta perithecia, rectae, simplices, obtusae, ad 350 um longae. Perithecia in exhyphopodiati mycelia, dispersa, ad 124 um; sporae obovatae vel cylindraceae, 4-septatae, constrictae, 43-45 x 18-22 um.

Colonies epiphyllous, thin, up to 2 mm in diameter confluent. Hyphae straight to substraight, branching mostly opposite at wide angles, loosely reticulate, cells 31-56 x 7-9.5 um. Capitate hyphopodia alternate, straight, rarely curved, 15-22 um long; stalk cells cuneate, 3-6 um long; head cells ovate, pointed and rounded towards the apex, mostly straight but rarely recurved, entire, 12-15.5 x 9-12.5 um. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-25 x 9-12.5 um. Mycelial setae very few, grouped around perithecia, simple, straight, obtuse, up to 350 um long. Perithecia seated on exhyphopodiate mycelium, scattered, up to 124 um; spores obovate to cylindrical, 4-septate, strongly constricted, 43-45 x 18-22 um.


This collection differs from other Meliola spp. reported on Fagaceae in that it forms thin, epiphyllous colonies, and the head cells of the capitate hyphopodia are conoid.

This fungus was noticed on a leaf of herbarium material deposited in the Madras Herbarium. The species is named in honour of the collector.

5. Meliola nairii Hosagoudar, sp. nov.

Plagulae epiphyllae, minutae, subdensae, ad 2 mm diam. Hyphae rectae, subrectae vel flexuose, opposite vel irregulariter late ramosae, laxe reticulatae, cellulis 18-31 x 6-9.5 um. Hyphopodia capitata alternata, antrorua vel obtusa, 12-16 um; cellula basali cuneata vel cylindracea, 3-6 um longa; cellula apicali ovata, late rotundata ad apex, recta vel curvula, integra, 9-12.5 x 6-9.5 um. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 18-25 x 9-12.5 um. Setae myceliales paucae, simplices ad perithecia, rectae, flexuose, acute vel obtusae, ad 310 um longae. Perithecia dispersa, verrucosa, ad 155 um; sporae obovatae, 4-septatae, constrictae, 31-34 x 16-18.6 um.
Colonies epiphyllous, minute, subdense, up to 2 mm in diameter. Hyphae straight, substraight to flexuous, branching opposite to irregular at wide angles, loosely reticulate, cells 18-31 x 6-9.5 um. Capitate hyphopodia alternate, antrorse to subantrorse, 12-15.5 um; stalk cells cylindrical to cuneate, 3-6 um long; head cells ovate, broadly rounded at the apex, straight to curved, entire, 9-12.5 x 6-9.5 um. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-22 x 9-12.5 um. Mycelial setae very few, grouped around perithecia, straight, flexuous, acute to obtuse, up to 310 um long. Perithecia scattered, verrucose, up to 155 um; spores obovoid, 4-septate, constricted, 31-34 x 15-18.5 um.

Holotype: On leaves of Annona squamulosa var. indica ilosagoudar, var. nov. Differt a var. osyridicola hyphopodiis mucronatis in hyphis distinctis evolutius.

Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 2 mm in diameter, rarely confluent. Hyphae substraight to flexuous, branching opposite to irregular at acute angles, closely reticulate and forming a solid mycelial mat, cells 12-22 x 7-9.5 um. Capitate hyphopodia alternate to unilateral, straight to closely antrorse, 18-25 um long; stalk cells cuneate, 6-12.5 um long; head cells globose, ovate, entire, 9-15.5 x 12-15.5 um. Mucronate hyphopodia borne on a separate mycelial branch, mostly opposite, ampulliform, 15-19 x 9-12.5 um. Mycelial setae numerous, scattered, straight, simple, very thin, acute to obtuse, up to 150 um long. Perithecia scattered, verrucose, up to 140 um; spores obovoid, 4-septate, constricted, 43-46.5 x 15-16.5 um.

Meliola osyridis Doidge, M. osyridis Doidge var. karamotensis Hansf. and M. osyridicola Hansf. have been reported on the host Osyris (Hansford 1961). The new variety is similar to M. osyridicola Hansf., which has been reported from India, but differs from the type variety in having mucronate hyphopodia borne on a separate mycelial branch, smaller capitate hyphopodia, mycelial setae, perithecia and ascospores.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. K. Ramamurthy, Scientist SC, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement and kindly providing the duplicate materials of Madras Herbarium. We thank Dr. F.A. Uecker for reviewing the manuscript and for assistance with the Latin diagnoses.

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Meliola mangiferae Earle, a new record of fungus for Andamans

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During a survey of the pathogenic microfungi of the Andaman islands, one of the authors (A. A. A.) came across Mangifera andamanica King (Anacardiaceae), an endemic wild mango plant, infected with a block mildew disease. Microscopic examination of the fungus revealed it as Meliola mangiferae Earle, a hitherto unrecorded fungus from Andaman Islands, the details of which are given below.


Colonies hypophyllous, thin, velvety, up to 4 mm in diameter. Hyphae substraight to crooked, branching opposite to irregular at wide angles, loosely reticulate, cells 27-40 x 5-6.5 μm. Capitate hyphopodia alternate, mostly unilateral and variously curved, 24-31 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells ovate, versiform, attenuated and rounded at the apex, entire, predominantly curved, 21-25 x 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, elongated, 21-28 x 8-9.5 μm. Mycelial setae scattered, simple, straight, acute, obtuse to 2-3 dentate at the tip, up to 860 μm long. Perithecia scattered, verrucose, up to 175 μm, surface cells conoid and projecting; ascospores obovoidal to ellipsoidal, middle cell slightly larger, 49-56 x 18-22 μm.

Found on leaves of Mangifera andamanica King (Anacardiaceae), Shoalbay, South Andaman, March 23, 1991, A. A. Ansari HCIO, New Delhi.

This species has earlier been reported on Mangifera indica L. from Jamaica, Trinidad, Panama, Costa Rica, Venezuela, British Guiana, India, Malaya, Java and Philippines (Hansford, 1961). In India, this species has been reported on M. indica L. from
ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for encouragement and valuable suggestions.

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ABSTRACT

The paper gives an account of 41 species and infra-specific taxa of the Meliolaceae collected from the Anamalai range of southern India, including two species from Karnataka. Of these, Asteridiella acronychiae-pedunculatae, A. anamalaiana, Irenopsis xanthophylli, Meliola altissiae, M. bhesae, M. ceropogiae, M. gambelii, M. travancoricae, and M. trewiae are new species; Meliola barosponsis Sydow var. puereriae, M. connarji Yates var. indica, M. demecylcica Hansf. var. indica, M. pulchella Spec. var. syzygi, and M. terammi Sydow var. milletiae are new varieties; Asteridiella malloticola (Yamam.) Hansf., Irenopsis chespeli Hansf., Meliola artocarpi Yates and M. parvuta Sydow are reported for the first time from India. The remaining species are first reports after the type collections, are reported for the first time from the state of Tamil Nadu, or are new host records.

Key Words: Meliolaceae, Black Mildews, Asteridiella Irenopsis, Meliola, India.
This paper gives an account of 41 species and infra-specific taxa of the Meliyocaceae collected from the Anamalai range of southern India, including two species from Karnataka. Eight new species and five new varieties are recognized. We are using the term phialide in place of mucronate hyphopodium, based on recent studies of Mueller et al. (1991).

   On leaves of Maesa decumbens (Roxb.) DC. (Myrsinaceae), near Sholayar dam, Valparai, Coimbatore, Dec. 25, 1990, V.B. Hosagoudar HCIG 3013.

   On leaves of Syzygium cumini (L.) Skeels (Myrtaceae), Shankarankudi, Valparai, Coimbatore, Dec. 27, 1990., V.B. Hosagoudar HCIO 3014

3. Asteridiella acronychiae-pedunculatae Hosagoudar, sp. nov. (Fig. 1)
   Plagulae amphigenae, dense, crustoseae, ad 2 mm diam., raro confluentes. Hyphae rectae vel subrectae, alternatae vel oppositae acuteque ramosae, laxe reticulatae, cellulis 27-34 x 7-9.5 μm. Hyphopodia capitata alternata, recta vel lenier curvula, antrorsa vel subantrorsa, 27-40.5 μm longa; cellula basali cylindracea vel cuneata, 9-18.5 μm longa; cellula apicali clavata, ovata, cylindracea, integra vel angulosa, 18-21.5 x 12-15.5 μm. Phialides numerosa, illis hyphopodia capitatis commixta, alternata vel opposita, ampullacea, 24-31 x 9-12.5 μm. Perithecia dispersa, ad 115 μm; cellulae peritheciales conoideae vel mammelliformiae, ad 18.5 μm longae; ascosporae obovoidae, 4-septatae, constrictae, 34-37.5 x 15-21.5 μm.

Colonies amphigenous, dense, crustose, up to 2 mm in diameter, rarely confluent. Hyphae straight to substraight, branching alternate to opposite at acute angles, loosely reticulate, cells 27-34 x 7-9.5 μm. Capitate hyphopodia alternate, straight to slightly curved, antorse to subantorse, 27-40.5 μm long; stalk cells cylindrical to cuneate, 9-18.5 μm longa; head cells clavate, ovate, cylindrical, entire to angular, 18-21.5 x 12-15.5 μm. Phialides numerous, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 24-31 x 9-12.5 μm. Perithecia scattered, up to 115 μm; perithecial cells conoid to mammelliform, up to 18.5 μm long; ascospores obovoidal, 4-septate, constricted, 34-37.5 x 15-21.5 μm.

Holotype: On leaves of Acronychia pedunculata (L.)
Asteridiella acronychiae Hu has been reported on A. pedunculata from China (Hu & Lu, 1986). The new species differs from it in having smaller capitate hyphopodia, perithecia and ascospores.

4. Asteridiella anamalaiana Hosagoudar, sp. nov. (Fig. 2).

Colonies epiphyllous, scattered, dense, crustose to velvety, up to 2 mm in diameter. Hyphae substraight to crooked, branching opposite to irregular at acute angles, loosely to closely reticulate, cells 24-28 x 6-8 μm. Hyphopodia capitata alternata, minuuee 1% opposita, plerumque antrorsa, 21-28 μm longa; cellula basali cuneata vel cylindracea, 6-9.5 μm longa; cellula apicali globoa, angulosa vel raro sublobata, 15-18 x 18-22 μm. Phialides numerosa, lillis hyphopodia capitatis commixta, opposita vel alternata, ampullacea, 18-22 x 6-9.5 μm. Perithecia dispersa, globosa, ad 140 μm; cellulae peritheciales protrudae, conoideae, curvatae ad apicem, 12-15.5 μm longae; ascospores obovoideae vel cylindraceae, 4-septatae, leniter constrictae, 43-53 x 18-22 μm.

This species is close to Asteridiella buettneriae (Stevenson) Hansf., reported on Buettneria ramosissima from Brazil (Hansford, 1961), but differs from it in having crustose and only epiphyllous colonies, smaller perithecia and larger ascospores.


On leaves of Vernonia monosis Clarke (Asteraceae), Shankarakundi, Valparai, Coimbatore, Dec. 12, 1990, V.B. Hosagoudar HCIO 30516.
   On leaves of Callicarpa tomentosa (L.) Murray (Verbenaceae), Kozhikamthi, Top slip, Coimbatore, Dec. 21, 1990, V.B. Hosagoudar HCIO 30517.


12. Irenopsis xanthophylli Hosagoudar, sp. nov. (Fig. 3)
    Plagulace epiphyllae, densae, crustosae, ad 3 mm diam. Hyphae rectae, subrectae vel leniter anfractuae, oppositae acutaeque vel laxe ramosae, laxae vel densae reticulatae, cellulis 18-25 x 6-9.5 µm. Hyphopodia capitata alternata, antrosera vel subantrosera, recta vel curvula, 21-31 µm longa; cellula basalii cylindracea vel cuneata, 6-12.5 µm longa; cellula apicalis globosa, ovata, integra vel angulosa vel irregulariter sublobata, 15-18.5 x 14-18 µm. Phialis illis hyphopodia capitatis commixta, opposita vel alternata, ampullaceae, 15-21 x 9-12.5 µm.
Perithecia dispersa, globosa, ad 155 μm; setae peritheciales 10-12, rectae, nigrae, leniter flexuosae ad apicale portionem, obtusae, ad 155 μm longae; cellula peritheciales protruda, conoidea, ad 12 μm longa; ascosporae obovoideae, 4-septatae, leniter constrictae, 34-43.5 x 12-18.5 μm.

Colonies epiphyllous, dense, crustose, up to 3 mm in diam. Hyphae straight, substraight to slightly crooked, branching mostly opposite at acute to wide angles, loosely to closely reticulate, cells 18-25 x 6-9.5 μm. Capitate hyphopodia alternate, antrorse to subantrorse, straight to curved, 21-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells globose, ovate, entire to irregularly sublobate, 15-18.5 x 14-18 μm. Phialides mixed with capitate hyphopodia, opposite to alternate, ampulliform, 15-21 x 9-12.5 μm. Perithecia scattered, globose, up to 155 μm; perithecial setae 10-12, straight, black, slightly flexuous at the apical portion, obtuse, up to 155 μm long; perithecial cells protruding, conoid, up to 12 μm long; ascospores obovoidal, 4-septate, slightly constricted at the septa, 34-43.5 x 12-18.5 μm.


There is no prior report of any meliolaceous fungus occurring on members of the Xanthophyllaceae (Hansford, 1961, Katumoto & Hosagoudar, 1989).


Colonies of the fungus were epiphyllous, producing leaf spots.

14. Meliola altissimae Hosagoudar sp. nov. (Fig. 4).

Plagulae caulicolae, epiphyllae, denseae, ad 2 mm in diam., confluentae. Hyphae rectae vel leniter flexuosae, plerumque oppositae acuteque ramosae, laxe reticulatae, cellulis 34-40.5 x 6-8 μm. Hyphopodia capitata alternata, antrorsa, recta vel curvata, 15-18.5 μm longa; cellula basali cylindracea vel cuneata, 3-6 μm longa; cellula apicali ovata, globosa, piriformia, integra, 9-12.5 x 12-15.5 μm. Phialis illis hyphopodia capitatis commixa, alternata vel opposita, ampullacea, 18-25 x 6-8 μm. Setae myceliales circa perithecia aggregatae, simplices, rectae, obtusae ad apicem, ad 360
μm longae. Perithecia disperma, ad 124 μm; ascosporae obovoidae, 4-septatae, lentiiter constriictae, 31-34 x 12-14 μm.

Colonies caulicolous, epiphyllous, dense, up to 2 mm in diameter, often confluent and covering the entire adaxial leaf surface. Hyphae straight to slightly flexuous, branching mostly opposite at acute angles, loosely reticulate, cells 34-40.5 x 4-6 μm. Capitate hyphopodia alternate, antrorse, straight to curved, 15-18.5 μm long; stalk cells cylindrical to cuneate, 3-6 μm long; head cells ovate, globose, ampulliform, entire, 9-12.5 x 12-15.5 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-25 x 6-8 μm. Mycelial setae mostly grouped around perithecia, simple, straight, obtuse at the apex, up to 360 μm long. Perithecia scattered, up to 124 μm; ascospores obovoidal, 4-septate, slightly constricted at the septa, 31-34 x 12-14 μm.

Holotype: On leaves and petioles of Vitex altissima L. (Verbenaceae), Koomati, Valparai, Coimbatore, Dec. 26, 1990, V.B. Hosagoudar HCIO 3052B.

The new species is close to Meliola viticicola Hansf., M. cookeana Speg. and M. cantareirensis Hansf., but differs from them in having epiphyllous and caulicolous, dense, and widely confluent colonies, straight to flexuous mycelia, and phialides mixed with capitate hyphopodia.


16. Meliola basosensis Sydow var. puieriae Hosagoudar, var. nov. (Fig. 5).

Differt a var. basosensis phialis illis hyphopodia capitatis commixtae.

Colonies epiphyllous, thin to subdense, up to 2 mm in diameter, widely confluent. Hyphae straight, substraight to slightly crooked, branching at acute to wide angles, loosely reticulate, cells 21-25 x 6-8.5 μm. Capitate hyphopodia alternate, antrorse to subantrorse, straight to curved, 12-15.5 μm long; stalk cells cylindrical to cuneate, 3-5 μm long; head cells ovate, globose, straight to curved, entire, 9-11 x 9-12.5 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-18.5 x 6-9 μm. Mycelial setae few, grouped around perithecia, straight to curved
but not uncinate, simple, acute, up to 300 μm long. Perithecia loosely grouped, globose, up to 300 μm; ascospores obovoidal to cylindrical, 4-septate, slightly constricted, 31-37.5 x 9-12.5 μm.

**Holotype:** On leaves of *Pueraria* sp. (Fabaceae), Erameparai, Top slip, Coimbatore, Dec. 20, 1990, V.B. Hosagoudar HCIO 30531.

*Meliola banogensis* Sydow has been reported on this host genus from the Philippines (Hansford, 1961). The new variety differs from the var. *banogensis* in having the Phialides mixed with the capitate hyphopodia.

17. **Meliola bhesae** Hosagoudar, sp. nov. (Fig. 6)

Colonies epiphyllous, rarely amphigenous, dense, up to 4 mm in diameter, confluent. Hyphae subrectae vel anfractuae, alternate vel opposite acutae vel obtuse, reticulatae, cellularis 15.5-40 x 6-9.5 μm. Hyphopodia capitata alternata, ad 20% opposita, recta vel diversa curvula, antroso ve subtanto vel patentia, 15-18.5 μm longa; cellula basali cylindracea vel cuneata, 5-6.5 μm longa; cellula apicali ovata, globosa, integra, recta vel curvula, 10-12.5 x 12-15.5 μm. Phialis illis hyphopodia consistita, alternata vel opposita, ampullacea, 15-22 x 9-12.5 μm. Setae myceliales numerosae, simplices, rectae, acutae vel obtusae ad epicem, ad 650 μm longae. Perithecia laxe aggregata, ad 200 μm; cellula peritheciales protruda; ascosporae obovoidae, 4-septatae, constrictae, 31-43.5 x 12.5-18.5 μm.

**Holotype:** On leaves of *Bhesa indica* (Bedd.) Ding Hou (Celastraceae), Koomati, Valparai, Coimbatore, Dec. 26, 1990, V.B. Hosagoudar HCIO 30535.

This species is close to *Meliola lophopetali* Stev. ex Hansf. (Beeli formula 3113.4223) reported on *Lophopetalum toxicum* from the Philippines (Hansford, 1961) but differs from it in having dense, epiphyllous colonies, substraight
to crooked mycelia, numerous mycelial setae, larger perithecia and ascospores.


20. Meliola ceropegia V.B. Hosagoudar & V.S. Ramachandran, sp. nov. (Fig. 7).
   Plagulae amphigenae, pleurocarpae epiphyllae, densae, velutinae, ad 2 mm diam., rarissimae confluentes.
   Hyphae rectae vel undulatae, oppositae acutaeque ramosae, laxae vel densae reticulatae, cellulae 24-37.5 x 6-8 μm.
   Hyphopodia capitata alternata et ad jeg opposita, plerumque recta vel raro curvula, antrose vel subantrorse, 18-22 μm longa; cellulula basali cylindracea, 20.5 μm longa; cellulula apicali ovata, globosa, integra vel lamellata vel lentic lobata, 12-15.5 x 10-15.5 μm. Phialides numerosa, illis hyphopodia capitata commixta, pleurocarpae opposita, ampullacea, 18-22 x 9-12.5 μm. Setae, celiales numerosa, plerumque circa perithecia aggregata, rectae, simplices, acutae vel obtusae ad apicem, raro villosae vel curvulae ad apicem, ad 330 μm longae. Perithecia dispersa, ad 130 μm; ascospores, 4-septatae, leniter constrictae ad septae, 12-15.5 μm.

Colonies amphigenae, pleurocarpae epiphyllae, dense, velvety, up to 2 mm in diameter, rarely confluent. Hyphae straight to undulating, branched, mostly opposite at acute angles, loosely to closely reticulate, cells 24-37.5 x 6-8 μm. Capitate hyphopodia alternate and about 1⁄4 opposite, mostly straight but rarely curved, antrose to subantrorse, 18-22 μm long; stalk cells cylindrical, 5-6.5 μm long; head cells ovate, globosa, entire, angular to slightly lobate, 12-15.5 x 10-15.5 μm. Phialides numerous, mixed with capitate hyphopodia, mostly opposite, ampulliform, 18-22 x 9-12.5 μm. Mycelial setae numerous, mostly grouped around perithecia, straight, simple, acutae to obtuse at tip, rarely geniculate to curved at apex, up to 330 μm long. Perithecia scattered, up to 130 μm;
ascospores cylindrical, 4-septate, slightly constricted at septa, 30-35 x 12-15.5 μm.


Meliola hovae Sacc. and M. tylophorae Hosagoudar are the only two species on asclepiadaceous hosts having opposite capitate hyphopodia (Hansford, 1961; 1963; Hosagoudar & Goos, 1990), M. ceropegiae differs in having phialides mixed with capitate hyphopodia. The head cells of the capitate hyphopodia are ovate, globose, entire to sublobate, distinguishing this species from other Meliola species reported on the members of the host family Asclepiadaceae.

On leaves of Notiodendron rimmoniana (Graham) Mabberley (Icacinaeae), Shankarankudi, Valparai, Coimbatore, Dec. 27, 1990, V.B. Hosagoudar HClO 30538.


On leaves of Clausena indica (Dalz.) Oliver (Rutaceae), Top slip, Coimbatore, Dec. 20, 1990, V.B. Hosagoudar HClO 30540.

This species is close to M. citricola Sydow but differs in forming distinct and isolated colonies, in contrast to a sooty appearance. Though the mycelium is closely reticulate, it never forms solid mycelial plates

24. Meliola connari Yates var. indica Hosagouda, var. nov. (Fig. 8)

Differt a var. connari plagulae tenuis, hyphae mycelii rectae, setae mycelii et perithecia brevioribus.

Colonies epiphyllous, thin, up to 2 mm in diam. rarely confluent. Hyphae straight, branching alternate to opposite at wide angles, loosely reticulate, cells 12-46.5 x 6-9.5 μm. Capitate hyphopodia alternate, antrorse, subantrorse to rarely spreading, 24-46 μm long; stalk cells cylindrical to cuneate, 6-15.5 μm long; head cells ovate, globose, cylindrical, often curved, entire to
angular to slightly lobate, 15-31 x 12-18.5 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 21-28 x 9-12.5 μm. Mycelial setae few, mostly grouped around perithecia, simple, straight, acute, up to 672 μm long. Perithecia scattered, up to 140 μm; ascospores obovoidal, 4-septate, constricted, 45-50 x 21-25 μm.


The new variety indica differs from the var. connare in having only epiphyllous, thin colonies, straight mycelium, and smaller mycelial setae and perithecia.


Uppal et al. (1935) and Srinivasulu (1974) have reported this species from Maharashtra but the materials are not available in any Indian herbaria.

26. Meliola gamblei Hosagoudar, sp. nov. (Fig. 9)

Plagulae epiphyllae, densae, crustosae, ad 2 mm in diam., confluentes. Hyphae utractae vel anfractuae, opposite acuteque ramosae, laxae vel dense reticulatae, cellulis 18-31 x 6-9 μm. Hyphopodia capitata alternata, recta vel curvula, antorsa vel patentia, 18-22 μm longa; cellula basal; cylindracea vel cuneata, 4-5 μm longa; cellula apicali recta vel curvula, ovoidea vel globosa, atenuata et rotundata ad apicem, integra, 12-15.5 x 12-14 μm. Phialis illis hyphopodia capitis conmiixa, opposita vel alternata, ampullaceae, 15-25 x 6-9.5 μm. Setae myceliales paucae, rectae, simplices, acutae vel obtusae ad apicem, ad 650 μm longae. Perithecia dispersa, verrucosa, ad 280 μm; ascosporae obovoidae, 4-septatae, lieniter constrictae, 37-42.5 x 19-21 μm.

Colonies epiphyllae, dense, crustose, up to 2 mm in diam., confluent. Hyphae substraight to crooked, branching opposite at acute angles, loosely to closely reticulate, cells 18-31 x 6-9 μm. Capitate hyphopodia alternate, straight to curved, antorse to spreading, 18-22 μm long; stalk cells cylindrical to cuneate, 4-5 μm long; head cells straight to curved, ovoid to globose, often bluntly pointed at apex, entire, 12-15.5 x 12-14 μm. Phialides mixed with capitate hyphopodia, opposite to alternate, ampulliform, 15-25 x 6-9.5 μm. Mycelial setae few, straight, simple, acute to obtuse at apex, up to 650 μm long. Perithecia scattered, verrucose, up to 280 μm.
ascospores obovoidal, 4-septate, slightly constricted, 37-43.5 x 15-18.5 μm.

Holotype: On leaves of *Smilax zeylanica* L. (Smilacaceae), Kombar, South Canara, Karnataka, Dec. 16, 1918, J.S. Gamble HCIO 30546.

To date, six taxa of the genus *Meliola* are known on the members of the family Smilacaceae. Of these, *M. gambeli* is closest to *M. saleana* Hansf., from which it differs in having crooked mycelium, smaller and entire capitate hyphopodia, and phialides mixed with capitate hyphopodia. It also differs from *H. saleana* Hansf. var. *smilacis* Hosagoudar in having dense and crustose colonies with crooked mycelium.


On leaves of Argyeria latula (Roxb.) Choisy (Convolvulaceae), Top slip, Coimbatore, Dec. 20, 1990, V.B. Hosagoudar HCIO 30553.

34. Meliola memecylicola Hansf. var. indica Hosagoudar, var. nov. (Fig. 10)

Differs from var. memecylicola by having longer mycelial setae, larger ascospores.

Colonies amphigenous, mostly epiphyllous, subdense, up to 2 mm in diameter. Hyphae straight, branching opposite at acute to wide angles, loosely reticulate, cells 18-22 x 6-9.5 μm. Capitate hyphopodia alternate and about 20% opposite, subanisogamous, 15-18.5 μm long; head cells ovate, curved, entire, 9-12.6 x 9-11 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 21-25 x 9-12.5 μm. Mycelial setae few, grouped around perithecia, straight, simple, acute, up to 575 μm long. Perithecia scattered, up to 100 μm; ascospores obovoidal, 4-septate, hyaline, 37-58 x 15-18.5 μm.


35. Meliola panici Earle, Muchl. J. 1: 12, 1901.


On leaves of Aglaia sp. (Meliaceae), Manjiparai, Sheikalmudy, Valparai, Coimbatore, March 26, 1990, V.B. Hosagoudar HCIO 30557.

37. Meliola pulchella Sydow, var. pulchella Hosagoudar, var. nov. (Fig. 11)

Differs from var. pulchella by having longer, capitate hyphopodia, and rarer flexuous, subepiphyllous, alternate to irregular at acute angles, loosely reticulate, cells 27-45 x 6-8 μm. Capitate hyphopodia alternate, straight to curved.
antrorse to reflexed, rarely flexuous to crooked, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, globose, entire to slightly and irregularly sublobate, 15-18.5 x 9-12.5 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 21-28 x 9-12.5 μm. Mycelial setae very few, straight, acute to obtuse at apex, up to 300 μm long. Perithecia scattered, up to 170 μm; ascospores ellipsoidal to ellipsoidal, 3-septate, mostly curved, 43-50 x 15-17 μm.

**Feltotype:** On leaves of *Syzgium lactum* (Buch.-Ham.) Gandhi (Myrtaceae), near Manambuli power house, Valparai, March 28, 1990, V.B. Hosagoudar HCIO 30558.

There is only one species, *M. pulchella* Speg., with thin colonies and 3-septate ascospores known on the members of the family Myrtaceae from Brazil (Hansford, 1961). The new variety differs from the var. *pulchella* in having longer and rarely flexuous capitate hyphopodia and larger ascospores.

38. *Meliola teramni* Sydow var. *millettiae* Hosagoudar, **nov.** (Fig. 12)

Differt a var. *teramni* hyphopodia capitata 5% opposita nulla, setae myceliales brevioribus et acuto ad apicem.

Colonies amphigenous, dense to subdense, crustose to velvety, up to 4 mm in diameter, confluent. Hyphae substraight to slightly crooked, branching opposite to irregular at acute angles, loosely to closely reticulata, cells 21-28 x 6-8 μm. Capitate hyphopodia alternate, antrorse, subantrorse to spreading, straight to curved, 18-22 μm long; stalk cells cuneate to cylindrical, 6-9.5 μm long; head cells ovate, globose, rarely truncate at apex, entire, 12-15 x 10-15 μm. Phialides mixed with capitate hyphopodia, opposite to alternate, ampulliform, 15-18.5 x 9-12.5 μm. Mycelial setae very few, straight, simple, acute to bifid to rarely cristate, up to 790 μm long. Perithecia scattered, up to 140 μm; ascospores ellipsoid to cylindrical, 4-septate, constricted, 37-40.5 x 12-15.5 μm.

**Holotype:** On leaves of *Millettia rubiginosa* Wight & Arn. (Fabaceae), Shankarankudi, Valparai, Coimbatore, Dec 27, 1990. V.B. Hosagoudar HCIO 30559.

The new variety differs from the var. *teramni* in lacking 5% opposite capitate hyphopodia, and in having smaller mycelial setae that are mostly acute to 2-dentate, but not furcate.
39. *Meliola travancoricae* Hosagoudar, sp. nov. (Fig. 13)

Plagulae epiphyllae, densae, crustosae, ad 2 mm in diam. Hyphae rectae vel subrectae, pleumque opposite acutae vel laxae ramose, densae reticulatae, cellulis 12-15.5 x 8-9.5 μm. Hyphopodia capitata alternata, antrorsa vel patentia, recta vel curvula, 18-22 μm longa; cellula basali cylindraca vel cuneata, 3-6.5 μm longa; cellula apicali ovata, integra, 14-16 x 10-12.5 μm. Phialis illis hyphopodia capitatis commixta, alternata vel opposita, ampullacea, 15-22 x 12-15.5 μm. Setae myceliales numerosae, simplices, rectae, acutae vel obtusae, ad 500 μm longae. Perithecia dispersa, globosa, ad 200 μm; cellulae peritheciales protrudae, ad 10 μm longae; ascospores ellipsoideae, 4-septatae, constrictae, 43-46.5 x 18-22 μm.

Colonies epiphyllous, dense, crustose, up to 2 mm in diameter. Hyphae straight to substraight, branching mostly opposite at acute to wide angles, closely reticulate, cells 12-15.5 x 8-9.5 μm. Capitate hyphopodia alternate, antrorsa to spreading, straight to curved, 18-22 μm long; stalk cell cylindrica to cuneata, 3-6.5 μm long; head cell ovata, entire, 14-16 x 10-12.5 μm. Phialides mixed with capitate hyphopodia, alternata vel opposita, ampulliform, 15-22 x 12-15.5 μm. Mycelial setae fairly numerous, simple straight, acute to obtuse at the apex, up to 500 μm long; perithecia scattered, globose, up to 200 μm; perithecial cells projecting, up to 10 μm long; ascospores ellipsoidal, 4-septate, constricted, 43-46.5 x 18-22 μm.


This species is close to *Meliola semecarpicola* Hansf. but differs from it in not causing leaf spots, in having smaller capitate hyphopodia and mycelial setae, in forming larger perithecia, and in having the capitate hyphopodia mixed with phialides.

40. *Meliola trewiae* Hosagoudar sp. nov. (Fig. 14)

Plagulae epiphyllae, tantum tenuis, ad 4 mm diam., confluentes. Hyphae flexuose, opposite vel alternate acutae ramose, laxe reticulatae, cellulis 30-34 x 8-9.5 μm. Hyphopodia capitata alternata, antrorsa vel subantrorsa, 12-18.5 μm longa; cellulae basali cylindraceae vel cuneatae, 3-6.5 μm longa; cellulae apicali ovatae vel globosae, integra, 9-12.5 x 10-12.5 μm. Phialis illis hyphopodia capitatis commixta, alternata vel opposita, ampullacea, 12-18.5 x 9-12.5 μm. Setae myceliales paucae, circa perithecia aggregatae vel disseminatae, simplices, rectae, obtusae, ad 300 μm longae. Perithecia disseminata, verrucosa, ad 124 μm;
ascosporae obovoideae, 4-septatae, constrictae, 31-34 x 12-15.5 µm.

Colonies epiphyllous, very thin, up to 4 mm in diameter, confluent. Hyphae flexuous, branching opposite to alternate at acute angles, loosely reticulate, cells 30-34 x 8-9.5 µm. Capitate hyphopodia alternate, antrorse to subantrorse, 12-18.5 µm long; stalk cells cylindrical to cuneate, 3-6.5 µm long; head cells ovate to globose, entire, 9-12.5 x 10-12.5 µm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 12-18.5 x 9-12.5 µm. Mycelial setae few, grouped around perithecia and also scattered, simple, straight, obtuse, up to 300 µm long. Perithecia scattered, verrucose, up to 124 µm; ascospores obovoidal, 4-septate, constricted, 31-34 x 12-15.5 µm.


ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Deputy Director, and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore, for the encouragement; to Dr. V.J. Nair, Scientist SD, Mr. K. Vivekanthan, Scientist B and Mr. P. Bhargavan, Senior Scientific Assistant of the same organization for their help in identifying of the host plants. We are most grateful to Dr. Gareth Morgan-Jones for reviewing the manuscript and for many helpful suggestions.
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Abbreviations used in figures:
Ch = Capitate hyphopodia
Mh = Phialide
Ms = Mycelial setae
Pc = Perithecial cells
PS = Perithecial setae
Fig. 1. Asteridiella acronychiae-pedunculatae Hosagoudar.
Fig. 2. Asteridiella anamalainana Hosagoudar.
Fig. 3. *Irenopsis xanthophylli* Hosagoudar.
Fig. 4. *Meliola altissima* Hosagoudar.
Fig. 5. *Meliola banosensis* Sydow var. *puereriae* Hosagoudar.
Fig. 6. *Meliola bhesae* Hosagoudar.
Fig. 7. Meliola ceropeqiae Hosagoudar.

Fig. 8. Meliola connari Yates var. indica Hosagoudar.
Fig. 9. *Meliola gamblei* Hosagoudar.

Fig. 10. *Meliola memecylicola* Hansf. var. *indica* Housagoudar
Fig. 11. *Meliola pulchella* Speg. var. *pygmaei* Hosagoudar.
Fig. 12. *Meliola teresii* Sydow var. *milletti* Hosagoudar
Fig. 13. *Meliola travancoricae* Hosagoudar.
Fig. 14. *Meliola trewiae* Hosagoudar.
ABSTRACT

The present paper deals with the importance, characters and parasitism of Meliolaceous fungi. They flourish well in the tropics and their distribution extended to temperate regions. A detailed review of literature on taxonomy of the family and the genera included in it; developmental biology, ecology and evolution, and mounting techniques and literature and references on Indian Meliolales have been dealt herewith.

INTRODUCTION

Plant diseases have got much importance because of their direct influence on mankind. In 1830, late blight disease of potato caused famine in Ireland which resulted in the migration and death of several hundred people. This incidence has thrown light on the importance of plant diseases. Till 1867, Ceylon was the leading nation in coffee production. During the subsequent ten years, the country started losing crores of rupees every year due to the devastating effect of coffee rust. During the second world war, there was a heavy reduction in the rice yield because of Helminthosporium...
leaf spot diseases. The severe incidence of wheat rust made the farmers to alter their cropping pattern in Southern Europe, India and far east.

The diseases which attacked the cultivated plants and caused heavy loss to our staple food have widely attracted the attention of the investigators to study them thoroughly. On the other hand, several other groups of fungi whose occurrence is mostly restricted to wild plants and which cause less damage to the cultivated plants received less attention. 'Black Mildews' are one among them. Wellman (1972) states that "Now here are these black mildews being made a subject of major pathological study, although agriculturists who observe their crops well, know that at times these fungi are very damaging in their effect".

CHARACTERS

Because of the gross appearance with dark colonies, the superficial ascomycetes are designated as 'Sooty Moulds'. The term is applied not only to the superficial saprophytes but also to the parasites. To distinguish certain taxonomic group of fungi, the term 'Sooty Moulds' in reality should be applied to the saprophytic fungi of the family Capnodiales having usually dark coloured hyphae, producing brown to black colonies on the living plants. These moulds are associated with scale insects and honey-dew producers. Hyphae of these fungi are with mucilaginous outer wall which readily absorb water from the environment, maintain the supporting plant portion in moist condition and also act as an adhesive. When handled, these colonies peeled off easily and stuck to hands and cloths.

However, Stevens (1931) deplored the use of 'Sooty Moulds' to meliolaceous fungi.

In contrast to the sooty moulds, the black or dark mildews or meliolaceous fungi are classified under the family 'Meliolaceae' of the order 'Meliolales'. These are obligate ectoparasites, usually infecting the leaves, petioles, young and soft stems, having superficial mycelium which produce both mucronate and capitulate hyphopodia. The apical cells of the capitulate hyphopodia produce haustoria which penetrate into the host epidermal cells through the cuticle. Mucronate hyphopodia are also called phialides and produce phialocconidia (Hughes, 1981; Mueller et al., 1991). Function of the phialocconidia is unknown. Perithecial initials arise as short lateral branches from the mycelia, like that of capitulate hyphopodia but without haustoria, and an apical portion enlarges to form perithecium. Perithecia are flattened-globose to globose, mostly non-ostiolate and break at the apex at maturity to release the spores. Outer wall of the perithecium is dark and thick, while the inner wall is thin and hyaline. Perithecial or mycelial setae are present in some genera, while both are absent in others. Asci are many, arranged in groups at the basal portion of the perithecium. subsessile to sessile, initially 4-8 spored, while at maturity, usually 2-4 spored. Initially, the asci are persistent and thick-walled, while evanescent at maturity. Ascospores are brown and 1 to 4 septate.

The parasitism of Meliolaceous fungi is equated to that of uredinales. Before attempting to identify this group upto species level, it is essential to known the identity of the host plant preferably upto the genus and species
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level, if not, at least up to the family level, rather than to describe a new taxon on an unidentified host plant.

DISTRIBUTION

These fungi are widely distributed, but flourish well in the tropical and subtropical regions of the world. However, their distribution is also extended to warm temperate zones and a few are also recorded from cold temperate zones. Large number of these species have been studied from tropical South America, South Africa, Uganda, Gold Coast and Sierra Leone. However, only the Philippines and Java islands are systematically surveyed. Obviously, many tropical and subtropical regions are yet to be studied systematically for this group.

TAXONOMY

Since the beginning of the twentieth century, enormous changes have taken place in the studies on systematic mycology. It is not only because of the addition of more and more new genera but also because of revisionary works the limits of the genera, families and orders have been greatly modified.

(i) Taxonomy of the Genera

The present day's well-known genus Meliola Fr. is based on Sprengel's (1820) three collections originally assigned to the genus Amphitrichum Nees. Fries (1823) placed these three materials under the provisional name Sphaeria ? amphitricha (Spreng.) Fr. and gave a variety status to all these three materials as Sphaeria ? amphitricha (Spreng.) Fr. var. hibisci Fr., Sphaeria ? amphitricha (Spreng.) Fr. var. aralae Fr. and Sphaeria ? amphitricha (Spreng.) Fr. var. sacchari Fr. Later, Fries (1825) described a new genus Meliola without assigning any type species to it. Then he (1828) intended to include Sprengel's materials as species of the genus Meliola. Therefore we have Meliola hibisci (Spreng.) Fr., M. aralae (Spreng.) Fr. and M. sacchari (Spreng.) Fr. However, after Meliola Fr. was established as a genus, M. amphitricha (Spreng.) Fr. was considered as its type specie.

Bornet (1851) emended the description of the genus Meliola Fr. and gave the first general description of this genus along with the then known six species. Gaillard (1892), in his Monograph "Le Genre Meliola", gave a detailed description of this genus, recognized 111 species and brought 30 names under excluded or dubious species with several others as synonyms.

Arnaud (1918) was the first to express his doubt regarding the type species of this genus and he selected Meliola hibisci (Spreng.) Fr. as the 'pseudotype'. Theissen & Sydow (1917) mentioned two species namely Meliola aralae (Spreng.) Mont and M. amphitricha Fr. Beeli (1920) gave an account of 459 species of the genus Meliola Fr. and mentioned M. amphitricha Fr. and M. hibisci (Spreng.) Fr. as types. He introduced a formula, now known as 'Beeli formula' and also described a new genus Meliolinopsis with characters "of Meliola but asci persistent, generally 8 spored and paraphysate" with the type M. octospora Beeli. Stevens (1928a) stated uncertainty about the type species of the genus Meliola. Clements & Shear (1957) designated Meliola nidulans (Schw.) Cooke as a type species. Toro (1952) did not agree with all these views of the type
species. He examined the specimen, *M. psidii* Fr., reported on the leaves of *Psidium pometiferum* which Kunze (on herb. sheet) had given the name *Sphaeria? tridostroma* Kunze which later became (*Meliola* Fr. Keeping the views of all these problems regarding the published names, priority and availability of the material, Toro (1952) selected *Meliola tridostroma* (Kunze) Toro as the lectotype.

Kunze (1827) established the genus *Myxothecium* with the type species *M. musae* Kunze. Montagne (1838) showed that it belonged to the genus *Meliola* Fr. Fries (1846) called attention towards similarity of the genus *Couturea* Cast. with that of *Meliola*. Sacco (1882) established the genus *Asteridium* with the characters "sporidis 2, pluriseptatis". It is nothing but the specieis of the genus *Meliola* Fr.

Theissen (1913a) proposed the genus *Amazonia* with the characters "mycelium superficial, hyphopodiadite, *Meliola* like; perithecium radial, shield formed, circular, inverse; asci clavatae, aparaphysate, 2-spored; spores 5-celled". The type is *A. asterinoides* (Wint.) Theiss. Because of its radial, circular perithecia, this genus placed under the family Microthyriaceae. von Hoehnel (1918) showed the existence of thin-walled, completely closed perithecium under the brown shield of mycelia.

Sydow & Sydow (1914b) proposed another genus *Actinodothis* with the characters "stromata superficial, circular, radiate, several layers thick; loculi one to several, separate; attachments to the haustorium several. Hyphostroma tenuous, asci aparaphysate, 2-spored; spores dark, 3-4 septate" and type *A. piperis* Sydow & Sydow. Because of the tenuous perithecia, this genus was placed under Dothideales. However, Stevens (1927), based on the mycelium and spore characters placed it under Meliolaceae.

Theissen & Sydow (1915) described a new genus *Armatella* based on *Dimerosporium litseae* P. Henn. with the type species, *A. litseae* (P. Henn) Theissen & Sydow. However, they classified it under the family Polystigmellaceae of Dothideales. After re-examination of the materials, Hansford (1946), placed this genus under Meliolaceae. The original description of the genus *Armatella* is: "mycelium superficial, ramosum, septatum, hyphopodiadite. Stromata superficialia, ex hyphostromate epidermali extenso oriunda, radiatocontexta, punctis pluribus affixa, unilocularia (as seper?). Asci paraphysati, octospori. Sporae didymae hyaline".

Batista & Maia (Atas Inst. Micol. Recife 1 : 221, 1960) described a new genus *Artallendea* with the type species *A. cinnamomi* Bat & Maia. The original description of this genus is "Mycelio libero brunneo, reticulato, non setoso sed hyphopodiadite. Cleistothecia hemisphaerica vel subglobosa, carbonaceae glabrata, verrucosa vel non, astoma, efformata. Asci 1-tenuicati, paraphysati. Ascosporae ellipsoideae vel
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cylindraceae, continuae, fuscae". However,
Katumoto (1962) compared the morphological
characters of these two genera and found that
they are quite similar to each other except
in the septation of ascospores. He also
remarked that "the ascospores of Armatella
are likely to be divided into two cells by a
septum though they often remain continuous.
It can readily be imagined that the establish­
ment of the genus Artallendea was made on
the basis of immature and aseptate ascospores.
Hence he treated the latter genus as synonym
of the former (see also von Arx, 1958).

3:19, 1957) described a new genus Armata
with the characters "mycelium omni superficial,
ex hyphis irregulariter ramosis, hypopodiatis
compositum. Hyphopodia capitata monosep­
tata. Setae myceliales nullae. Perithecia,
supercialia, globosa vel subglobosa, glabra,
atra. Asci fasciculati, octospori, paraphysati.
Sporidia ellipsoidea, continua, fusca". Katumoto (1962) stated that the genus Armata
Yamam. seems to be taxonomically highly
related to the genus Armatella Theiss. & Sydow.

Theissen & Sydow (1917) made the
subdivision of the genus Meliola by proposing
a new genus Irene with the type I. inermis
(K. & C.) Theiss. & Sydow to accommodate
those species having no mycelial or perithecial
setae.

Certain species included by Theissen &
Sydow (1917) in the genus Irene had a peculiar
larviform perithecial appendages. To accommo­
date such species, von Hoehnel (1919) proposed
a new genus, Appendiculella with the type A.
calostroma (Desm.) Hoehnel.

von Hoehnel (1919) also proposed the
new genus Leptioniella having the characters
"with or without setae, asci persistent 8-spored,
spores spindle-form, 4-6 celled with small,
almost hyaline end cells, paraphyses numerous,
and often with Arthrobotryum as conidial
stage" with I. hyalospora (Lev.) Hoehnel as the
type. Later, Petruk (Sydowia 7:350, 1953)
brought this genus under Dothideales
(Hawksworth et al., 1983).

Beeli (1920) gave synopsis of 459 species
of Meliola and proposed a useful system of
group numbers known as "Beeli formula" and
also described the genus Meliolinopsis having
the characters of Meliola but the asci are
persistent, paraphysate, 8-spored with the type
M. octospora Beeli. However, this genus has
been placed under Dothideales (Hawksworth
et al., 1983).

Stevens (1927, 1928a) made a mono­
graphic study of the group Meliolinae and has
effectively used Beeli formula. He has included
the genera Actinodothis, Amazonia, Irene,
Meliola and Meliolina along with his newly
proposed genera Irenina and Irenopsis.
The genus Irenopsis was proposed to accommodate
the species of the genus Irene having true
perithecial setae and with the type I. tortuosa
(Wint.) Stev. The genus Irenina was proposed
to accommodate the species of the genus Irene
having "no mycelial setae, no perithecial setae
and no larviform appendages" with the type
Irenina glabra (Berk. & Curt.) Stev. He
reached the genus Meliolaster Doidge synony­
mous to Amazonia Theiss., while Actinodothis
Sydow & Sydow was considered with distinct
characters from that of Amazonia in having
dimidiate perithecia with no free mycelium.
His monograph comprised about 700 species and 45 excluded species.

Stevens (1927) introduced confusion when he stated that the type designated for Irene was Meliola inermis K. & C. which has larviform appendages. The forms with larviform appendages must bear the name Irene, not Appendiculella Hoehnel. Hansford & Doidge in Hansford (1961) examined the wide range of South African species and found that the appendages of sensu Stevens (1927) were merely conoid projections of the perithecial wall cells. Hence the species classified by Stevens under Irene are nothing but the species of the genus Appendiculella while those of Irenina Stevens are true species of Irene Theiss. & Sydow.

Hansford (1961) rediscovered McAlpin's (1897) genus Asteridiella which was established with the characters "superficial and hyphopodiuate mycelia, absence of perithecial and mycelial setae and lack of perithecial appendages with globose perithecia". Obviously, the true Irene Theiss. & Sydow corresponds to this genus. Hence, McAlpine's (1897) genus Asteridiella antedates Irene.

Cifferi (1938, 1951, 1954), in a series of papers, accepted Stevens's (1927, 1928a) genera but gave them the inferior rank of subgenera namely Eumeliola Cif., Chaetomeliola Cif., Irene (Theiss. & Sydow emend Stev.) Cif., Irenopsis (Stev.) Cif. and Irenina (Stev.) Cif. For differentiating the above subgenera, he considered mycelial setae as the main character and perithecial appendages as secondary. These subgenera were further subdivided into sections based on the arrangement of the capitiate hyphopodia and gave a long list of new combinations for the species based on his new subgenera. Later, Batista et al. (1962) redescribed the genus Chaetomeliola Cif. and proposed a new genus Laeviomeliola Bat. However, Hansford (1961) commented that the new combinations made by Cifferi (l.c.) were unnecessary and superfluous name making.

Hansford (1961) brought an up-to-date monograph of this group by including 5 genera Amazonia, Appendiculella, Asteridiella, Irenopsis and Meliola with 1814 species and excluded 47 species. He has made the genera Meliolaster Doidge and Actinodothis Sydow & Sydow synonymous to the genus Amazonia Theiss.; the genus Irene sensu Stevens (1927) synonymous to Appendiculella von Hoehnel; Irene Theiss. & Sydow, Irenina Stev. Synonymous to Asteridiella McAlpine; Meliola Fr., Amphitrichum Nees ex Spreng., Sphaeria Fr., Myxothecium Kunze ex Fr., Couturea Cast. and Asteridium Sacc. synonymous to Meliola Fr. emend Bornet.

Later, Hansford (1963a) validated 47 species included in his Monograph by providing Latin diagnosis, described Asteridiella cupaniae, Meliola symphorematis Petrak var. major, gave new name Meliola ichnocarpivoluta Hansf. for M. ichnocarpi Stev. & Rold. and added Asteridiella fidalis (Toro) Hansf. to the monograph and also corrected 8 taxa by making them either synonyms or new combinations, while, Amazonia corozalensis Batista & Nascimento was rejected from this group. Hansford (1963b) also supplemented his work by providing line drawings of the taxa dealt in his Monograph. Later, Deighton (1968) made some nomenclatural corrections of the species
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included in Hansford's (1961) Monograph. Stevenson (1968) provided the host index to Hansford's Monograph. Katumoto & Hosagoudar (1989) provided an additional list of 169 taxa to Hansford's Monograph with 5 doubtful ones and also host and species indices.

Gordon & Shaw (1960) proposed a new genus Diporotheca on the roots of Solanum tuberosum from Washington, U.S.A. which is characterized by the presence of superficial, dark, septate mycelium bearing capitate hyphopodia; perithecia superficial, ostiolate and aparaphysate; ascii octosporous and unitunicate; ascospores 2-septate, brown; with the type D. rhizophila Gordon & Shaw.

Batista & Maia (1960) were the first to divide the genus Amazonia Theiss. by proposing a new genus Amazoniella Bat. & Maia with the type A. strassiae Bat. & Maia from Leiden. The latter genus differs from the former in having paraphyses.

Batista et al. (1965) described a new genus Balladynocalyx Bat. as a member of the family Meliolaceae with the type B. glabra (Hansf.) Bat. This new genus is characterized by superficial mycelia, single celled capitulate hyphopodia; bitunicate, octosporous and persistent ascii; pseudothecia stalked (see Sivanesan, 1981). This genus can be excluded from the family Meliolaceae because of the bitunicate, octosporous and persistent ascii.

Dilcher (1965) described Meliola spinksii from the fossils of Eocene period. Selkirk (1974) proposed a new genus Meliolinites to accommodate the fossil forms of Moliolas. It is characterized by "fossil fungal colonies, mycelium and spores like that of Meliolaceae members, mycelial setae absent, information regarding perithecial structure and nature of the perithecial appendages uncertain or lacking". The type is M. spinksii (Dilcher) Selkirk. Selkirk (l.c.) described another species, Meliolinites nimius on the cuticle of a doubtful Myrtaceae member of lower Miocene period from South Wales and also provided the description of an unidentified species of Meliolinites and two more doubtful materials.

(ii) Taxonomy of the family Meliolaceae

Before proposing the family Meliolaceae, the genus Meliola Fr. emend Bornet and its associated genera were grouped either under the order Perisporiales or Erysiphales. Though there were differences of opinion regarding the acceptance of the order Meliolales, there was unanimous opinion on accepting the family Meliolaceae.

Fries (1823) coined the term 'Perisporiae' to include the fungi producing small, non-ostiolate fruiting bodies seated on a superficial mycelium. This concept increased the complications and diversity of opinions and resulted in bringing the unrelated forms into one group. Winter (1887) made the first attempt to bring out all the fungi having superficial mycelia with a fruiting borne on them into a family "Perisporiazeen" and classified all of them under two sub-families "Erysipeae and Perisporiae". Lindau (1897) revised Winter's concept and added a family 'Microthyriaceae' segregating the sub-family 'Perisporiae'.

Theissen (1913a, b) studied all these forms and excluded the family 'Microthyriaceae' from Perisporiales and transferred some
of the genera to his new order "Hemisphaeria-lese". Simultaneously, Saccardo (1913) divided the family Perisporiaceae into five tribes. Theissen & Sydow (1917) once again revised this order and included four families, 'Erysiphaceae, Perisporiaceae, Englerulaceae and Capnodiacae'. Gwynne-Vaughan (1922) substituted another order 'Erysiphales' based on the well-known genus *Erysiphe*.

Arnaud (1918) considered all such superficial fungi under the name 'Asterinees'. But the name 'Asterinees' was rather confusing because of the genus *Asterina* Leve. Hence he coined the name 'Meliolines' for the forms having superficial hyphopodiate mycelia and the globose superficial fruit bodies. Specuizzini (1918) distinguished these fungi into parasitic and saprophytic species. For parasitic species he introduced the term 'Meliolaceae' and reserved the name 'Perisporaceae' for saprophytic forms.

Martin (1941) proposed the family 'Meliolaceae' to accommodate genus *Meliola* and its related genera. Hansford (1946) emended the description of the family 'Meliolaceae' and classified it under the order 'Myriangiales' along with the families 'Myriangiaceae, Dothideaceae, Montagnella-ceae and Erysiphaceae'. Further, he considered 14 genera under this family but classified the genera *Actinodothis, Amazonia, Appendiculella, Irene, Irenopsis* and *Meliola* under the group 'Meliolaceae'. Miller (1949) stated that the concept of *Meliola* Fr. and related genera cannot be satisfactorily fixed in the system until more species are investigated. Gaumann (1952) classified the genus *Meliola* and its related genera under Meliolales of the order Pseudophaeriales. Roger (1953) recognised the family 'Meliolaceae' along with nine other families and under this family, he considered the genera *Actinodothis, Amazonia, Irene, Irenina, Irenopsis, Meliola* and *Meliolina*.

Hansford (1961), in his monograph, considered the genera *Amazonia, Appendiculella, Asteridiella, Irenopsis* and *Meliola* under the group 'Meliolaceae'. Yarwood (1973) divided the order Erysiphales into two families, Erysiphaceae and Perisporiaceae and brought the genera *Actinodothis, Amazonia, Appendiculella, Asteridiella, Irenopsis* and *Meliola* along with several other genera under the family 'Perisporiaceae'. Ainsworth (1971) recognised the order 'Meliolales' and the family 'Meliolaceae' but stated that the family 'Meliolaceae' includes fifty genera with the representative genera like *Amazonia, Appendiculella, Asteridiella, Irenopsis* and *Meliola*. Mueller & von Arx (1973) recognised the family 'Meliolaceae' and the order 'Meliolales' under Pyrenomycetes. However, they have considered seven genera under the family 'Meliolaceae', viz. *Amazonia, Appendiculella, Armellata, Asteridiella, Diporthea, Irenopsis* and *Meliola*. Barr (1976) recognised the order 'Meliolales' and a single family 'Meliolaceae' under the subclass 'Parenchymycetidae' of the class 'Euascomycetes'. Alexopoulos & Mims (1979) recognised the order 'Meliolales' and brought it under *Phyllactinia* type of centrum. Under this type, they have considered two orders, Erysiphales and Meliolales.

Hawksworth et al. (1983) recognised the family Meliolaceae under bitunicate of the order Dothideales. Eriksson (1982b) stated that "---some families characterised by
cleistothecia with ± reduced hamathecium and pseudoprototunicate asci have obviously evolved from typical bitunicate ascomycetes. One of them is 'Meliolaceae'—but probably be referred to Asterinales—Further, Eriksson (1982a, 1983) recognised the family Meliolaceae and followed Hawksworth et al. (1983) in placing this family under the order Dothideales. Sarbhoy (1983) recognised the order Meliolales under unitunicatae (Pyrenomycetes). Later Eriksson & Hawksworth (1986a) validated Gaumann's (l.c.) proposal of the order Meliollales. Eriksson & Hawksworth have mentioned 21 genera along with 3 doubtful ones under the family Meliolaceae. While, Luttrell (1989) stated that there are no data to support Eriksson's (1981) hypothesis that: "The Meliolaceae evolved from bitunicate ascomycetes by reduction of endotunica".

DEVELOPMENTAL BIOLOGY, ECOLOGY AND EVOLUTION

From the taxonomic point of view, the group Meliolineae has considerably attracted the attention of the investigators but very little is known about its biology.

Bal (1919) was the first to make an attempt to grow the ascospores of *Meliola* spp. on host extract, cow dung, beef broth, beef agar, peptone, etc. However, he could germinate the ascospores of *Meliola* spp. growing on *Citrus* sp. and *Phoenix sylvestris* (L.) Roxb. on a laboratory medium containing KNO₃, Na₂HPO₄ and (NH₄)₂SO₄ of 0.5 g of each prepared in 100 ml distilled water. The ascospores germinated in 72 h by producing a single capitate hyphopodium. On the 11th day, the ascospores produced 4 capitate hyphopodia from the terminal cell. Hansford (1961) could not succeed in germinating the ascospores of *Meliola* spp. and *Asteridiella* spp. either on the laboratory media or on their correct hosts in the field. Goos (1974) cultured the macerated colonies and ascospores of *Meliola* sp. growing on *Serenoa repens* on laboratory media like Difco Corn meal agar, P.D.A., Rabbit food agar, Blakeslee's malt extract agar (BME), etc. However, the ascospores produced black, sterile mycelia but failed to produce hyphopodia or fruiting bodies. These spores were also inoculated on the tender leaves of banana but the growth ceased soon. Hence, Goos (l.c.) concluded that *Meliola* spp. are unable to decompose carbohydrates and are also host specific. Thite (1975) succeeded in germinating the ascospores of *Meliola jasminicola* P. Henn. in hanging drops of sterile water. The ascospores produced 1-6 capitate hyphopodia from their terminal cell. Goos (1978) attempted to germinate the ascospores of *Meliola argentina* and *M. palmicola* on several types of agar media and on a drop of sterile water placed on a microscope slide. Ascospores germinated by producing single (rarely two) germ tube approximately equal to the length of the ascospores and later ceased in their growth. However, the spores near the periphery of the water drops produced capitate hyphopodia. Hence, Goos (l.c.) suggested that adequate aeration and contact with a solid, hard surface are needed for the formation of capitate hyphopodia. Goos & Palm (1979) studied the early stages in the colony development of *Meliola palmicola* Wint. and *M. peleae* Setv. on their natural substrate. The ascospores in the former, produced single capitate hyphopodium, while in the latter, produced three from
terminal cells. The subsequent growth was from the remaining cells.

Thite (1985) treated the ascospores of Meliola holigarnae Stev. with freezing, desiccation and with different laboratory chemicals like HCl, H2SO4, KOH, NaOH along with sugars like fructose, glucose, maltose, sucrose in 54-66% moisture. After the treatment, the spores were placed on sterile water drop. Spores readily germinated by producing germ tubes instead of capitate hyphopodia. Normally single germ tube was produced from the terminal cell but occasionally two. However, germ pores in the ascospores were not observed. As the germ tube elongated, the nucleus and cytoplasm migrated into it and septum was laid. The septate germ tube further developed into a multicellular hyphae but the capitate hyphopodia were not formed. The percentage of germination in different sugars like maltose, glucose, sucrose, xylose and in distilled water was studied.

Hosagoudar (1991) studied the ascospore germination in ten Meliolaceous fungi representing the genera Amazonia, Armatella, Asteridiella, Irenopsis and Meliola under natural conditions. Ascospore germination initiated either from terminal or middle cells by producing 1-2 capitulate hyphopodia. Often spores on incompatible hosts were noticed but their further growth was unknown except the production of sterile germ tube.

Ryan (1926) showed the development of the fruiting bodies from the capitulate hyphopodia like lateral branches of the mycelia in Meliolaceae, while the fruiting bodies are formed directly on the mycelial cells in Asterinaceae. Graff (1932) showed the process of ascocarp development in Meliola cirinnans Earle. However, Hansford (1961) doubted the reality of Graff's work. His work showed similarity with that of Sphaerotheca described by Harper (1895, 1905).

Thite (1982) studied the nuclear behaviour during the sexuality and origin of asci in Meliola osyridicola Hansf. and M. jasminicola P. Henn. The uninucleate sex organs are formed in the protective stromatic shield. Plasmogamy occurred in sex organs while karyogamy occurred in ascus mother cell; and Crozier formation took place in the formation of asci.

Luttrel (1989) studied the development of perithecia and its centrum structure in Meliola floridensis Hansf. and stated that Meliolaceae are unrelated to Erysiphaceae and other superficial Loculoascomycetes but constitute a homogenous family Meliolaceae in the separate order Meliolas of the Pyrenomycetes.

Roger (1953) gave an exhaustive information on the developmental biology and distribution of Meliolaceae. Moreau (1953) schematically explained the mechanism of haustoria and centrum structure of the perithecia. Schmiedekhent (1970) showed the increase in temperature by 1.35-1 65°C in the infected leaf blotches due to enzyme transformation during the host parasite interaction.

Bessey (1950) opined that the Erysiphales originated from Sphaeriales and Monoascaceae. Based on the habitat, perithecial centrum structure and ascospore symmetry, Barr (1976) illustrated the concepts of evolutionary features of Ascomycetes in the form of “family tree”.
In the concept, Meliolales, Diaporthales, Sordariales and Coronophorales are on one line, while the Erysiphales are slightly deviated from the main line. Hijwegen (1979) suggested various interfamiiy relationships based on the data obtained from Hansford's (1961) monograph of Meliolineae. Savile (1979) stated that the Meliolineae are the tropical counterparts of Erysiphaceae having similarity in possessing external mycelium and host range. The pigmentation in Meliolineae certainly reduce the water loss during dry seasons. Eriksson (1982a) stated, some of the families characterized by cleistothecia with more or less reduced hamathecium and prototunicate asci have obviously evolved from typical bitunicate ascomycetes and one of them is Meliolaceae.

MOUNTING TECHNIQUES

Several techniques have been adopted to study the meliolaceous fungi in natural conditions. Gaillard (1892) appears to have been the first to use "Celloidin solution drops". In this method, a drop of celloidin solution is placed on the fungal colonies, which is lifted off after drying along with the fungal colonies that get firmly embeded within. He recommended the following composition for the celloidin solution: celloidin - 4 ml, alcohol - 10 ml, ether - 32 ml, castor oil - 2 ml and lactic acid - 2 ml. Later, the celloidin film dissolved in ether-alcohol (32 ml and 10 ml, respectively) solution and the celloidin free colonies mounted in glycerine jelly. Steven (1916) modified Gaillard's (1892) celloidin drops formula by excluding castor oil and lactic acid. Then the flips were prepared by placing a drop of celloidin solution on the colonies, dried, lifted off and placed on a slide. Then this flip was dehydrated with absolute alcohol, flushed with xylol and mounted in xylol-balsam. This procedure avoided the dissolving of celloidin film.

Ellis (1950, 1960) proposed 'necol' or any similar cellulose preparation for the meliolaceous fungi. The method involved the placing of the necol drops on colonies, thinning it down, peeling off the flips after drying and mounting in lactophenol to dissolve the necol. He suggested the following cellulose-acetate preparation: 4-parts of acetone, 1-part of diacetone alcohol to which 1% each of benzyl abietate and triacetin were added, plus cellulose acetate to bring the solution to the right consistency.

Hansford (1961) after pointing out the demerits of other mountants suggested "celloidin-acetone drops" as a better mountant. By the usual procedure 'flip' was prepared. Then those flips were mounted in lactophenol and the cover slips sealed with double layers of nail polish. He also suggested the use of Canada balsam in the place of lactophenol for making the permanent slides.

Butler & Mann (1959), Bretz & Berry (1964) and Flegal (1980) suggested the "adhesive cellopane tape" for mounting the pathogenic epiphyllous fungi. Rao (1972) and Nayar & Wilson (1973) have suggested "Quick fix" for the cuticular impressions and epiphyllous dematiaceous fungi. Hosagoudar & Kapoor (1985) suggested the application of thin layer of "natural coloured nail polish" on the selected colonies. After drying, the apple-rose coloured flip was mounted in D.P.X. (or
Canada balsam) for preparing the permanent slides.

Hosagoudar & Mohanan (1985) further suggested “Thermocol isobutyl methyl ketone” solution for mounting the meliaceous fungi. The composition of this solution was: 2.5 g of pure white thermocol dissolved in 10 ml of isobutyl methyl ketone solution. The former readily dissolves in the latter. A thin layer of this solution applied on the selected colonies to form slips. These slips were then mounted in D.P.X. for making the permanent slides.

INDIAN MELIOLAS

The first reports of the genus Meliola from India have been by Cooke (1880, 1881) who reported Meliola denia Cooke and M. zigzag Berk. & Curt. These materials were collected and communicated by Col. Julian Hobson from Belgaum, Karnataka. Gamble (1899) collected Meliola amphitricha Fr. from Dehra Dun forest and got it identified from Kew. Sydow et al. (1911) described Meliola butleri, M. diospyri, M. geniculata and M. indica along with seven new records to India. Sydow (1913) and Sydow & Sydow (1914a) described Meliola opilae and M. monocyli from India. From McRae’s Indian collections, Stevens (1928b) published two new species, namely Meliola euginicola, M. holigarnae and a new variety M. indica Sydow & Sydow var. careyae along with five new records to India. Uppal communicated 66 fungal collections from Bambay State to Stevens. Of them, Stevens & Pierce (1933) reported Meliola carissae Doidge and Irenopsis crotonis (Stev. & Tehon) Stev. Bal & Dutta (1922) reported Meliola cadigensis Yates, M. stenospora Wint. and M. jasminicola P. Henn. from West Bengal. Uppal et al. (1935) reported Meliola sacchari Sydow & Sydow, M. citricola Sydow & Sydow and M. psidi Fr. and also enlisted the hosts, Atalantia racemosa Wight & Arn. and Erythrina indica Lam., for an undetermined species of Meliola from Maharashtra. Hansford (1947) described Meliola bambusicola collected by Somayajula from Ooty. Tunstall & Sarmah (1947) reported an undetermined species of Meliola on tea. Hansford & Thirumalachar (1948) described 19 new species, one new variety, three new records to India and these collections were made by Thirumalachar from the southern part of Karnataka. Hansford (1957) further described Meliola simillima Ell. & Ev. var. major and M. nuthopegiae from India. Bagchee (1953) reported an undescribed species of Meliola on Shorea robusta Gaertn. from Dehra Dun forest. Agnihothrudu (1960) reported Meliola albizziae Hansf. Deight. from Assam. Mueller & Bose (1959), Bose (1962) and Bose & Mueller (1964) described Irenopsis crataegi and reported Asteridiella taxi (Sawada) Hansf. and Meliola melanochaeta Sydow from Himalayas. After critical study of the Meliolinae, based on HCIO materials and his collections from Sikkim, Kapoor (1967), described six new species, two new varieties and eleven new records to India. Rao (1967). while studying the hyperparasites, described a variety Meliola aethiops Sacc. var. cassiae on Cassia fistula L. from Andhra Pradesh. Anahosur (1969) described Irene indica from Coorg, Karnataka.

Kar & Maity (1970a, b, 1971) described 8 new species, 2 new varieties and reported Meliola palmicola Wint. var. africana Hansf. from West Bengal. They (1972) further reported three species and a variety of the genus
Indian Meliolales


The first attempt to provide a complete list of Indian fungi was made by Butler & Bisby (1931) and it was revised by Vasudeva (1960), who included all reported from India upto 1952. This list included an account of 55 species of this group. Subsequently, several additional lists by Mundkur (1938), Ramakrishnan & Subramanian (1952), Subramanian
& Ramakrishnan (1958), Subramanian & Tyagi (1964), Tandon & Chandra (1964), Tilak & Rao (1968), Mukerji & Juneja (1974), Sarbhoy et al. (1975) have appeared. The latest available check-list of Indian fungi is by Bilgrami et al. (1979, 1981) which includes the fungi reported up to 1979. These latest lists include 100 taxa of Meliolaceae.

Rangaswamy et al. (1970) have prepared a separate list of South Indian fungi and have compiled 50 taxa of this group.

After 1970, this group has considerably increased the attention of Indian mycologists. Till 1985, the total number of Meliolaceae taxa known from India was only 138 but their number now is about 300. Though, the Western Ghats are well known for their luxuriant vegetation, species diversity and endemic phanerogams, there is much scope for the abundance of these fungi.

CONCLUSIONS

We follow here Mueller & von Arx (1973) in considering seven genera under the family Meliolaceae of the order Meliolales namely, Annatella, Amazonia, Appendiculella, Asteridella, Diporotheca, Irenopsis and Meliola. However, for the homogeneity of the family, the rhizophyllous and saprophytic genus Diporotheca has been excluded though the second species is follicolous (Hosagoudar et al. 1989). All the six genera of this family have the representatives in Himalayan regions of India, while the genus Appendiculella not reported either from the Eastern or Western Ghats of southern India. The genus Prataprajeela with its type, P. turpinicola (Hosagoudar) Hosagoudar has been proposed from the Western Ghats (Hosagoudar, 1992) and its another species, A. turpiniae (Yamam.) Hosagoudar is known from Formosa and Philippines.

Acknowledgements: We thank Dr. N.P. Balakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

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Indian Meliolales


MELIOLACEAE OF SOUTHERN INDIA -XV

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This paper gives an account of six meliolaceous fungi, of which five were collected from Karnataka and one from Kerala. Of these, *Asteridiella lephopetali*, *Meliola cryptocaricola* and *M. ilicis-malabaricae* are the new species; *Meliola pterospermi* Stev. var. *microspora* is the new variety described here.

**Asteridiella lephopetali** sp. nov. (Fig.1)

Colonies epiphyllae, dense, crustose vel velutinae, ad 2 mm diam., confluentes. Hyphae rectae vel subrectae, plerumque opposite acuteque ramosae, dense reticulate et solidae, cellulae 9-12.5 x 6-9.5 μm. Hyphopodia capitata alternata, antorsa, 15-22 μm longa; cellula basali cuneata, 2-6.5 μm longa; cellula apicali ovata vel globosa, integra, angularia vel sublobata, 13-15.5 x 9-12.5 μm. Hyphopodia mucronata illis capitatis commixta, alternata, ampullacea, 18-22 x 6-9.5 μm. Perithecia aggregata ad centre, ad 220 μm; cellulae peritheciales mammaliformae, rectae vel curvulae ad apicem, ad 25 μm longae; ascospores obovoidae, 4-septatae, constrictae, 37-40.5 x 15-18.5 μm.

Holotype: On the leaves of *Lophopetalum wightianum* Arn.(Celastraceace), Gersoppa, Uttar Kannada, Karnataka, Oct. 22, 1992, P. A. Raghu HCIO 40857
1. Asteridiella lophopetali sp. nov.
The present new species is close to *Asterdieila pleurostylinia* (Sydow) Hansf. in having alternate capitate hyphopodia with lobate head cells and 4-septate ascospores. However, the present new species differs from it in having smaller capitate hyphopodia, perithecia and ascospores.

*Meliola cryptocaricola* sp. nov. (Fig. 2)

Colonies, hypophyllous, dense, crustose, patentiae, confluentes. Hyphae anfractuque, opposite vel irregulariter acuteque vel laxe reticulatae, dense reticulatae et solidiae, cellulare 12-22 x 5-6.5 μm. Hyphopodia capitata alternata, 10% opposita, recta vel varie curvula antrorsa vel recurva, 18-28 μm longa; cellula basali cylindracea vel cuneata, 4-6.5 μm longa; cellula apicali ovata, globosa vel oblonga, integra, angularia vel leniter sublobata, 13-18.5 x 9-12.5 μm. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 12-15.5 x 9-12.5 μm. Setae myceliales pauciae vel numerosae, dispersae vel juxta perithecia aggregatae, simplices, rectae acute, obtusae vel dentatae ad apicem, ad 300 μm longae. Perithecia dispersa, ad 150 μm; ascosporae obovodeae, 4-septae, leniter constrictae, 43-46.5 x 18-22 μm.

Colonies hypophyllous, dense, crustose, spreading, confluent. Hyphae tortuous, branching opposite to irregular at acute to wide angles, closely reticulate and form solid mycelial mat, cells 12-22 x 5-6.5 μm. Capitate hyphopodia alternate, about 10% opposite, straight to variously curved, antrorse to recurved, 18-28 μm long; stalk cells cylindrical to cuneate, 4-6.5 μm long; head cells ovate, globose to oblong, entire, angular to slightly sublobate, 13-18.5 x 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 12-15.5 x 9-12.5 μm. Mycelial setae very few in some colonies but numerous in others, scattered to grouped around perithecia, simple, straight, acute, obtuse to dentate at the tip, up to 300 μm long. Perithecia scattered, up to 150 μm; ascospores obovoidal, 4-septate, slightly constricted, 43-46.5 x 18-22 μm.


The present new species is allied to *Meliola neolitseae* Yamam. But differs from it mainly in the morphology of the capitate hyphopodia, mycelial setae and smaller ascospores. It can also be compared with *Meliola cryptocaricola* Doidge and *M. philippensis* (Stev.) Hansf. in having hypophyllous colonies. However, it differs from both in having smaller capitate hyphopodia and perithecia and simple to dentate mycelial setae.

*Meliola ilicis-malabaricae* sp. nov. (Fig. 3)

Colonies amphigenae, plurumque hypophyllae, dense, crustosae vel velutinae, ad 2 mm diam., confluentes. Hyphae rectae vel subrectae, plurumque opposite acuteque ramosae, dense reticulatae, cellulae 18-34 x 9-12.5 μm. Hyphopodia capitata opposita, rare solitaria, recta vel curvula, antrorsa vel subantrorsa, 18-25 μm longa; cellula basali plurumque cuneata, 6-7 μm longa; cellula apicali ovata vel globosa, integra, 12-18.5 x 12-14 μm. Hyphopodia mucronata illis capitatis commixta, alternata, vel opposita, ampullacea, longicolla, 21-25 x 7-9.5 μm. Setae myceliales numerosae, simplices, rectae, acutae vel obtusae ad apicem, ad 500 μm longae. Perithecia dispersa vel laxe aggregata, verrucosa, ad 220 μm; ascosporae obovodeae, 4-septae, leniter constrictae, 52-59 x 24-...
2. *Meliola cryptocanicola* sp. nov.
Colonies amphigenous, mostly hypophyllous, dense, crustose to velvety, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching mostly opposite at acute angles, closely reticulate, cells 18-34 x 9-12.5 μm. Capitate hyphopodia opposite, rarely solitary, straight to curved, antrorse to subanatrose, 18-25 μm long; stalk cells mostly cuneate, 6-7 μm long; head cells ovate to globose, entire, 12-18.5 x 12-14 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, neck elongated, 21-25 x 7-9.5 μm. Mycelial setae numerous, simple, straight, acute to obtuse at the tip, up to 500 μm long. Perithecia scattered to loosely grouped, verrucose, up to 220 μm; ascospores obovoidal, 4-septate, slightly constricted, 52-59 x 24-26 μm.


The present species is close to *Meliola Khasiens* Hansf. in having opposite capitate hyphopodia but differs from it in having only opposite and longer capitate hyphopodia, only straight mycelial setae and larger ascospores.


In the present collection, colonies are amphigenous, epiphyllous colonies dense, velvety and head cells of the capitate hyphopodia entire, angular to rarely slightly lobate. Colonies were associated with *Asterina* sp.

*Meliola pterospermi* Stev. var. microspura var. nov. (Fig.4)

- Differt a var. *pterospermi* perithecias et ascosporis brevioribus. Colonies epiphyllous, dense, crustose to velvety, up to 2 mm in diameter, confluent. Hyphae mostly substraight, rarely crooked, branching opposite to irregular at acute to wide angles, closely reticulate, cells 18-22 x 6-8 μm. Capitate hyphopodia alternate, 5-10% opposite, antrorse, subantrorse to rarely recurved, 18-28 μm long, stalk cells cylindrical to cuneate, 3-9.5 μm long; head cells ovate globose, entire to angular in young colonies while irregularly sublobate in mature colonies, 15-18.5 x 12-18.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, rarely neck elongated, 15-25 x 6-9.5 μm. Mycelial setae scattered, straight, simple, acute to obtuse at the tip, up to 500 μm long. Perithecia scattered, verrucose, up to 155 μm; ascospores obovoidal, 4-septate, slightly constricted, 37-40.5 x 15-18.5 μm.


The present collection is close to *Meliola pterospermi* Stev., reported from Burma (Hansford, 1961), in its morphology. The present new variety differs from the var. *pterospermi* in having smaller perithecia and ascospores.
4. *Meliola pterospermii* Stev. var. *microspora* var. nov. nov.

- **Ch** - Capitate hyphopodia
- **Mh** - Mucronate hyphopodia
- **Ms** - Mycelial setae
- **Pc** - Perithecial cells
Meliola stenospora Wight., Hedwigia 25: 97, 1886.


The present collection is with hypophyllous colonies, only alternate capitate hyphopodia, mycelial setae up to 530 μm long and ascospores 40-46.5 x 12-18.5 μm. Meliola stenosora Wint. var. major Hansf. differs from var. stenospora in the crenation on the head cells of the capitate hyphopodia.

ACKNOWLEDGEMENTS

We are thankful to Dr. N.P. Balakrishnan, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore, Prof. K.M. Kaveriappa and Mr. B.V. Shetty, (Emeritus Scientist, BSI), Mangalore University for the encouragement. The senior author (VBH) is grateful to the Scientists' Pool Scheme of CSIR, New Delhi and the junior author (PAR) to the Karnataka Power Corporation for the financial help.

REFERENCE

GEOGRAPHICAL DISTRIBUTION OF THE MELIOLACEAE WITH SPECIAL REFERENCE TO INDIA

Hosagoudar, V. B., and Goos, R. D. Botanical Survey of India, Southern Circle, Coimbatore, 641 003, Tamil Nadu, India, and Department of Botany, University of Rhode Island, Kingston, Rhode Island, 02881, USA.

Over 300 species of meliolaceous fungi are now known to occur on the Indian sub-continent. An analysis of the distribution of these species on a world-wide basis revealed that 208 species appear to be endemic to India; 107 species are also known from other countries in Asia, 48 taxa have been reported from Africa, 23 from South America, and 21 from North America. None of the fungi reported from India are known from Europe. From this analysis, it is evident that the meliolaceous fungi of India show their greatest affinity with those of other Asian countries, but that components of the mycota of other tropical and sub-tropical regions are also present.

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A NOTE ON THE NEW RECORD OF BLACK MILDEW ON THE NEW HOST FROM INDIA

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Meliola toddaliae hitherto unknown to India causing black mildew disease on an unrecorded host species, Pamburus missionis deserves significance in its host-pathogen relationship.

On reviewing the occurrence of black mildews of Western Ghats, the authors came across a conspicuous infection of Meliola species on Pamburus missionis (Atalantia missionis (Wight) Oliver) in Tropical Botanic Garden and Research Institute, Thiruvananthapuram. The infection was very severe on the leaves though all parts of the aerial portion of host trees were susceptible. The affected trees showed drooping symptoms due to decrease in the photosynthetic area of leaves and simultaneously increase in temperature in the affected portions due to their black appearance. The tree is of considerable economic importance since its fruit is like a small orange (Trimen 1893).

On microscopic examination, the pathogen was identified as Meliola toddaliae Doidge. Perusal of the literature indicated that the pathogen is hitherto unknown to India, that too on new host species. Hence, the detailed description is provided here with a diagram to facilitate its easy identification.

Meliola toddaliae Doidge, Trans Roy Soc South Africa 5 732, 1916; Hansford, Svdowia Beih 2 387, 1916 (Fig. 1)

Colonies amphigenous, dense, velvety, up to 4mm in diameter, confluent, easily detachable from the host leaves. Hyphae straight, branches mostly opposite at acute to wide angles, very closely reticulate and form solid mycelial mat, cells 15-18.5x6-8 μm. Capitate hyphopodia opposite, straight to slightly curved, antrorse to subantrorse, 15-22 μm long; stalk cells cylindrical to cuneate, 3-9.5 μm; head cells ovate, globose, oblong to cylindrical, entire or rarely angular, 12-15.5x6-9.5 μm. Mucronate hyphophodia mixed with capitate hyphopodia, opposite, or opposite to capitate hyphopodia, amphulliform, 15-18.5x16-9.5 μm. Mycelial setae numerous, simple, straight, acute to obtuse at the tip, up to 572 μm long. Perithecia closely scattered, verrucose, up to 310 μm; ascospores obovoidal, 4-septate, slightly constricted, central cell slightly larger, 46-50x18-22 μm.

A NOTE ON THE NEW RECORD OF BLACK MILDEW

This is the unique pathogen on the members of the family Rutaceae having opposite capitate hyphopodia (Doidge 1916; Hansford 1961). It was earlier known only from South Africa on *Vepris lanceolata*, *Teclea natalensis*, *Fagara capensis*, *F. davyi*. The present report from India on an unrecorded host genus (Bilgrami *et al.* 1978, 1981; Sarbhoy *et al.* 1986) deserves scientific importance.

We are grateful to Dr N P Balakrishnan, Joint Director, Botanical Survey of India, Coimbatore and Dr P Pushpangadan, Director, Tropical Botanic Garden and Research Institute, Thiruvananthapuram for encouragement.

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MELIOLACEAE OF SOUTH INDIA - III

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ABSTRACT

Six taxa of Meliaceae were taken up for study: Meliola chandleri Hansf. var. excoecariae as a new variety, Meliola jasmini Hansf. & Stev. was first reported from India, Meliola tawaoensis Hansf. was reported for the first time from South India and, Meliola nothopegiae Hansf., Meliola opiliae Syd. and Meliola petchi Hansf. were reported for the first time from the States of Tamil Nadu, Andhra Pradesh and Kerala respectively. The materials have been deposited in AMH, MACS Research Institute, Pune, Maharashtra.

1. Meliola chandleri Hansf. var. excoecariae var. nov. (fig. 1).

Differt a Meliola chandleri Hansf. var. chandleri hyphopodiis mucronatis in hyphis distinctis evolutis.

Colonies amphigenous, minute, subdense to dense, up to 3 mm in diameter. Hyphae straight to substraight, branching alternate to irregular at acute angles, loosely to closely reticulate, cells 16-20 × 6-8 μm. Capitate hyphopodia alternate, antorse, spreading, reflexed, 21-25 μm long; stalk cells cylindrical to cuneate, 6-10 μm long; head cells angulose to suboblate, 12-16 × 14-18 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, ampulliform, 15.0-21.5 × 9-13 μm. Mycelial setae scattered, bifid to dichotomously branched, up to 240 μm long till branching, first ray up to 20 μm long and second ray up to 13 μm long, branches reflexed, acute to obtuse at the tip. Perithecia scattered, verrucose, up to 170 μm; spores obovoidal, 4-septate, constricted, 40-47 × 15-17 μm.


Four species of the genus Meliola are reported on different members of the family Euphorbiaceae: Meliola acalyphidis Toro, Meliola chandleri Hansf., Meliola crotonicola Stev. and Meliola ugandensis Hansf. have dichotomously branched mycelial setae (Hansford, 1961). However, the present collection is closer to Meliola chandleri Hansf. in having alternate capitate hyphopodia, lobed head cells of the capitate hyphopodia and in the morphology of the branched mycelial setae. However, the new variety excoecariae differs from Meliola chandleri Hansf. var. chandleri in having the mucronate hyphopodia borne on a separate mycelial branch.


Colonies amphigenous, mostly epiphyllous, dense, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching opposite at acute to wide angles, loosely to closely reticulate, cells 18.5-25.0 × 6-8 μm. Capitate hyphopodia alternate, straight, antorse, 15.5-22.0 μm long; stalk
Fig. 1. *Meliola chandleri* Hansf. var. *excoecariae* var. nov.

Fig. 2. *Meliola Jasmini* Hansf. & Stev.

- **M**: Mycelium
- **Ch**: Capitate hyphopodia
- **Mh**: Mucronate hyphopodia
- **MS**: Mycelial Setae
- **SP**: Spores
cells cuneate, 4.5–6.0 μm long; head cells ovate, entire, 12.5–15.5 × 9.0–12.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, opposite to alternate, conoid to ampulliform, 31–37 × 9.0–15.5 μm. Mycelial setae fairly numerous, scattered, simple, straight, acute to obtuse, up to 500 μm. Perithecia scattered, verrucose, up to 124 μm; spores obovoidal, 4-septate, 31–34 × 12–18 μm.

On leaves of *Jasminum sambac* Ait., Calicut (Kerala), V.B. Hosagoudar, Nov. 17, 1986, AMH 7134.

This species was reported on *Jasminum* spp. from Malaya, Gold coast, Sierra Leone and Uganda (Hansford, 1961) and has been reported here for the first time from India on a hitherto unrecorded host species (Bilgrami et al., 1979, 1981).


This species has been reported here for the first time from Tamil Nadu on a hitherto unreported host species (Bilgrami et al., 1979, 1981).


This species has been reported here for the first time from Andhra Pradesh.


On leaves of *Strychnos nux-vomica* L., Calicut (Kerala), V.B. Hosagoudar, Nov., 17, 1986, AMH 7135.

This species has been reported here for the first time from Kerala.


Kar & Maity (1972) reported this species on *Ixora undulata* Roxb. from West Bengal and is reported here for the first time from South India on a hitherto unreported host species.

ACKNOWLEDGEMENT

We are grateful to Dr. N.P. Balakrishnan, Scientist D, Botanical Survey of India, Southern Circle, Coimbatore for encouragement.

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TAXONOMIC NOTES ON INDIAN MELIOLACEAE

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ABSTRACT

The paper gives an account of 7 meliolaceae taxa. Of these, Amazonia daphniphylli, A. karii, Diporothyca litsea are the new species; Meliola rubi Stev. & Rold. ex Hansf. var. garhwalensis (Srivastava & Topal) Stat. et Comb. nov.; Meliola parvifoliae Singh & Kanal made synonym to M. mitragynae Syd. while, Asteridiella perrottetiae (Stev.) Hansf., Meliola ambigua Pat. & Gaill. are reported for the first time from India.

Amazonia daphniphylli Patil, *sp. nov.*

Plagulae epiphyllae, crustosae, ad 2 mm diam. Hyphae mycelii subrectae vel anfractuose, alternate vel irregulariter acuteque ramosae et solidae ad centre, cellulis 20-30 x 6-7 \( \mu \)m. Hyphopodia capitata alternata vel unilateralia, antorosa vel patentia, 15-18 \( \mu \)m longa; cellula basali cylindracea vel cuneata, 6-7 \( \mu \)m longa; cellula apicali ovata vel globo-sa, integra, 9-12.5 x 9-15.5 \( \mu \)m. Hyphopodia mucronata illis capitatis commixa, opposita vela lterata, ampullacea, 15.5-22 x 6-7 \( \mu \)m. Perithecia paucu, aggregata ad centre, flattered-globosa, ad 313 \( \mu \)m; sporae obovoidalae, 4-septatae, constrictae, 30-37.5 x 9-15.5 \( \mu \)m.

Colonies epiphyllous, crustose, up to 2 mm in diameter. Hyphae substraight to crooked, branching, alternate to irregular at acute angles, closely reticulate and forming solid mycelial mat at the centre, cells 20-30 x 6-7 \( \mu \)m. Capitate hyphopodia alternate to unilateral, antennis to spreading, 15-18 \( \mu \)m long; stalk cells cylindric to cuneate, 6-7 \( \mu \)m long; head cells ovate to globose, entire, 9-15.5 x 9-12.5 \( \mu \)m. Mucronate hyphopodia mixed with capitate hyphopodia opposite to alternate, ampulliform, 15.5-22 x 6-7 \( \mu \)m. Perithecia few, grouped at the centre, flattered-globose, up to 313 \( \mu \)m; spores obovoidal, 4-septate, constricted, 30-37.5 x 9-15.5 \( \mu \)m.

Holotype: On leaves of Daphniphyllum neilgherrense (Wight) Rosenth (Daphniphyllaceae), Kodaikanal, T.N., Nov. 29, 1987, R.S. Sawant, deposited in ICIC, New Delhi.

There is no report of Meliolaceous fungi on the members of the family Daphniphyllaceae. Hence, it is proposed here a new species.

Amazonia karri Hosagoudar & Balakrishnan *sp. nov.*

So far three taxa of the genus *Meliola* viz. *M. grewia* Hansf., *M. grewia* Hansf. var. *longispora* Hosagoudar & Raju and *M. grewicola* Hansf. have been reported on the host genus *Grewia* (Hansford, 1961 and Hosagoudar & Raju, 1985). However, the present species differs from them in having flexuous to crooked mycelia, angular to sublobate head cells of the capitate hyphopodia, mucronate hyphopodia borne on a separate mycelial branch and in the measurements.

The species is named in honour of the eminent Indian Mycologist, Dr. M.J. Thirumalachar.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

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Plagulae amphigenae, plerumque epiphyllae, densae, densae, velutinae usque ad 2 mm diam., confluentes. Hyphae mycelii rectae vel subrectae, opposite acutaeque ramosae, densae reticulatae et solidae ad centre, cellulis 24-34 x 9-12.5 μm. Hyphopodia capitata alternata, plerumque recta, antrorsa vel patentia, 18-35 μm longa; cellula basali cylindracea vel cuneata, 6-9.5 μm longa; cellula apicali ovata, globosa, integra angulosae vel sublobata, 10-12.5 x 9-12 μm. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 27-46.5 x 12-15.5 μm. Perithecia densa dispersa, dipresso-globosa, ad 217 μm; sporae obovoidae, 4- septatae. constrictae, 40-43.5 x 15-19 μm.

Colonies amphigenous, mostly epiphyllous dense, velvety, up 2 mm in diameter, confluent. Hyphae straight to sub-straight, branching opposite at acute angles, closely reticulate and form solid mycelial mat at the centre, cells 24-34 x 9-12.5 μm. Capitate hyphopodia alternate, mostly straight, antro-rse to spread ng. 18-25 μm long; stalk cells cylindrical to cuneate 6-9.5 μm long; head cells ovate, globose, entire, angulose to sublobate, 10-12.5 x 9-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia,
Husagoudar et al.

Fig. 3. Diporotheca lilseae, sp. nov.
mixed with capitate, hyphopodia, opposite to alternate, ampulliform, 27-46.5 x 12-15.5 μm. Perithecia closely scattered, flattened-globose, up to 217 μm; spores obovoidal, 4-septate, 40-43.5 x 15-19 μm.


Presence of the flattened-globose perithecia covered with a radiate mycelial layer is the characteristic of the genus Amazonia Theiss. So far there is no report of the genus Amazonia on the members of the host family Ericaceae. Hence it is proposed here as a new species. However, this material was deposited in IMI as Asteridiella pentapterygii Kar & Maity.

This species is named in honour of Dr. A.K. Kar for his notable contributions to the Indian Meliolaceae.

Asteridiella perrottetiae (Stev.) Hansf., Sydowia Beih. 1: 91. 1957.


Plagulae hypophyliae, subdense vel dense, ad 5 m diam., confluentes. Hyphae anfractuosae irregulariter lateque vel acutae ramosae, dense reticulatae et solidae, cellulis 18-25 x 3-4 μm. Hyphopodia capitata paucia, alternata, patentia, 13-16 μm longa; cellula basali cylindracea vel cuneata, 6-7 μm longa; cellula apicali globosa, angulata vel leniter lobata, 9.5 μm. Hyphopodia mucronata non visa. Setae myceliales nullae. Perithecia numerosa, dispersa, globosa, non ostiolarata, ad 315 μm; sporae plerumque 2-septatae, raro 3-4 septatae, cellula terminalis

Fig. 4. Meliol rubi Stev. & Rold. ex Hansf. var. garhwalensis (Srivastava & Topal) stat. et comb. nov.

Ch—Capitate hyphopodia
Mh—Mucronate setae
Ms—Mycelial setae
Sp—Ascospores
conoideae, cellula centralis magna, 40-50 x 15.5-18.5 μm.

Colonies hypophyllous, subdense to dense, up to 5 mm in diameter, confluent. Hyphae crooked, irregularly branched at acute to wide angles, closely reticulate and forming solid mycelial mat at the centre, cells 18-25 x 3-4 μm. Capitate hyphopodia few, alternate, spreading, 13-16 μm long; stalk cells cylindrical to cuneate, 6-7 μm long; apical cells globose, angulate to slightly lobate, 9.5 μm. Macronate hyphopodia not seen. Mycelial setae absent. Perithecia numerous; scattered, globose, non-ostiolate, up to 3-4 mm; spores mostly 2-septate, rarely 3-4 septate, 40-50 x 15.5-18.5 μm; in case of 2-septate spores middle cells larger in the ratio of 1 : 3 : 1, covered by a thin sheath, apical cells conoid.

Holotype: On leaves of Litsea sp. (Lauraceae), Kodaikanal, Nov. 29, 1987, R.S. Sawant, material deposited in HCIO.

Gordon & Shaw (1960) described a new genus Diporotheca, with the type D. rhizophila Gordon & Shaw, isolated from the roots of Solanum spp. The present collection well suits to the genus Diporotheca in having 2-septate ascospores covered with gelatinous sheath. However, the present species differs from D. rhizophila Gordon & Shaw in having folicolous habit, longer ascospores and smaller perithecia. Further, this is the first report of the genus Diporotheca from India.


Meliola mitragynae Syd. in Philipp. J. Sci. 8 : 478. 1913.


Kamal et al. (1982), while describing their new species Meliola parvifoliae (IMI 200029 type, deposited as Meliola sp.) have compared it with M. woodiana Sacc. and M. canthi Hansf. var. leonensis Hansf. & Deight but failed to compare it with M. mitragynae Syd., a well-established species on the host genus Mitragyna.


Srivastava & Topal (1982) have stated that the capitate hyphopodia are alternate and the head cells are entire and stellately lobate. However, the type material of M. garhwalensis Srivastava & Topal deposited in IMI (257869 type) as Meliola sp. revealed that the capitate hyphopodia are opposite and alternate, head cells are mostly entire but rarely angulate to slightly sublobate. It is similar to M. rubi Stev. & Rold. ex Hansf. but
differs from it in having epiphyllous colonies and longer mycelial setae.

ACKNOWLEDGEMENTS

We are grateful to the Director, C.M.I., Kew, England for generously sparing the Indian collections deposited at 1MI for our study.

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A new *Meliola* species from Madurai district of Tamil Nadu, India

by

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With 1 figure


During a study of Ethnobotany and Phanerogams in the Madurai district of Tamil Nadu, the authors came across infected plants of *Syzygium lanceolatum* (Lam.) Wight & Arn. (Myrtaceae). Microscopic examination of these infected plants revealed that they were infected with an undescribed species of the genus *Meliola* which is described below.

*Meliola maduraiensis* sp. nov.

Plagulae epiphyllae, dense, crustose, ad 4 mm in diam., confluentes. Hyphae rectae vel flexuose, oppositae vel irregulariter acuteque ramosae, laxae vel dense reticulatae, cellulis 21.5-37.5 × 9-12.5 μm. Hyphopodia capitata alternata, raro opposita (minusve 1%), recta, curvula vel flexuosa, anthorsa vel raro reflexa, 21.5-28 μm longa; cellula basali recta vel raro flexuosa, cylindracea, 8-10 μm longa; cellula apicis ovata, globose, integra, angulosa vel lobata, 12-18.5 × 12-15.5 μm. Hyphopodia micronuta illis capitatis coniuncta, plerumque alternata, conoida vel ampullacea, 18-25 × 9-12.5 μm; Setae myceliales etiam in mycellio integrum, simplices, rectae vel uncinatae, acutae vel obtuse ad apicem, ad 444 μm longae. Perithecia dispersa vel aggregata, ad 190 μm; ascospores cylindraceae vel fusiformiae, rectae vel plerumque curvatae, 3-septatae, 46.5-53 × 15-18.5 μm.

Colonies epiphyllous, dense, crustose, up to 4 mm in diameter, confluent. Hyphae straight to flexuous, branching alternate to irregular at acute angles, loosely to closely reticulate, cells 21.5-37.5 × 9-12.5 μm. Capitate hyphopodia alternate, rarely opposite (less than 1%), straight, curved to flexuous, anthorsa to reflected, 21.5-28 μm long; stalk cells straight to rarely flexuous, cylindrical, 8-10 μm long; head cells ovate, globose, entire, angular to lobate, 12-18.5 × 12-15.5 μm. Micronate hyphopodia mixed with capitate hyphopodia, mostly alternate, conoid to ampulliform, 18-25 × 9-12.5 μm. Mycelial setae grouped around perithecia, simple, straight to uncinate, acute to obtuse at apex, up to 444 μm long. Perithecia scattered to grouped, up to 190 μm; ascospores cylindrical to fusiform, straight but mostly curved, 3-septate, 46.5-53 × 15-18.5 μm.
Fig. 1. *Meliola maduraiensis*, sp. nov.: Ch - Capitate hyphopodia, Mh - Mucronate hyphopodia, Ms - Mycelial setae, Sp - Ascospores.

**Holotype:** On leaves of *Syzygium lanceolatum* (Lam.) Wight & Arn. (Myrtaceae), Hospital Valley, High Wavy Mountain, Madurai dist., Tamil Nadu, August 25, 1990, V. Lakshmanan HCIO 30457.

*Meliola pulchella* Speg. is the only species reported on an unidentified host of the family Myrtaceae from Brazil having 3-septate ascospores (Hansford, 1961; Spegazzini, 1889). Morphologically, the present species is close to it but differs from it in having epiphyllous and dense colonies, acute branching and dense reticulation of the hyphae, flexuous and larger capitate hyphopodia, mucronate hyphopodia mixed with capitate hyphopodia, smaller perithecia, larger ascospores and straight to uncinate mycelial setae. Hence, it is accommodated in a new species.

**Acknowledgements**

We are grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for their encouragement.

**References**


Developmental morphology of *Meliola chandrasekharanii* Hosagoudar (meliolaceae)

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**ABSTRACT**

The morphology of *Meliola chandrasekharanii* Hosagoudar on leaves of *Notropodytes nimmoniana* (Graham) Mabberley (Icacinaceae) collected from the Valparai area of Tamil Nadu has been studied in detail. Mycelium produced two types of hyphopodia, two-celled capitate and single-celled mucronate (phialides), black mycelial setae and globose asccarp. Perithecial primordia initiated from the head cells of the modified capitate hyphopodia. Perithecial initials by subsequent divisions formed the stromatal structures. Antheridium and ascogonium developed simultaneously. Nuclear fusion occurred through trichogyne of the ascogonium. Binucleate ascus mother cells formed from the crook cells of the ascogogenous hyphae developed into two spored asc. Peridium single layered, textura angularis, with ostiolar primordia. Haustoria bulbous and intracellular in epidermal cells.

*Meliola chandrasekharanii* Hosagoudar was collected on the leaves of *Notropodytes nimmoniana* (Graham) Mabberley (Icacinaceae) from the Valparai area of Coimbatore district, Tamil Nadu, India on Dec. 27, 1990 and the exsiccata has been deposited in HCIO (Hosagoudar & Goos, 1990, 1991). The colonies, mostly hypophyllous, dense to subdense, velvety, up to 3 mm in diameter and often confluent. Hyphae undulating, branching opposite at acute angles, loosely to closely reticulate and formed almost solid mycelial mat at the centre, cells 16-30 × 6-8 μm. Capitate hyphopodia mostly alternate and very few opposite, straight to curved, spreading, mostly antrorse, 16-24 μm long; stalk cells cuneate to cylindrical, 4-10 μm long; head cells subglobose, ovate, angular to subulate, 12-14 × 12-16 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, ampulliform, 12-20 × 6-10 μm. Mycelial setae numerous, straight, simple, acute to subacute at the tip, up to 477 μm long. Perithecia scattered, globose, verrucose, up to 153 μm; ascospores obovoidal to cylindrical, 4-septate, constricted at the septa, 32-42 × 1-16 μm.

**MATERIAL AND METHODS**

After examining colonies in the field, colonies along with host leaves were cut into pieces of 2-10 mm in rectangular shape and fixed in formalin-acetic-alcohol and simultaneously the infected materials along with the host twigs were collected in the polythene bag to facilitate the host identity as well as that of fungus. The materials, collected in the polythene bag were dried by pressing between blotters and the fixed materials were changed to 70% alcohol after 24 hours from the time of fixation. The materials were dehydrated in tertiary butyl alcohol.
alcohol series; sections of 10-12 μm thickness were cut in rotary microtome, stained in 0.5% Heidenhain’s haematoxylin and differentiated in picric acid for five minute, and mounted in D.P.X. Scrapes were made from the dried material, mounted in 5% KOH solution prepared in water and the scraped material remounted in lactophenol (Rangaswamy, 1971). Both the mountants worked well as good clearing agents. Nail polish ‘flip’ method was used to prepare the permanent slides for the camera lucida drawings (Hosagoudar & Kapoor, 1985).

RESULTS AND DISCUSSION

The scrapes made from the dried infected host parts mounted in KOH and later in lactophenol showed every detail by clearing the heavy deposition of the pigments. Mycelial setae arose from the mycelium were initially parallel to the host surface and immediately turned, perpendicular to the host surface; central core of the mycelial setae flanked with dark borders and was closed at the tip. Mucronate hyphopodia borne on separate mycelial branch were...
ampulliform, neck elongated and the tip opened in older ones, while it was closed in younger ones. Production of the conidia from the mucronate hyphopodia was not observed as stated by Hughes (1978, 1981) and Muller et al (1991). From the top view, at the centre of the apical cells of the capititate hyphopodia; a hyaline pore was observed, which is the indication of the presence of the haustorium from the lower surface. However, a few head cells were without such hyaline spots and function as the perithecial initials (Luttrell, 1989). These perithecial initials enlarge considerably and start dividing. The first division of each perithecial initial takes place by a vertical septum which passes diagonally across the cell; the subsequent divisions of perithecial initial resulted in the formation of disc or plate with a sub-radial-subhelicoid appearance. As the development proceeds, the exposed cell wall becomes thicker and darker. The vertical walls remained thicker and coloured for a short while and became thinner and colourless. Repeated division of the cells in the centre makes the perithecial primordium to become hemispherical structure. Hitherto, this stromatic growth is purely vegetative (Ward, 1883; Ryan, 1926). The subsequent development of the primordium resulted in the differentiation of the sex organs. The initials of antheridium developed simultaneously; antheridial initial was slightly longer, linear, slender and curved at the tip; stout and straight ascogonium initial formed the ascogonium with trichogyne (Fig. 2, 3). The tip of the antheridial initial curved and pressed on the tip of the trichogyne of the ascogonium and the wall between ascogonium and antheridium initials dissolved at the point of contact so as to allow the flow of the male nucleus into the ascogonium initial and the subsequent development may be as stated by Thite (1974, 1982). The crooked dikaryotic binucleate ascus mother cells originating from the ascogeneus hyphae became clavate, uninucleate young asci arranged on the hymenium; the single diploid nucleus of the young ascus by meiotic and mitotic divisions resulted in the formation of eight haploid nuclei. All these eight nuclei arranged in four pairs, of which only two ascospores, each with the haploid nuclei, are formed and the remaining two disappear (Fig. 6). Now, the binucleate young ascospores divided to form four nucleate ascospore septa formed at both the distal ends with one nucleus in each cell by leaving two nuclei in the central cell. Once again, nuclei in the distal cells divide and the septa are laid so as to make the spore proper as five uninucleate cells by leaving the central cell alone as binucleate. Till now the ascospores remained hyaline with acute terminal cells and as they attain maturity, spores turned brown and the ends became rounded. At this stage, the ascus was ununicate and evanescent at maturity (Fig. 6). The material mounted in 5% KOH, released individual spores from the apical portion of the ascocarp with air bubbles either by gelatinization or by imbition. From the top view, it was not evident of the presence of ostiole. However, ostiolar primordia was visible in the section. Other than the asci and brown ascospores, we were unable to locate a typical paraphyses except a gelatinous mass. Peridium single layered, texture angularis, exposed surface of the cells dark while the inner surface was pale yellow to brown. Haustoria were bulbous, intracellular in the epidermal cells of the host but there is no evidence of penetration of haustoria beneath the epidermal layer. However, it is essential to study at least a representative species for each genus of the family Melio-
DEVELOPMENTAL MORPHOLOGY OF MELIOLA SP.

laceae so as to get a clear picture of developmental morphology and their life cycle.

ACKNOWLEDGEMENTS

We are thankful to Dr. N.P. Balakrishnan Deputy Director and Dr. A. N Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

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Meliolaceae of southern India - XI

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Summary: The paper gives an account of eleven Meliolaceae taxa. Of these, *Amazonia flacourtiae* is a new species; *Meliola anisophylla* Hansl. & Deighton var. *carallidae*, *M. caryophylla* Hansl. & Hirum. var. *indica*, *M. goruburiae* Hansl. & Hirum. var. *indica*, *M. millerioides-horsipilata* Hansl. var. *indica*, *M. mucronata-acuminata* Hansl. var. *indica* and *M. tenuonae* Rehm var. *indica*, are new varieties. *M. spigolae* Hansl. is reported for the first time from India while the identity of earlier reported species namely, *M. diospyricola* Hansl. and *M. isora* Yates has been corrected.

1. *Amazonia flacourtiae* sp. nov. Fig. 1

Plagulae amphigenous, tenerae vel subdense, ad 2 mm in diam., confluentes. Hyphae subrectae vel flexuosae, oppositae acuteque vel laxe ramosae, laxe reticulatae, cellulis 12.5-22 × 6-9.5 μm. Hyphopodia capitata alternata, recta vel rara curvula, anversa, 15.5-25 μm longa; cellula basali cuneata, 3-6.5 μm longa; cellula apicali ovata, integra, 12.5-20.5 × 8-14 μm. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 15.5-22 × 6-9.5 μm. Perithecia aplana-globosa, dispersa, ad 124 μm; ascospores obovatae, 4-septatae, collugum ad septis, 34-46.5 × 12.5-18.5 μm.

Colonies amphigenous, thin to subdense, up to 2 mm in diameter, confluent. Hyphae substraight to flexuous, branching opposite at acute to wide angles, loosely reticulate, cells 12.5-22 × 6-9.5 μm. Capitate hyphopodia alternate, straight, rarely curved, anversa, 15.5-25 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovate, entire, 12.5-20.5 × 8-14 μm. Mucronate hyphopodia mixed with capitata hyphopodia, alternate to opposite, ampulliform, 15.5-22 × 6-9.5 μm. Perithecia flattened-globose, scattered, up to 124 μm; ascospores obovoidal, 4-septate, strongly constricted at the septa, 34-46.5 × 12.5-18.5 μm.
Abbreviations used:
Ch - Capitate hyphopodia
Mh - Mucronate hyphopodia
Ms - Mycelial setae
Sp - Ascospores

HOLOTYPE: On leaves of Flacourtia sp. (Flacourtiaceae), Kolithorai, Kotagiri, Nilgiris, Tamil Nadu, Feb. 16, 1991, V.B. Hosagoudar HClO 30617.

Species in the genus Amazonia have not been reported on the members of the family Flacourtiaceae (Hansford, 1961; Katumoto & Hosagoudar, 1990). The related host families to Flacourtiaceae are Bixaceae and Samydaceae. There is no report of the genus Amazonia on the former family while A. caseariae Viégas has been reported on Casearia sylvestris (Samydaceae) from Brazil. This species produces conidia and thyrothecia and hence this species should be excluded from the family Meliolaceae.
For these reasons we believe that the fungus which we have collected on *Flacourtia* warrants description as a new species.


*Differt a var. anisophylleae in coloniae crustosae, hyphopodia capitata remote ordinata; cellula apicalis de hyphopodia capitata integra vel angulosa. Setae myceliales longae, acutae vel obtusae, perithecia brevioribus.*

Colonies amphigenous, mostly hypophyllous, dense, crustose, confluent. Hyphae sub-straight to crooked, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 24-31 × 9-12.5 μm. Capitate hyphopodia alternate, antirorse to spreading, straight to variously curved, 15.5-22 μm long; stalk cells cylindrical to cuneate, 6-8 μm long; head cells straight to curved, ovate, globose, entire to angular, 9-15.5 × 12-15.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, neck elongated and curved, 21-28 × 12-15.5 μm. Mycelial setae few, simple, straight, erect, acute to obtuse at the tip, up to 1150 μm long. Perithecia scattered, up to 150 μm; ascospores obovoidal to cylindrical, 4-septate, constricted, 52-56 × 15-19 μm.

**HOLOTYPE:** On leaves of *Carallia brachiata* (Lour.) Merr. (*C. integerrhima* DC.) (Rhizophoraceae), Amboli, Maharashtra, Feb. 8, 1975, M.S. Patil HCIO 31945.

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![Diagram](image-url)
There are two species namely, *Meliola anisophylleae* Hansf. & Deighton and *M. bru- 
guarae* Sydow reported on the members of the family Rhizophoraceae. The present 
collection is close to the former species in having only alternate capitate hyphopodia 
but differs from the var. *anisophylleae* in having crustose colonies, distantly arranged 
capitate hyphopodia, ovate to globose, entire to angular head cells of the capitate 
hyphopodia, longer and acute to obtuse mycelial setae and smaller perithecia.

3. *Meliola cansjerae* Hansf. & Thirum. var. *indica* var. nov. Fig. 3

Differ a var. *cansjerae* hyphopodis capitatis brevioribus, setae myceliales simplicibus et bidentatis sed 
non furcatae, perithecia magnioribus et ascosporis brevioribus.

Colonies amphigenous, dense, up to 2 mm in diameter, confluent. Hyphae straight 
to substraight, branching opposite at acute to wide angles, closely reticulate, cells 
9.18.5 x 6.9.5 μm. Capitate hyphopodia alternate to opposite, straight to rarely 
curved, antrorse, 12.5-19 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovate, 
entire, 9-12.5 x 8-11 μm. Mucronate hyphopodia mixed with capitate hyphopodia, 
alternate to opposite, ampulliform, 15.5-18.5 x 6-12.5 μm. Mycelial setae grouped 
around perithecia, simple, straight to curved but not uncinate, acute, obtuse to 2-3 
dentate at the tip, up to 465 μm long. Perithecia scattered, up to 214 μm; ascospores 
obovoidal to cylindrical, 4-septate, constricted at the septa, 37-43.5 x 12-15.5 μm.

HOLOTYP: On leaves of *Canssra rhedii* J.F. Gmel. (Opiliaceae), Jammunarai, Ko-

There are three taxa namely, *Meliola cansjerae* Hansf. & Thirum. *M. cansjerae* Hansf. 
& Thirum. var. *singalensis* Hansf. and *M. cansjerica* Hosagoudar (Hansford, 1961; 
Hosagoudar & Goos, 1990; Kalamota & Hosagoudar, 1990) which have been reported 
on this host genus. The present collection is close to *M. cansjerae* Hansf. & Thirum.

![Diagram](image-url)
in having 4-septate ascospores, alternate and opposite capitate hyphopodia. However, the present new variety differs from the var. cansjerae in having longer but non-furcate mycelial setae, larger perithecia and smaller ascospores.


Two closely related species, M. diospyri Sydow and M. diospyricola Hansf. are reported on this host genus, the former species having 90% opposite capitate hyphopodia and the latter having 3% opposite capitate hyphopodia. The present collection belongs to M. diospyri Sydow but not to M. diospyricola Hansf. (Thite & Patil, 1982).

5. Meliola gardneriae Hansf. & Thirum. var. indica var. nov. Fig. 4

Differ a var. gardneriae setae myceliales et ascosporae brevieribus.

Colonies epiphyllous, dense, velvety, up to 6 mm in diameter. Hyphae straight to flexuous, branching opposite to alternate at acute angles, loosely to closely reticulate, cells 18-25 × 5-7 μm. Capitate hyphopodia alternate, antrorse to subantrorse, 21-28 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, versiform, entire, 12-18.5 × 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, elongated, conoid to ampulliform, 21-25 × 6-8 μm. Mycelial setae numerous, scattered, simple, straight to curved, acute to obtuse at the apex, up to 300 μm long. Perithecia loosely grouped, verrucose, up to 160 μm; perithecial cells conoid, projecting; ascospores obovoidal, 4-septate, 31-35 × 15-18.5 μm.

Fig. 4. Meliola gardneriae Hansf. & Thirum. var. indica var. nov.

The new variety differs from the var. *gardneriae* in having smaller mycelial setae and ascospores.


On leaves of *Ixora polyandha* Wight (Rubiaceae), Amboli, Maharashtra, Feb. 23, 1975, M.S. Patil HCIO 31943.

The irregularly sublobalc and variously curved head cells of the capitate hyphopodia, slightly constricted and curved ascospores are the characters of this species. However, this species was associated with another species having opposite capitate hyphopodia and it was wrongly identified by Thite & Patil (1982) as *M. ixorae* Yates which is evidenced by the line drawings provided therein. Since the material was scanty, the species having opposite hyphopodia was not determined.

7. *Meliola millettiae-chrysophyllae* Deighton var. *indica* var. nov. Fig. 5

Differt a var. *millettiae-chrysophyllae* plagulae tennes, ad 2 mm diam., hyphopodis capitatis longioribus, peritheciis brevioribus et ascosporis longioribus.

Colonies epiphyllous, thin to subdense, up to 2 mm in diameter, rarely confluent. Hyphae straight to substraight, branching mostly opposite at acute to wide angles, loosely reticulate, cells 21.5-40.5 × 6-9.5 μm. Capitate hyphopodia alternate, opposite, straight to usually curved, antorse, 18.5-25 μm long; stalk cells cuneate, 3-6.5 μm long; head cells ovate, versiform, entire, 15.5-18.5 × 6-11 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 12-21.5 × 7-9.5 μm. Mycelial setae fairly numerous, scattered, straight to curved but not uncinate, acute, obtuse to rarely dentate at the tip, up to 425 μm long. Perithecia scattered, globose, up to 136 μm; ascospores obovoidal, 4-septate, slightly constricted at the septa, 31-43.5 × 12-15.5 μm.


Of the several species of *Meliola* reported on the host genus *Millettia*, the present collection is close to *M. millettiae-chrysophyllae* Deighton in having simple and dentate setae but the new variety differs from the var. *millettiae-chrysophyllae* in having thin colonies up to 2 mm in diameter, longer capitate hyphopodia, smaller perithecia and larger ascospores.

8. *Meliola mucunae-acuminatae* Hansf. var. *indica* var. nov. Fig. 6

Differt a var. *mucunae-acuminatae* et *mucunae* Hansf. var. *hirsuta* Hosagoudar hyphopodia capitata 5% opposita, cellula apicalis ovata vel globosa; hyphopodii mucunatae illis capitatis commixtae; setae myceliales simplicibus et dentatis; ascosporis brevioribus.
Fig. 5. Alcolola milletiace-chrysophyllae Hansf. var. indica var. nov.

Fig. 6. Meliola mucinae-acuminatae Hansf. indica var. nov.
Colonies epiphyllous, thin to dense, confluent. Hyphae crooked, branching opposite to irregular at wide angles, loosely reticulate, cells 15-28 × 4-6.5 μm. Capitate hyphopodia alternate, about 5% opposite, straight to variously curved, 12-18.5 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells ovate, globose, curved, entire, 9-12.5 × 10-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, conoid to ampulliform, 18.5-25 × 6-8 μm. Mycelial setae few, grouped around perithecia, simple, straight, acute, obtuse to few dentate at the tip, up to 280 μm long. Perithecia scattered, up to 125 μm in diameter; ascospores cylindrical, 4-septate, constricted at the septa, 30-34 × 12-15.5 μm.

**HOLOTYPE:** On leaves of *Mucuna pruriens* (L.) DC (Fabaceae), Anmode, Goa, Oct. 10, 1974, A.N. Thite HCIO 31907.

The present collection is close to *M. mucunae-acuminatae* Hansf. and *M. mucunae* Hansf. var. *hirsutae* Hosagoudar (Hansford, 1961; Hosagoudar & Goos, 1990) in having simple and dentate mycelial setae but the new variety differs from the var. *mucunae-acuminatae* in having 5% opposite capitate hyphopodia, ovate to globose head cells of the capitate hyphopodia, mucronate hyphopodia mixed with capitate hyphopodia, having simple and dentate mycelial setae and smaller ascospores.


Colonies amphigenous, caulicolous, dense, crustose to velvety, up to 2 mm in diameter, rarely confluent. Hyphae straight to substraight, branching opposite to irregular at acute angles, closely reticulate and forming an almost solid mycelial mat, cells 12-22 × 6-9.5 μm. Capitate hyphopodia mostly opposite (about 90-100%) and rarely alternate and unilateral, densely arranged, antrorse, 15-22 μm long; stalk cells cuneate, 2-6 μm long; head cells mostly globose, often ovate, entire, 10-15 × 10-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-25 × 7-12 μm. Mycelial setae grouped around perithecia, straight to curved but not uncinate, acute to obtuse to 2-3 dentate at the tip, up to 214 μm long. Perithecia scattered, up to 214 μm; ascospores oboviodal to cylindrical, 4-septate, slightly constricted at the septa, 37-45 × 10-15 μm.

On leaves of *Canssella rhedi* Gmel. (Opiliaceae), Kannoth reserve forest, Cannanore, Kerala (Alt. ± 125 m), Nov. 3, 1979, V.S. Ramachandran (MH 57690) HCIO 30623; Anaikatty, Nilgiris, Tamil Nadu (875 m), March 15, 1972, G.V. Subbarao (MH 40249) HCIO 30625; mendasal forest, Orissa, Oct. 4, 1915, Haines (MH 86814) HCIO 30624; On leaves of *Lepionurus sylvestris* DC. (Opiliaceae), Sikkim Himalayas (alt. 2000 ft.), 1877, G. King (MH 64594) HCIO 30626.


*M. strychnicola* Gaillard sensu Thite & Patil, Kavaka 10: 34, 1982 (non Gaillard, 1892). Colonies amphigenous, subdense to dense, up to 2 mm in diameter, confluent. Hyphae straight to undulating, branching opposite at acute to wide angles, loosely to
closely reticulate, cells 18-37 × 5-7 μm. Capitate hyphopodia alternate, antrorse, 18-22 μm long; stalk cells cuneate, 6-9.5 μm long; head cells ovate, versiform, entire, attenuated and rounded to truncate at the apex, entire, 12-15.5 × 9-12.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-25 × 3-6.5 μm. Mycelial setae fairly numerous, scattered, simple, straight, acute to obtuse at the apex, up to 250 μm long. Perithecia scattered, up to 155 μm; ascospores obovoidal to cylindrical, 4-septate, constricted at the septa, 31-34 × 12-15 μm.


The present species is close to M. petchi Hansf. but is distinct in having bluntly attenuated head cells of the capitate hyphopodia. This species has been reported on Spigelia sp., Strychnos taxifera and S. panamensis from Brazil, Panama and Ecuador and is reported here for the first time from India (Hansford, 1961; Bilgrami et al. 1979, 1981; Sarbhoy et al. 1984).

11. Meliola telosmae Rehm var. indica var. nov. Fig. 7

Distinct a var. telosmae hyphopodia capitata 5% opposita et ascosporis magnioribus.

Colonies epiphyllous, thin, crustose, up to 1 mm in diam., rarely confluent. Hyphae undulating, branching opposite at wide angles, loosely to closely reticulate, cells 21-31 × 6-9.5 μm. Capitate hyphopodia alternate and about 5% opposite, mostly antrorse, 15-18.5 μm long; stalk cells cylindrical to cuneate, 5-7 μm long; head cells ovate, globose, entire, 9-12.5 × 9-11 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-18.5 × 9-12.5 μm. Mycelial setae few, straight, erect, acute to obtuse at the tip, up to 286 μm long. Perithecia scattered, up to 108 μm; ascospores obovoidal, 4-septate, 37-40.5 × 15-18.5 μm.

HOLOTYPE: On leaves of Tylophora tenuis Bl. (Asclepiadaceae), Radhanagari, Kolhapur, Maharashtra, Jan. 21, 1975, A.N. Thite HCIO 31946.

There are three taxa of the genus Meliola known on this host genus namely, M. telosmae Rehm, M. telosmae Rehm var. tylophorae Hansf. and M. tylophorae Hosagoudar. Capitate hyphopodia predominantly being alternate, the present collection is closer to M. telosmae Rehm. The present new variety differs from the var. telosmae in having 5% opposite capitate hyphopodia and larger ascospores.

Acknowledgements

We are thankful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for encouragement. We are grateful to Prof. John Webster, England for critically reviewing the manuscript and for valuable suggestions.
Fig. 7. Meliola telepseae Rehm var. indica var. nov.

References


MELIOLACEAE OF SOUTHERN INDIA-XII

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ABSTRACT

This paper gives an account of thirteen species of meliaceous fungi collected from Madikeri and Sampaje in Kodagu district and Kaiga in Uttara Kannada district of Karnataka. Of these, Meliola kinniiodendri is a new species; Asteridicella sapotaecarum Hansf., Meliola canthi Sydow, M. mutuapiae Stev. and M. uterocarpi Yates are new records for India, while Amazonia syzygi Hosagoudar, Meliola bicorns Wint., M. indica Sydow, M. holigarnae Stev., M. machili Yamam., M. malabarensis Hansf., M. mangiferae Earle and M. tamarind Sydow are reported for the first time from Karnataka.

Key words: Meliolaceae, Amazonia, Asteridicella, Meliola, Karnataka.
The first report of meliolaceous fungi from India, *Meliola densa* Cooke and *M. zigzag* Berk. & Curt., was from Belgaum in Karnataka (Cooke, 1880, 1884). Based on M.J. Thirumalachar’s collections from Karnataka, Hansford and Thirumalachar (1948) described a number of meliolaceous fungi. Hosagoudar (1988) and Hosagoudar and Manian (1989) described two more taxa of these fungi from Karnataka. Though the Western Ghats of Karnataka are rich in these fungi, only about forty taxa have been recorded so far from this region.

This report is concerned with meliolaceous fungi collected from the Western Ghats, mainly from the forest nurseries in Madikeri and Sampaje, Kodagu district, and two specimens collected from the forests in Kaiga, Uttara Kannada district, Karnataka.


This species was described by Hosagoudar from the forests of Idukki, Kerala (Hosagoudar & Goos, 1989).


Colonies amphigenous, dense, crustose to velvety, up to 3 mm in diam., rarely confluent. Hyphae substraight, branching alternate, opposite or irregular at acute to wide angles, loosely reticulate, cells 18-34 x 6-9.5 μm. Capitate hyphopodia alternate, antorse to subantrorse, 18-25 μm long; stalk cells cylindrical to cuneate, 6-9.5 μm long; head cells ovate, entire, 12-15.5 x 9-12.5 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, conoid to ampulliform, 15-25 x 9-12.5 μm. Perithecia scattered, globose, up to 155 μm; perithecial wall cells conoid, straight to curved, acute to obtuse at the apex, 10-15 μm long; ascospores obovoid, 4-septate, slightly constricted at the septa, 34-40.5 x 15-18 μm.


This collection slightly differs from the type in having amphigenous, dense, crustose to velvety colonies. This species was first recorded on an undetermined host of the family Sapotaceae from Brazil and is reported here for the first time from India (Bilgrami et. al. 1979, 1981).
Fig. 1. *Asteridiella sauotacearum* Hansf.

Fig. 2. *Meliola canarii* Sydow.


Careful examination of the collection revealed very few repent setae around perithecia and only one mycelial seta among several colonies. The possibility of missing these setae and arriving at a wrong determination is high. This is the first report of this species on this host.


*Meliola nigro-rufescens* Sacc., *Att. Accad. Ven.-Trent.-Istr.* 10: 60, 1914. (Fig. 2)

Colonies epiphyllous, thin to thinly velvety, up to 5 mm in diameter, rarely confluent. Hyphae straight to flexuous, branching opposite at wide angles, loosely reticulate, cells 34-50 x 6-8 um. Capitate hyphopodia alternate, less than 1% opposite, antrorse, 30-45.5 um long; stalk cells cuneate, 6-12.5 um long; head cells ovate, tapered and broadly rounded but rarely truncate at the apex, entire, 24-28 x 6-8 um. Mycelial setae thinly scattered all over the colonies, simple, straight, acute to obtuse at the tip, up to 1050 um long. Perithecia scattered, globose, up to 140 um; ascospores obovoid to cylindrical, 4-septate, slightly constricted at the septa, 43-46.5 x 18-20 um.


This collection differs slightly from the type of the species in having only epiphyllous colonies, larger hyphal cells, larger and less than 1% opposite capitate hyphopodia and mycelial setae (Hansford, 1961).

This species was reported on *Canarium spp.* and *Bursera serrata* from Philippines, Malaya and Pakistan and is reported here for the first time from India on a hitherto unrecorded host species (Bilgrami et al. 1979, 1981).


The southern Indian collections from Western Ghats show overlapping characters between Meliola indica Sydow and M. indica Sydow var. carevae Stev. However, in the former taxon phialides are mixed with capitate hyphopodia, while in the latter, they are borne on a separate mycelial branch.

7. Meliola kingiodendri sp. nov. (Fig. 3)

Plagulae hypophyllae, raro amphigenae, densae, ad 5 mm diam., raro confluentes. Hyphae rectae, raro anfractae, ramifications plurumque oppositis in angulis acutis vel latis, laxe reticulatæ, cellulae 27-35.5 x 6-9.5 um. Hyphopodia capitata opposita, raro solitaria, antrorse, reflexa vel patentia, 15-18 um longa; cellulae basali cylindracea vel cuneata, 3-6.5 um longa; cellulae apicali piriformia, conoida vel rotundata ad apicem, recta, curvula vel recurva, integra, 12-15.5 x 6-9.5 um. Phialides illis capitatis commixtae, ampullaceae, rectae vel curvulae ad apicem, 18-25 x 9-12.5 um. Setae mycelialesae generaliter dispersae in coloniis, simplices, rectae, obtusae vel dentatae ad apicem, usque ad 575 um longae. Perithecia dispersa, globosa, usque ad 248 um longae.; cellulae peritheciales ad apicem rotundae et protrudentia; ascosporiae 4-septatae, ellipsoidea, constricta ad septos, 37-40.5 x 18-22 um.

Colonies hypophyllous, rarely amphigenous, dense, up to 5 mm in diam., rarely confluent. Hyphae straight, very rarely crooked, branching mostly opposite at acute to wide angles, loosely reticulate, cells 27-35.5 x 6-9.5 um. Capitate hyphopodia opposite, rarely solitary, antrorse, reflexed to spreading, 15-18 um long; stalk cells cylindrical to cuneate, 3-6.5 um long; head cells conoid with rounded ends, straight, curved to recurved, entire, 12-15.5 x 6-9.5 um. Phialides mixed with capitate hyphopodia, ampulliform, straight to curved at the apex, 18-25 x 9-12.5 um. Mycelial setae evenly scattered on the colonies, simple, straight, obtuse to dentate at the tip, up to 575 um long. Perithecia scattered, globose, up to 248 um in diam., perithecial cells projected and rounded at the apex; ascospores 4-septate, ellipsoid, constricted at the septa, 37-40.5 x 18-22 um.

Holotype: On leaves of seedlings of Kingiodendron pinnatum (Roxb.) Harms (Caesalpiniaeae), Sampaje forest
This new species is close to Meliola aethiops Sacc. and M. caesalpinicola Deight. reported on Cassia spp. from Singapore, Sumatra, Java, and Sierra Leone, and on Caesalpinia nuda from Philippines, respectively, in having only opposite capitate hyphopodia (Hansford, 1961). However, the new species differs from M. aethiops in having loosely reticulate hyphae, conoid head cells of the capitate hyphopodia, larger perithecia, smaller ascospores and larger but simple to dentate mycelial setae. It differs from M. caesalpinicola in having conoid head cells of the capitate hyphopodia and straight, simple to dentate mycelial setae.


11. Meliola mayapeae Stev., Illinois Biol. Monograph 2: 48, 1916. (Fig. 4)

Colonies epiphyllous, dense, up to 2 mm in diam., often confluent. Hyphae straight to flexuous, branching opposite at wide angles, closely reticulate, cells 15-34 x 5-7 um. Capitate hyphopodia alternate, antrorse, reflexed to spreading, mostly straight, 15-18.5 um long; stalk cells cylindrical to conic, 3-6.5 um long; head cells obovoidal, entire, 12-13 x 9-11 um. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, 15-18.5 x 7-9.5 um. Mycelial setae grouped around perithecia, straight, simple, acute to obtuse, up to 235 um long. Perithecia loosely grouped, up to 186 um in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 37-40.5 x 15-18.5 um.

On leaves of seedlings of Ligustrum perrottetii DC
Fig. 3. *Meliola kingiodendri* Hosayoudat

Fig. 4. *Meliola mayapeae* Stev.
This species was recorded on *Mayavea dominguensis* from Puerto Rico (Stevens, 1916), and is reported here for the first time from India on a hitherto unreported host genus.

12. *Meliola pterocarpi* Yates, Philipp. J. Sci. 13: 235, 1918. (Fig. 5)

Colonies amphigenous, mostly epiphyllous, dense, up to 3 mm in diam., rarely confluent. Hyphae straight to flexuous, branching opposite at acute angles, loosely to closely reticulate, cells 18-31 x 6-9.5 um. Capitate hyphopodia alternate, straight to curved, antrorse to reflexed, 15-18 um long; stalk cells cylindrical to cuneate, 6-9.5 um; head cells globose to obovoid, entire to rarely slightly angulose, 12-16 x 12-15.5 um. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-22 x 7-9.5 um. Mycelial setae mostly grouped around perithecia, simple, straight, obtuse at the apex, up to 300 um long. Perithecia scattered, globose, up to 168 um in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 40-43.5 x 15-18.5 um.


The Indian collection differs from the description in having slightly larger capitate hyphopodia, larger head cells and larger mycelial setae. This species was reported on *Pterocarpus indicus* from Sumatra and Philippine islands. This is the first report of the fungus from India (Bilgrami et al. 1978, 1981).


This species was reported from Kerala by Hosagoudar & Goos (1990).

ACKNOWLEDGEMENTS

The authors are grateful to Prof. K.M. Kaveriappa and Mr. B.V. Shetty, Emeritus Scientist (BSI), Mangalore University for their valuable suggestions and to Mr. Shridhar Shetty for providing two of his collections. Two of us (VBH & BRD) express our gratitude to Scientists' Pool Scheme, CSIR, New Delhi and Nuclear Power Corporation, Govt. of India, respectively for financial assistance. We are grateful to Dr. F.A. Decker for his pre-publication review of the manuscript.
Fig. 5. *Meliola pterocarpi* Yates
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Meliolaceae of southern India - XIV

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With 11 figures


Abstract: This paper gives an account of 20 taxa of meliolaaceous fungi collected from the Western Ghats of Karnataka, Kerala and Tamil Nadu states in southern India. Of these Asteridiella ehreiiae, Irenopulus chukraeue, Melioia allophyli-concanici, M. ixorae-coccineue, M. melanoxylonis and M. myristieue are the new species; Asteridiella cyrtandrae (Stev.) Hansf. var. didymocarpi, A. schlegeliae (Stev.) Hansf. var. stereospermi, Melioia aethiops Sacc. var. moullavae and M. capensis (K. & C.) Theiss. var. schlecherue are the new varieties; Meliola anacardi Simm. and M. bunthinucula Yamam. are reported for the first time from India. The description of Meliola adunthi Sharma, Mohanan & Florance has been emended. The rest of the species are either new reports to their respective states or form new host records.


On leaves of Leca indica (Burm. f.) Merr. (Lecaceae), Gersoppa, Uttara Kannada, Karnataka, Sept. 24, 1992, P.A. Raghu HCIO 40746.

The material was severely hyperparasitized by Isthmospora sp.

Asteridiella cyrtandrae (Stev.) Hansf. var. didymocarpi Hosagoudar, var. nov.

Fig. 1

Differentia var. cyrtandrae hyphopodiis capitatis brevibus, cellulis hyphopodis ovatis vel globosis et asco- sporis brevibus.

Colonies amphigenous, minute, dense, velvety, up to 2 mm in diameter. Hyphae flexuous, branching alternate at acute angles, loosely reticulate, cells 24-28 x 5-7 μm. Capitate hyphopodia alternate, straight, antrorse, 15-22 μm long; stalk cells cuneate, 6-9.5 μm long; head cells ovate, globose, 9-12.5 x 10-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform,
15-18.5 x 6-8 μm. Perithecia scattered to loosely grouped, up to 170 μm; perithecial cells conoid to mammiform, up to 10 μm long; ascospores obovoidal, 4-septate, 31-34 x 13-15.5 μm.


**Asteridiella ehretiae** V.B. Hosagoudar et P.A. Raghu, sp. nov.

Colonies hypophyllous, dense, crustose, up to 5 mm in diameter, rarely confluent. Hyphae straight to substraight, branching alternate to opposite at acute angles, loosely to closely reticulate, cells 24-28 x 6-8 μm. Capitate hyphopodia alternate, straight to curved, antorse to recurved, 21-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells globose, stellately and irregularly sublobate to lobate, 15-18.5 x 12-18.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-22 x 6-8 μm. Perithecia scattered, widely opened at maturity, up to 120 μm; protruding cells not distinct; ascospores obovoidal, 4-septate, slightly constricted, 42-45 x 18-20 μm.

Holotype: On leaves of *Ehretia camarenensis* (Clarke) Gamble (Boraginaceae), Gerusoppa, Uttara Kannada, Karnataka, May 23, 1992, P.A. Raghu HC10 40748.
Stellately sublobate to lobate head cells of the capitate hyphopodia distinguish this species from the rest of the reported *Asteridiella* species on the members of the family Boraginaceae.

**Asteridiella schlegeliae** (Stev.) Hansf. var. *stereospermii* V.B. Hodagoudar et P.A. Raghu, var. nov. fig. 3

Colonies amphigenous, dense, crustose, up to 3 mm in diameter. Hyphae straight to substraight, branching alternate to opposite at acute angles, closely reticulate, cells 12-22 \(\times\) 6-9.5 \(\mu\)m. Capitate hyphopodia alternate, straight to variously curved, antorse, 21-31 \(\mu\)m long; stalk cells cylindrical to cuneate, 6-15.5 \(\mu\)m long; head cells ovate, globose, mostly sublobate, rarely entire to angular, 15-18.5 \(\times\) 12-15.5 \(\mu\)m. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-21.5 \(\times\) 6-7 \(\mu\)m. Perithecia scattered, up to 124 \(\mu\)m; perithecial cells conoid to mammiform, straight to curved, up to 25 \(\mu\)m long; ascospores obovoidal, 4-septate, slightly constricted, 40-43.5 \(\times\) 18-22 \(\mu\)m.

**Holotype**: On leaves of *Stereospermum colais* (Buch.-Ham. ex Dillwyn.) Mabb. (Bignoniaceae), Gerusoppa, Uttara Kannada, Karnataka, May 24, 1992, P.A. Raghu HCIO 40749.

Of the *Asteridiella* species reported on the members of the family Bignoniaceae, the present collection is close to *A. schlegeliae* (Stev.) Hansf. in having sublobate head cells of the capitate hyphopodia. However, the new variety differs from the var. *schlegeliae* in having mucronate hyphopodia mixed with capitate hyphopodia and smaller perithecia.

An interesting fact is that an ascospore germinated into a single capitate hyphopodium and also with a mucronate hyphopodium.
Irenopsis chukrasiae V.B. Hosagoudar, sp. nov.

Colonies hypophyllous, subdense to dense, strongly appressed to the leaf, up to 4 mm in diameter, rarely confluent. Hyphae straight to crooked, branching alternate to irregular at acute angles, closely reticulate, cells 24-31 × 6-9.5 μm. Capitate hyphopodia closely to distantly placed, alternate, straight, curved to flexuous, antrorse to recurved, 18-46.5 μm long; stalk cells cylindrical to cuneate, straight to flexuous, 1-3 celled, 6-34 μm long; head cells ovate, globose, angular to sublobate to deeply lobate, 9-15.5 × 12-18.5 μm. Mucronate hyphopodia borne on a separate mycelial branch, alternate to opposite, ampulliform, 21-25 × 5-7 μm. Perithecia scattered, verrucose, up to 210 μm diameter; perithecial setae 5-12, erect to prostrate, simple, straight, acute to obtuse at the tip, bulbous at the base, up to 110 μm long; ascospores oblong, obovate, 4-septate, 40-46.5 × 15-18.5 μm.

Fig. 4
Holotype: On leaves of *Chukrasia tabularis* A. Juss. (Meliaceae), North of Pachaiyar estate, Sethur hills, Kamarajar dist., Tamil Nadu, Sept. 9, 1992, V.B. Hosagoudar HCIO 40750.

This is the first report of a species of *Irenopsis* on a member of the family Meliaceae (Hansford 1961; Katumoto & Hosagoudar 1989).

**Meliola aethiops** Sacc. var. *moullavae* V.B. Hosagoudar et P.A. Raghu, var. nov.

Colonies epiphyllous, thin to dense, up to 2 mm in diameter, confluent. Hyphae straight to flexuous, branching opposite to irregular at acute angles, loosely reticulate, cells 21-25 × 5-7 μm. Capitate hyphopodia alternate, 10% opposite, straight to rarely curved, subantrorse, 15-17 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm; head cells ovate, globose, 9-12.5 × 8-12 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-18.5 × 9-12.5 μm. Mycelial setae grouped around perithecia, straight, simple, acute, up to 286 μm long. Perithecia scattered, verrucose, up to 124 μm; ascospores obovoidal to slightly fusiform, 4-septate, slightly to deeply constricted, 31-34.5 × 9-12.5 μm.
Holotype: On leaves of Moullava spicata (Dulz.) Nicolson (Caesalpiniaeae), Gerusoppa, Ullara Kannada, Karnataka, Sept. 24, 1992, P.A. Raghu HCIO 40751.

The present collection has the Beeli formula 3113.3221 and is close to M. aethiops Sacc. and its two varieties, M. aethiops Sacc. var. trompillana (Toro) Hansf. and M. aethiops Sacc. var. minor Hansf. & Deight. The new variety differs from the var. aethiops in having 10% opposite capitate hyphopodia and smaller ascospores. It differs from M. aethiops Sacc. var. trompillana in having straight hyphae in contrast to crooked. It differs from M. aethiops Sacc. var. minor Hansf. & Deight, in having only 10% opposite capitate hyphopodia. It also differs from M. erythrophtloei Hansf. & Deight, in having smaller perithecia and ascospores.

Meliola ailanthi Sharma, Mohanan & Florence, Kerala Forest Research Institute Report 36: 248, 1985 (ailanthii) emend V.B. Hosagoudar

Colonies epiphyllous, scattered, dense, velvety, up to 2 mm in diameter. Hyphae straight, rarely straight; branching mostly opposite at acute angles, loosely to closely reticulate, cells 24-31 × 5-7 μm. Capitate hyphopodia alternate, straight, antrorse, 15-22 μm long; stalk cells cylindrical to cuneate, 5-7 μm long; head cells ovate to cylindrical, entire, 10-15.5 × 9-11 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-22 × 9-12.5 μm. Mycelial setae numerous, straight to slightly curved but not uncinate, simple, 2-3 dentate at the tip, up to 260 μm long. Perithecia scattered to loosely grouped, verrucose, up to 172 μm; ascospores obovoidal, 4-septate, constricted at the septa, 37-40.5 × 13-15.5 μm.

Sharma et al. (l.c.) described this species from Kerala but the description provided by them is inadequate to identify the species and genus. Hence, the description has been emended here by providing a detailed description and drawing.

**Meliola allophylil-concanici** V.B. Hosagoudar, sp. nov.  

Colonies epiphyllous, scattered, dense, up to 2 mm in diameter. Hyphae straight, branching opposite at acute angles, loosely to closely reticulate, cells 15-22 × 9-11 μm. Capitate hyphopodia opposite, crowded, antrorse to subantrorse, rarely recurved, 18-22 μm long; stalk cells cuneate, 6-7 μm long; head cells globose, rarely cylindrical, entire, 12-15.5 × 12-14 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-22 × 9-11 μm. Mycelial setae...
grouped around perithecia, simple, straight, acute, obtuse to dentate at the tip, up to 550 μm long. Perithecia scattered to loosely grouped, verrucose, up to 155 μm; ascospores obovoidal, 4-septate, constricted, 37-40.5 × 15-18.5 μm.

Holotype: On leaves of *Allophyllus concanicus* Radlk. var. *lanceolatus* Gamble (Sapindaceae), north of Pachaiyar estate, Sethur hills, Kamarajar dist., Tamil Nadu, Oct. 9, 1992, V.B. Hosagoudar HCIO 40753.

The present collection is close to *M. capensis* (K. & C.) Theiss. var. *lacuniodisci* Hansf. & Deight. and *M. capensis* (K. & C.) Theiss. var. *baileyana* Hansf. However, the new species differs from them in having globose head cells of the capitate hyphopodia, in contrast to conoid (Hansford 1961).

*Meliola altissimae* Hosagoudar in Hosagoudar & Goos, Mycotaxon 42: 129, 1991


This species was described from a collection from Anamalai hills of Tamil Nadu (Hosagoudar & Goos 1991) and is recorded here from Karnataka.


Colonies epiphyllous, dense, velvety, up to 3 mm in diameter, confluent. Hyphae
straight to substraight, branching alternate to opposite at acute to subacute angles, loosely reticulate, cells 21-30 \( \times \) 5-7 \( \mu m \). Capitate hyphopodia alternate, antrorse to subantrorse, mostly straight, 15-18.5 \( \mu m \) long; stalk cells cuneate, 3-6.5 \( \mu m \) long; head cells ovate, attenuate at the apex, entire, 12-15.5 \( \times \) 6-8 \( \mu m \). Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, neck elongated, 24-28 \( \times \) 9-12.5 \( \mu m \). Mycelial setae scattered, simple, straight, acute, obtuse to dentate at the tip, up to 450 \( \mu m \) long. Perithecia scattered, verrucose, up to 140 \( \mu m \); ascospores broadly ovoid to obovoid, 4-septate, slightly constricted, 43-46.5 \( \times \) 20-22 \( \mu m \).


This species has been reported from Java, Dominican Republic, Philippines and Malaya and is recorded here for the first time from India.


Colonies epiphyllous, subdense, spreading, confluent. Hyphae straight, branching mostly opposite at acute angles, loosely reticulate, cells 18-31 \( \times \) 6-8 \( \mu m \). Capitate hyphopodia mostly opposite, few alternate and very few solitary or isolated between opposite ones, straight to rarely curved, subantrorse to rarely recurved, 12-15.5 \( \mu m \) long; stalk cells cylindrical to cuneate, 3-6.5 \( \mu m \) long; head cells globose to oblong, entire, 8-10 \( \times \) 8-9.5 \( \mu m \). Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-20 \( \times \) 6-8 \( \mu m \). Mycelial setae scattered to grouped around perithecia, simple, straight, acute, up to 500 \( \mu m \) long. Perithecia loosely grouped, up to 110 \( \mu m \) in diameter; ascospores obovoidal, 4-septate, slightly to deeply constricted, 40-43.5 \( \times \) 12-15.5 \( \mu m \)

On leaves of *Bauhinia racemosa* Lam. (Caesalpiniaaceae), Gerusoppa, Uttara Kannada, Karnataka, Sept. 24, 1992, P.A. Raghu HCIO 40756.

This species was reported on *Bauhinia championi* from Taiwan (Yamamoto 1941; Hansford 1961) and is recorded here for the first time from India on a hitherto unreported host species.

The present collection has smaller capitate hyphopodia and perithecia.

**Meliola capensis** (K. & C.) Theiss. var. schleicherae V.B. Hosagoudar et C.M. Pillai, var. nov. Fig. 8

Differt a var. capensis ascosporis brevioribus et differt a capensis (K. & C.) Theiss. var. baileyana Hansf. hyphopodis capitatis brevioribus et antroris.

Colonies epiphyllous, rarely amphigenous, dense, velvety, up to 3 mm in diameter, confluent. Hyphae straight, branching opposite at acute angles, loosely to closely reticulate, cells 15-25 \( \times \) 6-7 \( \mu m \). Capitate hyphopodia opposite, crowded to sparse, antrorse, 19-15.5 \( \mu m \) long; stalk cells cuneate, 3-5 \( \mu m \) long; head cells conoid, rarely

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broadly rounded at the apex, entire, 6-11 × 6-9.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 12-15.5 × 6-9.5 μm. Mycelial setae scattered, straight, acute to dentate at the tip, up to 320 μm long. Perithecia scattered, verrucose, up to 155 μm; ascospores obovoidal, 4-septate, slightly constricted, 30-35 × 12-15.5 μm.

Holotype: On leaves of Schléihera oleosa (Lour.) Oken (Sapindaceae), Vettiyar, Mavelikara, Kerala, Sept. 14, 1992, C.M. Pillai HCIO 40757.

The present collection is close to Meliola capensis (Kalch. & Cooke) Theiss. and M. capensis (K. & C.) Theiss. var. baileyana Hansf. (31222) but the new variety differs from M. capensis (Kalch. & Cooke) Theiss. var. baileyana Hansf. in having shorter and antrorse capitate hyphopodia.

**Meliola diospyri** Sydow, Ann. Mycol. 9: 381, 1911


**Meliola erycibes-paniculatae** Hosagoudar in Hosagoudar & Goos, Mycotaxon 37: 231, 1990


This species was earlier described from Kerala (Hosagoudar & Goos 1990).


Meliola ixorae-coccinea V.B. Hosagoudar et C.M. Pillai, sp. nov. Fig. 9

Colonies epiphyllous, dense, crustose, up to 1 mm in diameter, rarely confluent. Hyphae straight, branching mostly opposite at acute to wide angles, densely reticulate and forming a solid mycelial mat, cells 12-15.5 × 9-12.5 μm. Capitate hyphopodia opposite, crowded, antorse to subantorse, mostly straight, 15-18.5 μm long; stalk cells cuneate, 5-7 μm long; head cells ovate, globose, entire, rarely attenuated at the apex, 9-12.5 × 9-11 μm. Mucronate hyphopodia few, mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-22 × 9-12.5 μm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute to obtuse at the apex, up to 800 μm long. Perithecia scattered, verrucose, up to 170 μm; ascospores oblongovoidal, 4-septate, strongly constricted, 40-43.5 × 15-18.5 μm.

Fig. 9. Meliola ixorae-coccinea sp. nov.

The present collection has Bеeli formula 3112.4223 and is close to *Meliola randicola* Hansf. and *M. bonari* Batista & Nascimento. However, the present new species differs from the former species in having very small and dense colonies only on the upper surface of the leaves, straight hyphae, closely arranged capitiate hyphopodia and longer mycelial setae. It differs from the latter species in having crowded and smaller capitiate hyphopodia and longer mycelial setae (Hansford 1961).


This species was reported from Kerala (Hosagoudar & Goos 199) and is recorded here for the first time from Karnataka.

*Meliola melanoxylonis* V.B. Hosagoudar et C.M. Pillai, sp. nov.  Fig. 10

Coloniae amphigenae, plurumque epiphyllae, dispersae, densae, subvelutinae, ad 2 mm diam. Hyphae subrectae vel anfractuæ, alternatae, oppositæ vel irregulariter ramosae, laxe vel dense reticulatae, cellulae 15-22 × 3-5 μm. Hyphopodia capitata plurumque opposita, raro alternata vel solitaria, recta vel curvula, antrorsa, subantrorsa vel recurva, 12-18.5 μm longa; cellula basali cylindracea vel cuneata, 3-6.5 μm longa; cellula apicali globosa, ovata, cylindracea, integra vel angularia, 9-12.5 × 6-9.5 μm. Hyphopodia macrona illis capitatis commixtæ, alternatae vel oppositæ, ampullacea, 12-15.5 × 6-8 μm. Setae myceliales numerosæ, dispersae, simplices, rectæ, obtusæ vel 2-3 dentatae ad apicem, ad 650 μm longae. Perithecia dispersa, verrucosa, ad 125 μm; ascosporangia obovoidae, 4 septatae, constrictae, 34-37.5 x 14-16 μm.

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Fig. 10. *Meliola melanoxylonis* sp. nov.
Colonies amphigenous, mostly epiphyllous, scattered, dense, subvelvety, up to 2 mm in diameter. Hyphae substraight to crooked, branching alternate, opposite to irregular at wide angles, loosely to closely reticulate, cells 15-22 × 3.5 μm. Capitate hyphopodia mostly opposite, rarely alternate to solitary, straight to curved, antrorse, subantrorse to recurved, 12-18.5 μm long; stalk cells cylindrical to cuneate, 3.6-5.5 μm long; head cells globose, ovate, cylindrical, entire to angular, 9-12.5 × 6.9-5.5 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 12-15.5 × 6-8 μm. Mycelial setae numerous, scattered, simple, straight, obtuse to 2-3 dentate at the tip, up to 650 μm Long. Perithecia scattered, verrucose, up to 125 μm; ascospores obovoidal, 4-septate, constricted, 34-37.5 × 14-16 μm.


The present collection is close to Meliola adenantherae (Cif.) Hansf. and M. aethiops Sacc. var. minor Hansf. & Deight. (Beeli formula 3113. 3223). However, the new species differs from the former species in having mostly opposite capitate hyphopodia, longer mycelial setae and smaller ascospores. It also differs from the latter species in having closely arranged, mostly opposite and longer capitate hyphopodia, longer mycelial setae and larger ascospores (Hansford 1961).

Meliola myristicae V.B. Hosagoudar et P.A. Raghu, sp. nov.

Colonies amphigenous, subdense to dense, thin to velvety, up to 5 mm in diameter. Hyphae substraight to crooked, branching opposite to irregular at wide angles, loosely to closely reticulate, cells 30-43.5 × 7-9.5 μm. Hyphopodia capitate alternata, recta vel curvata, antrorsa vel recurvata, 34-43.5 (-65) μm longa; cellula basali plerumque unicellula, recta, cuneiformis vel euneata, raro 1-2 septata, antrorsa, 12-18.5 (40-5) μm longa; cellula apicali ovata vel globosa, angulosa vel irregulariter subglobosa, 18-25 × 15-25 μm. Hyphopodia mucronata illis capitatis conminuta, alternata vel opposita, ampullacea; 18-25 × 9-12.5 μm. Setae myceliales juxta perithecia aggregatae, simplices, rectae, acutae vel obtuse ad apicem, ad 500 μm longae. Perithecia dispersa vel laxe aggregata, ad 248 μm diam.; cellulae perithecales protrudorae; ascosporea obovoideae, 4-septatae, leniter constrictae, 37-40 × 18-20 μm.

Colonies amphigenous, subdense to dense, thin to velvety, up to 5 mm in diameter. Hyphae substraight to crooked, branching opposite to irregular at wide angles, loosely to closely reticulate, cells 30-43.5 × 7-9.5 μm. Capitate hyphopodia alternate, straight to curved, antrorse to recurved, 34-43.5 (-65) μm long; stalk cells mostly unicellular, straight, cylindrical to cuneate, rarely 1-2 septate, crooked, 12-18.5 (40.5) μm; head cells ovate to globose, angulose to irregularly sublobate, 18-25 × 15-25 μm. Mucronate hyphopodia mixed with capitate hyphopodia, alternate to opposite, ampulliform, 18-25 × 9-12.5 μm. Mycelial setae grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 500 μm long. Perithecia scattered to loosely grouped, up to 248 μm in diameter; perithecial cells protruding; ascospores obovoidal, 4-septate, slightly constricted, 37-40 × 18-20 μm.

Holotype: On leaves of Myristica fatua Hautt. var. magnifica (Beddome) Sinclair (Myristicaceae), Gerusoppa, Uttara Kannada, Karnataka, Sept. 24, 1992, P.A. Raghu HCIO 40764.

Sublobate head cells, acute to obtuse and straight mycelial setae warrant recognition of the present collection as a new species.


This species was reported from Kerala (Hosagoudar et al. 1988) and is recorded here for the first time from Karnataka.

Acknowledgements

We thank Dr. N.P. Balakrishnan, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement; the help of Mr. S.R. Srinivasan, Botanic Survey of India, Coimbatore and Dr. Paul Raj, Wildlife Warden, Srivilliputur is acknowledged. We are thankful to Prof. K.M. Kaveriappa and Shri B.V. Shetty (Emeritus Scientist of IISL), Mangalore University for the valuable suggestions. The senior author (VBH) and the second author (PAR) are grateful to the Scientists' Pool Scheme of CSIR, New Delhi and the Karnataka Power Corporation respectively for the financial support. We gratefully acknowledge Dr. K.A. Pirozynski for reviewing the manuscript.
References


MELIOLACEAE OF SOUTHERN INDIA - XVI

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Abstract

This paper presents an account of twenty-four taxa of Meliolaceae collected from the southern Indian states of Kerala, Karnataka and Tamil Nadu. Of these, Amazonia mayteni, Meliola semecarp-ia-anacardi is new species; Appendiculella calophylli (Stev.) Toro var. apetalii is a new variety, while Irenopsis filioboides Hansf., Meliola africana Hansf., M. macrospora Sydow and M. sciriani Stev. var. major Hansf. are reported for the first time from India. The remaining species are either new records for the respective states from which they have been collected or form new host records.

Key words: Amazonia, Appendiculella, Irenopsis, Meliola, Southern India

1. Amazonia mayteni sp. nov. (Fig. 1)

Coloniae plures epiphyllae, densae, crustosae vel velutinae, usque ad 2 mm diam. Hyphae rectae vel subrectae, alternate ad angulum acutum ramosae, dense reticulatae, compactae et fere opaquae, cellulis 12-15.5 X 6-9.5 μm. Hyphopodia capitata alternata subantrorsa, 15-18.5 μm longa; cellula basalis cylindracea vel cuneata, 3-5 μm longa; cellula apicalis globosa, integra, 12-14 X 12-15.5 μm. Phialides non visa. Perithecia dispersa, applanata-globosa, usque ad 190 μm diam.; ascosporae obovoideae, 4-septatae, constrictae, 37-43.5 X 15-22 μm.
Colonies predominantly epiphyllous, dense, crustose to velvety, up to 2 mm in diameter. Hyphae straight to substraight, branching alternate at acute angles, very closely reticulate, compact and almost opaque, cells 12-15.5 X 6-9.5 μm. Capitate hyphopodia alternate, subantrorse, 15-18.5 μm long; stalk cells cylindrical to cuneate, 3-5 μm long; head cells globose, entire, 12-14 X 12-15.5 μm. Phialides not seen. Perithecia scattered, flattened-globose, up to 190 μm in diameter; ascospores obovoidal, 4-septate, constricted, 37-43.5 X 15-22 μm.


*Amazonia stevensii* Hansf. is the only species of this genus reported on members of the Celastraceae. The new species differs from it in having entire head cells of the capitate hyphopodia, in contrast to irregularly sublobate ones found in *A. stevensii* (Hansford, 1961).

### Key to abbreviations for all figures:

- **Ch:** capitate hyphopodia
- **Mh:** phialides
- **(mucronate hyphopodia)**
- **Ms:** mycelial setae
- **Pa:** perithecial appendages
- **Sp:** ascospores

2. *Appendiculella calophylli* (Stev.) Toro var. *apetali* var. nov. (Fig. 2)

Differt a var. *calophylli* peritheciis, appendicibus peritheciis, et ascosporis brevioribus.

Colonies hypophyllous, subdense, crustose, up to 3 mm in diameter, rarely confluent. Hyphae substraight to flexuous, branching alternate, opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 30-46.5 X 6-9.5 μm. Capitate hyphopodia alternate, less than 1% opposite, straight to curved, antorse to recurved, 30-43.5 μm long; stalk cells cylindrical to cuneate, 6-31 μm long; head cells ovoid to globose, entire, angular, sublobate to sinuate, 12-25 X 9-25 μm. Phialides mixed with capitate hyphopodia, opposite to alternate, ampulliform, 18-31 X 9-12.5 μm. Perithecia scattered, up to 125 μm in diameter; perithecial appendages numerous,
subcylindrical to mammiform, obtuse to hamate at the tip, up to 25 μm long; ascospores obovoidal, 4-septate, slightly constricted, 43-46.5 x 15-18.5 μm.

**Holotype:** On leaves of *Calophyllum inophyllum* Willd. (Clusiaceae), Gersoppa, Uttara Kannada, Karnataka, Oct. 24, 1992. P.A. Raghu HCIO 40854.

This specimen bears a few projection-like appendages and other mammiform-like cells on the perithecia, suggestive of the genera *Appendiculella* Hoehnel and *Asteridiella* McAlpine. The morphology of the hyphopodia is similar to that of *Appendiculella calophylli* (Stev.) Toro, however. The new variety differs from the var. *calophylli* in having smaller perithecia, perithecial appendages and ascospores.

![Fig. 2.](image)

*Appendiculella calophylli* (Stev.) Toro var. *aputali* var. nov.


On leaves of *Clerodendrum viscosum* Vent. (Verbenaceae), Seithur hills, Kamarajar Dist., Tamil Nadu, Nov. 12. 1992, V.B. Hosagoudar HCIO 40855.


This species was recorded earlier from Kerala State (Hosagoudar & Goos, 1989) and is reported here for the first time from Karnataka.


On leaves of *Clerodendrum viscosum* Vent. (Verbenaceae), Seithur hills, Kamarajar Dist., Tamil Nadu, Nov. 12, 1992, V.B. Hosagoudar HCIO 40861.


Colonies epiphyllous, thin, up to 6 mm in diameter. Hyphae straight to rarely crooked, branching opposite to irregular at acute angles, loosely reticulate, cells 24-31 X 5-6.5 μm. Capitate hyphopodia alternate, antrorse, straight to rarely curved, 18-25 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells globose to ovoid, entire to angular, 12-15.5 X 12-14 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 12-18.5 X 6-8 μm. Perithecia scattered, seated on loosely reticulate exhyphopodiode mycelia, up to 120 μm in diameter; perithecial setae very few, straight to slightly flexuous, dark, tip obtuse, up to 120 μm long; ascospores obovoidal, 4-septate, slightly constricted, 31-34.5 X 12-15.5 μm.


This species was recorded from Java and the Philippine Islands and is reported here for the first time from India on a hitherto unrecorded host species.


Colonies amphigenous, dense, velvety, up to 2 mm in diameter, confluent. Hyphae straight to flexuous, branching opposite to irregular at acute to wide angles, loosely reticulate, cells 18-37.5 X 8-9.5 μm. Capitate hyphopodia alternate, closely antrorse to spreading, 21-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells ovoid, oblong, entire, 12-18.5 X 12-15.5 μm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform or conoid, 15-18.5 X 5-11 μm. Mycelial setae densely scattered, simple, straight, acute to obtuse at tip, up to 520 μm long. Perithecia scattered, verrucose, up to 186 μm in diameter; ascospores cylindrical to slightly ellipsoidal, 4-septate, constricted, 34-40.5 X 12-18.5 μm.

Both *Meliola africana* Hansf. and *M. longiseta* Hoehnel come under the Beeli formula 3111.4223. The former species differs from the latter in having entire head cells of the capitate hyphopodia and in having phialides borne on a separate mycelial branch.

This species was recorded from Uganda, Sierra Leone and Java and is reported here for the first time from India on a hitherto unrecorded host genus.


On leaves of *Eugenia* sp. (Myrtaceae), Hosmatta, Dakshina Kannada, Karnataka, Aug. 31, 1992, H.S.P. Shenoy HCIO 40866.


Colonies amphigenous, mostly epiphyllous, thin, confluent. Hyphae straight to substraight, branching alternate to opposite at acute to wide angles, loosely to closely reticulate, cells 24-34 X 4-6.5 µm. Capitate hyphopodia alternate and opposite, straight to curved, antrorse to recurved, 12-15.5 µm long; stalk cells cylindrical to cuneate, 4-6.5 µm long; head cells ovoid, globose to oblong, entire to rarely angular, 7-9.5 X 6-8 µm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-22 X 6-9.5 µm. Mycelial setae fairly numerous, scattered, straight to rarely and slightly flexuous at the upper portion, acute, obtuse to dentate at the tip, up to 430 µm long. Perithecia scattered, up to 125 µm in diameter; ascospores oblong to cylindrical, 4-septate, slightly constricted at the septa, 34-37.5 X 12-15.5 µm.


This species was recorded from Sierra Leone and is reported here for the first time from India on a hitherto unrecorded host species.

On leaves of Erythrina stricta Roxb. (Fabaceae), Vettiyar, Mavelikkara, Kerala, Nov. 15, 1992, C.M. Pillai HCIO 40868.

This species was recorded from Maharashtra (Uppal et al., 1935; Srinivasulu, 1974) and Tamil Nadu (Hosagoudar & Goos, 1991) and is reported here for the first time from Kerala.


On leaves of Isonandra lanceolata Wight var. anfractuosa C.B. Clarke (Sapotaceae), Seithur hills, Kamarajar Dist., Tamil Nadu, Nov., 1992, V.B. Hosagoudar HCIO 40870.


Colonies amphigenous, hyphophysellous colonies mostly on the veins, dense, velvety, up to 5 mm in diameter. Hyphae substraight to flexuous, branching alternate to irregular at acute angles, loosely reticulate, cells 24-46.5 X 6-8 μm. Capitate hyphopodia alternate, antrorse, straight to curved, 24-37.5 μm long; stalk cells cylindrical to cuneate, 9-15.5 μm long; head cells ovoid to globose, entire to angular, crenately lobate to lobate, 15-22 X 15-18.5 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 24-28 X 9-12.5 μm. Mycelial setae scattered, straight, simple, acute to obtuse at the tip, up to 750 μm long, setae around perithecia small and pale in colour. Perithecia scattered to loosely grouped, verrucose, up to 150 μm; ascospores obovoidal, straight to slightly curved, 4-septate, slightly constricted, 40-46.5 X 12-15.5 μm.

On leaves of Canthium dicoccum (Gaertn.) Teijsm. & Binn. var. umbellata (Wight) Sant. & Merch. (Rubiaceae), Gersoppa, Uttara Kannada, Karnataka, Nov. 23, 1992, P.A. Raghu HCIO 40871.

Based on the morphology of the capitate hyphopodia and the position of the phialides, this collection has been assigned to M. longiseta Hoehnel, but it varies slightly in the ascospore morphology.
This species was recorded on Psychotria sp. from Samoa and is reported here for the first time from India on a hitherto unrecorded host genus.


Colonies amphigenous, dense, crustose to velvety, up to 5 mm in diameter. Hyphae straight to substraight, branching mostly opposite at acute to wide angles, loosely to closely reticulate, cells 24-46 X 6-8 μm. Capitate hyphopodia alternate, straight to slightly curved, antrorse to spreading, 21-28 μm long; head cells ovate to elongate-ovate, entire to slightly angular, often bluntly pointed towards the apex, 12-18.5 X 9-12.5 μm. Phialides mixed with capitate hyphopodia, opposite to alternate, ampulliform, 18-28 X 9-12.5 μm. Mycelial setae scattered straight, simple, most obtuse at the tip, up to 580 μm long. Perithecia scattered, up to 205 μm in diameter; ascospores obovoidal, 4-septate, constricted, 40-52 X 15-22 μm.


This species stands distinct from the rest of the *Meliola* species reported on Rutaceae in having distantly arranged and spreading capitate hyphopodia and elongate-ovate head cells of the capitate hyphopodia. This species was associated with *Meliola vepridis* sp. nov.

This species was recorded on Zanthoxylum spp. from Costa Rica and Panama and is reported here for the first time from India on a hitherto unrecorded host genus.


This species is reported here for the first time from southern India.


This species is reported here for the first time on this host species.

On leaves of Zanthoxylum ovalifolium Wight (Rutaceae), Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 7, 1992, V.B. Hosagoudar HClO 40875.

This taxon is reported here for the first time from Tamil Nadu.


Colonies epiphyllous, dense, velvety, up to 5 mm in diameter. Hyphae straight to substraight, branching mostly opposite at wide angles, loosely reticulate, cells 24-32.5 X 6-9.5 µm. Capitate hyphopodia alternate, about 1% opposite, antorose to subantorose, straight to curved, 18-25 µm long; stalk cells cylindrical to cuneate, 6-9.5 µm long; head cells ovate, clavate, entire to angular, 12-15.5 X 9-15.5 µm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 15-22 X 6.9.5 µm. Mycelial setae evenly scattered over the colonies, straight, simple, acute to obtuse at the tip, up to 510 µm long. Perithecia scattered, verrucose, up to 175 µm in diameter; ascospores obovoidal to cylindrical, 4-septate, slightly constricted, 40-45 X 12-15 µm.

On leaves of Sapindus laurifolia Vahl (Sapindaceae), Kasaragod, Kerala, Nov. 25, 1992, J. Bhandary HClO 40876.

This species was recorded on Serjania species from Brazil and Costa Rica and is reported here for the first time from India on a hitherto unrecorded host genus.

21. Meliola semecarp-anacardii sp. nov. (Fig. 3)

Colonies epiphyllous, dense, crustose, up to 3 mm in diameter. Hyphae rectae, opposite acutae vel laxe ramosae, dense reticulatae et tegentes myceliales dense formantes, cellulis 15-18.5 X 6-9.5 µm. Hyphopodia capitata alternata, antorose vel subantorose, 18-28 µm longa; cellula basalis cylindracea vel cuneata, 6-9.5 µm longa; cellula apicalis ovata, globosa, integra vel angularis, 12.5-18.5 X 12-15.5 µm. Phialides illis capitatis commixtae, alternatae vel oppositae, ampullaceae, 18-22 X 9-12.5 µm. Setae myceliales numerosae, simplices, rectae, acutae ad apicem, usque ad 500 µm longae. Perithecia dispersa vel laxe aggregata, verrucosa, usque ad 250 µm diam.; ascosporea obovoideae, 4-septatae, profunde constrictae, 49-56 X 21-25 µm.

Colonies epiphyllous, dense, crustose, up to 3 mm in diameter. Hyphae straight, branching opposite at acute to wide angles, closely reticulate, forming dense mycelial mat, cells 15-18.5 X 6-9.5 µm. Capitate hyphopodia alternate, antorose to subantorose, 18-28 µm long; stalk cells cylindrical to cuneate, 6-9.5 µm long; head cells ovate, globose, entire to angular, 12.5-18.5 X 12-15.5 µm. Phialides mixed with capitate hyphopodia, alternate to
opposite, ampulliform, 18-22 X 9-12.5 µm. Mycelial setae numerous, simple, straight, acute at the tip, up to 500 µm long. Perithecia scattered to loosely grouped, verrucose, up to 250 µm in diameter; ascospores obovoidal, 4-septate, deeply constricted at the septa, 49-56 X 21-25 µm.


The new species has Beeli formula 3111.5332 and is close to *Meliola rhois* Henn. var. *africana* Hansf. It differs from it in having strictly epiphyllous colonies, in having entire head cells of the capitiate hyphopodia, and in having phialides mixed with capitiate hyphopodia. It also differs from *M. semecarpicola* Hansf. in not showing a pathogenic effect on the host. Another species, *M. travancoricae* Hosag., recorded on the same host genus from the Western Ghats, differs from the new species in having smaller capitiate hyphopodia, perithecia and ascospores.

22. *Meliola swieteniicola* sp. nov. (Fig. 4)

Colonies amphigenous, plerumque epiphyllae, densae, velutinae, usque ad 3 mm diam., saepe confluentes. Hyphae rectae vel subrectae, alternate vel opposita et acute vel laxe ramosae, laxe reticulatae, cellulis 15-22 X 6-8 µm. Hyphopodia capitata alternata (raro aliquot opposita in colonis juvenilibus), plerumque antorsa, 15-22 µm longa; cellula basalis cylindracea vel cuneata, 6-9.5 µm longa; cellula apicalis ovata vel globosa, integra, 9-14 X 9-12.5 µm. Phialides illis capitatis commixtae, plerumque opposita, ampullaceae, 15-18.5 X 6-9.5 µm. Setae myceliales dispersae, rectae, usque ad 286 µm longae, plerumque dentatae et raro furcatae usque ad 10 µm ad apicem. Perithecia dispersa, verrucosa, usque ad 170 µm diam.; ascospora obvoideae, 4-septatae, leniter constrictae, 40-43.5 X 15-18.5 µm.

Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 3 mm in diameter, widely confluent. Hyphae straight to substraight, branching alternate to opposite at acute to wide angles, loosely reticulate, cells 15-22 X 6-8 µm. Capitate hyphopodia alternate (rarely few opposite in young colonies), mostly antorse, 15-22 µm long; stalk cells cylindrical to cuneate, 6-9.5 µm long; head cells ovate to globose, entire, 9-14 X 9-12.5 µm. Phialides mixed with capitate hyphopodia, mostly opposite, ampulliform, 15-18.5 X 6-9.5 µm. Mycelial setae scattered, straight, up to 286 µm long, mostly dentate and rarely furcate, up to 10 µm at the tip. Perithecia scattered, verrucose, up to 170 µm; ascospores obovoidal, 4-septate, slightly constricted at the septa, 40-43.5 X 15-18.5 µm.

Holotype: On leaves of *Swietenia mahagoni* (L.) Jacq. (Meliaceae), Kaiga, Uttara Kannada, Karnataka, Nov. 21, 1992, K.M. Kaveriappa HCIO 40878.
The new species is similar to *Meliola swieteniae* Cif. recorded on the same host from San Domingo (Cifferi, 1933) but differs from it in having phialides mixed with capitate hyphopodia and mycelial setae lightly furcate at the tip.


On leaves of *Tamarindus indica* L. (Caesalpinioideae), Gersoppa, Uttar Kannada, Karnataka, Nov. 13, 1992, C.M. Pillai HCOL 40879.

24. *Meliola vepridis* sp. nov. (Fig. 5).

Colonies amphigenous, dense, crustose to velvety, up to 4 mm in diameter, rarely confluent. Hyphae straight to substraight, branching mostly opposite at wide angles, closely reticulate, forming a solid mycelial mat, cells 21-31 X 8-9.5 μm. Capitate hyphopodia alternate, straight to curved, antrorse to recurved, 24-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells ovate, globose, cylindrical, entire, angular to sublobate, often truncate at the apex, 15-18.5 X 14-17 μm. Phialides illis capitatis commixtae, alternatae vel oppositae, ampullaceae, 18-22 X 11-12.5 μm. Setae myceliales numerosae, simplices, rectae, aliquot uncinatae, acutae ad apicem, usque ad 930 μm longae. Perithecia dispersa, usque ad 186 μm diam.; ascospores obovatoideae vel cylindricalae, 4-septatae, constrictae, 46-56 X 20-22 μm.

Colonies amphigenous, dense, crustose to velvety, up to 4 mm in diameter, rarely confluent. Hyphae straight to substraight, branching mostly opposite at wide angles, closely reticulate, forming a solid mycelial mat, cells 21-31 X 8-9.5 μm. Capitate hyphopodia alternate, straight to curved, antrorse to recurved, 24-31 μm long; stalk cells cylindrical to cuneate, 6-12.5 μm long; head cells ovate, globose, cylindrical, entire, angular to sublobate, often truncate at the apex, 15-18.5 X 14-17 μm. Phialides illis capitatis commixtae, alternatae vel oppositae, ampullaceae, 18-22 X 11-12.5 μm. Setae myceliales numerosae, simplices, rectae, aliquot uncinatae, acutae ad apicem, usque ad 930 μm longae. Perithecia dispersa, usque ad 186 μm diam.; ascospores obovatoideae vel cylindricalae, 4-septatae, constrictae, 46-56 X 20-22 μm.


This species has Beeli formula 3111.5323 and can be compared with *Meliola kisubiensis* Hansf. and *M. macropoda* Sydow. It differs from the former species and its four varieties in having longer capitate hyphopodia with entire, angular to sublobate head cells. It differs from the latter species in having robust and carbonaceous dark mycelia and hyphopodia.
This species was associated with Meliola macropoda Hansf.

ACKNOWLEDGEMENTS

We thank Dr. N.P. Balakrishnan, Joint Director, (ret.) Botanical Survey of India, Southern Circle, Coimbatore and Mr. B.V. Shetty, Emeritus Scientist of BSI, Mangalore University, for their critical perusal of the manuscript. One of us (VBH) is grateful to the Scientists' Pool Scheme of CSIR, New Delhi for financial assistance. We are most grateful to Dr. F.A. Uecker for his careful review of the manuscript and for assistance with the Latin diagnoses.

REFERENCES

Meliola symphorematicola sp. nov. from India

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Key words: Meliola symphorematicola, new species.

During the exploration of foliicolous fungi in the Western Ghats of southern India, Symphorema involucratum Roxb. (Symphoremataceae) was found infected with black mildew fungus. Critical microscopic observation revealed that the fungus is an undescribed species of the genus Meliola Fr.

Meliola symphorematicola sp. nov. (Fig. 1)

Coloniae amphigenae, plerumque hypophyllae, densae, usque ad 5 mm diam. Hyphae valde ad hospitem appressae, rectae, flexuosae vel anfractae, laxe inangulo recto oppositae, racemosae, laxe vel dense tuctulatas, cellulis 15-22 X 3-6.5 μm. Hyphopodia capitata plerumque alternata, antornae vel patentia, recta vel curvata, 12-15.5 μm longa, cellula basali cylindracea vel cuneata, 3-6.5 μm longa, cellula apicali globosa vel ovata, recta vel curvata, integra, 9-10 X 9-12.5 μm. Phialides paucis, illis capitatis commixtae, alternatae vel oppositae, ampullaceae, 13-15.5 X 6-9.5 μm. Setae myceliales numerosae, simplices, plerumque rectae, paucae uncinatae vel geniculatae, acuta ad apicem, usque ad 375 μm longae. Perithecia dispersa vel laxe aggregata, usque ad 130 μm; ascosporae obovoidae, 4-septatae, leniter constrictae, 34-40.5 X 12-18.5 μm.
Colonies amphigenous, mostly hyphophyllous, dense, up to 5 mm in diameter. Hyphae strongly appressed to the host, straight, flexuous to crooked, branching opposite at wide angles, loosely to closely reticulate, cells 15-22 x 3-6.5 μm. Capitate hyphopodia alternate and about 5% opposite, antorse to spreading, straight to curved, 12-15.5 μm long; stalk cells cylindrical to cuneate, 3-6.5 μm long; head cells globose to ovate, straight to curved, entire, 9-10 x 9-12.5 μm. Phialides mixed with capitate hyphopodia, alternate to opposite, ampulliform, 13-15.5 x 6-9.5 μm. Mycelial setae numerous, simple, predominantly straight, few uncinate to geniculate, acute at the tip, up to 375 μm long. Perithecia scattered to loosely grouped, up to 130 μm; ascospores obvoidal, 4-septate, slightly constricted, 34-40.5 x 12-18.5 μm.

Holotype: On leaves of Symphorema involucratum Roxb. (Symphoremataceae), Dhoni forest, Palghat Dist., Kerala State, India, March 1, 1993, V.B. Hosagoudar NCIO 46881.

Stevens & Roldan (1935) described Meliola symphoremati for a fungus collected on Symphorema luzonicum in the Philippines. The name was not validly published because it lacked a Latin description (ICBN, Art. 36). Petrak (1958) was either unaware of M. symphoremae Stevens & Roldan or simply considered it different from M. symphonematis Petrak, collected on the same host and same island but from a different province. Since the fungus is named after the host, which Petrak also misspelled as Symphorema, the epithet symphonematis is an orthographic variant to be corrected (ICBN, Arts. 73, 75). Thus M. symphonematis Petrak is the appropriate basionym for the fungus described on Symphorema. Hansford (1963) used the correct form when he cited the new variety M. symphonematis Petrak var. major Hansf. The new species differs from the type of M. symphonematis in having smaller and alternate to opposite capitate hyphopodia and larger ascospores. It differs from M. symphonematis var. major in having uncinate to geniculate mycelial setae.

Acknowledgements
We are thankful to Mr. K. Ravikumar, Botanical Survey of India, Southern Circle, Coimbatore for identification of the host. One of us (VBH) is grateful to Scientists' Pool Scheme of CSIR, New Delhi for the financial assistance. We are most grateful to Dr. F.A. Uecker for his review of the manuscript and for his comments regarding nomenclature.
REFERENCES

Fig. 1. Meliola symphorematicola sp. nov. (Ch = capitate hyphopodia, Mh' = phialide; Ms = mycelial setae; Sp = ascospores)
SUPPLEMENT TO HANSFORD’S “THE MELIOLINEAE MONOGRAPH”

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ABSTRACT

The paper gives an account of 169 supplemental taxa to Hansford’s “The Meliolineae Monograph” and 5 doubtful taxa. The list includes omissions, additions and illegitimate names. Host and species index is provided at the end of the text. In the index, corresponding number of fungal species/host plants represent the particular taxa dealt in the text.

The genus Meliola was established by Fries in 1825. A comprehensive account of the genus with its then known species was given by Bornet in 1851. Toro (1952) selected M. trichostroma (Kunze) Toro as the lectotype species of the genus Meliola. Gaillard’s (1892 a, b) monumental work “Le Genre Meliola” was the first comprehensive account of 111 species of the genus. Beeli (1920) listed 459 species under two genera known till that time. Stevens (1927, 1928) brought out an account of about 660 species under 7 genera. The latest monograph of this group is by Hansford (1961) who dealt 1814 species under the genera—Amazonia, Appendiculella, Asteridiella, Irenopsis and Meliola and excluded 47 species.

Hansford (1961) made some omissions in his work. Several new taxa have been added after his work. The present work attempts to fill the lacuna of Hansford’s monograph by filling the omissions therein and by adding the newly described species since 1961. This paper gives a list of 169 taxa and 6 doubtful species. Index to the host and fungal species have also been provided.

ACANTHACEAE

   On leaves of an acanthaceous member from the Philippines.

   On leaves of Barleria strigosa from Maharashtra, India.


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On leaves of *Blepharis asperrima* from Maharashtra, India.

**Aceraceae**

   
   On leaves of *Acer negundo* from Florida and Georgia, U.S.A.

   
   On leaves of *Sansevieria laurentii* from Ivory Coast.

**Anacardiaceae**

   
   On leaves of *Spondias purpurea* from Panama.

   
   On leaves of *Semecarpus philippinensis* from the Philippines.

**Apocynaceae**

   
   On leaves of *Alstonia comptonii* from New Caledonia.

   
   On leaves of *Alyxia leucogyna* from New Caledonia.

   
   On leaves of *Anodendron affine* from Taiwan.

   
   On leaves of *Hancornia spectosa* from Brazil.

   
   
   On leaves of *Ichnocarpus volubilis* from Philippines.

   
   On leaves of *Plumeria alba* from Maharashtra, India.

**Araliaceae**

   
   On leaves of *Schefflera vieillardii* from New Caledonia.

   
   On leaves of *Fatsia oligocarpella* from Japan.

   
   On leaves of *Schefflera cerifera* from New Caledonia.

On leaves of *Tieghemopanax* sp. from New Caledonia.

**ARAUCARIACEAE**

   On needles of *Araucaria angustifolia* from Brazil.

   On leaves of *Agathis palmerstonii* from North Queensland, Australia.

   On leaves of *Araucaria cunninghamii* from Queensland, Australia.

**ARISTOLOCHIACEAE**

   On *Aristolochia elegans* from Jamaica.

**BIGNONIACEAE**

   On leaves of a bignoniaceous member from Brazil.

   On leaves *Crescentsia cujete* from Brazil.

**BURSERACEAE**

   On leaves of *Aucoumea klaineana* from Gabon.

   On leaves of *Protium* sp. from Brazil.

**BUXACEAE**

   On leaves and twigs of *Buxus microphylla* var. *japonica* from Japan.

**CAESALPINIACEAE**

   *A. hymenaecola* (Frag. & Cif.) Hansf., 1957 – nom. invalid.
   *A. hymenaecola* (Frag. & Cif.) Hansf., 1961 – nom. illegit.
   (Later homonym of *A. hymenaecola* by Batista & Maia).

   On leaves of *Cassia fistula* from Hyderabad, India.

   On leaves of *Cassia bacillaris* from Brazil.
On leaves of Copaifera officinalis from Brazil.

On leaves of Hylodendron gabonens from Gabon.

**CAMPANULACEAE**

(Later homonym of Meliola lobellae Stev. 1925).

On leaves of Lobelia stricta from Dominica.

**CAPPARIDACEAE**

On leaves of Capparis pedunculosa from Maharashtra, India.

**CAPRIFOLIACEAE**

On leaves of Leycesteria glaucophylla from West Bengal, India.

**CARICACEAE**

On leaves of Jacaratia dodecaphylla from Brazil.

**CASYTHIACEAE**

On stems of Cassytha filiformis from Brazil.

**COCHLOSPERMACEAE**

On leaves of Cochlospermum inconspicue from Brazil.

**CUMBRETAECACEAE**

On leaves of Terminalia tomentosa from Maharashtra, India.

**COMPOSITAE**

On leaves of Ligularia tussilaginea var. formosana from Taiwan.

On leaves of Caereopsis auristosa from Maharashtra, India.

**CONNARACEAE**

On leaves of Rourea praineana from South India.
On leaves of Agelae sp. from Philippines.

CONVOLVULACEAE
On leaves of Argyreia hookeri from Maharashtra, India.
On leaves of Erycibe henryi from Taiwan.

CUPRESSACEAE
On leaves of Pancheria sp. from New Caledonia.
On leaves of Codia spathulata from New Caledonia.

CUPROSIACEAE
On leaves of Austrocedrus chilensis from Chile.
On leaves of Fitzroya cupressoides from Chile.

CYCLANTHACEAE
On leaves of Pilgerodendron uviferum from Chile.

CYCLANTHACEAE
On leaves of Carludovica plumieri from Dominica.

CYPERACEAE
On leaves of Rhynchospora miliacea from Jamaica.
On leaves of Choryzandra cymbaria from New Caledonia.
On leaves of Remirea marillia from Brazil.

DILLENIACEAE
On leaves of Saurauia elegans from the Philippines.

DIOECOREACEAE
On leaves of Dioscorea sp. from the Philippines.
ERICACEAE

On leaves of Pentapterygium serpens from West Bengal.

EUPHORBIACEAE

Meliola acalyphae Toro apud Chardon & Toro (as "acalyphidis"). 1934—nom. illegit. (non M. acalyphae Rehm, 1913).

On leaves of Bridelia montana from Sikkim, India.

On leaves of Mallotus philippensis from Castle Rock, India.

On leaves of Ostodes paniculata from Sikkim, India.

On leaves and stems of Euphorbia papillosa from Brazil.

FAGACEAE

On leaves of Castanopsis hystrix from West Bengal, India.

64. Meliola nothofagi Huguenin, Rev. Mycol. 34 : 36, 1969.
On leaves of Nothofagus baumanii from New Caledonia.

FLACOURTIACEAE

On leaves of Xylosma buxifolium from San Domingo.

GRAMINACEAE

On leaves of Cymbopogon tandus from Kerala, India.

On leaves of Sasa boroculis from Japan.

GUTHIERACEAE

On leaves of Ochrocarpus longifolius from Maharashtra, India.

On leaves of Symphonia globulifera from Brazil.

HAMMAMELIDACEAE

On leaves of *Buchlandia populnea* from West Bengal, India.


On leaves of *Symingtonia populnea* (*Buchlandia populnea*) from Sikkim, India.

**Houmiaceae**


On leaves of *Sarcoglottis* sp. from Brazil.

**Lamiaceae**


On leaves of *Ocinium selloi* from Argentina.

**Lauraceae**


*A fraseriana* (Syd.) Hansf., 1956-nom. invalid.

*A. fraseriana* (Syd.) Hansf., 1961-rom. illegit. (later homonym of Batista).


On leaves of *Actinodaphne lancifolia* from Japan.

**Loganiaceae**


On leaves of *Geniostoma oleifolium* from New Caledonia.


On leaves of *Couthovia neocaledonica* from New Caledonia.


On leaves of *Buddleia asiatica* from Philippines.

**Lythraceae**


On leaves of *Woodfordia fruticosa* from Castle Rock, India.

**Malvaceae**


On leaves of *Sida javensis* from Taiwan.


On leaves and stems of *Sida* sp. from Brazil.

**Marantaceae**

On leaves of *Calathea tuberosa* from Brazil.

**MELIACEAE**


On leaves of *Aphanamixis polystachya* 1970.

(= *Amoora rohituka*) from Coorg, Karnataka, India.


On leaves of *Dysoxylum nitidum* from New Caledonia.


On leaves of *Dysoxylum sp.* from New Caledonia.

**MELIANTHACEAE**


On leaves of *Exchweileria ovata* from Brazil.

**MENISPERMAEAE**


On leaves of *Cissampelos pareira* from Brazil.

**MIMOSACEAE**


On leaves of *Mimosa caesalpinifolia* from Brazil.


On leaves of *Albizia odoratissima* from Assam, India.


On leaves of *Albizia granulosa* from New Caledonia.


On leaves of *Pithecellobium diversifolium* from Brazil.


On twigs of *Mimosa invisa* from New Caledonia.

**MYRTACEAE**


On leaves of *Rapanea neriifolia* from Japan.

**MYRTACEAE**


On leaves of *Melaleuca griseophylla* from New Caledonia.
On leaves of Syzygium claviflorum from West Bengal, India.

96. Meliola amonicola Stev. var. longispora
On leaves of Pimenta racemosa (= Amomia caryophyllata) from Brazil.

97. Meliola eugeniae-jamboloidis var. amphi-
On leaves of Syzygium jambos from West Bengal, India.

98. Meliola trichostroma (Kunze) Toro var.
On leaves of Psidium guajava from Brazil.

On leaves of Culpidia artensis from New Caledonia.

100. Meliola kisubiensis Hansf. var. neeae
On leaves of Neea sp. from Brazil.
(Doubtful: M. kisubiensis is on the rutau-
ous plants).

101. Meliola jasminicola P. Henn. var. indi-
ca Kapoor, Indian Phytopath. 22 : 156.
1967.
On leaves of Jasminum auriculatum from Calcutta, India.

102. Meliola osmanthi-cymosi Huguenin,
On leaves of Osmanthus cymosus from New Caledonia.

PALMAE

103. Meliola caryotae Srinivarulu, Nova
On leaves of Caryota urens from Maharashtre, India.

On leaves of Livistona chinensis var. boniensis from Japan.

PANDANACEAE

105. Meliola pandani Sawada & Yamamoto
On leaves of Pandanus odoratissimus from Taiwan.

PAPILIONACEAE

106. Amazonia leguminosarum Batista, Herr-
On leaves of Leguminosae member from America.
On leaves of *Desmodium incanum* from Brazil.

On leaves of *Dipteryx odorata* from Brazil.

On leaves of *Ormosia formosana* from Taiwan.

On leaves of *Tephrosia toxicaria* from Brazil.

**PINACEAE**


On leaves of *Piper** from Jamaica.

On leaves of *Piper** from Jamaica.

On leaves of *Piper** from Maharashtra, India.

On leaves of *Piper** from Argentina.

**POLYPODIACEAE**

On leaves of *Polygoneum adesmum* from Castle Rock India.

**PROTEACEAE**

On leaves of *Knightia excels* from New Zealand.


On leaves of *Grevillea gillivrayi* from New Caledonia.

**Ranunculaceae**


On leaves of *Coptis trifolia* from Japan.

**Rhamnaceae**


On leaves of *Hovenia dulcis* from West Bengal, India.


On leaves of *Gouania leptostachya* from West Bengal, India.

**Rosaceae**


123. *Irenopsis crataegi* Bose, Indian Phytopath. 15: 144, 1962.

On leaves of *Crataegus crenulata* from Himalayas, India.


On leaves of *Pyracantha crenulata* from U.P., India.

**Rubiaceae**


On leaves of *Rondeletia* sp. from Puerto Rico.


On leaves of *Plectronia monstrosa* from the Philippines.


On leaves of *Adina* sp. from the Philippines.


On leaves of *Plectronia divociicum* from Maharashtra, India.


On leaves of *Randia seznatia* from New Caledonia.


On leaves of *Knoxia corymbosa* from the Philippines.


On leaves of *Lasianthus microphyllus* from the Philippines.


On leaves of *Mycetia javanica* from Philippines.


On leaves of *Mitragyna parvijolia* from U.P., India.


On leaves of a Rubiaceae member from Brazil.


On leaves of *Webera corymbosa* from Karnataka, India.

**RUTACEAE**


On leaves of *Comptonella drupacea* from New Caledonia.


On leaves of *Glycosmis pentaphylla* from Calcutta, India.


On leaves of *Acronychia laevis* from New Caledonia.


On leaves of *Melicope triphylla* from the Philippines.


On leaves of *Evodia oreophila* from New Caledonia.

**SAPIIDACEAE**


On leaves of *Meliosma simplicifolia* from West Bengal, India.


On leaves of *Meliosma* sp. from the Philippines.

**SAPIACEAE**


On leaves of *Cupania americana* from Porto Rico.


On leaves of *Cupania revoluta* from Brazil.


On leaves of *Ellatostachis* sp. from the Philippines.


On leaves of *Paullinia pinnata* from Brazil.

**SAPOTACEAE**

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A new variety of the fungus *Meliola sempeiensis* Yamam. (Meliolaceae) from Great Nicobar

V. LAKSHMANAN, P. BHARGAVAN and V. B. HOSAGOUĐAR

*Botanical Survey of India, Southern Circle, Coimbatore-641 003*

White surveying the Angiosperm flora in the Bay Islands, the authors came across a *Litsea* species infected with a black mildew fungus. Microscopic study of the fungus revealed that it is a hitherto undescribed infra-specific taxon of the species *Melilo/a sempeiensis* Yamam. *Melilo/a sempeiensis* Yamam. var. *nicobarica* var. nov. (Fig. 1).

*Melilo/a sempeiensis* Yamam. var. *nicobarica* var. nov. (Fig. 1).

Fig. 1. *Melilo/a sempeiensis* Yamam. var. *nicobarica* var. nov.

- Ch - Capitate hyphopodia
- M - Mycelium
- Mh - Mucronate hyphopodia
- Ms - Mycelial setae
- Sp - Ascospores
Am long; stalk cells cylindrical to cuneate, mostly straight but rarely curved, 9-12.5 µm long; head cells ovoid to globose, mostly straight but rarely curved, entire, 18-22 × 15-22 µm. Mucronate hyphopodia mixed with capitate hyphopodia, opposite to alternate, ampulliform, neck elongated, 27-31 × 12-15.5 µm. Mycelial setae numerous, straight to curved, acute to dentate at apex, up to 1050 µm long. Perithecia scattered, verrucose, up to 170 µm; ascospores ellipsoid to obovoid, 4-septate, constricted, 49-59 × 18-22 µm, middle cell larger than the remaining cells.


Several species of the genus Meliola have been recorded on members of the family Lauraceae. But, M. sempeiensis Yamam. reported on Notaphoebe saccadoi from Formosa is distinct from the rest in having the middle cells of the ascospores larger than the remaining cells (Hansford, 1961; Yamamoto, 1941). The present collection matches well with this species but differs from the var. sempeiensis in having acute to dentate mycelial setae, and hence considered as an undescribed variety.

ACKNOWLEDGEMENTS

We are grateful to Dr. N. P. Balakrishnan, Deputy Director and Dr. A. N. Henri, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for their encouragements. We are grateful to Dr. J. L. Ellis, Scientist SE, Botanical Survey of India, Andaman - Nicobar Circle, Port Blair for providing all facilities for the exploration work.

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TELIOSPORE ABNORMALITY IN
PUCCINIA VERSICOLOR DIET. & HOLW.

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ABSTRACT

The teliospores of Puccinia versicolor Diet. & Holw. showed the variations in their morphology. A random count revealed 89.3% normal pucciniod type, 2.9% diorchidioid type and 7.8% intermediate between pucciniod and diorchidioid types.

After its description on Heteropogon melanocarpus from Mexico, the rust, Puccinia versicolor Diet. & Holway, was reported on several grasses from various parts of the World including India. Thirumalachar and Narasimhan (1949) and Patil and Thirumalachar (1964) have studied its heteroecism. They reported Canthium parviflorum and Lantana indica as its alternate hosts.

The teliospores of Puccinia versicolor are typically pucciniod, two-celled with a transverse septum-Fig. 1 A. (Cummins, 1971). However, the teliospores recently collected from Idukki, Kerala, on Heteropogon contortus (L.) Beauv. ex Roemer & Schultes, a fodder grass, showed such deviations/abnormalities from the normal pattern in teliospore morphology were not previously recorded for the species and hence this note.

The abnormalities include variations in the position of septum, thickening of outer cell wall and the attachment of pedical (Fig. 1-B-M). Position of the septum varied from horizontal to oblique, accompanied by variation in the shape of both the cells (Fig. 1 B-D). In extreme cases, the spores have attained

Fig. 1: A. Normal teliospore; B-D. Variations in cell morphology and position of the septum; E-H. Pendent spores; I-L. Unequal sized cells; M-N. Diorchidioid spores.
Hosagoudar

A random observation of the teliospores of this taxon showed 89.3% normal puccinioid type, 2.9% diorchidioid type and 7.8% intermediate between puccinioid and diorchidioid types. According to Arthur et al. (1929), the spore abnormalities fall under four categories viz.: (i) distorted shapes (ii) abortion of one or more cells in a compound spore, (iii) multiplication of cells by extra cross walls, and (iv) unusual septation. The abnormalities noticed in the present case belong to the first and last categories.

The factors responsible for these variations may be genetical, nutritional or ecological. Further studies are needed to know the significance of these abnormalities either in the interpretation of evolution of teliospores or in the classification of rust fungi.

ACKNOWLEDGEMENTS

Thanks are due to Dr. N.C. Nair, Joint Director, Botanical Survey of India, Coimbatore, for guidance, to Dr. P. Ramachar, Mycologist, Nizam College, Hyderabad, for his valuable suggestions on the subject and to the Department of Environment, New Delhi, for financial assistance.

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A NEW RUST ON ELAEOCARPUS TUBERCULATUS ROXB. FROM IDUKKI, KERALA, INDIA

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DURING a survey and study of the rusts of Idukki, Kerala, it was observed that the stems and the peduncles of Elaeocarpus tuberculatus Roxb. were studded with several brown and sessile galls. The galls were of different shapes and sizes. When the galls were disturbed, spores were blown out of them in the form of clouds. The galls were persistent even after they were devoid of spores though they dropped out ultimately along with the host parts. Infected inflorescences did not produce any flowers. No infection was observed on the leaves.

**Aecidium elaeocarpi-tuberculatæ** Hosagoudar sp. nov.


**Holotypus:** In caule et pedunculi de *E. tuberculatus* Roxb. Sylvum secus viam inter Painavu et Kulamavu, Februarius 25, 1983; A. Divaviadoss, BS1/ISV/75013 (Positus in Botanical Survey of India, Coimbatore, India).

**Isotypus:** In Osmania University, Hyderabad, India (Num. Acc. RHOU 504/Coim.)

**Figure 1.** Infected host showing galls on the stem.

| Table 1 A comparative account of the present rust and *A. elaeocarpi* |
|-----------------------------|-----------------------------|
| Name of the fungus          | Galls                       | Aecidium | Aeciospores | Aeciospore wall |
| *A. elaeocarpi*             | On leaves and stems, 2–10 mm in diameter | 700–900 × 350 μm | 44 × 18–24 μm | Minutely verrucose |
| *A. elaeocarpi-tuberculatæ* | On stems and peduncles, 1–4 inches in diameter | 387–750 μm | 50–450 μm | 40–60 × 16–28 μm | Proninently echinulate |
So far three species of Aecidium have been reported on Elaeocarpus L., namely A. puspa Racib., A. elaeocarpi Racib. and A. elaeocarpicola Cummins. A. puspa is an aecial stage of Puccinia puspa Racib. Among all these three species only A. elaeocarpi Racib. produces galls on leaves, stem and branches. The present fungus differs from it in possessing the smaller aecial cups, larger aeciospores and in producing bigger galls of different sizes (1–4 inches in diameter) only on stems and peduncles but not on the leaves.

Thanks are due to Dr N. C. Nair, Joint Director, for guidance and Dr V. J. Nair, Systematic Botanist, for Latin translation. Thanks are also due to Dr P. Ramachar, Mycologist, Nizam College, Hyderabad for confirming the identity of the fungus and to the Department of Environment for financial assistance.

20 July, 1983

TWO INTERESTING FUNGI ON CINNAMOMUM MALABATRUM FROM IDUKKI, KERALA, INDIA

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ABSTRACT

Two interesting fungi were collected on Cinnamomum malabatrum (Burm. f.) Blume from the forest of Idukki, Kerala. Caeoma keralensis is described as a new species and Exobasidium cinnamomi Petch is recorded for the first time from South India.

INTRODUCTION

During a survey of pathogenic fungi of Idukki forest area, two interesting disease causing fungi were collected on Cinnamomum malabatrum (Burm. f.) Blume at Calvary Mount which is a small forest patch converted into Cardamom Estate by clearing the ground vegetations in which Cinnamomum malabatrum (Burm. f.) Blume occurs abundantly. This forest patch is at an altitude of 1000 metres (± 50 m) from the Mean Sea Level. In the preceding two years, these diseases were not observed on this host other than this forest patch.

Caeoma keralensis Hosagoudar sp. nov.

Infection restricted to young, growing, tender shoots causing litching and hypertrophy of the infected parts. The infected shoots turned to brick red colour, covered with a mat of pale yellow spores. A little disturbance to the host released a cloud of spores into the air. The diseased plants can be easily detected by their appearance even from a distance.

Pycnia, uredinia et telia ignota. Aecia folicola, amphigena, rotunda, cupulata, innata, ultime erumpenta, 162-270 µ peridium obsens; sporae prime catenulat irregulariter dispositae, hyalinae dilute brunneae, rotundae, ellipsoideae, saepe curvatae, raro papiliatae et ad medii constrictae, 10-20 x 8-10 µm; paries lacunaris dilutus, usque ad 2 µm crassus.

Pycnia, uredinia et telia ignota. Aecia folicola, amphigena, round, cupulate, innate, finally erumpent, 162-270 µ peridium absent; spores initially catenulate irregularly arranged at maturity, hyaline pale brown, round, ellipsoidal, often curvilinearly papililated and constricted at the middle, 10-20 x 8-10 µm; wall smooth, up to 2 µm thick.

Holotype: On the living leaves of Cinnamomum malabatrum (Burm. f.) Blume.
A—C. *Cucumis keralezii* Hosagoudar *sp. nov.*

A. Infected young tender shoot showing the symptom of witches broom.
B. Non-peridiate aecium
C. Smooth walled and papillate aecomatoid spores,
D. *Exobasidium cinnamomi* Petch showing infection pattern on the stem.
Hosagoudar

Type locality Calvary Mount forest. Leg. V.S. Raju, on December 12, 1982. Deposited at Botanical Survey of India, Southern Circle, Coimbatore (MH) under BSI/ISV/75654. Isotype: Osmania University, Hyderabad (Andhra Pradesh), under RHOU No. 505/C.

Cummins (1949) described 10 species of Puccinia parasitizing different member of the family Lauraceae from China. Of these, only P. cinnamomicola Cummins was reported on Cinnamomum sp with aecia. The present fungus differs from it in absence of peridium and spore morphology. From India, Goswami and Bhattacharjee (1973) reported Aecidium cinnamomii Racib. on C. tamala Fr. from Shillong, Meghalaya. Ramakrishnan T.S. (1965) added C. zeylanicum Cl. as an additional host to Uredium nothopegiae Ramkr. T.S. & K. However, the present fungus differs from Aecidium cinnamomii Racib. in causing hypertrophy and witches broom on the young tender shoots, smaller spores and aecial cups and in absence of peridium. But, symptomologically, it comes closer to U. nothopegiae Ramkr. T.S. & K. though differs from it in having the catenulate, smooth walled, cuneomatoid spores. Since the aecidium lacks well defined peridium, the fungus has been placed under a form genus Caeoma (Cummins, 1959, Thirum. & Mundk. 1949). So far the genus Caeoma has not been reported on Cinnamomum. Hence the present fungus is described here as a new species.


The infection starts after the onset of monsoon. A bunches of finger-like, cinnamon coloured, twisted, ribbed, rarely branched, brittle projections arose from the trunk, branches and leaf petioles, 4-15 cm long and 2-4 cm in breadth, covered with a white mass of powdery spores on their surfaces at maturity. The central core of these projections was paranchymatous and the basidia formed peripherically. Basidia initially arose in tufts and later forming a continuous hymenium, compact, brown narrowly clavate, often constricted at the middle. 30-50 x 4-10 μm; sterigmata 2-4 hyaline, cylindrical, 4-10 μm long; basidiospores oval to ellipsoidal, hyaline, single celled, rarely constricted at the middle, 8-11 x 3-5 μm.

On the living stem, branches and leaf petioles of Cinnamomum malabaricum (Burnt f.) Blume at Calvary Mount. A Diraviadona Deposited at Botanical Survey of India Southern Circle, Coimbatore (MH) under BSI/ISV/75829.

Bilgrami et al. (1979) have enlisted this fungus on C. tamala Fr. and C. zeylanicum Br. from Himalayas. This is the first record of the fungus from South India on a new host.

ACKNOWLEDGEMENTS

The author is grateful to Dr. N.C. Nair, Joint Director and Dr. V.J. Nair, Systematic Botanist, Botanical Survey of India, Coimbatore for guidance and for rendering Latin translation, respectively. Thanks are due to Dr. P. Ramachar, Mycologist, Nizam College, Hyderabad for confirming the identity of the rust fungus and to the Department of Environment, New Delhi for financial assistance.
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During a course of mycological collection at Coimbatore, plants of *Nyctanthes arbor-tristis* L. (Oleaceae) were found infected with a powdery mildew. Initially, the infection spots were epiphyllous, small, circular and powdery. Later, the spots coalesced and covered the entire leaf surface. Several infected leaves turned yellow, followed by defoliation. Even from a distance, it was easy to detect the infected plants.

The fungus was observed in the conidial stage and belongs to the genus *Oidiurn* which was studied extensively by Boesewinkel (1979, 1980) and Braun (1980, 1982a, 1982b) who, however, reported no *Oidiurn* on *Nyctanthes*. Bilgrami & al. (1979, 1981) have simply enlisted this fungus as *Oidiurn* sp. A critical study of the fungus revealed the features of this *Oidiurn* to be quite distinct, to justify its treatment as a new species.

*Oidiurn braunii* V. B. Hosagoudar, sp. nov. — Fig. 1, A—C


Appressoria lobed. — Mycelium superficial, creeping, septate, hyaline, cells 3—5 μm wide. — Foot-cells of the Conidiophores erect, followed by 1—2 short cells, 50—90 × 6.5—11 μm; basal portion of the footcells straight to curved to flexuosus or twisted. — Conidia formed singly, ellipsoid-ovoid to ellipsoid-doliform, 24—33 × 13—18 μm, germ tube short, arising at an end.


The species is named in honour of Dr. U. Braun whose contribution to the study of powdery mildews is notable.
Fig. 1. A—C: Oidium braunii Hosagoudah (type): A. Apressorium. — B. Conidiophores. — C. Conidia (ovoid primary conidium, conidium with germ tube, secondary conidium).

Acknowledgements

The author is grateful to Dr. N. C. Nain, Joint Director, Botanical Survey of India, Coimbatore for guidance and to Dr. V. J. Nain, Systematic Botanist of the same organisation for Latin translation. Sincere thanks are also due to Dr. U. Braun, GDR, for confirming the identity of the fungus, to Prof. A. Venkata Rao, Tamil Nadu Agricultural University, Coimbatore for making the material available and to the Department of Environment, New Delhi for financial assistance.
References


NEW AND NOTEWORTHY SPECIES OF PHYLLACHORA FROM SOUTH INDIA

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ABSTRACT: Eleven species of Phyllachora are recorded from Idukki area. Of these, *P. ambigua*, *P. dalbergiae*, *P. ischaemi*, *P. pongamiae*, *P. sacchari*, *P. themedae* are reported for the first time from Kerala. *P. paspalicola*, *P. setariaecola*, *P. stenospora* are additions to the fungal flora of India and *P. gardoniae* is the new species described.

Keywords: Phyllachora, Species

During the survey of the pathogenic fungi of the Idukki forest area, in the last two years, the author came across certain interesting species of *Phyllachora* Nits. Apud Fückel which are enumerated in the present paper. There is not much earlier work on the fungal flora of Kerala (Bilgrami et al., 1979, 1981; Kamat et al., 1978; Rangaswami et al., 1972) and Idukki area is almost a virgin place for the study of fungi.

   On the living leaves of *Syzygium cumini* (L.) Skeels (*Eugenia jambolana* Lam.) at Lakshmi Estate on December 12, 1983. BSI/1SV/75084.

   On the living leaves of *Ficus hispida* L. at Calvary Mount on January 8, 1982. BSI/1SV/72617.

   On the living leaves of *Dalbergia latifolia* Roxb. in the forest at Painavu and Kulamavu Road on June 9, 1983. BSI/1SV/750 48.
   New host record from India.

4. *P. gardoniae* sp. nov. (Fig. A–D)
   Maculae foliicolae, amphigenae, 5-10 mm in diametro; stromata foliicola amphigena, circulatim diposita, rotundata, nigra, nitida, elevata, elypeata, magnit, 2 mm diametro; perithecia 1-5 per stroma, ovalia, laviter irregularia, magnit, 212-450 : 75-117 μm. Asci obclavati vel cylindracei, numerosi, unitunicati, stipitati, ooctospori: filiformibus, hyalinibus, magnit, 86-130 × 8-12 μm. Ascosporea hyalinae, rotundatae vel ellipsoidae, uniseriatae vel irregulariter ordinatae, magnit, 6-18 × 6-8 μm.


Received for publication November 7, 1983.

Subnumero BSI/ISV/75796 et *Isotypus* positus ad M.A.C.S. Poona (MS.) Subnumero-AMH 5164.

Infection spots folicolous, amphigenous, 5-10 mm in diameter; stromata folicolous, amphigenous, round, arranged in circles, black, shining, raised, clypeate, up to 2 mm in diameter, separate or often coalescent; perithecia 1-5 per stroma, oval to slightly irregular, 212-450 × 75-117 μm. Asci obclavate to cylindrical, many, unitunicate, stipitate, octosporous, 66-130 × 8-12 μm; paraphysate; paraphyses thread like, hyaline. Ascospores hyaline, round to ellipsoidal, uniseriate to irregular, 6-18 × 6-8 μm, contents granular.

On the living leaves of *Gordonia obtusa* Wall. (THEACEAE). Type locality Kanchiar forest, December 12, 1982. V. B. Hosagoudar. Deposited at Botanical Survey

### Comparative account of *Phyllachora* species on Theaceae

<table>
<thead>
<tr>
<th>Name of fungus</th>
<th>Spots</th>
<th>Perithecia</th>
<th>Asci</th>
<th>Ascospores</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>P. cymbispora</em></td>
<td>amphiphyllous, stromata 0.3-1.5 mm</td>
<td>Broadly flask shaped, 225-396 x 162-221 μm</td>
<td>Cylindrical or spindle shaped, 102-150 x 10-20.5 μm</td>
<td>Cymbiform, indistinctly distinctive, 22-35 x 3-9 μm.</td>
</tr>
<tr>
<td><em>P. euryae</em></td>
<td>—</td>
<td>—</td>
<td>80-90 x 14-16 μm.</td>
<td>Oval, 14-16 x 6-8 μm.</td>
</tr>
<tr>
<td><em>P. gordsniae</em></td>
<td>Amphigenous stromata up to 2 mm</td>
<td>Oval to slightly irregular, 212-450 x 72-117 μm</td>
<td>Oblong to cylindrical, 66-130 x 8-12 μm.</td>
<td>Round to elliptical, uniseriate to irregular, 6 18 x 6-8 μm. with granular contents.</td>
</tr>
<tr>
<td><em>P. translens</em></td>
<td>Hypophyllous stromata 0.5-1 mm</td>
<td>Flask shaped 200-300 x 150-200 μm</td>
<td>Cylindrical to clavate or fusoid 50-70 x 10-11 μm.</td>
<td>Oblong, distichous, 20-22 x 5-7 μm.</td>
</tr>
</tbody>
</table>


On the living leaves of *Ficus infectoria* Roxb. at Churuly on August 22, 1981. BSI/ISV/75790.


All the three hosts are new records.


Infection spots amphiphyllous, amphigenous black, round to irregular, up to 1 mm in diameter; perithecia flask shaped, 1-3 per stroma, 88-180 x 80-130 μm; asci cylindrical, stipitate, octosporous, 46-80 x 8-14 μm; ascospores hyaline, oval to ellipsoidal, uniseriate to bisetigate, 12-16 x 4-8 μm.

On the living leaves of *Digitaria longiflora* (Retz.) Pers.; at Painavu and *Kulamv Road side* on January 11, 1982. BSI/ISV/72665.

New host record.


9. *P. sacchari* P. Henn. in *Hedwigia* 41: 143, 1902.

(= *P. sorghi* Hoehnel, *Fragm. 2, Myk. VII No. 313, 1909)

On the living leaves of *Sorghum bicolor* (L.) Moench. (*S. vulgare* Pers.) near Erretyar dam tunnel on October 10, 1982. BSI/ISV/73655.


Infection spots amphiphyllous, oval to elongated, 1-2 mm, form yellow halo around the spots; stroma loculate, 1-3 locules per stroma; perithecia round, paraphysate, 99-297 × 54-162 μm; asci cylindrical, stipitate, octosporous, 54-100 × (6-) 8-12 (16) μm; ascospores hyaline, uniseriate, oval to ellipsoidal, 8-14 × 6-8 μm.

On the living leaves of *Setaria palnifolia* (Koen.) Stapf at Calvary Mount on January 8, 1982. BSI/ISV/72616.


Infection spots amphiphyllous, oval to irregular, small up to 2 mm in diameter; stroma loculate, locules 1-2 per stroma; perithecia bowl shaped, paraphysate, 79-90 × 135-225 μm; asci slightly stipitate, cylindrical, 40-70 × 6-10 μm; ascospores hyaline, uniseriate, rarely biseriate, ellipsoidal, slightly sigmoid with acute ends, 10-16 × 4-6 μm.

On the living leaves of *Cytroccum patens* (L.) A. Camus at Tanikandam on January 7, 1982. BSI/ISV/71578.


On the living leaves of *Themeda triandra* Forsk. at Erretyar village on October 13, 1982. BSI/ISV/73652.

Parbery (1967) has pointed out the unusual nature of this fungus.

**Acknowledgements:** Thanks are due to Dr. N. C. Nair, Joint Director, Botanical Survey of India, Coimbatore for guidance; Dr. (Mrs.) Alka Pande, Scientist, M.A.C.S. Pune, for confirming the identity of the new species and for rendering Latin translation; C. N. Mohanan and P. V. Sreekumar, Research Associates, Botanical Survey of India, Coimbatore for their help in identifying the host plants and to the Department of Environment, New Delhi for financial assistance.

**References**


MISCELLANEOUS FUNGI FROM SOUTH INDIA

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ABSTRACT

The paper gives an account of 14 fungi collected from Karnataka, Kerala and Tamil Nadu. Of these, *Puccinia microspora* is a new record to India; *Oidium tamarindii*, *Phyllachora dendrocalami* and *Macrophoma crinicola* are the new records to South India; *Aecidium ocimi* is recorded for the first time from Karnataka, while *Meiioia holigarnae* recorded for the first time from Kerala. *Clematis gouriana* *Ocimum sanctum*, *Imperata cylindrica* and *Urochloa setigera* are the new host records to their pathogens.

During the course of a mycological study, the author collected 14 fungi from Karnataka, Kerala and Tamil Nadu. They are either unrecorded from these regions or recorded on new hosts. The distribution account of the pathogens is based on Bilgrami *et al.* (1979, 1981) and are arranged alphabetically under their respective groups.


   The abnoxious weed, *Parthenium hysterophorus* L., can be biologically controlled by using this pathogen.

   The pathogen is recorded for the first time from Tamil Nadu.


   The fungus is common in and around Coimbatore and observed in all seasons. So far, the pathogen was recorded as an unidentified species of *Oidium* from India and is recorded for the first time from South India.


   The pathogen is recorded for the first time from Kerala.


   Earlier, the pathogen was recorded from Ooty.

On the leaves of Syzygium cumini (L.) Skeels (MYRTACEAE), Silent Valley, March 6, 1984. A. Diraviadoss. BSI/JSV/80374.

Earlier, the pathogen was recorded from Wynad, Kerala.


The pathogen was recorded for the first time from South India.


Pyenia not seen. The pathogen is recorded for the first time from Karnataka and makes a new host record.


On the leaves of Zizyphus rugosa Lam. (RHAMNACEAE), Maruthamalai, Coimbatore, January 14, 1982. V.B. Hosagoudar, BSI/ISV/80392.

The pathogen collected only in the uredial stage and is recorded for the first time from Tamil Nadu.


Earlier, the pathogen was recorded from Tiruvannamalai and North Arcot district.

Two species of Masseeella have been recorded on this host viz. M. capparidis (Hobson) Diet and M. narashimhani Thirum. These two species were distinguished on microcyclic and eucyclic characters. Raghunathan and Ramakrishnan (1972) merged the latter species with the former, based on the telial characters.


Uredina hypophyllous, cinnamon brown, paraphysate. Paraphyses few, pale brown, capitate, thicker at the apex. Urediospores oval to obovoidal, pale brown to cinnamon brown, 20-28 x 18-22 μm; wall minutely echinulate, 1.5-2 μm thick. Germ pores 2-4, equatorial or subequatorial. Telia black, hypophyllous, seriate, early exposed; teliospores cinnamon brown to deep brown, ellipsoidal, two celled, slightly constricted at the septum, 30-40 x 14-20 μm; wall deep brown, 1-2 μm thick at sides and up to 4 μm thick apically; pedicels hyaline to pale brown, small, persistent, up to 10 μm long.

On the leaves of Imperata cylindrica (L.) Raeuschel (GRAMINEAE), Pamba, Kerala. October 12, 1983. V. B. Hosagoudar BSI/ISV/78946.

The fungus is recorded for the first time from India and on a hitherto unrecorded host (see Cummins, 1972).


Earlier, the pathogen was recorded from Ooty and is recorded on a new host.


On the leaves of Urochloa setigera (Retz.) Stupf ( = Brachiaria setigera (Retz.) C. E. Hubb.) (Gramineae). BSI Campus, Coimbatore. May 22, 1983. V. B. Hosagoudar. BSI/ISV/80394.

The fungus was severely parasitized by Eudarluca caricis (Fr.) O. Eriks. and inhabited the formation of the telia. The rust was perpetuated in the uredial stage only.

The pathogen is recorded for the first time from Tamil Nadu on a hitherto unrecorded host.


The fungus infects mostly the older leaves and causes severe leaf blight.

The fungus is recorded for the first time from South India.


The fungus causes black circular spots on the pods. However, the infection was superficial.

The fungus is recorded for the first time from Tamil Nadu.

ACKNOWLEDGEMENTS

Author is grateful to Dr N. C. Nair, Joint Director, Botanical Survey of India, Coimbatore for guidance; to Dr. J. N. Kapoor, Senior Mycologist, I. A. R. I., New Delhi for the suggestions on the paper and to the Department of Environment, New Delhi for the financial assistance.

REFERENCES


TELIOMYCETES OF SOUTH INDIA

V. B. HOSAGOUĐAR

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ABSTRACT: Seventeen species of Teliomycetes are recorded from Idukki, Kerala. Of these 14 are first records for Kerala, 10 new host records to their pathogens from India while Kudneola spondias is described as a new species.

Keywords: Teliomycetes, Uredinales, Ustilaginales

As a part of the work on the ecology of fungi in the Hydro-electric project area, the author has collected the following members of Teliomycetes in the last two years. Single asterisk before the name of the pathogen denotes that it is recorded for the first time from Kerala, while, two asterisks denote that it is not only a new record for Kerala but also forms a new host record from India.

   On the basis of the peduncles and pedicels of *Cyperus pengori* Roxb. at Panamkutty (Lower Periyar Hydel Project area) on December 18, 1982. BSI/ISV/75811.

2. **Tilletia themedicala** Mishra & Thirum. in Sydowia 7 : 82, 1953.
   In the enlarged ovaries of *Themeda triandra* Forssk. at Meenmutty on December 12, 1982. BSI/ISV/73693.

   On the living leaves of *Diospyros paniculata* Dalz. in the forests of Painavu and Kulamavu Road side on June 10, 1983. BSI/ISV/75053.

4. **Dasturella divina** (Syd.) Mundk. & Kheswalla in Mycologia 35 : 203, 1943.
   On the living leaves of *Ochlandra travancorica* (Bred.) Benth. ex Gamble at Idukki dam site on April 25, 1982. BSI/ISV/73783.

   On the living leaves of *Tokallia asiatica* (L.) Lamk. in the forests of Painavu and Kulamavu Road on June 10, 1983. BSI/ISV/75060.
   Telia not observed.

Received for publication November 17, 1983.
6. *Kuehneola spondias* Hosagoudar, sp. nov. (Fig. A—B)

Pycnia et aecia ignota. Uredinia folicoia, hypophylla, subepidermica, erumpenta, minuta, sparsa, brunneo; paraphyses uredinosporis intermixtae, cylindricae, capitatae, brunneoae ad basim saepe septatae, paraphyses perimetrices incurvatae; uredinosporae rotundae vel ovaes, luteobrunneae, 16-28 x 16-18 μm; peries cinamomeobrunneus, minuta echinulatus. Pori germinis obscui. Telia folicoia, hypophylla, subepidermica, erumpenta, minuta, sparsa, aureoluta; paraphyses marginales, rectae vel leviter curvatae, capitae, cylindricae, saepe septatae; teliospores catenis sporarum 3-5 for- mantibus, catanae nonramosis, dilutae, lateraliiter discreteae, etiam usque ad afflicionem basalem rampentes; teliospores dilutae, catenulatae, globosae, exgue angulosae, versus faciem unam aculeatae, cella basali tenaciter connatae, non separalibes, cella basalis in pedicella, 12-18 x 10-14 μm; paries subtilis, laevis, dilute brunneus, germinatione ex extremis aculeatis.

Figures : *Kuehneola spondias* sp. nov. A. Uredinium with peripheral incurved paraphyses. B. Telium with teliospores in columns.

Pycnia and aecia unknown. Uredinia folicoia, hypophyllous, subepidermal, erumpent, minute, sparse, brownish; paraphyses intermixed with uredinospores, cylindrical, capitate, brownish, often septate at the base, peripheral paraphyses incurved; uredinospores round to oval, yellowish brown, 16-28 x 16-28 μm; wall cinnamon brown, minutely echinulate. Germ pores obscure. Telia folicoia, hypophyllous, subepidermal, erumpent, minute, sparse, golden yellow; paraphyses marginal, straight or slightly curved, capitate, cylindrical, often septate; teliospores forming chains of 3-5 spores, chains unbranched, pale, free laterally, falling apart even upto the basal attachment; teliospores pale, catenulate, spherical, slightly angular, pointed towards one side, each joined firmly to the basal cell, not separable, basal cell on the pedicel, 12-18 x 10-14 μm; wall thin, smooth, light brown, germinate through pointed end.

**Holotype :** On the living leaves of *Spondias pinanata* (L.f.) Kurz. (Anacardiaceae) at Kanchipur forest on December 15, 1982; V.B. Hosagoudar. Deposited at Botanical Survey of India (MH) under BS/ISV/75805.

**Isotype :** Osmania University Hyderabad R1HOU No. 502/C.

Telial columns arise in the uredinia and retain the uredinal paraphyses. However, paraphyses were not observed in the matured telia. Teliospores germinate *in situ* and form a white mycelial net on the telia.
Pelcli (1912) described *Uredo spondiadis* on *Spondias mangifera* Willd [= *S. pinnata* (L.f.) Kurz]. Sydow and Butler (Saccardo, 1925) reported *Kuehneola aliena* on the same host from Chittagong, Bangla Desh. Recently Chavan (1975) reported the uredinal state of *K. aliena* Syd. & Butl. from Ratnagiri and Malvan, Maharashtra, on the same host. The present fungus differs from *K. aliena* Syd. & Butl. in presence of the basally septate uredinial paraphyses, shorter telial columns with lesser number of teliospores which germinate through the pointed ends. Hence it is described here as a new species.

7. **Puccinia arthraxonis-ciliaris** Cumm. in *Uredineana* 4 : 16, 1953.


On the living leaves of *Ryncheleytrum repens* (Willd.) C.E. Hubb. at Errytiar Village on December 13, 1982. BSI/ISV/73654.


On the living leaves of *Spodiopogon rhizophorus* (Steud.) Pilger in the forests of Kanchiār on December 17, 1982. BSI/ISV/75789.

Kerala is the type locality for this fungus.


On the living leaves of *Capillipedium huegelli* (Hack) Stapf in the forests of Kanchiār on December 14, 1982. BSI/ISV/73659.


On the living leaves of *Chasalia opioxyloides* (Wall.) Craib in the forests along Painavu-Kulamavu Road on February 20, 1983. BSI/ISV/75865.


On the living leaves of *Ophiórrhiza mangos* L. in the forests along Painavu-Kulamavu Road on February 2, 1983. BSI/ISV/75849.


On the living leaves of *Dalbergia latifolia* Roxb. in the forests along Painavu-Kulamavu Road on February 20, 1983. BSI/ISV/75867.
The fungus collected in the uredial stage. It differs from *Uredo sissi* Syd. in the absence of paraphyses. The morphology and measurements of the urediniospores match well with *Uromyces aelrous* Syd.

   On the living leaves and leaf sheaths of *Themeda triandra* Forssk at Meenmutty on February 2, 1983. BSI/ISV/75874.

   On the living leaves of *Crataeria retusa* L. at Calvary Mount on December 12, 1982. BSI/ISV/73634.

17. *U. pianhyensis* P. Henn. in Hedwigia 47 : 266, 1908.
   On the living leaves of *Wedelia urticaefolia* DC. var *wrightii* DC. in Kanchiar forest on December 15, 1982. BSI/ISV/75783; Osmania University, Hyderabad RHOU 501/C.

Acknowledgements: Thanks are due to Dr. N. C. Nair, Joint Director, Botanical Survey of India, Coimbatore for guidance; Dr. P. Ramachar, Mycologist, Nizam College, Hyderabad for confirming the identity of the new species; Mr. K. Vivekananathan, Systematic Botanist, for identifying the hosts and Dr. V. J. Nair, Systematic Botanist, Botanical Survey of India, Coimbatore for rendering Latin translation; Department of Environment, New Delhi, for the financial aid.

References


AECIDIUM PAINAVUENSIS SP NOV FROM IDUKKI, KERALA, INDIA

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Botanical Survey of India, Southern Circle, Coimbatore 641 003, India.

During a survey and study of rust fungi in the forests of Idukki Hydroelectric Project area, the plant *Meliosma pinnata* (Roxb) Walp ssp *arnottiana* (Wight) Beus, was seen to be infected with a fungus. Infection was restricted to the growing tender shoots and a few leaves below the growing tip. Infected shoots were brick-red coloured and showed a typical symptom of witches' broom. The leaves immediately below the infected shoots showed hypertrophied lesions. Infection was not observed on old leaves. A little disturbance to the infected shoots released a cloud of spores into air and such infected plants could easily be detected by their appearance even from a distance. Microscopic study of this fungus revealed that it belongs to the form genus *Aecidium* Pers.

*Aecidium painavuensis* Hosagoudar, sp nov (figures 1–4)


**Figure 1.** Infected young tender shoot showing the symptom of witches' broom.
amphigenous, subcuticular, brown to black, applanate to conoid, hymenium flat, terminal paraphyses pale yellow to brown, 86–120 × 34–100 μm. Pycniospores round to oval, small, hyaline to pale yellow. Aecia folicolous, caulicolous, amphigenous, subepidermal, cupulate, innate, erumpent at maturity, 243–342 × 135–306 μm; peridium fragile, peridial cells catenulate, fusiform, hyaline to pale, 26–38 × 18–22 μm, wall verrucose, 3–9 μm thick. Aeciospores catenulate, irregular at maturity, oval, subellipsoidal to angular, pale yellow to cinnamon brown, 22–48 × 18–28 μm; wall verrucose, 2–4 μm thick at sides and 6–8 μm thick at apex.

Holotype: On the living leaves, petioles and tender shoots of Meliosma pinnata (Roxb) Walp ssp arnotiana (Wight) Beus, near Painavu, January 10, 1982, A. Diraviadoss, deposited in MACS, Pune, under AMH no. 6788.

Paratype: Deposited in the Botanical Survey of India, Southern Circle, Coimbatore under BSI/ISW 78937, 78978.

So far five species of Aecidium Pers have been recorded on Meliosma Bl namely A. hornowicum Cum, A. meliosmae-myrianthiae P. Henn, A. meliosmae-pungentis P. Henn and Shirai, A. meliosmae-wightiae Ramakr and Sund and A. wareorense Cum. Of these, A. meliosmae-myrianthiae P. Henn and A. meliosmae-wightiae Ramakr and Sund have been recorded from India. The former causes leaf spots while the latter causes woody galls. The present species differs from all the reported species on Meliosma in producing a characteristic symptom of witches' broom. Hence, it is proposed here a new species.

The species is named after its collection locality.

Thanks are due to Dr V. S. Raju of Kakatiya University, Warangal, for identifying the host plant and to the Department of Environment, New Delhi for financial assistance.

20 May 1986

A NEW "TAR SPOT" DISEASE ON APORUSA LINDLEYANA (WIGHT) BAILL. FROM IDUKKI, KERALA, INDIA

V.B. Hosagoudar

Botanical Survey of India, Southern Circle, Coimbatore-641 003

During the course of the mycological survey in Idukki district, Kerala, the author came across the plants of Aporusa lindleyana (Wight) Baill. (Euphorbiaceae) infected with tar spot disease. The microscopic examination of the fungus revealed that it is different from rest of the Phyllachora spp. reported on members of the family Euphorbiaceae. Hence it is described here as a new species.

Phyllachora shettyi Hosagoudar, sp. nov.

Maculae infectionis foliicolas, amphigenae plerumque epiphyllae, dispersae vel raro confluentes, ad 2 mm diametro. Stromata amphigena, plerumque epiphylla, nigra, rotunda, elevata, usque ad 2 mm diametro, raro confluentia, clypeata, nitida, usque uniloculata. Perithecia ovata, bow shaped to lanceolate, 371-386 x 185-215 μm; asci numerosi, cylindrical, 8-spored, stipitate 70-74 x 12-15.5 μm; ascospores globose, ovate to fusiform, hyaline, uniseriate to biseriate 15-18.6 x 9.3-12.5 μm.

Holotype: On leaves of Aporusa lindleyana (Wight) Baill. (Euphorbiaceae), in the forest along the road from Painavu to Kulamavu, December 12, 1982, V.B. Hosagoudar deposited in Botanical Survey of India Southern Circle, Coimbatore under BSI1SY75707.

So far 27 species and varieties of the genus Phyllachora have been reported on various members of the family Euphorbiaceae (Parbery, 1978). Of these, only five species are known from India (Bilgrami et al. 1978; 1979; Kamat, et al. 1978). However, the present species differs from the rest in the infection pattern, morphology of the asci and ascospores. Further, there is no report on the genus Phyllachora on the host genus Aporusa. Hence, it warrants to place it in a new species.
Fig. 1. Infected host leaf

Fig. 2. T.S. through stroma showing perithecium and asci.

Fig. 3. Ascus

Fig. 4. Ascospores.
The species is named in honour of Shri B.V. Shetty for his notable contribution to the angiosperm family Vitaceae.

ACKNOWLEDGEMENTS

Thanks are due to Dr. V.J. Nair, Scientist B, for Latin diagnosis, to Dr. K. Ramamurthy, Scientist B, Botanical Survey of India, Southern Circle, Coimbatore for identifying the host plant.

REFERENCES


Phyllachora prataprajii sp. nov. from Kerala

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Coimbatore 641003

Phyllachora prataprajii Hosagoudar, sp. nov.

Maculae foliicolae, amphigenae, orbiculare, 4-6 mm in diametro. Stromata foliicola, amphigena, rotunda, concentrica, nigra, nitida, elevata, clypeata, ad 0.5 mm diametro, separatae vel coalescentae; perithecia 1-2 per stroma, cupulata, 231-280 x 132-165 μm. Asci cylindrici, stipitati, unitunicati, octospori, 76-82.5 x 8-10 μm; paraphysatae, paraphyses filiformis. Ascosporae hyalinae, obovatae vel piriformae, uniseriatae, oblique dispositum, irregulariter ad maturitatem, 10-13 x 3.5-8 μm.

Infection spots foliicolous, amphiphyllous, orbicular, 4-6 mm in diameter. Stromata foliicolous, amphiphyllous, round, concentric, black, shining, slightly raised, clypeate, up to 0.5 mm in diameter, separate to coalescent; perithecia 1-2 per stroma, cupulate, 231-280 x 132-165 μm. Asci cylindrical, stipitate, unitunicate, octosporous, 76-82.5 x 8-10 μm; paraphysate, paraphyses filiformis. Ascospores hyaline, obovate to pyriform, uniseriate, obliquely arranged, irregular at maturity, 10-13 x 3.5-8 μm.

Holotype: On the leaves of Xanthophyllum flavescens Roxb. (Xanthophyllaceae), in the forest along the road from Painavu to Kulamavu, February 20, 1983, C. N. Mohanan, deposited in Maharashtra Association for the Cultivation of Science, Pune under AMH. No. 6789.

The host Xanthophyllum was earlier placed under the family Polygalaceae. On Monnina (Polygalaceae), two species of the genus Phyllachora have been recorded viz.

A. T. S. through stroma  B. Ascus  C. Ascospores
P. monninae Syd.3 and P. aequatoriensis Theiss. & Syd. (P. dendritica Rehm)4. The present species is distinct from the above species in having obovate to pyriform ascospores. There is no record of the genus *Phyllachora* on the host *Xanthophyllum*1 and the host genus *Monnina* is not reported from India2. Hence, it is proposed here as a new species.

The species is named in honour of my teacher Dr. Pratapraj B. Chavan, who introduced me to the field of Mycology.

Thanks are due to Shri B. V. Shetty, Scientist D, Botanical Survey of India, Southern Circle, Coimbatore for generously providing the duplicate material from Madras Herbarium for the present study.

---

**Evaluation of rice cultures against bacterial leaf blight and sheath blight diseases**

R. Bener Raj, Tayaba Wahab, G. Venkata Rao, A. Sudhakara Rao and T. C. Venkata Reddy

Agricultural Research Institute, A. P. Agricultural University, Hyderabad 500 030

Bacterial leaf blight, *Xanthomonas campestris* pv. *oryzae* (Ishiyama) Dye, is known to cause severe yield losses in high yielding varieties. In recent years, sheath blight, *Rhizoctonia solani* Khun, has become more prevalent causing up to 25 per cent losses in yield4. In the absence of any chemical for controlling the bacterial leaf blight4 and high cost involved in controlling the sheath blight1, evaluation and identification of resistant cultures assumes greater importance. Since 1974, over 2,500 rice cultures for bacterial leaf blight and over 1,500 cultures (since 1978) for sheath blight were evaluated from the breeding programme at Agricultural Research Institute, Rajendranagar during kharif seasons till 1983. For bacterial leaf blight, the rice cultures were artificially inoculated with a virulent isolate by leaf clipping method at tillering stage4. The disease incidence was assessed after three weeks of inoculation. For sheath blight disease, the cultures were artificially inoculated in the leaf sheaths1. For both the diseases T (N) 1 was used as a susceptible check. The incidence was recorded as per 0–9 scale (SES) for both the diseases2.
MISCELLANEOUS FUNGI FROM SOUTH INDIA—III

V. B. HOSAGOUĐAR

Botanical Survey of India, S. Circle, Coimbatore - 641003 (T. N.)

During the mycological studies in three states of Southern India, author has collected several pathogenic micro fungi. Of them, the following fungi are either hitherto unreported from those states or form new host records. This is the third report on the South Indian fungi (Hosagoudar, 1985; Hosagoudar & Nair, 1987).

The author is grateful to Dr. N. P. Balakrishnan, Deputy Director and Dr. A. N. Henry, Scientist 'C', Botanical Survey of India, Southern Circle, Coimbatore for their encouragement; to the Curator, A. M. H., M. A. C. S. Pune and Dr. U. Braun, Germany for confirming the identity of some fungal species.

REFERENCES


Received for Publication September 26, 1987.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Fungi</th>
<th>Host</th>
<th>Localities</th>
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<tbody>
<tr>
<td>1</td>
<td>Aecidium criri Kalch</td>
<td>Chlorella tuberosum</td>
<td>Muskambavi, Kurnool Dist (A.P.)</td>
</tr>
<tr>
<td>2</td>
<td>Aecidium sp.</td>
<td>Catunaregam spinosa (Thunb.) Tiruvengadam</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cercospora aejecarii Syd.</td>
<td>Jacotpha heynei Balkr.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Dasturella divina (Syd.) Mundk. &amp; Kesh.</td>
<td>Dendrocalamus strictus Nees</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Graphiola phoenicis Poiteau</td>
<td>Phoenix tourerii Kunth</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Mazzarella echinulata (Raben.) Ono</td>
<td>Medhuka longifolia (Koning) Mac.</td>
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<tr>
<td>7</td>
<td>Mescasesella capparicis (Hobson) Diet.</td>
<td>Fluggera leucophrus Willd.</td>
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<tr>
<td>8</td>
<td>Micronectia agharkarit Ananth.</td>
<td>Syzygium cumini (L.) Skeels</td>
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<tr>
<td>9</td>
<td>Myxomyphallage congesta (Berk &amp;Br.) Souton</td>
<td>Syzygium cumini (L.) Skeels</td>
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<tr>
<td>10</td>
<td>Oidium cassiae-siamii Yen</td>
<td>Cassia fistula L.</td>
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<td>11</td>
<td>O. ipomoeae (Yen &amp; Wang) Braun</td>
<td>Ipomoea nil (L.) Roth</td>
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<tr>
<td>12</td>
<td>O. caesalpiniaeceum Hosagoudar &amp; Braun</td>
<td>Bauhinia sp.</td>
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<tr>
<td>13</td>
<td>O peltophori (Yen) Boesew.</td>
<td>Peltophorum pterocarpaceum (DC.) Backer ex Heyne</td>
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<td>14</td>
<td>Oidium sp.</td>
<td>Dolichos sp</td>
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<td>15</td>
<td>Ophiophila lagerstroemiae Hosagoudar &amp; Nair</td>
<td>Lagerstroemia parviflora Roxb.</td>
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<tr>
<td>16</td>
<td>Phylactore phalii Sharma &amp; Agarwal</td>
<td>Bauhinia phalii Wight &amp; Arn.</td>
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<tr>
<td>17</td>
<td>P glycosidica Petch</td>
<td>Glycosmum murinum L.</td>
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<tr>
<td>18</td>
<td>P. tugonla Theisars. &amp; Syd.</td>
<td>Hugonia myrtex L</td>
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<td>19</td>
<td>P. infectoria cooke</td>
<td>Ficus infectorum Roxb.</td>
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<tr>
<td>20</td>
<td>P. pongamiae (Berk. &amp; Br.) Petch</td>
<td>Pongamia pinata Vent.</td>
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<tr>
<td>21</td>
<td>Puccinia dutiae Ell. &amp; Tracy</td>
<td>Bothriochloa bladhii (Retz.) S. T. Blake</td>
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<tr>
<td>22</td>
<td>P heterospora Berk. &amp; Curt.</td>
<td>Abutilon crispum G Don</td>
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<tr>
<td>23</td>
<td>Revenelii hobsonii Cooke</td>
<td>Pongamia pinata Vent.</td>
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<tr>
<td>24</td>
<td>Septoria aejecarit Cooke</td>
<td>Ficus benghalensis L.</td>
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UREDINALES OF KERALA

V.B. Hosagoudar

Botanical Survey of India, Southern Circle, Coimbatore - 641 003

ABSTRACT

The present paper deals with the list of Uredinales so far reported from Kerala State. The list gives an account of 93 species distributed among 22 genera of rust fungi.

During a study of pathogenic micro fungi in the forest of Idukki Hydro-electric Project area, author has collected good number of pathogenic micro fungi. Of those, the members of Uredinales are prominent. Along with the author’s collections, the present paper deals with the detailed list of Uredinales so far reported from Kerala State. Author’s collections have been deposited in Botanical Survey of India, Southern Circle, Coimbatore and have been designated as BSI/ISV. While the rest have been compiled from Bilgrami, et al. (1971, 81) and Rangaswami et al. (1972).


In the galls formed on the peduncles and stems of Elaeocarpus tuberculatus Roxb., A Diraviadoss HCIO 3610, RHoward 504/C. V.B. Hosagoudar BSI/ISV/75013, 75051, 79024.


On the leaves of Oldenlandia nitida (Wight & Arn.) Gamble (=Hedyotis nitida Wight & Arn.) from Malabar.


On the leaves of Merremia viitifolia (Burm.) Hall. f., Meenmutty forest, V.B. Hosagoudar BSI/ISV/71508, 72674.


On the leaves of Meliosma simplicifolia (Roxb.) Walp. ssp. simplicifolia Beus, in the forest along the road from Painavu to Kulanavu, Idukki, V. B. Hosagoudar BSI/ISV/73710. On the leaves of Meliosma simplicifolia (Roxb.) Walp from Wynad.

Aecidium painavuensis Hosagoudar (in ed)

On the young tender shoots and leaves of Meliosma pinata (Roxb.) Walp. ssp. ornottiana (Wight) Beus, near Painavu, A. Diraviadoss BSI/ISV/72665, 78937, 78978; AMH no. 6788


On the leaves of Paratnigna monophylla Wight from Wynad.


On the leaves of Diospyros paniculatus Dalz. in the forest along the road from Painavu to Kulanavu, V. B. Hosagoudar BSI/ISV/75053. On the leaves of D. malabaricus Kosterm., Pamba, V.B. Hosagoudar BSI/ISV/78949, 79046.

On the leaves of Coffea travancorenstis Wight & Arn. from Kottayam.

Aecidiuni sp.

On the leaves of Asystasia sp., lake side of Calvary Mount, V. B. Hosagoudar BS1/ISV/79063.

Aecidiuni sp.

On the leaves of Tylophora asthmatica Wight from Kottayam.


On the tender shoots of Cinnamomum malabatrum (Burm.f.) Blume, Calvary Mount, V.S. Raju BS1/ISV/75654, KHOU No. 505/C. On the tender shoots of Persea macrantha L., Calvary Mount, V.B. Hosagoudar BS1/ISV/79049.

Both the hosts were growing nearby in the small forest patch of Calvary Mount. The latter host showed the similarity in the symptoms and in the morphology of the pathogen. This pathogen appears to be an endemic to the Calvary Mount range.


On the leaves of Morus alba L., Vazha-thope, V.B. Hosagoudar BS1/ISV/79026.

Telia not observed.

Colesporium campanulæ (Strau·s) Tul. in Cummins and Hiratsuka, Illustrated genera of rust fungi, p. 39, 1983.

On the leaves of Wahlenbergia erecta (Roemer & Schultes) Tuyn (=Cephalostigma schimperi Hochst. ex Rich.) from Wynnaad.


On the leaves of Clematis sp. from Wynnaad.

Dasturella divina (Syd.) Mundk. & Keshwal, Mycologia 35: 360, 1909.

On the leaves of Ochlandra travancorica (Bedd.) Benth. ex Gamble, Idukki dam site, V.B. Hosagoudar BS1/ISV/73783. On the leaves of Randia brandisii Gamble from Valayar.

Petch (1912) described Uredo ochlandrae on Ochlandra striulata Thw. from Peradeniya, Ceylon. However, the present collection showed only telia and has been tentatively placed under Dasturella divina (Syd.) Mundk & Keshwal.


On the leaves of Toddalia asiatica (L.) Lamk., in the forest along the road from Painavu to Kulamavu, V.B. Hosagoudar BS1/ISV/75060.

Hosagoudar (1985) erroneously mentioned this species as Didymopsora macrocarpa (Mund. & Thirum.) Thirum.


On the leaves of Heliotropium indicum L. from Wynnaad.

Hamaspora longissima (Theum.) Korn., Hedwigia 16: 23, 1877.

On the leaves of Rubus ellipticus Sm. and R. niveus Thunb. Rajamala Hills, V.B. Hosagoudar BS1/ISV/80303, 80304, 80307.

On the leaves of Holarrhena antidysenterica Wall. from Walayar.


On the leaves of Pavetta tomentosa Roxb. from Puthupalli, Kottayam.


On the leaves and fruits of Coffea arabica L. and C. robusta Willd., Churuly Coffee Estate, Idukki, V. B. Hosagoudar BSI/ISV/72633.

This rust is very common on coffee plantations throughout Kerala.


On the leaves of Wrightia tinctoria R. Br. Cheruthoni, V. B. Hosagoudar BSI/ISV/73787.

Kuehnela spondiadis Hosagoudar, Indian Phytopath. 38: 279, 1985. (Publ. as Spondias)

On the leaves of Spondias pinuata (L. f.) Kurz, Kanchiar forest, V. B. Hosagoudar BSI/ISV/75805.

Kulkarniella indica Gokhale & Patil, Indian Phytopath. 4: 171, 1951.

On the leaves of Pavetta indica L., along the road from Painavu to Kalamavu, V. B. Hosagoudar BSI/ISV/71509.

Cummins & Hiratsuka (1983) have merged this genus with Monosporidium. This rust is very common in Kerala.

Maravalia echinulata (Raben.) Ono, Mycologia 76: 904, 1984.


On the leaves of Madhuca longifolia (Koenig) Macbride, Vazhathope, V. B. Hosagoudar BSI/ISV/71553, 79016.


On the leaves of Pterocarpus marsupium Roxb. and Dalbergia puniculata Roxb. from Walayar.


On the leaves of Securinega viridis (Willd.) Bail, along the road from Painavu to Kulamavu, V. B. Hosagoudar BSI/ISV/75046.


On the leave of Stereospermum personatum (Hassk.) Chatterjee (= S. tetragonum A. DC.) from Malabar. On the leaves of S. suaveolens DC. from Walayar.


On the leaves of Tectona grandis L. from Walayar.

Phakopsora spoda (Har. & Pat.) Mains, Mycologia 30: 45, 1939.

On the leaves of Pennisetum polystachyon T. Schult., Vazhathope, V. B. Hosagoudar BSI/ISV/71553.
Hosagoudar


On the leaves of Glochidion velutinum Wight, in the Savanna along the road from Painavu, to Kulamavu, V. B. Hosagoudar BSI/ISV/75030, 78999.

Cummins & Hiratsuka (1983) have made the genus Stakmania Kamat & Sathe synonymous to Phukupsora Diet. P. incompleta (Syd.) Cummins, Mycologia 42 : 786, 1950.


On the leaves and stems of Cyperus cyperoides Wight, in the Savanna along the road from Painavu to Kulamavu, V. B. Hosagoudar BSI/ISV/75040. On the leaves of Cyperus iria L., near Erattyar tunnel, Idukki, V. B. Hosagoudar BSI/ISV/73648.


On the leaves of Curculigo mulbarica Wight, Calvary Mount, Idukki, V. B. Hosagoudar BSI/ISV/75158.

Only Uredenia were present. P. deodikari Nair, Curr. Sci. 41: 575, 1972.


On the leaves of Stula cordato (Burm.) Borss., along the road from Painavu to Kulam-
avu, Idukki, V. B. Hosagoudar BSI/ISV/73788.

On the leaves of *Launaea nudicaulis* Less. from Wynaad.


On the leaves of *Saccharum spontaneum* L., Panamkutty, Idukki, V.B. Hosagoudar BSI/ISV/73676, 75005, 79005.


On the leaves of *Peristrophe montana* Nees, Kanchiar forest, Idukki, V.B. Hosagoudar BSI/ISV/73663. On the leaves of *Justicia betonica* L. from Wynaad.


On the leaves of *Rynchelyttrum repens* (Willd.) C.E. Hubb., Erattyar village, Idukki. V.B. Hosagoudar BSI/ISV/73654.


On the leaves of *Imperata cylindrica* (L.) Rausschet, Gavi, Pamba, V.B. Hosagoudar BSI/ISV/78936.

P. nakanishiki Diet., Englers Bot, Jahrb. 34: 585, 1905.

On the leaves of *Cymbopogon nudus* Rendle ( = *Andropogon nudus* L.) from Palghat.


On the leaves of *Coix lacyrma-jobi* L. from Wynaad.

P. operculinae Ramkr., T.S. Sundaram, Indian Phytopath. 5: 111, 1952.

On the leaves of *Operculina turpethum* (L.) S. Manso from Walayar.


On the leaves of *Ottochloa nodosa* (Kunth) Dandy from Wynaad.


On the leaves of *Spodiopogon rhizophorus* (Steu.) Pilger, (= *S. albidus* (Wall.) Benth.) Kanchiar forest, Idukki, V.B. Hosagoudar BSI/ISV/75789; and also from Vayiiri, Malabar.

Kerala is the type locality for this species.

P. phragmitis (Schum.) Koern. in Ramakrishnan, T.S. and Sundaram, Indian Phytopath. 5: 112, 1952.

On the leaves of *Rumex* sp. from Walayar.


On the leaves of *Smilax zeylanica* L. from Wynaad.

P. purpureae Cooke, Greville 5: 15, 1876.

On the leaves of *Sorghum bicolor* (L.) Moench. (= *S. vulgare* L.), Erattyar tunnel, V.B. Hosagoudar BSI/ISV/73657.


On the leaves of *Cupillipedinium huegelli* (Huck.) A. Camus, Kanchiar forest, Idukki, V.B. Hosagoudar BSI/ISV/73659.

P. rufipes Diet. in Sundaram, Indian Phytopath. 9: 133, 1956.

On the leaves of *Imperata* sp. from Walayar.

On the leaves of *Asystasia dalzelliana* Sant., along the road from Painavu to Kulamavu, Idukki, V. B. Hosagoudar BSI/ISV/78128.

P. solmsii P. Henn. in Saccardo, Syll. Fung. 14: 357, 1899.

On the leaves of *Polygonum chinense* L. Vazhatope, V. B. Hosagoudar BSI/ISV/71544.


On the leaves of *Justicia gendarussa* L. from Wynnaad.


On the leaves of *Vernonia monosis* Benth. ex Clarke, Calvary Mount, V. B. Hosagoudar BSI/ISV/73751.


On the leaves of *Heteropogon contortus* (L.) P. Beauv. Meenmutty, V. B. Hosagoudar BSI/ISV/72670.


On the leaves of *Zingiber officinale* Roscoe from Thodupuzha.


On the leaves of *Breynia retusa* (Dennst.) Alston, Panorama View point, Idukki, V. B. Hosagoudar BSI/ISV/73610, 73620.


On the leaves of *Albizia procera* (Roxb.) Benth. from Walayar.


On the leaves of *Phyllanthus emblica* L. (=*Emblica officinalis* Gaertn.) Calvary Mount V. B. Hosagoudar BSI/ISV/79055.


On the leaves of *Acacia polycantha* Willd. (=*A. sumo* (Roxb.) Ham. ex Voigt) from Walayar.


On the leaves of *Acacia ferruginea* DC. from Walayar.


On the leaves of *Kiranalia reticulata* (Poir.) Baill., Panamkutty, V. B. Hosagoudar BSI/ISV/80315.


On the leaves of *Abras pulchellus* Thw. from Walayar.

Rajendran (1970) has segregated the genus *Ravenelia* Berk. and placed some of the *Ravenelia* Berk species occurring on Euphorbiaceous hosts under a new genus *Kernkmpella* Rajendran. However, the present author has placed all the species under an old genus *Ravenelia* Berk.


On the leaves and shoots of *Cinnamomum zeylanicum* L. from Vandiperiyar.

On the leaves of *Chasalia ophioxyloides* (Wall.) Craib., in the forest along the road from Painavu to Kulamavu, Idukki, V. B. Hosagoudar BSI/ISV/75865.


On the leaves of *Dalbergia latifolia* Roxb. in the forest along the road from Painavu to Kulamavu, Idukki, V. B. Hosagoudar BSI/ISV 75867; AMH no. 6787.


On the leaves of *Hygrophila quadralvalvis* L. from Kerala.


On the leaves of *Fuirena umbellata* Rottb. from Wynaad and on the leaves of *Fuirena* sp. from Tellicherry.


On the leaves of *Bidelia retusa* Spr, from Walayar.


On the leaves of *Ophiorrhiza mungos* L., in the forest along the road from Painavu to Kulamavu, Idukki, V. B. Hosagoudar BSI/ISV/75849.


On the leaves of *Pterocarpus marsupium* Roxb. from Kottayam.


On the leaves of *Tephrosia purpurea* (L.) Pers., Lakshmi Estate, Idukki, V. B. Hosagoudar BSI/ISV/79080 and also from Pattambi, Malabar.


On the leaves of *Terminalia paniculata* Roth from Walayar.


On the leaves of *Bidens pilosa* L. from Wynaad.

U. *eligyi* Pat. & Har. *J. Bot.* 14 : 237, 1900


On the leaves of *Themeda triandra* Forssk, Meenumutty, V. B. Hosagoudar BSI/ISV/75874.


On the leaves of *Commelina benghalensis* L., on the way to Panamkutty, V. B. Hosagoudar BSI/ISV/73674. On the leaves of *Cyanotis papilionaceae* Schult. f., along the road from Painavu to Kulamavu. V. B. Hosagoudar BSI/ISV/78905.


On the leaves of *Crotalaria retusa* L. Calvary Mount, V. B. Hosagoudar BSI/ISV/73634.
On the leaves of *Apluda tmutica* L. var. *aristata* (L.) Hack. ex Back. (= *Apluda aristata* L.) from Wynaad.

On the leaves of *Panicum repens* L., Vazhathope, Idukki, V. B. Hosagoudar BSI/ISV/73796.

On the leaves of *Mucuna* sp. from Vayitri, Wynaad.

On the leaves of *Wedelia urticaifolia* DC. var. *wightii* DC., Kanchiari forest Idukki, V. B. Hosagoudar BSI/ISV/75783.

On the leaves of *Cymbopogon Schoenanthus* L.) Spreng. (= *Andropogon schoenanthus* L.) from Wynaad.

On the leaves of *Setaria italica* L.) P. Beauv. from Wynaad.

On the leaves of *Bauhinia acuminata* L., from Paighat.

On the leaves of *Olea dioica* Roxb., Vazhathope, V. B. Hosagoudar BSI/ISV/71552.

ACKNOWLEDGEMENTS

Thanks are due to Dr. N.C. Nair, ex-Joint Director, and Shri B.V. Shetty, Scientist D, Botanical Survey of India, Southern Circle, Coimbatore for their encouragement.

REFERENCES


A new species of Olivea Arth. from India

by

V.B. Hosagoudar

Botanical Survey of India, Southern Circle, Coimbatore 641003 (TN), India

With 2 figures

During a survey of the pathogenic microfungi in the Western Ghats region of Tamil Nadu, plants of Isonandra lanceolata Wight var. anfractuosa Cl. (Sapotaceae) showed yellow spots on the lower surface of the leaves and the corresponding upper surface of the leaf turned yellow. Initially the pustules on the lower surface of the yellow leaf spots were brick-red coloured, gregarious but at maturity, the spots were covered with a yellow coloured powdery spore mass. A little disturbance to the infected plant parts released a cloud of spores in the air. Microscopic examination of these infected plant parts revealed the presence of the rust fungus belong to an undescribed species of the genus Olivea Arth.

Olivea isonandræ Hosagoudar sp. nov.


Holotype: On living leaves of Isonandra lanceolata Wight var. anfractuosa Cl. (Sapotaceae), Pudukadu (Lower Sheikalmudy), Valparai (T.N.), India, January 17, 1987, V.B. Hosagoudar, deposited in Ibaraki University, Japan. Isotypes: Botanical Survey of India, Southern Circle, Coimbatore, India under MH 82676; IMI 329754.
The monographic work of Ono & Hennen (1983) given an account of seven species of the genus *Olivea* Arth, infecting members of the family Euphorbiaceae, Labiatae and Verbenaceae. Of these, *O. colebrookiana* Thirum. & Yadav and *O. tectonae* (Ramakr. & Ramakr.) Mulder have been reported from India. However, there is no report of the genus *Olivea* on any members of the family Sapotaceae and also the micro-cyclic nature of the present rust warrants to place it under new species.
Acknowledgements

The author is grateful to Dr. Yoshitaka Ono, Ibaraki University, Japan for confirming the identity of the rust fungus and also for providing photomicrographs. Thanks are also due to Mr. K. Vivekananthan, Scientist B, Botanical Survey of India, Southern Circle, Coimbatore for identifying the host plant.

References

THE GENUS *PHYLLACHORA* NKE. IN FCKL. IN KERALA STATE

V.B. HOSAGOU Dar

Botanical Survey of India, Southern Circle, Coimbatore-641 003

As a part of the Ecological Impact Study in the Idukki Hydro-electric Project Area, for the past four years author has collected a good number of pathogenic micro fungi (Hosagoudar, 1985). The present paper deals with a concise list of *Phyllachora* species reported from Kerala State. Author’s collections have been designated as BSI/ISV and deposited in the Botanical Survey of India, Southern Circle, Coimbatore, while, HClO deposition numbers are mere compilation (Kamat, et al. 1978) to give a complete list of the *Phyllachora* species reported from Kerala State.


On the leaves of *Syzygium cumini* (L.) Skeels (= *Eugenia jambolana* Lam.), Lakshmi Estate, Idukki, V.B. Hosagoudar BSI/ISV/75084.


On the leaves of *Syzygium cumini* (L.) Skeels (= *Eugenia jambolana* Lam.), Kanouth, Malabar, E.J. Butler HCIO 1246.


On the leaves of *Bauhinia malabarica* Roxb., reservoir side of Calvary Mount, Idukki, V.B. Hosagoudar BSI/ISV/79064.


On the leaves of *Bischofia javanica* Bl., Panora, Wynaad, W. McRae HCIO 1293.

**P. catervaria** (Berk.) Sacc., Syll. Fung. 2 : 598, 1883.

On the leaves of *Ficus hispida* L., Calvary Mount, Idukki, V.B. Hosagoudar BSI/ISV/72617. On the leaves of *Ficus* sp. Wynaad, W. McRae HCIO 4196.

**P. coicis** P. Hienn., Hedwigia 36 : 12, 1895.

On the leaves of *Coix aquatica* Roxb., in the savanna along the road from Painavu to Kulamavu, Idukki, V.B. Hosagoudar BSI/ISV/78909. On the leaves of *Coix lacrymaina-jobi* L., Wynaad, E.J. Butler HCIO 1262. On the leaves of *Coix* sp. Wynaad, W. McRae HCIO 4199.


Hosagoudar


On the leaves of Cynodon dactylon (L.) Pers., Calvary Mount, Idukki. And Pamba V.B. Hosagoudar BSI/ISV/78919, 79060. Also reported from Wynaad.


P. dalbergiae Niessl, Hedwigia 20: 97, 1881.

On the leaves of Delbergia latifolia Roxb., in the forest along the road from Painavu to Kulamavu, Idukki, V.B. Hosagoudar BSI/ISV/75048. On the leaves of Dimeria sp., Wynand, W. McRae HCIO 1288.


On the leaves of Lablab purpureus (L.) Sweet (= Dolichos lablab L.), Wynand, P.K. Ramchandran HCIO 20575.


On the leaves of Ehretia conarouensis Miq., in the forest along the road from Painavu to Kulamavu, Idukki, V.B. Hosagoudar BSI/ISV/78960; AMH no. 6791.


On the leaves of Elettaria cardamomum (L.) Maton, Calvary Mount, V.B. Hosagoudar BSI/ISV/75780, 73618.

P. elyonuri Doidge, Bothalia 4: 424, 1942.

On the leaves of Dimeria sp., Lakshmi Estate, Idukki, V.B. Hosagoudar BSI/ISV/79077.


On the leaves of Chionachne koenigii (Spreng.) Thw., Kanchiar forest, Idukki, V.B. Hosagoudar BSI/ISV/75606, 80348. On the leaves of Chrysopogon sp., Rajamala hills, V.B. Hosagoudar BSI/ISV/80310.


On the leaves of Ficus gibbosa Bl., Calvary Mount, Idukki, V.B. Hosagoudar BSI/ISV/79011. In the forest along the road from Painavu to Kulamavu, A. Diraviadoss BSI/ISV/79011.


On the leaves of Gordonia obtusa Wall., Kanchiar forest, Idukki, V.B. Hosagoudar BSI/ISV/75796; AMH 5164.


P. infectoria Cooke, Grevillea 13: 63, 1885.

On the leaves of Ficus infectoria Roxb., Churuly, V.B. Hosagoudar BSI/ISV/75790; Panamkutty, A. Diraviadoss BSI/ISV/82608; Malabar, W. McRae HCIO 4169.

On the leaves of Ixora elongata Don, in the forest along the road from Painavu to Kulamavu, Idukki, A. Diraviadoss BSI/ISV/82615.

On the leaves of Bambusa sp., Wynnaad, E.J. Butler HCIO U70.

On the leaves of Artocarpus heterophyllus Lam., in the forest along the road from Painavu to Kulamavu, Idukki, A. Diraviadoss BSI/ISV/82604.

On the leaves of Ficus drupacea Thunb. var. pubescens (Roth)Comer (= F. mysoresensis Heyne var. pubescens Roth), Wynnaad, E.J. Butler HCIO 1280.

On the leaves of Millettia rubiginosa Wight & Arn., in the forest near Kulamavu, Idukki, V.B. Hosagoudar BSI/ISV/78992, AMH 5279.

P. minuta P. Henn. in Soccardo, Syll. Fung. 17 : 832, 1913.
On the leaves of Hibiscus tiliaceus L., Alwaye, T.S. Ramakrishnan HCIO 22655.

On the leaves of Arundinella mesophylla Nees, Painavu, V.B. Hosagoudar BSI/ISV/72655.

P. paspalicula P. Henn., Hedwigia 48 : 106, 1908.
On the leaves of Digitaria longiflora (Retz.) Pers., in the savanna along the road from Painavu, Idukki, V.B. Hosagoudar BSI/ISV/72655. On the leaves of Isachne bourneorum C.E.C. Fischer, Pamba, V.B. Hosagoudar BSI/ISV/78920; Rajamala hills, V.B. Hosagoudar BSI/ISV/80309.

On the leaves of Anthistiria sp., Wynnaad, W. McRae HCIO 1253.

On the leaves of Pongamia pinnata (L.) Pierre (= P. glabra Vent.), Pananukutty, V.B. Hosagoudar BSI/ISV/80336, 75099; South Mulabar, E.J. Butler HCIO 4274.

P. prataparajii Hosagoudar (in ed.)
On the leaves of Xanthophyllum flavescens
Phyllachora sp.

On the leaves of *Borassus flabellifer* L., Palghat, V.B. Hosagoudar BSI/ISV/79000.

ACKNOWLEDGEMENTS

Thanks are due to Sri C.N. Mohanan and Shri P.V. Sreekumar, Research Associates, Botanical Survey of India, Southern Circle, Coimbatore for their help in the identification of host plants and to the Department of Environment, Govt. of India for financial help.

REFERENCES


A NEW OIDIUM SPECIES FROM COIMBATORE, INDIA

Sesbania grandiflora (L.) Poir. of Fabaceae is extensively cultivated in the backyards of Coimbatore for its use as a green vegetable. For the past two years, a particular powdery mildew fungus was noticed on these plants. To study the fungus in detail, these plants were planted on December 15, 1987 and were kept under continuous observations. The infection started appearing only after the plants attained the age of one month. The severity of infection was during the month of February, 1988. The infection was mostly restricted to the upper surface of the lower leaves with less infection on the young leaves. Severely infected leaves turned yellow and resulted in defoliation. Such plants were easily noticed even from a distance with yellow-coloured lower leaves covered with a mass of white patches. However, by the end of March, 1988 the plants were almost free from the disease. The disappearance of the disease may be due to the decrease in humidity in the air. Throughout the observations, the fungus persisted in its anamorph stage only. This disease has been reported on the same host from Sri Lanka, Thailand and Vietnam but the fungus was indicated as Oidium sp. with a specific name. Since the fungus persists only in its anamorph stage, it is necessary to propose a name. Hence the fungus is described here as a new species.

Oidium fabacearum, Hosagoudar, sp. nov.
Plagulae infectionis foliicolae, epiphyllae, albae, densae, ad 4 mm diam., confluentis. Hyphae mycelii effusae, albae, septatae, 3.5 μm latae. Appressoria moderatim lobata. Conidiophora erecta cellulis (1-) 2(-3) sequentibus, 25-50 x 5-9.5 μm; fundus pedis rectus, plurumque curvatus vel anfractus. Conidia solitaria, ellipsoido-ovoidae vel doliformio-cylindracea, 25-45 x 12-19 μm.

Infection spots foliicolous, epiphyllous, white, dense, up to 4 mm in diameter, confluent. Mycelium effuse, white, septate, 3.5 μm broad. Appressoria moderately lobed. Conidiophores erect, followed by (1-) 2(-3) short cells, 25-50 x 5-9.5 μm; basal portion
of the foot cells straight, mostly curved to flexuous. Conidia solitary, ellipsoid-ovoid to doliiform-cylindrical, 25-45 x 12-19 µm.

Oidium fabacearum sp. nov.


Holotype: On leaves of Sesbania grandiflora (L.) Poir. (Fabaceae), Pudur, Coimbatore, Tamil Nadu, Feb. 15, 1988, V. B. Hosagoudar HAL, Germany. Isotype deposited in the Botanical Survey of India, Southern Circle, Coimbatore under MH 82700.

Braun (1987) reported Erysiphe communis and E. pisi on the host genus Sesbania. However, the distinctly curved to flexuous basal portion of the foot cells of the conidiophores distinguishes the present species from the anamorph stages of the above said species and hence it warrants to place it under a new species.

ACKNOWLEDGEMENTS

The author is grateful to Dr. U. Braun, Germany for his valuable suggestions and to Dr. N. P. Balakrishnan, Deputy Director, Botanical Survey of India, Coimbatore for encouragements.

V. B. Hosagoudar

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The Euphorbiaceae plant, *Croton bonplandianum* Baill., grows as a weed along the roads and in wastelands in and around Coimbatore. These plants are infected with a powdery mildew fungus. The infection is restricted to the lower surface of the leaves but a few infection spots are also observed on the upper surface of the leaves. The fungus persists in its conidial form. Ponnappa (1979) has described *Kokkala crotonis* on this host from Bangalore, Karnataka. After the examination of the type material, Braun (1984) made the genus *Kokkala* Ponnappa synonymous to *Sphaerotheca* Lev. because of the presence of conidia in chains and also the presence of appendages. Further, Braun (1987) states that the original description of the taxon is insufficient, misleading and the anamorph description in mystery. Since the present fungus is in its anamorph stage, it is necessary to propose a name. Hence, it is described here as a new species.

**Oidium bonplandiani** Hosagoudar, *sp. nov.*

Plagulae infectionis foliicolae, plerumque hypophyllae, albae, densae, ad 2 mm diam., plerumque confluentis. Hyphae mycelii effusae, albae, ramosae, septatae, 6-8 μm latae. Appressoria mammilliformis. Conidiophorae erectae, simplices, 139-233 × 15-18.5 μm. Fundus pedis rectae, cylindraceae, 46-74.5 × 12-14 μm. Conidia catenulatae (6-10), ovoidae vel ellipsoidae, 24-40.5 × 15-17 μm.

Infection spats foliicolous, mostly hypophyllous, white, dense, up to 2 mm in diameter, mostly confluent. Hyphae effuse, white, branched, septate, 6-8 μm in breadth. Appressoria mammilliform. Conidiophores erect, simple, 139-233 × 15-18.5 μm (including conidia). Foot cells straight, cylindrical, 46-74.5 × 12-14 μm. Conidia in chains of 6-10, ovoid to ellipsoid, 24-40.5 × 15-17 μm.

**Holotype**: On leaves of *Croton bonplandianum*. 

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** OIDUM BONPLANDIANI—A NEW SPECIES OF POWDERY MILDEW FROM COIMBATORE, INDIA**
Based on Braun's (1987) opinion the fungus was collected frequently and studied in its fresh condition.

ACKNOWLEDGEMENT

The author is grateful to Dr. N. P. Balakrishnan, Deputy Director, Botanical Survey of India, Coimbatore for encouragement.

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An account of eight powdery mildews is presented. Of these, *Oidium malachrae* and *O. rosacearum* are new species, while, the conidial state of *Erysiphe glycines* Tai var. *glycines* is reported for the first time from India and rest of the species are reported on hitherto unrecorded hosts.

   var. *glycines*

   On leaves of *Pisum sativum* L. (Fabaceae), in experimental fields of Tamil Nadu Agric. Univ., Coimbatore, Jan. 8, 1989, V.B. Hosagoudar HAL, Germany.

   Only conidial state was reported. This species is very close to the *Oidium* state of *E. pisi* DC. but differs from it in having flexuous foot cells of the conidiophores. This species was reported on *Glycine* sp. from China (Braun, 1987). Paul & Kapoor (1984) described *E. desmodii* on *Desmodium* sp. from Punjab but Braun (Lc.) made it synonymous to *E. glycines* Tai var. *glycines*.

   This species is reported here on a hitherto unrecorded host.

2. *Oidium malachrae* V.B. Hosagoudar et D. Stephen, sp. nov.


   Holotype: On leaves of *Malachra capitata* L. (Malvaceae), near Ramanathapuram paddy fields, Coimbatore, Tamil Nadu, January 15, 1989, D. Stephen HAL, Germany.

   *Brassiliomyces malachrae* (Seaver) Boesewinkel is the only powdery mildew fungus reported on this host from Puerto Rico but the conidial state is unknown in this genus (Braun, 1987). Presence of the fibrosin bodies in Eu-oidium type of conidia is the characteristic feature of the genus *Sphaerotheca*. However, the present species differs from *S. hibiscicola* Zhao reported on *Hibiscus mutabilis* from China in having epiphyllous colonies, oval and smaller conidia. It also differs from all the known *Oidium* species reported on the members of Malvaceae (Braun, 1987). Hence it is proposed here as a new species.


   On leaves of *Abutilon indicum* (L.) Sweet and *Sida acuta* Burm.f. (Malvaceae), Coimbatore, Feb. 10, 1989, V.B. Hosagoudar HAL, Germany.

   Both the hosts form new host records.

On leaves of *Phyllanthus amarus* Schum. & Thonn. (Euphorbiaceae), B.S.I. Garden, Coimbatore, Jan. 21, 1989, V.B. Hosagoudar HAL, Germany.

Narayanaswamy and Ramakrishnan (1967) described *O. phyllathi* from Coimbatore on *Phyllanthus naruri* L.

5. *Oidium rosacearum* V.B. Hosagoudar et S. Manian, sp. nov.


Infection restricted to the lower surface of the young and tender leaves. Colonies hypophyllous, scattered to confluent. Hyphae branched, septate, cells 4-8 μm wide. Appressoria mammeliform. Conidiophores straight, erect, 150-232.5 μm long. Foot cells straight to flexuous at the base, cylindrical, 51-124 × 12-15 μm, followed by 1-2 shorter cells. Conidia in chains of 4-10, oval to ellipsoidal, 24-31 × 18.5-22 μm.


Severe infection results in the death of the infected parts. *Oidium rosea-indicae* Sawada is the only *Oidium* species known on *Rosa indica* L. from Formosa, Taiwan (Braun, 1987; Sawada, 1933). The present species is distinct in having Eu-oidium type (conidia in chains) of conidia, longer foot cells and conidiophores.


On leaves of *Stachytarpheta jamaicensis* (L.) Vahl (Verbenaceae), Anamalai, Coimbatore, Jan. 22, 1989, V.B. Hosagoudar HAL, Germany.

7. *Oidium sp.*

On leaves of *Tephrosia* sp. (Fabaceae), Anamalai, Coimbatore, Jan. 22, 1989, V.B. Hosagoudar HAL, Germany.


On leaves of *Lepidagathis* sp. (Acanthaceae), Siruvani, Coimbatore, Jan. 10, 1989, D. Stephen HAL, Germany.

Acknowledgements

The author is grateful to Dr. U. Braun, Germany for confirming the identity of the pathogens and to Dr. N.P. Balakrishnan, Deputy Director, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

References


A. Oidium mutachrae V.B. Ilagoudar et D. Stephen, sp. nov.

B. Oidium rosacearum V.B. Ilagoudar et S. Massan, sp. nov.
THE IDENTITY AND NOMENCLATURE OF *DOTHIDEA MICROCENTA* BERKELEY & BROOME

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**Abstract**

The identity and nomenclature of *Dothidea microcenta* Berkeley & Broome described from Sri Lanka are discussed. It is concluded that, as per the prevailing view, it represents two taxa, namely, *Phyllachora microcenta* (Berkeley & Broome) Saccardo var. *microcenta* and *Phyllachora microcenta* var. *graphica* (Theissen & H. Sydow) Kamat et al.

**Keywords:** *Dothidea microcenta*; Ascomycetes; identity; nomenclature.

Berkeley and Broome (1875) described *Dothidea microcenta* on the leaves of a species of *Artocarpus* from Sri Lanka. Saccardo (1883) transferred it to the genus *Phyllachora*. When Theissen and H. Sydow (1915) re-examined the type material of *Dothidea microcenta* at Kew, they found it as a mixture from two different hosts, namely, *Artocarpus* sp. and *Ficus mysorensis*. Consequently, they transferred *Dothidea microcenta* Berkeley & Broome proper, parasitic on *Artocarpus* sp., to the genus *Catacauma* and accommodated the undescribed taxon parasitic on *Ficus mysorensis* as *C. microcentum* (Berkeley & Broome) Theissen & H. Sydow var. *graphica* Theissen & H. Sydow. Based on this view and ignoring Saccardo’s (1883) combination, Kamat et al. (1978) have made a new combination of it with the basionym, *C. microcentum* (Berkeley & Broome) Theissen & H. Sydow as *Phyllachora microcenta* (Berkeley & Broome) Theissen & H. Sydow var. *graphica* (Theissen & H. Sydow) Kamat et al. Since the genus *Catacauma* Theissen & H. Sydow is now merged in the genus *Phyllachora* Nitschke by von Arx and Mueller (1954) and Eriksson and Hawksworth (1986), the correct names of these two taxa involved are:


On leaves of *Artocarpus* sp. from Sri Lanka.


On leaves of *Ficus mysorensis* from Mysore.
ACKNOWLEDGEMENT

The author is grateful to Dr. A.N. Henry, Scientist SI, Botanical Survey of India, Southern Circle, Coimbatore for his valuable suggestions.

REFERENCES


Oidium nyctaginacearum sp. nov. from Coimbatore

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Keywords: Oidium nyctaginacearum sp. nov., Powdery mildew

During the survey of the powdery mildew fungi in Coimbatore, the plants, Mirabilis jalapa L. (Nyctaginaceae) extensively cultivated in gardens for their showy flowers were found infected with powdery mildew. The infection was restricted to leaves. Microscopic examination of the fungus revealed that it is Pseudoidium type of the genus Oidium. Further, the review of literature revealed that it is hitherto undescribed species and hence the note.

Oidium nyctaginacearum Hosagoudar, sp. nov.


Colonies amphigenous, mostly apiphyllous, dense, confluent. Hyphae flexuous, branched, septate, 3-5 μm wide. Appressoria nipple-shaped. Conidiophores straight,
erect, 74-118 × 9-12.5 μm. Foot cells straight to slightly flexuous, cylindrical, 15-37 × 9-11 μm, followed by 1-2 shorter or longer cells. Conidia formed singly (pseudoidium type), oval to ellipsoidal, rarely doliform, 38-45.5 × 15-22 μm, oil globules present.


Braun (1) stated that Pseudoidium type are mostly with lobed appressoria but Oidium indigoferae Yen and O. peltophori (Yen) Boesewinkel are the exceptions having nipple-shaped appressoria. The present species is also of Pseudoidium type with nipple-shaped appressoria. Hirata (2) has reported Oidium sp. and Erysiphe communis on Mirabilis. Braun (1) brought several forms of Erysiphe communis under an excluded and doubtful species. Hence, there is no report of any recognized species of powdery mildew on any members of the family Nyctaginaceae (1). Hence, it is described here as a new species.

The author is grateful to Dr. N. P. Balakrishnan, Deputy Director, Botanical Survey of India, Coimbatore, for his valuable suggestions.


Received for publication January 18, 1989.

Gonapodya terrestris sp. nov.

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Keywords: Zoosporic fungus, Gonapodya sp., Terrestrial phycomycete, Eugenia jambolana

A terrestrial, saprophytic species of phycomycetes, termed Gonapodya terrestris sp. nov., which combines the basal cell character of Blastocladiad and lomentaceous hyphae of Gonapodya prolifera (Cornu) Fischer has been described on decaying leaves of Eugenia jambolana.

Leaves of E. jambolana L. were collected from the moist soil under the tree in 1950 at the Botanical Garden of the Botany Department, Lucknow University, Lucknow. The samples were packed in a tube and sealed with wax. The sealed tube was opened in 1990 and the material was found in fairly good condition for investigations. The detailed description of the fungus is given below.

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†Deceased
Some powdery mildews from Tamil Nadu, India

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An account is given of 13 anamorphs of powdery mildews. Oidium abutili, O. kydiae, O. moringae and O. passifloracearum are new species; O. abelmoschi, O. azadarnachae, O. cilioriae, Sphaerotheca crotonis are described and illustrated in detail; Oidium bixaef and O. cassinii-hirsutae are reported for the first time from India; Erysiphe sikkimensis and Sphaerotheca balsaminae are reported for the first time from southern India. The new name Oidium ramakrishnae is proposed based on O. phylianthi and a neotype is chosen.

Keywords: Ascomycetes, powdery mildews, anamorphs

Narayanaswamy & Ramakrishnan (1971) reported several powdery mildews from Coimbatore. These, however, were not studied in detail and they assembled morphologically similar species from taxonomically unrelated hosts (Braun, 1987). The anamorphs of some of those species have been found by the present author and studied in detail along with other less well-known and hitherto undescribed species.

1. Erysiphe sikkimensis Chona, Kapoor & Gill. – Indian Phytopathol. 13: 72, 1960. – Plate 1, Fig. 1.

Anamorph: Oidium

Colonies amphigenous, mostly epiphyllous, dense, white, later becoming dusty white, confluent. – Hyphae straight to crooked, branched, septate, 4–8 µm wide. – Appressoria simple, mammelliform. – Conidiophores straight, erect, simple, 62–90 µm long; foot cells straight to flexuous, 25–53 x 6–9.3 µm, followed by 1–2 shorter or equal cells. – Conidia borne singly, ovoid, ellipsoidal to doliform, 28–37 x 15–18.5 µm.

Material examined. – On leaves of Quercus sp. (P. d. d.), Tamil Nadu, Udhagumandalam, Nilgiris, Govt. botanic garden, 25.11.1989, V.B. Hosagoudar CEOL 30352.

Chona & al. (1960) reported this species from the Himalayas and it is reported here for the first time from Southern India.

**2. Oidium abelmoschi** Thunb. *Grevillea* 6: 102, 1877. 78. Plate 1, Fig. 2.


Colonies amphigenous, mostly epiphyllous, dense, confluent. – Hyphae branched, septate, 12–15.5 μm wide. – Appressoria nipple-shaped. – Conidiophores straight, erect,
52-155 x 12-15.5 μm; foot cells cylindrical, straight, 18-37 x 12-
15.5 μm, followed by 1-2 shorter cells. - Conidia in chains of 2-5,
ovoid to ellipsoidal, 27-37 x 12-15.5 μm.

Material examined. - On leaves, stems and petioles of *Abelmoschus
esculentus* (L.) Moench (Malvaceae), Tamil Nadu, Coimbatore, P.N. Pudur, 15.1.1988,
V.B. Hosacoudal HCIO 46599.

3. *Oidium abutili* V.B. Hosacoudar, sp. nov. - Plate 1, Fig. 3.

Plugulae epiphyllae, dense, confluentes. Hyphae ramosae, septatae, 4-8 μm
crassae. - Appressoria mammella-formia. Conidiophora recta, erecta, 77-90 μm longa,
cellula basalis recta vel curvata, 27-43.5 x 9-12.5 μm, cellula subsequens breviar.
Conidia solitaria, cylindrico-ellipsoidal, 27-33 x 12-15.5 μm.

Colonies epiphyllous, dense, confluent. - Hyphae branched,
septate, 4-8 μm wide. - Appressoria mammelliform. - Conidiophores straight, erect, 77-90 μm long; foot cells straight to curved,
27-43.5 x 9-12.5 μm, followed by 1-2 shorter cells. - Conidia
formed singly, cylindric-ellipsoidal, 27-33 x 12-15.5 μm.

Material examined. - On leaves of *Abutilon ramosum* (Cav.) Guel. & Perk.
(Malvaceae), Tamil Nadu, Nilgiris, Sri Madurai, 24.1.1990, V.B. Hosacoudal HCIO
30345 (Holotype).

*Oidium abutili* differs from *O. pavoniae* Bagyanarayana & Braun
in having dense epiphyllous colonies, smaller foot cells, and smaller
and cylindric-ellipsoidal conidia.

4. *Oidium azadirachtae* Narayanaswamy & K. Ramakrishnan. -
Madras Univ. J. 37-38: 90, 1971. - Plate 1, Fig. 4.

Colonies amphigenous, mostly epiphyllous, dense, confluent.
Hyphae septate, branched, 4-8 μm wide. - Appressoria nipple-
shaped. - Conidiophores mostly curved, 68-93 μm long; foot cells
straight, curved to flexuous, 28-56 x 6-9.5 μm, followed by 0-2
smaller cells. - Conidia formed singly, ovoid, ellipsoidal to cylindrical,
24-34 x 12-15.5 μm, germinating to produce a bulbous haustorium.

Material examined. - On leaves, stems and petioles of *Azadirachta indica*
A. Juss. (Malvaceae), Tamil Nadu, Coimbatore, in the garden of Botanical Survey of

5. *Oidium bixae* Viegas. - Bragantia 4: 19, 1944. - Plate 1, Fig. 5.


Infection restricted mostly to the younger leaves. Severe infection
causd crumpling of leaves. - Colonies amphigenous, dense,
1-4 mm in diameter, confluent. - Hyphae branched, septate, 4-
8 μm wide. - Appressoria nipple-shaped. - Conidiophores straight, erect, simple, 30-48 μm long; foot cells straight, cylindrical, 18-28 x 6-8 μm, followed by 1-2 shorter cells. - Conidia formed singly, ovoid to doliform, 21-29 x 10-17 μm.

Material examined. - On leaves of *Bixa orellana* L. (Bixaceae), Tamil Nadu, Nilgiris, Thunepalli, 29.1.1996, V.B. Hosagoudar HCIO 30346.

The host is a native plant of America and has been introduced to India due to its economic importance as a source of dye. Along with the plant, *Oidium bixae* also appears to be introduced to India. This fungus was reported from South America, Africa and Taiwan by Braun (1987) but is reported here for the first time from India (Bilgrami & al. 1979, 1981).

6. *Oidium cassiae-hirsutae* Yen, Rev. Mycol. 31: 284, 1966. - Plate 1, Fig. 6.

Colonies hypophyllous, dense, scattered, rarely confluent. - Hyphae branched, septate, 6-9.5 μm wide. - Appressoria mam-melliform. - Conidiophores straight, erect, 90-110 μm long; foot cells straight, cylindrical, 37-46.5 x 9-12.5 μm. - Conidia in chains of 2-6, ovoid to doliiform, 27.34 x 15-18.5 μm.


The present collection differs slightly from typical representatives of the species in having strictly hypophyllous colonies and conidiophores with flexuous foot cells.


Colonies amphigenous, often following the veins, confluent. - Hyphae branched, septate, 4-8 μm wide. - Appressoria nipple-shaped. - Conidiophores straight, erect, 52-80.5 μm long; foot cells straight, cylindrical, 30-40.5 x 5-6.5 μm, followed by 1-2 shorter cells. - Conidia formed singly, ovoid to ellipsoidal, 34-43.5 x 12-15.5 μm. - Germination by production of a long, bulbous haustorium.

Material examined. - On leaves, stems and petioles of *Clitoria ternatea* L. (Fabaceae), Tamil Nadu, Coimbatore, in the garden of Botanical Survey of India, 19.1.1987, V.B. Hosagoudar HCIO 40604.

8. *Oidium kydiae* V.B. Hosagoudar, sp. nov. - Plate 2, Fig. 8.

Plagulic epiphyllae, densae, dispersae, confluentes. Hyphae rectae vel flexuose, septatae, ramosae. 6-8 μm crassae. Appressoria lobata. Conidiophora simplicia,

Colonies epiphyllous, dense, scattered, confluent. Hyphae straight to flexuous, branched, septate, 6-8 μm wide. Appressoria lobed. Conidiophores simple, straight, erect, 68-77.5 μm long; foot cells straight, cylindrical, 24-37 x 6-8 μm, followed by a shorter cell. Conidia borne singly, ovoid to doliiform, 24-37.5 x 15-13.5 μm.

Material examined. On leaves of Kydia calycina Roxb. (Malvaceae) Tamil Nadu, Nilgiris, Sri Madurai, 28.1.1990, V.B. Hosakumar HCTO 80247 (Holotype).
Oidium kydiae is similar to O. schmiedeknechtii Braun, reported on Urena lobata H. from Taiwan but differs in having dense epiphyllous colonies and ovoid to doliform conidia.

9. Oidium moringae V.B. Hosagoudar, sp. nov. – Plate 2, Fig. 9.

Plagulae epiphyllae, densae, raro confluentes. Hyphae rectae, ramosae, septatae, 6–8 μm crassae. Appressoria lobata. Conidiophora recta, erecta, 52–84 μm longa; cellula basalis recta, cylindracea, 15–53 μm longa, 6–9.5 μm lata, cellulae subsequentes breviores. Conidia solitaria, ovoidea vel ellipsoidae, 30–37 × 12–15.5 μm.

Colonies epiphyllous, dense, rarely confluent. – Hyphae straight, branched, septate, 6–8 μm wide. – Appressoria lobed. – Conidiophores straight, erect, 52–84 μm long; basal cells straight, 15–53 μm long, 6–9.5 μm wide, followed by 1–2 shorter cells. – Conidia formed singly, ovoid to ellipsoidal, 30–37 × 12–15.5 μm.


Hihata (1966) has merely mentioned Oidium species on this host genus from Israel and Braun (1987) did not name them either.

10. Oidium passifloracearum V.B. Hosagoudar, sp. nov. – Plate 2, Fig. 10.


Colonies epiphyllous, thin to dense, confluent. – Hyphae straight, branched, septate, 4–8 μm wide. – Appressoria mammilliform, lobed. – Conidiophores straight, erect, up to 80 μm long; basal cells straight to flexuose, 45–55 × 8–12 μm, followed by 1–2 smaller cells. – Conidia in chains of 2–4, ovoid to ellipsoidal, 30–60 × 10–15 μm.


Leveillula taurica (Lev.) Arnaud and Ovulariopsis passiflorae Sydow are the only two species previously reported on this host genus. Oidium passifloracearum differs from the former species in having ovoid conidia, and from the latter species by its conidiophores and epiphyllous infection spots which are not uncoloured. Hihata (1966) has reported an unidentified Oidium species
on Tuscania from South America. Tuscania is not present in India and the two collections are unlikely to be conspecific.

11. *Oidium ramakrishnanii* V.B. Hosagoudar, nom. nov. - Plate 2, Fig. 11.


Colonies amphigenous, caulicolous, covering the entire aerial parts of the host and rarely causing hypertrophy. - Hyphae branched, septate, cells 4–6 μm wide. - Appressoria nipple-shaped. - Conidiophores straight, erect, 62–103.5 μm long; foot cells straight to flexuous, 31–34 x 4–6.5 μm. - Conidia in chains of 2–6, ovoid to cylindrical, guttulate, 15–18.5 x 7–12.5 μm.

Material examined. - On leaves, stems and petioles of *Phyllanthus amarus* Scroph. (Euphorbiaceae), Tamil Nadu, Coimbatore, in the garden of the Botanical Survey of India, 9.19.1988, V.B. Hosagoudar HCIO 30373 (Neotype)

Narayanaswamy & Ramakrishnan (1971) and Yen (1967) have both published the name *Oidium phyllanthi* for collections on *Phyllanthus* spp. Although they are homonyms, the collections are taxonomically different. The Indian collection differs from *O. phyllanthi* Yen in having smaller conidiophores, foot cells and conidia with guttules. The type material of *O. phyllanthi* Narayanaswamy & K. Ramakrishnan is not available in the Tamil Nadu Agricultural University Herbarium. Hence, a collection from the type locality has been designated as a neotype.

This species is named in honour of late Prof. K. Ramakrishnan for his notable contributions to mycology.


Anamorph: *Oidium*

Colonies amphigenous, dense, confluent. - Hyphae branched, septate, 4–6 μm wide. - Appressoria nipple-shaped, elongated. - Conidiophores erect, simple, 114–155 μm long; foot cells straight to slightly curved, 18–49.5 x 10–12.5 μm. - Conidia in chains of 4–6, ellipsoidal to doliiform, 31–34(-56) x 12–18.5 μm.


The anamorph of this species has been reported from Nagapur, Maharashtra (Bilgrami et al., 1979; 1981). This is the first record from southern India on a new host species.


**Anamorph: Oidium**

Colonies foliicolous, mostly hypophyllous, dense, confluent. - Hyphae septate, branched, 6-8 μm wide. - Appressoria mammelliform. - Conidiophores straight, erect, simple, 139-233 μm long; foot cells straight, cylindrical, 46-74.5 x 12-14 μm. - Conidia in chains of 6-10, ovoid to ellipsoidal, 20 - 40.5 x 15-18 μm.

**Material examined.** On leaves of *Crotalaria longiflora* H.B.K. (Bignoniaceae), Tamil Nadu, Coimbatore, P.N. Pathur, 8.8.1911, V.ii. Hosahannur HC104902.

Ponnappa (1970) described *Kokkalera crotonis* on this host from Bangalore, Karnataka. After examination of the type, Braun (1984) synonymized *Kokkalera Ponnappa* with *Sphaerotheca Lev.* because of the catenate conidia and perithecial appendages. Braun (1987) stated that the original description of this taxon is insufficient and misleading.

**Acknowledgments**

I am grateful to Dr. N.P. Balakrishnan and Dr. A.N. Hosay (Coimbatore, India) for their help.

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New species of *Balansia* and *Ophiodothella* from southern India

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**Abstract:** Two new species, *Balansia carecis* on *Carex filicina* and *Ophiodothella calami* on *Calamus pseudotenuis* have been illustrated and described from southern India.

**Keywords:** *Balansia carecis*, *Ophiodothella calami*, new species

During a survey of the foliicolous fungi in the Western Ghats of Tamil Nadu, *Carex filicina* Nees (Cyperaceae) in Seithur hills of Kamarajar district and *Calamus pseudotenuis* Beccari ex Beccari & Hook. f. (Arecaceae) in Anamalai hills of Coimbatore district were found infected with diseases. Critical microscopic examination of these fungi revealed that they are hitherto undescribed species of the genera *Balansia* Speg. and *Ophiodothella* (Henn.) Hoehnel respectively.

*Balansia carecis* Hosagoudar, sp. nov. (Fig. 1-4)

Maculae infectionis restringentis inflorescentiae, inflorescentia delicta veluti unus baccula et stromata posita in. Conidia non visa. Stromata sessilia, globosa, anthracina, subclevata, nitida, ad 3 mm diam., plerumque confluentes et pluriloculata. Perithecia ovata, innata, posita ad ambita, 257-315 × 114-172 µm, ostiolata, ostiola periphysata. Asci numerosi, cylindrici, elongati, stipitati, multispori, 139-233 × 3-5 µm, apicum rotundatus et hyalinus. Ascosporae numerosae, hyalinae, aciculariae, 62-72 µm longae et ad 1.5 µm creassae.

Infection restricted to inflorescence, entire inflorescence turned as single stick and stromata arranged on it. Conidium not seen. Stromata sessile, globose, carbonaceous black, raised, shining, up to 3 mm in diameter, frequently coalesced, multiloculate. Perithecia ovata, innate, arranged peripherally in the stromata, 257-315 × 114-172 µm, ostiolate, ostiole lined with periphyses. Asci numerous, cylindrical, elongated, stipitate, multisporous, 139-233 × 3-5 µm long, up to 1.5 µm wide.

**Holotype:** In the inflorescence of *Carex filicina* Nees (Cyperaceae), top of Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 12, 1992, V.B. Hosagoudar HCIO 40860.

Diehl (1950) in his monographic work on *Balansia* included two species, *Balansia cyperi* Edg. and *B. cyperacearum* (Berk. & Curt.) Diehl infected the members of Cyperaceae. The former species produces conidia and infects the culms with bases of involucral leaves and an undeveloped inflorescence. The latter species produces no...
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Fig. 1: Balansia carecis sp. nov.: infected and healthy inflorescences.

eonidia and infects the abaxial leaf surfaces or partially surrounding the culms at nodes. However, the present new species differs from both the species in having the infection restricted only to the inflorescence and smaller stromata. In the hill top of the Savanna with isolated evergreen plants, the population of Carex filicina Nees was luxuriant. About three-fourth of the population was found infected and the infected plants were very distinct from the healthy ones in their stunted growth of less than half to their normal size and with an incense candle like inflorescence.

Ophiodothella calami Hosagoudar, sp. nov. (Fig. 5-7)

Maculae infectionis folicolae, amphigenae. Stromata plerumque epiphylla, raro amphigena, nigra, subelevata, nitida, confluentes et linea formatus per venula et ad 20 mm longa vel a latere connota et adamus formata, cinctus luteus halonis, subepidermalia, raro patula epidermis inferiora, 1-5 loculata. Perithecia ampullacae, ovata vel globosa, ostiolata, 250-350 μm crassa, 170-200 μm alta. Asci numerosi, fusiformil, attenuati ad apicem, quadrispore, 80-100 × 7-9.5 μm. Ascospores hyalinae, perpendiculum positae in ascii, aciculariae, rectae vel leniter curvulue, non-septatae, rotundatae ad ambit apicem, 80-87 × 2-3 μm.

Infection spots folicolous, amphigenous, even on leaf sheaths. Stromata mostly epiphyllous, rarely amphigenous, black, raised, shining, confluent and form streaks along veins up to 20 mm long or join laterally so as to appear diamond shaped, surrounded by yellow halo, subepidermal, rarely extended up to the lower epidermis, 1-5 loculate. Perithecia flask shaped, ovate to globose, ostiolate, 250-350 μm broad, 170-200 μm high. Asci numerous, fusiform, taper towards apex, quadrispore, 80-100 × 7-9.5 μm. Ascospores hyaline, vertically arranged in the ascii, acicular, straight to slightly curved, non-septate, distal ends rounded, 80-87 × 2-3 μm.


After maturity, asci break open apically and part of the ascospores projected outside. So far 27 species of this genera are known and of which, Ophiodothella palmicola Batista & Peres reported on an unidentified Palm from Guyana (Hanlin et al. 1992). The present new species differs from it in having quadrispore ascii in contrast to octosporous, smaller ascii (80-100 × 7-9.5 μm against 200-240 × 10-13 μm) and
larger ascosporres (80-87 x 2-3 μm against 22-25 x 2-2.5 μm). Further, this is the second species of this genus from India (Bilgrami et al., 1979; Hosagoudar and Nair, 1985; Sarbhoy et al., 1986).

Acknowledgements

The author is thankful to Dr. N.P. Balakrishnan, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for the critical perusal of the manuscript; to Messrs. S.R. Srinivasan and P. Bhargavan, S.S.A. of the same organisation for association in the field collection tour and host identification, respectively. Author expresses his sincere gratitude to Scientists Pool Scheme of CSIR, New Delhi for the financial support.

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MISCELLANEOUS FUNGI FROM SOUTHERN INDIA

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ABSTRACT

The paper gives an account of five fungi collected from the Western Ghats of Tamil Nadu. Of these, *Phyllachora bambusae* (Sydow & Butler) Sydow & Butler var. *ochlandrae* is described as new variety; *Asperisporium caricae* (Speg.) Maubl. is reported for the first time from Tamil Nadu; *Phyllachora elattariae* (Ramkr. T.S. & K.) Kamat, Seshadri & Pande cause heavy damage to the cash crop. *Phyllachora viventis* (Cooke) Sacc. is reported on an endemic host and *Puccinia Purpurea* Cooke reported in its acecidine form.


Infection spots hypophyllous, carbonaceous black, up to 2 mm in diameter, rarely coalesced, corresponding upper surface of the infected spots turned necrotic and resulted in shot holes. Sporodochia hypophyllous, carbonaceous black, punctiform, pulvinate, up to 2 mm in diameter. Stroma subepidermal, up to 400 μm; conidiophores macronematous, mononematous, compact, straight to curved, usually simple, rarely branched, entire to septate, smooth, brown to pale brown, 27-46.5 X 5-8 μm; conidiogenous cells polyblastic, integrated, terminal, sympodial, cylindrical to clavate, cicatrized, scars permanent; conidia solitary, cry, acropleurogenous, ovoid, clavate to rarely cylindrical, pale brown to dark brown, 0-2 horizontally septate, 12-24 X 9-12.5 μm, wall smooth in young spores while verrucose at maturity.

On leaves of *Carica papaya* L. (Caricaceae), Erattiyar Estate, Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 12, 1992, V.B. Hosagoudar HCIO 40847.

This species was recorded from Brazil, Costa Rica, Cuba, Dominican Republic, Jamaica and Venezuela (Ellis, 1971). Ullasa et al. (1978) have reported it from Karnataka and is reported here for the first time from Tamil Nadu (Bilgrami et al. 1991).
2. *Phyllachora bambusae* (Sydow & Butler) Sydow & Butler var. *ochlandrae* var. nov. (Fig. 1-3).

Differt a var. *bambusae* ascorporis longioribus.

Stromata amphigenous, dark, raised, shining, oval to elongated, up to 2 mm in diameter, rarely coalesced, 1-3 loculate; locules oval to bowl shaped, 300-360 X 170-215 μm; asci many, long, cylindrical, stipitate, octosporous, 114-155 X 6-9.5 μm; ascospores biseriate, hyaline, ovate-acuminate, one end rounded and other end acuminate to sharply pointed, 43-46.5 X 3-5 μm.

Holotype: On leaves of *Ochlandra travancorica* Benth. ex Gamble (Poaceae), Top of Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 12, 1992, V.B. Hosagoudar HCIO 40898.

Sydow & Butler (1911) described *Metachora bambusae* on *Bambusa* species from Kanouth of Malabar, Kerala. Later, Sydow & Butler in Theissen & Sydow (1915) made a new combination of it as *Phyllachora bambusae*. Parbery (1967), in his Monograph, recognised this species and stated that clypeus over the older colonies cracks, ascospores distichous to tristichous. Kamat et al. (1978), in their Monograph, adapted the description of this species based on Ananthanarayanan (1964) and stated that the ascospores distichous, oblong to cylindrical. Both Kamat et al. (l.c.) and Parbery (l.c.) have given ascospore measurement as 18-32 μm long. In the present collection, older colonies never cracked but ascospores biseriate. The present collection is quite similar to the species type but the new variety differs from the var. *bambusae* in having longer ascospores.


*P. dalbergiae* Niessl., Hedwigia 20: 97, 1881.

On leaves of *Dalbergia acaciifolia* Dalz. (Fabaceae), Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 15, 1992, V.B. Hosagoudar HCIO 40897.

This species was known to infect *Dalbergia sympethetica*, *D. melanoxylon*, *D. paniculata* and *Dalbergia* sp. in Assam, Bihar, Karnataka, Kerala, Maharashtra and West Bengal. The present host
(endemic to T.N.) forms a new host record and the fungus is reported for the first time from Tamil Nadu.


On leaves of *Elattaria cardamomum* (L.) Maton (Zingiberaceae), Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 12, 1992, V.B. Hosagoudar HCIO 40896.

Necrotic spots formed around the black stromata, spots coalesced and caused the death of the entire leaf. All the leaves were infected except few younger ones. Apparently, Kamat *et al.* (1978) have stated the type collection was from Papanasam and has not been recorded from other states. However, Hosagoudar (1989) recorded it from Kerala and the present report is from the adjacent district in the Tamil Nadu. It appears that this species has been spread throughout the Western Ghats wherever the host is grown. If this disease is not controlled now, it may become a big menace to Cardamum plants in near future.

5. *Puccinia purpurea* Cooke, Grevillea 5: 15, 1876.

stat. *Aecidium*

On leaves of *Oxalis corniculata* L. (Oxalidaceae), Seithur hills, Kamarajar dist., Nov. 15, 1992, V.B. Hosagoudar HCIO 40895.

Cummins (1971) doubted its authenticity of being an alternate host for this rust. However, this host grows as a ground vegetation in Cardamum estate.

ACKNOWLEDGEMENTS

I am thankful to Dr. N.P. Balakrishnan, Joint Director (Retd.) and Mr. S.R. Srinivasan, Senior Scientific Assistant Botanical Survey of India, Southern Circle, Coimbatore for the critical perusal of the manuscript and association in the field collection tour respectively. I am grateful to Scientists' Pool Scheme of CSIR, New Delhi for the financial assistance.
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EXPLANATION TO FIGURES

Fig. 1-3. *Phyllachora bambusae* (Sydow & Butler) Sydow & Butler var. *ochlandrae* var. nov.

1. T.S. through the stroma
2. Ascus
3. Ascospores
A New Tar Spot Disease on *Millettia rubiginosa* Wight & Arn. from Idukki, Kerala, India

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DURING the course of the mycological survey in Idukki District, Kerala, one of the authors (V.B.H.) came across the plants of *Millettia rubiginosa* Wight & Arn. (Papilionaceae) infected with tar spot disease. The microscopic examination of the fungus revealed that it is different from *Phyllachora millettiae* P. Henn. recorded on *Millettia merrillii* Perk. from Rampage Stotsenberg (in Engl. Bot. Jahrb. 28: 326, 1900) in its morphology and measurements (Table 1). Moreover, the genus *Phyllachora* is hitherto unrecorded on this host genus from India (Bilgrami et al., 1979, 1981; Kamat et al., 1978). Hence, it is described here as a new species. *Phyllachora millettiae-rubiginosae* Hosagoudar et Pande, sp. nov. (Text-figs A-C).

Maculae infectionis foliicolae, luteobrunneae, dispersae, sejuncte, 5-10 mm diametro, sape confluentes et arca ampla oblongati. Stromata epiphylia, nigra, elevata, usque ad 1 mm diametro, confluentia, clypeata, nitida, 1-3 loculata. Perithecia ovata, clavata, 8-11 μm clavate, 36-58 × 10-14 μm clavate, 6-8 μm clavate, 8-11 μm clavate,

### Table 1 — A Comparative Account of the Present *Phyllachora* Species with *P. millettiae*

<table>
<thead>
<tr>
<th>Name of the fungus</th>
<th>Stromata</th>
<th>Perithecia</th>
<th>Ascii</th>
<th>Ascospores</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>P. millettiae</em></td>
<td>Amphigeneous</td>
<td>200-250</td>
<td>Clavate, 30-45 × 10-15 μm</td>
<td>Uniseriate to sub-biseriate, sub-fusiform, hyaline, guttulate, 8-11 × 5-7 μm</td>
</tr>
<tr>
<td><em>P. millettiae-rubiginosae</em></td>
<td>Epiphyllous</td>
<td>Ovate, 36-58 × 10-14 μm</td>
<td>Cylindric to irregular, oval, hyaline, 10-16 x 6-8 μm</td>
<td></td>
</tr>
</tbody>
</table>

1. Received April 5, 1984; revised June 15, 1984.
lanceolata vel crateriformia, 140-200 × 80-100 μm; asci numerosi, cylindrici ad late clavati, leviter stipitati, octospori, 36-58 × 10-14 μm; ascosporeas ovales, hyalinae, biseriatae vel irregulares, 10-16 × 6-8 μm.

Infection spots foliicolous, yellowish brown, scattered, isolated, 5-10 mm in diam., often confluent and covering larger area. Stromata epiphyllous, black, shining 1-3 loculate. Perithecia ovata, lanceolate or bowl shaped, 140-200×80-100 μm; asci numerosi, cylindrical to broadly clavate, slightly stipitate, octosporous, 36-58×10-14 μm; ascospores oval, hyaline, biseriate to irregular, 10-16×6-8 μm.

Holotype — On the living leaves of Millettia rubiginosa Wight & Arn. in the forest near Painavu, on December 12, 1983.


ACKNOWLEDGEMENTS

Authors are grateful to Dr N. C. Nair, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore, for encouragement and to Dr V. J. Nair, Systematic Botanist of the same organization for Latin translation. Senior author is thankful to the Department of Environment, New Delhi, for financial assistance.

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EXPLANATION OF TEXT-FIGS (A-C)

Figs A-C — Phyllachora millettiae-rubiginosae Hosagoudar et Pande sp. nov. A, Infected host; B, T.S. through stoma; and C, Ascus with ascospores.
TWO NEW SPECIES OF PHYLLACHORACEAE FROM IDUKKI, KERALA, INDIA

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ABSTRACT

Two new species viz, Ophiodolhella iagerstroemiae and Phylbuchora ehretiae have been described from Idukki, Kerala, India.

In the course of ecological impact study of the Idukki Hydro-Electric Project Area, the authors collected a large number of pathogenic ascomycetous fungi. Of these, two fungi of the genera Ophiodolhella and Phyllachora infecting Lagerstroemia and Ehretia respectively, were found to be new and are described here.

Ophiodolhella iagerstroemiae Hosagoudar et N.C. Nair, sp. nov.

Maculae folicolae, amphigenae, atrae, 8-14 mm diam., halonibus luteis cinctae. Stroma amphigenum, atrum, coraeinum, pagina superioriori foliorum clypeo crassiori et pagina inferioriori tenuiori, 8-10 mm in diam. Perithecia ovata vel sphaerica in quoque stromate 1-4, 198-270 x 133-234 μm, ostiolata; ostiole in superficibus ambabus l’oliae apereiUia. Asci paraphysibus commixti, cylindrici, aliquantum stipitati, apertura apicalis non distincta, apicent versus lati et basim versus attenuati, 66-110 x 6-8 μm. Paraphyses multae, hyalinae, liliformes. Ascospores octosparae, compactae, verticaliter ordinatae in 2-4 seriebus, verticalibus aciculatae, 3-6 septatae, guttulatae. Extremitatibus ambabus obtusis, 56-70 μm longae et usque ad 2 μm latae.

Infection spots folicolous, amphigenous, black, 8-14 mm in diameter, surrounded by yellow holoes. Stroma amphigenous, black, shining, forming thicker clypeus on the upper surface of the leaves and comparatively thinner on the lower surface; 8-10 mm in diameter. Perithecia oval to spherical, 1-4 per stroma, 198-270 x 133-234 μm, ostiolate; ostiole open on both surfaces of the leaves. Asci mixed with paraphyses, cylindrical, slightly stipitate, apical aperture not distinct, broad towards the apex and slightly narrowed towards the base, 66-110 x 6-8 μm. Paraphyses, numerosus, hyaline, threadlike. Ascospores 8, compact, arranged lengthwise in the asc in 2-4 vertical rows, acicular, 3-6 septate, guttulate, obtuse at the both ends, 56-70 μm long and up to 2 μm broad.


The infection was found to be restricted to the plants growing near the water source and in damp and shady places. So far 10 species of the genus Ophiodolhella have been recorded on various species of angiosperms...
A. Injured host leaves U. I. through the struma C. Ascites D. Ascospores but none of them on the members of the family Lythraceae. Hence, the present species is described here as a new species. Further, the genus *Ophiolothella* is recorded here for the first time from India (Bilgrami *et al.*, 1979, 1981).

**Phyllachora ehretiae** Hosagoudar et N.C. Nair, sp. nov.

Maculae, foliicolae, amphigenae, indistinctae. Stroma rotundatum, atrum, prominens in pagina superiori et depressum in pagina
in inferiori foliorum, multiloculatum 1-2 mm in diam. Perithecia in quoque stromate 1-2, sphaerica vel crateriformia, rare lanceolata, 405-450 x 162-198 μm. Asci cylindrici, aliquantum stipitati, octospori, paraphysati, 94-100 x 12-16 μm. Ascosporeae uniseriatae vel biseriatae, ellipsoidae, 16-18 x 6-10 μm.

Infection spots folieolous, amphigenous, indistinct. Stroma round, black, raised with the corresponding lower surface of the leaves depressed, multiloculate, 1-2 mm in diameter. Perithecia 1-2 per stroma, spherical to bowl-shaped, rarely lanceolate, 405-450 x 162-198 μm. Asci cylindrici, slightly stipitate, octosporous, paraphysate, 94-100 x 12-16 μm. Ascospores uniseriate to biseriate, ellipsoidal, 16-18 x 6-10 μm.

Holotype: On the leaves of Ehretia canarensis Gamble (BORAGINACEAE). In the forest along the road from Painavu to Kulamavu, December 21, 1983, V.B. Hosagoudar BSI/ISV/78960. Deposited in the Botanical Survey of India, Southern Circle Coimbatore (MH).

Parbery (1978) recognised Phyllachora bouerritae Stev. & Daeby, P. caffra (Syd.) Theiss. & Syd., P. evena Syd. and P. javanica (Koord.) Pet. On the members of the family Boraginaceae. The present species differs from the rest in having cylindrical and longer asci and uniseriate to biseriate, ellipsoidal ascospores. Further, there is no record of the genus Phyllachora on the host Ehretia. Hence the present species has been described here as a new species.

ACKNOWLEDGEMENTS
Our sincere thanks are due to Dr. V. J, Nair, Botanical Survey of India, Southern Circle, Coimbatore, for Latin translation and to Dr. M. S. Patil, Shivaji University, Kolhapur, Maharashtra for his opinion on the identity of both the fungi. We extend our thanks to Dr. E. Horak, Geobotanisches Institute, ETHZ, Switzerland for correcting the manuscript. One of us (VBH) is grateful to the Department of Environment, New Delhi for financial assistance.

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A NEW SPECIES OF UREDO PERS. ON DALBERGIA LATIFOLIA ROXB. FROM IDUKKI, KERALA, INDIA

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During the course of the mycological collections in the forests of Idukki, Kerala, the authors came across plants of *Dalbergia latifolia* Roxb. (FABACEAE), infected with rust fungus. During the past four years, the rust was in uredial stage only. Critical study of this rust fungus revealed the features of the form genus *Uredo* Pers. and is quite distinct to justify its treatment as a new species.

**Uredo dalbergiae-latifoliac** Hosagoudar et N.C. Nair, sp. nov.

Uredinia folicola, hypophylla, minuta, latericia, sub-epidermica, aparaphysata, erumpent through breaking the epidermis, mere or less globular, 80-160 μm; urediniospores round, oval or clavate, pale-brown, 14-28 x 12-16 μm; wall brown, minutely echinulate, 1-2 μm thick; germ pores 4, scattered; pedicels small, simple.

Holotype: On the leaves of *Dalbergia latifolia* Roxb. (FABACEAE), in the forests along the road from Painavu to Kulamavu, February 20, 1983, V.B. Hosagoudar BS1/ISV/75867. Deposited in the Botanical Survey of India, Southern Circle, Coimbatore (MM).

Hennings (1885) described *Uredo dalbergiae* on *Dalbergia sp.* from Brazil. Sydow & Butler (1907) described *Uredo sissio* on *Dalbergia sissio* from Kirkee, Pune, India. The examination of the type material of *Uredo sissio* Syd. & Butl.

Fig. 1. *Uredo dalbergiae-latifoliac* Hosagoudar & N. C. Nair, sp. nov. A. Uredinium and urediniospores.
deposited in HCIO (No. 7818), revealed the presence of clavate, cinnamon brown paraphyses in the uredinia with brown urediniospores. After the discovery of the telial stage, both the species viz. *Uredo dalbergiae* P. Henn. *U. sissio* Syd. & Butl. have become synonymous to *Sphaerophragmium dalbergiae* Diet. (Monoson, 1974). However, the present species differs from both the species of the form genus *Uredo* Pers. in the absence of paraphyses and in having smaller, pale brown urediniospores.

**ACKNOWLEDGEMENTS**

Thanks are due to Dr. V.J. Nair, Botanical Survey of India, Southern Circle, Coimbatore for rendering Latin translation. One of us (VBH) is grateful to Dr. A.K. Sarbhoy, Curator, HCIO, New Delhi for permitting to examine the rust materials and also to the Department of Environment, Government of India for financial assistance.

**REFERENCES**


MYCOLOGICAL NOTES ON SOME RUST FUNGI REPORTED FROM INDIA

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*Infestation Control Laboratory, Central Food Technological Research Institute, Mysore-570 013

ABSTRACT

Two species viz. Puccinia citrullina and P. coimbatorica have been validated here by providing Latin translation. Spermatogonial stage of Aecidium cinnamomum Rucib. described here for first time.

Raghunathan and Ramakrishnan (1972, 1973) have made a monographic work on the Rust Fungi of Madras State wherein included 150 species. Of these, Puccinia citrullina and P. coimbatorica are the two new species described and are without Latin diagnosis. According to the International Code of Botanical Nomenclature, Art. 36, a new taxon of any rank must be accompanied with a Latin diagnosis for valid publication. Hence, the above mentioned two species are validated here by providing Latin translation.

Puccinia citrullina Raghunathan & Ramakrishnan ex Hosagoudar & Raghunathan

Spermatogoniis et aeciis ignotis. Urediniis amphigenus, pleuremque hypophyllis, fuscus; teliosporis oblongatus vel ellipsoideus, 26-38 x 17-26 μm, ad apicem rotundatus; parietis 2-3 μm crassus, chastaneus, verrucosus; pedicello hyahnus, ad 60 μm longo.

In foliis Citrullus vulgaris Schard, Coimbatore, November, 1962, A.N. Raghunathan, HPP 184 (type), Coimbatore HCM 1117.

Puccinia coimbatorica Raghunathan & Rama Krishnan ex Hosagoudar & Raghunathan

Spermatogoniis et aeciis ignotis. Urediniis hypophyllis, luteus, disseminatus; paraphysibus clavatus, luteus, 25-45 x 10-15 μm; urediniosporis late globosus vel ellipsoideus, 22-29 x 12-16 μm; parietis echinulatus, fulvus, 2-3 μm crassus; poris germinationis 3-4, sparsis. Telisiis amphigenus, pleuremque hypophyllis, fuscus; teliosporis oblongatus vel ellipsoideus, 26-38 x 17-26 μm, ad apicem rotundatus; parietis 2-3 μm crassus, chastaneus, equabilis, 2-3 μm; pedicello sub-brunnneus, ad 65 μm longo.

1. Pyenidium
2. Avicidium
In foliis Setaria italica Beauv., Coimbatore, HGM 647 (type),

Spermogonial stage of Aecidium cinnamomi:
(Fig. 1-2)

Raciborski (1900) described this fungus on Cinnamomum sp. from Java based on the aecidial stage alone. Goswami and Bhattacharjee (1973) recorded this species on Cinnamomum tamala Fr. Nees from Meghalaya, India but failed to observe spermogonia. One of the present authors (VBH), while examining Bhattacharjee’s collection deposited in HCIO No. 31568, could locate spermogonia in addition to aecia and are described here.

Spermogonia few, epiphyllus, subepidermal, scattered, dark-brown, appplanate to conoid, hymenium hat, 110-114 x 44-64 μm. According to Hiratsuka & Hiratsuka (1980), this kind of spermogonia fall under the type 7 of the group VI.

ACKNOWLEDGEMENTS

Thanks are due to Dr. N.G. Nair, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for encouragement; to Dr. A.K. Sarbhoy, Curator, HCIO, New Delhi for generously permitting one of us (VBH) to examine the material and also grateful to the Department of Environment, New Delhi for financial assistance.

REFERENCES


SOME OVERLOOKED PLANT SPECIES OF HIMACHAL PRADESH

B P. UNIYAL & S.K. MURTI

Botanical Survey of India, Dehra Dun—748 001

A State Flora Analysis for Himachal Pradesh has recently been published (H.J. Chowdhery & B.M. Wadhwa, 1984). A cursory scrutiny of this work revealed that several species have not been included though collections are available in the herbarium of the Botanical Survey of India, Dehra Dun (BSD). Species like *Bidens cernua* L., *Orobanche hansii* Kern., *Viola jangiensis* Beck. and *Albizia gamblei* Prain which are known from literature, have also been overlooked.

In the following list 51 species are enumerated which should have been included in the State Flora. The plants are alphabetically arranged with family names in parenthesis followed by their distribution in Himachal Pradesh.

**Albizia gamblei** Prain

*(MIMOSACEAE)*

Kangra: *vide* Parker, Forest Flora for Punjab with Hazara and Delhi 186, 1973 (Rep. ed.).

**Alysicarpus monilifer** (L.) DC.

*(PAPILIONACEAE)*

Una, *Uniyal* 61114.

**Anaphalis stoliczkae** Cl.

*(ASTERACEAE)*

Lahul & Spiti, *Bhattacharyya* 45829.

**Antidesma acidum** Retz.

*(EUPHORBIACEAE)*

Una, *Uniyal* 61172.

**Argemone ochroleuca** Sweet

*(PAPAVERACEAE)*

Una, *Uniyal* 61230.

**Argostemma sarmentosum** Wall.

*(RUPELLACEAE)*


**Arnebia hispidissima** (Sieb ex Lehm.) DC.

*(BORAGEACEAE)*

Una, *Uniyal* 61059.

**Balanophora involucrata** Hook.f.

*(KALANCHRORACEAE)*

Simla: *vide* Collett, Fl. Simlensis 443. 1902.

**Bauhinia racemosa** Lamk.

*(CAESALPINACEAE)*

Una, *Bhattacharyya* 39140.

**Bidens cernua** L.

*(ASTERACEAE)*


**Blumea laciniata** DC.

*(ASTERACEAE)*

Una, *Misra* 46984.

**Broussonetia papyrifera** Vent.

*(MORACEAE)*

Sarbhoy et al.: *Hedromena verrucosa* sp. nov.

A-B. T.S. through the stromata showing the sporodochia and verrucose conidiophores

C. Verrucose conidia

---

30 μm

A-C: *Hedromena verrucosa* sp. nov.
THREE NEW HYPHOMYCETES FROM IDUKKI, KERALA, INDIA

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*Division of Mycology and Plant Pathology, IARI, New Delhi - 110 012

ABSTRACT

The paper presents three new species of hyphomycetes viz. Hadromenia verrucosa, Mycellosiella gmelinae-arboresae and Verrucispora brijbeae collected from Idukki, Kerala, India.

In the course of ecological impact study of the Idukki Hydro-Electric Project Area, the authors have collected a good number of hyphomycetous fungi. The following fungi were found to be new and are described here.

Hadromenia verrucosa sp. nov. (Fig. A, B & C)

Colonies hypophyllae, anthracinae, haloribus luteis circumcinctis, elevatis, 3-8 mm in diam., confluentibus Sporodochia 80-100 μm, bene evoluta, subepidermalia, brunneo-atra. Conidiophora a sporodochis orientia, macronematata, mononematata, caespitosa, saepe laxe compacta, non ramosa, recta vel leviter curva, 1-3 septata, profunde fusca, verrucosa, 34-50 x 8-10 μm. Cellulae conidiogenae inconspicuae, apicalibus conidiophororum in conidia (gangliformes). Conidia solitaria, cylindrica, brunneo-atra, ad basim distincte truncata, 1-2 septata, verrucosa, 18-36 x 8-10 μm.

Colonies hypophyllous, carbonaceous black, surrounded by yellow haloes, raised, 3-8 mm in diameter, confluent, later the infected portion detached from the leaf and forming shot holes. Sporodochia well developed, 80-100 μm., subepidermal, brownish black. Conidiophores arise from the sporodochia, macronematous, mononematous, caespitose, often loosely compact, unbranched, straight or slightly curved, 1-3 septate, deep brown, verrucose, 34-50 x 8-10 μm. Conidiogenous cells inconspicuous. Apical cells of the conidiophores develop into conidia (gangliar). Conidia solitary, cylindrical, brownish black, distinctly truncate at the base, 1-2 septate, verrucose, 18 36 x 9-10 μm.


The present species differs from Hadromenia orbiculare Syd. in larger conidia and conidiophores.

Mycellosiella gmelinae-arboresae sp. nov. (Fig. D-E)

Colonies hypophyllae, griseo-brunneae, velutinae, 1-4 mm in diam., saepe confluentes. Mycelium superficiale, olivaceo-brunnium, septatum. 6-8 μm latum. Conidiophora macronemata, mononemata, repetite ramosa, flexuosa, implexa, olivaceo-brunnea, 72-88 x 4-6 μm. Cellulae conidiogenae apicales, simpodiales,
ter, yellowish-brown, smooth-walled, entangled, dichotomously branched, net like, outer most hyphae anchored, bearing long, simple appendages; appendages seta like, elongated, unbranched, septate, hyaline, smooth. about 64 μm long and 2.8 μm in breadth; asci crowded in the centre of the ascocarp, globose, hyaline, 4.8-6.4 μm in diameter, 8-spored, evanescent; ascospores hyaline, one-celled, fusoid, smooth, 2.8-3.2 x 1.8 μm.


Remarks: This species has been recorded on various substrata like decaying stems of Barisia odontites, Fraxinus and oak bark, pineapple-pericarp, frozen blue berry pasturies and soil from Schrewsburry, England. Present collection agrees with the above species and therefore, is referred to it. It makes a new record to the fungi of India.

REFERENCES
Table 1. Comparison of the present collection with other known species of *Dichilaeum*.

<table>
<thead>
<tr>
<th>Species</th>
<th>Stromata</th>
<th>Ascocarp</th>
<th>Asci</th>
<th>Ascosporos</th>
<th>Substrate &amp; locality</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>D. barium</em></td>
<td>—</td>
<td>100 μm in diam.</td>
<td>30 x 17-19 μm</td>
<td>14-15 μm</td>
<td><em>Vaccinium</em> leaves Sicily.</td>
</tr>
<tr>
<td><em>D. lentisi</em></td>
<td>200-1000 μm in diam.</td>
<td>—</td>
<td>9.7 μm in length</td>
<td>3-4.2 x 2-3.5 μm</td>
<td><em>Pistacia lentiscum</em> leaves Sicily.</td>
</tr>
<tr>
<td><em>D. pterodontis</em></td>
<td>—</td>
<td>500-100 μm in diam.</td>
<td>10-10 x 8-11 μm</td>
<td>3-8 x 3.5 μm</td>
<td>Wood of <em>Pterodontis</em> pubescence Culto.</td>
</tr>
<tr>
<td>Present collection</td>
<td>375-750 μm in diam. or 275-312 x</td>
<td>10-13 μm in diam. or 5 x 6.5 μm</td>
<td>8-10 x 11-13 μm</td>
<td>On fallen decaying leaves of <em>Cunina</em> sp. Amboli (India)</td>
<td></td>
</tr>
</tbody>
</table>

length, 6.25 μm in width; peridium of two layers: outer layer 2-3 cells thick, dark-brown, opaque, pseudoparenchymatous, outer cells with wavy contour, inner wall layer hyaline, made up of 2-3 layers of elongated hyaline cells, 3.4-4 μm in diameter; ascus single, uniform in diameter, globose, 8-spored, hyaline, uniloculate, evanescent, 12 μm in diameter; ascospores irregularly disposed, crowded, hyaline, one-celled, smooth, thin-walled 4.8-6.4 x 3.2 μm.


Remarks: The genus *Anechanomyces* Mass. and Salm. (Fam. Oxygynaceae) is characterised by its globose, reddish-brown, membranaceous, non-stromatic, non-ostiolate, glabrous or with long appended ascocarp; asci globose, evanescent and irregularly disposed; ascospores one-celled, oblate, reddish-brown and without germ pore. No conidial state. It is known by its four species and key cut by Malloch & Cain (1970).

Present collection has been compared with these species and shows similarities with *A. nilkhis* Mass. and Salm. in respects of dimensions and morphology of ascocarps, appendages, asci and ascospores except the ascospores which are not dark. The unique feature of this collection is the uniascal eleistothecium, which is not known in any species of the genus.


Ascocarp spherical, sulphur-yellow in colour, about 125-200 μm in diameter without appendages and 197-250 μm in diameter with appendages, peridial hyphae 2.4 μm in diam-
Fruiting bodies hypophyllous, superficial, stromatic, separate or coalescing, stroma on basal radiating hyphae, dark-brown with yellowish-orange centre, hard, 375-750 μm in diameter or 160-450 x 500-925 μm; stroma made up of two walls: Outer wall layer cells, dark-brown, thick-walled, pyriform or globose; inner wall layer cells hyaline, irregular in outline, usually elongated, collectively 100-130 μm thick; ascocarp (cleistothecium) single, completely filling the stroma centrally, spherical to vertically compressed, wall thin, hyaline to pale yellow, 3.4-5 μm thick, ascocarp measured 275-310 x 450-625 μm; asci many, irregularly disposed, free, ellipsoidal to globose, unitunicate, evanescent, 8-spored, 10-13 μm in diameter or 8-10 x 11-13 μm; ascospores irregularly arranged, one-celled, hyaline, globose to oblong, thin-walled, narrow equatorial band not observed, 6.5 μm in diameter or 5 x 6.5 μm; conidial state Aspergillus.


Remarks: The genus is known by three species. Present collection has been compared (Table 1) with these species. From the above table, it seems that the present collection somewhat compares with D. lentiscii and D. petrodontis but does not match completely with either of them. Therefore, a new species to accommodate the present collection as D. indica sp. nov. is proposed.

(2) Arachniomyces nitidus Massee and Salmon


Coloumns hypophyllous, separate or coalescing to form large colonies covering the entire leaf surface; vegetative mycelium absent; cleistothecia crowded or in groups, dark-brown, non-stromatic, globose, shining rough or bulbous with appendages, 72-88 μm in diameter; appendages long, flexuous. slender, anastomosing or free, tapering towards apex and with bulbous base, brown, turning pale at the apex, non-septate, 300 μm or more in
Three species of Plectomycetes, viz. \textit{Dichlacroea indica} sp. nov. (Fam. Trichocoma-taceae), \textit{Arachnomyces nitidus} Mont. and Duront (Fam. Oxygonaceae) and \textit{Taxotrichum cancellatum} (Phillips) Orr and Kuehn (Fam. Gymnoascaceae) have been described here. Out of these three, one is a new species and two are new genetic records for the fungi of India.

(1) \textit{Dichlacroea indica} sp. nov. (Figs. 1-4)

Fructification hypophyllus, supernacularis, stromatidius; mycelium radioatum, separata et caespitosa, hemisphericita et globosa. Sclerotid, bruna, centro lutea, 375-750 μm in diametro et 160-420 x 500-925 μm; cleistothecia singulata, vitellina et tunica duplia, composita, utricle membranacea, 275-310 x 450-625 μm; asci numerosi, irregulariter dispositio, ellipsoides et globosae, unitunicati, octospori, evanescentes, 10-13 μm in diametro et 8-10 x 11-13 μm; ascospori unicellularis, minus, globosae et oblongobus, pellucidae, 6.8 μm in diametro vel 5 x 6.5 μm, status conidia \textit{Aspergillus}. 

*H.S.I., Coimbatore.*
Phyllosticta sorghina Sacc., Michelia 1: 140. 1879.

On the leaves of *Sorghum vulgare* Pers. (POACEAE), Shivaji College fields. V.B. Hosagoudar. October 6, 1975.

The pathogen is reported for the first time from Maharashtra.


The pathogen is recorded for the first time from Maharashtra.

*Pyricularia oryzae* Cav., Fungi, Longob. Exsicc. 49. 1891.

On the leaves of *Setaria italica* (L.) P. Beauv. (POACEAE) and *S. tomentosa* (Roxb.) Kunth. (POACEAE), Satara Road and Chinchaner. V.B. Hosagoudar. September 21, & 24 1975.

All the collections mentioned in this paper are deposited in Science College, Satara, Maharashtra, India.

ACKNOWLEDGEMENTS

Authors are thankful to Dr. S.V. Tirodkar, Principal, Science College, Satara, for providing library and laboratory facilities. Thanks are also due to Mr. V.P. Khandekar, Lecturer of the same College and to Mr. M.B. Vaidya, Lecturer, G.K. College, Kolhapur, for identifying the host plants.
Chavan & Hosagoudar


The latter forms a new host record to the pathogen from India.


New host record to the pathogen from India.


FUNGI IMPERFECTI


Cercospora sorghi Ellis & Everh., J. Mycol. 3: 15. 1887.


In the ears of Pennisetum typhoides (Burm.) Stapf & Hubb. (POACEAE). Borgaon V. B. Hosagoudar. October 16, 1974.

New Host record to the pathogen from India.


Colletotrichum graminicolum (Ces.) Wilson, Phytopathology 4: 110. 1914.


In the ears of Oryza sativa L. (POACEAE). Karanje. V. B. Hosagoudar. October 9, 1975.

Phylosticta saccharicola P. Henn., Fl. du Bas et Moy. Congo H. fa. II. p. 105. 1907.


The pathogen is recorded for the first time from Maharashtra.

In the inflorescence of *Echinochloa crusgalli* (L.) P. Beauv. (POACEAE), Karanje. V.B. Hosagoudar. October 6, 1975.

The pathogen is reported for the first time from Maharashtra and forms a new host record from India.


In the inflorescence of *Saccharum officinarum* L. (POACEAE) Godoli. V.B. Hosagoudar. August 16, 1975.


In the spikelets of *Triticum aestivum* L. (POACEAE), Mahabaleshwar. V.B. Hosagoudar. February 28, 1974.

**THEOMYCETES : UREDINALIS**


Puccinia arstidae Tracy, J. Mycol. 7: 281. 1893.


The pathogen is reported for the first time from Maharashtra.


Both are new host records to the pathogen from India.


New host record to the pathogen from India.

Puccinia purpurea Cke., Grevillea 5: 15. 1876.


Phyllachora sacchari P. Henn., Hedwigia 41: 143. 1902.


New host record to the pathogen from Maharashtra.

TELIOMYCETES : USTILAGINALES


New host record to the pathogen from Maharashtra.


The pathogen is reported for the first time from Maharashtra and forms a new host record from India.


New host record to the pathogen from India.

Sphacelotheca cruenta (Kuehn) Potter, Phytopath 2: 98. 1912.


Sphacelotheca reiliana (Kuehn.) Clint., J. Mycol. 8: 141. 1902.


The pathogen is reported for the first time from Maharashtra and forms a new host record from India.

Sphacelotheca sorghi (Link) Clint., J. Mycol. 8: 140. 1902.


The pathogen is reported for the first time from Maharashtra.


A PRELIMINARY SURVEY OF THE FUNGI ON MONOCOT CROPS AND WEEDS OF SATARA, MAHARASHTRA, INDIA

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Science College, Satara - 415002

ABSTRACT

The paper gives an account of 42 pathogenic fungi. Of these, 22 were found on economically important plants and 20 on farm weeds. 11 form new host reports to their pathogens from India. 10 pathogens reported for the first time from Maharashtra, while *Phyllachora paspalicola* is reported for the first time from India.

The fungal diseases on monocot crops and farm weeds of Satara have not received the attention of previous workers. To fill the gap, an attempt has been made during the period 1974-76. As a result, the following pathogens were recorded and are arranged alphabetically under their respective groups.

**PHYCOMYCETES**

*Sclerotiora graminicola* (Sacc.) Schrott., Coh’s Kryptogamen-Flora Von Neuen 3: 236. 1886.

In the ears of *Pennisetum typhoides* (Burm.) Stapf & Hubb. (POACEAE), Karanjé, V.B. Hosagoudar, September 21, 1975.

**ASCOMYCETES**


In the ears of *Pennisetum typhoides* (Burm.) Stapf & Hubb. (POACEAE), Borgaon V.B. Hosagoudar, October 16, 1974.


New host record for the pathogen from Maharashtra.

*Phyllachora paspalicola* P. Heim., Hedwigia 48: 106. 1906.

Infection spots amphigenous, scattered or aggregated, often form streaks. Stromata black, shining, 1-2 mm in diameter. Perithecia round to oval, 1-3 per stroma, 0.15-0.165 x 0.15-0.20 mm. Asci cylindrical, slightly stipitate, mixed with paraphyses, 54-96 x 6-9 μm. Ascospores oval to ellipsoidal, obliquely mon斯特ichous (9-) 12 (-15) x 6-9 μm.


The pathogen is reported for the first time from India and forms a new host record.

* S.S.G.M. College, Kopargaon - 421 601.

** Botanical Survey of India, Southern Circle, Coimbatore - 641 003.
TABLE. Comparative account of the allied rust species reported on Digitaria.

<table>
<thead>
<tr>
<th>Name of the species</th>
<th>Urediniospores</th>
<th>Teliospores</th>
<th>Pedicels</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>P. zahuenensis</em></td>
<td>(23-) 25-32 (-40) μm</td>
<td>(27-) 35-45 (-52) μm</td>
<td>Non-persistent, upto 20 μm.</td>
</tr>
<tr>
<td></td>
<td>(18-) 20-25 (-28)μm</td>
<td>(12-) 16-22 (-26) μm</td>
<td>Persistent, upto 25 μm.</td>
</tr>
<tr>
<td><em>P. digitaria-velutina</em></td>
<td>(23-) 25-32 (-35) μm</td>
<td>(36-) 39-50 (-52) μm</td>
<td>Persistent, 54-105 x 6-9 μm</td>
</tr>
<tr>
<td><em>P. digitaria-biformis</em></td>
<td>(18-) 20-25 (-28)μm</td>
<td>(17-22; (-24) μm)</td>
<td>Persistent, 54-105 x 6-9 μm</td>
</tr>
</tbody>
</table>

ACKNOWLEDGEMENTS

The authors are thankful to Dr. S.V. Tirodkar, Principal, Science College, Satara, for providing library and laboratory facilities; Mr. V.P. Khandekar, Lecturer in Botany, Science College, Satara for identifying the host plants.

REFERENCES

A-E. *Guignardia cypri* chavant el *Hexagona* sp. nov.
A. Healthy and infected host indiscernible.
B. Infected host with wrinkled leaves without indiscernible.
C. Perithecium on the host leaf.
D. Perithecium with ostiole.
E. Asci with biarticulate ascospores.

F-H. *Pestergenia poudrieri* chavant el *Hexaspora* sp. nov.
F. Infected leaf with red margin.
G. Arrangement of the perithecia beneath the host epidermis.
H. Asci with ascospores.
2. *Vestergrenia pandani* Chavan et Hosagoudar, sp. nov. (Fig. F-H).

Maculae foliicola, amphiphylla, pluremque epiphyllus, ovala ad elongatae, coalescentos et areas magnas accupates, pluremque secus midrib, griseo-rufa marginatae. Perithecia subepidermica, nigra, globosis, ostiolatis, bysinae subiculo basim, 180-205 x 77-180 μm, Ascii hyalinius, cylindrical, bitunicale, 8-spori, 87-105 x 9-12 μm, stipitatis; ascosporis hyalinis, unicellularis, ellipsoides, uniseriatae, 16.5-21.0 x 6-7.5 μm.

Spots folicolous, amphiphyllous, mostly epiphyllous, oval to elongate, coalescing to form large patches, mostly along the midrib, grey with deep red margin. Perithecia subepidermica, dark, globose, ostiolate, cottony subicle at the base, 180-205 x 77-180 μm. Ascii hyalinius, cylindrical, bitunicate, 8-spored, stalked 87-105 x 9-12 μm; ascospores hyalinius, ellipsoides, uniseriatae, thin-walled, single-celled, 16.5-21.0 x 6-7.5 μm.

Holotype: On the living leaves of *Pandanus fascicularis* L. (PANDANACEAE) at Science College Garden, Satara; P.B. Chavan; on July 6, 1974; deposited at Science College, Satara, Maharashtra, India. Acc. No. 504.

3. *Puccinia digitaria-biformis* Chavan et Hosagoudar, sp. nov. (Fig. I-J).

Urediniis amphiphyllous, subepidermalis, rubro-brunneis; paraphysibus clavatus, subluteus, 24-45 x 6-7.5 μm; urediniosporae rotundus vel ovala, cinnamomeo-brunneis, 24-33 x (18-) 21 (-24). μm membrana echinulata, 1.5-3 μm crassa. Telii amphiphyllis, pluremque epiphyllis, nigro, teliosporae late ellipsoidae, bicellularis, brunneis, pluremque puccinioides, 30-36 x 21-24 μm; membrana glabra, ad later 1.5-3.45 μm crassa, ad apicem 4.5-6.9 μm. Pedicello hyalinus ad sublateus, 54-105 x 6-9 μm, persistenti.

Uredinia amphiphylla, subepidermal, reddish brown; paraphyses clavate, pale yellow, 24-45 x 6-7.5 μm; urediniospores round to oval, cinnamon-brown, 24-33 x (-18) 21 (-24) μm; wall echinulate, 1.5-3 μm thick. Telia amphiphylla, mostly epiphylla, black; teliospores broadly ellipsoidal, two celled, brown, mostly puccinioid, 30-36 x 21-24 μm; wall smooth, 1.5-3.45 μm thick at sides and 4.5-6.9 μm thick apically; pedicels hyalinae to pale-yellow, 54-105 x 6-9 μm, persistent.

Holotype: On the living leaves of *Digitaria biformis* Willd. (POACEAE) at Karanje; V.B. Hosagoudar; October 30, 1975; deposited at Science College, Satara, Maharashtra, India. Acc. No. 551.

Cummins (1971) recorded seven species of *Puccinia* parasitizing the host *Digitaria*. Of those, *P. cahuensis* Ell. & EV. and *P. digitaria-valutinae* V. Bourgin are closer to present rust but differs from them in the long, persistent pedicels, measurements and morphology of teliospores.
THREE NEW FUNGI FROM SATARA MAHARASHTRA, INDIA.

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ABSTRACT

Three new species of fungi are described from Satara, Maharashtra, India. They are Guignardia cyperi, Vestergrcuia pandani and Purculia digitaria-biformis.

During the survey of the pathogenic fungi of Satara, the authors have come across an infected two farm weeds, Cyperus rotundus L. and Digitaria biformis Willd. and a garden plant, Pandanus fascicularis L. The infected plants of Cyperus rotundus L. were almost stunted and showed stunted growth. They did not bear any healthy and mature seeds. The pathogen did not grow in P.D.A. and seems to be an obligate parasite. If the attempts to culture the pathogen are successful, Cyperus rotundus L. which is an noxious farm weed can be controlled biologically by using the pathogen. The screw-pine, Pandanus fascicularis L., showed the leaf spot disease; the spots were distinct, 2 to several millimetres in diameters, grey-coloured with blood red margins and mostly confined to the mid-rib of the leaves. In case of Digitaria biformis L., the infection was mostly restricted to old leaves and the severely infected leaves were wrinkled and twisted.

As the three pathogens observed on the above three hosts are not in agreement with any of the fungi so far reported on the latter and hence they are described here as new species.

1. Guignardia cyperi Chavan et Hosagoudar, sp. nov. (Fig. A-E).

Maculae foliicula, hypophylla, amphigena orbicularis; perithecia nigra, separata, ostiulatus, prima innatu, maturitate erumpentia, paraphysibus vel paraphysoide nulla, (75-) 90 (-135) x (45-) 75 (-90) /m. Asci numerosae, cylindricus, bitimicatis, octosporus, stipitatus, 51-81 x 6-9 /m; ascosporis hyalinis, unicellul-aris, ellipsoideus, compactus, glabro-tunicatus, uniseriatae vel irregularis, 21-24 x 3-6 /m.

Spots foliiculae, hypophyllae, amphigenae, orbicularis; perithecia at first innate, erumpent at maturity, black, separate, ostiulate paraphyses or paraphysoids lacking, (75-) 90 (-135) x (45-) 75 (-90) /m. Asci many, cylindricus, bitimicatus, 8-spored, short stalked, 51-81 x 6-9 /m; ascosporis hyalinis, unicellularis, ellipsoidalis, compactus, smooth-walled, uniseriatus to irregular, 21-24 x 3-6 /m.

Holotype: On the living leaves of Cyperus rotundus L. (CYPERACEAE) at Ghendamala, P.B. Chaven, on July 5, 1974; deposited at Science College, Satara, Maharashtra, India. Acc. No 503.

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References


Holotype: On leaves and petioles of *Gmelina arborea* Roxb. (Verbenaceae), Kombaikadu, Kodaikanal, Tamil Nadu, Feb. 12, 1993, M. Bappammal HC10, New Delhi.

Presence of single type of clavate shaped conidia is the characteristic of the genus *Ovulariopsis* which is an anamorph of the genus *Phyllactinia* (Braun 1987). *Phyllactinia suffulta* (Rebent.) Sacc. var. *gmelinae* Patil has been reported from Maharashtra (Patil 1961). However, this teleomorph is devoid of anamorph and hence, the present anamorph state warrants its placement under a new species.


Plagulae infectionis plerumque hypophyllae, saepe coalescentes et confluentes, folia superficia supra luteobrunnae. Anamorph non-visa. Cleistothecia numerosa, aurea vel fusca, globosa vel spherica, 248-322 μm in diam; appendages peritheciales verticillatim in 5-10, hyalinus bulbosis ad basim. Asci 16-25 numero, 80-97 x 24-34 μm, bisporis; ascosporae ovatae vel ellipsoideae, 28-38 x 17-24 μm quod intus continetur aureae.

Infection spots chiefly hypophyllous, often coalescent and covering the whole leaf, upper surface showing pale-yellow colour. Cleistothecia abundantly produced, golden yellow to dark-brown in colour, globose to spherical, 248-322 μm in diameter; appendages in a whorl of 5-10, hyaline with bulbous base. Asci 16-25 in number, 80-97 x 24-34 μm, 2-spored with golden-yellow contents; ascospores ovate or ellipsoid, 28-38 x 17-24 μm, with orange-yellow contents.


Patil (1961) published *Phyllactinia suffulta* (Rebent.) Sacc. var. *gmelinae* Patil. This species is distinct from rest of the *Phyllactinia* species (Braun, 1977). According to ICBN Art. 36, since the name was invalid, it is validated here and given a species status.
Fig 1: Onalariopsis gmeline - arboreae sp. nov.
(1) Conidiophores  (2) Foot cell
(3) Appressoria  (4) Conidia
Powdery Mildews on Gmelina arborea Roxb. in India

V. H. H. H. HOHAGOUDDAR*, M. DAPPAMMAL**, AND K. UDAIYAN***

Gmelina arborea Roxb. (Verbenaceae), a dry deciduous tree occurring throughout India is economically important for its timber, leaves for silkworms, good fodder for cattle and the bark to cure chest pain (Nayar, et al. 1989). This tree was found infected by two species of powdery mildews.

1. Ovulariopsis gmelinae-arboreae sp. nov.


Infection spots foliicolous, caulicolous, hypophyllous, round, rarely coalesced, corresponding upper surface of the infected spots turned yellow and result in shot holes. Colonies hypophyllous, dense, persistent, hyphae septate, branched, 4–8 μm wide. Appressoria indistinct to nipple shaped. Conidiophores straight, 133–235 μm long; foot cells straight, cylindrical, 38–49 x 5–9.5 μm, followed by 1–2 longer cells. Conidia borne singly, clavate, 42–33 x 15–23 μm, germ tube simple, apical.

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ment and to Shri K. Vivekananthan, Scientist B of the same organisation for identifying the host plants.

REFERENCES


Phyllachora javaniea (Koord.) Petrak in

Infection spots indistinct. Stromata amphigenous, scattered, black, shining, up to 1 mm in diameter. Perithecia mostly oval 1-2 per stromata, 228-286 x 170-125 pm. Asci numerous, mostly cylindrical, slightly stipitate, paraphysate, 62-77.5 x 12-15.5 pm. Ascospores uniseriate to partly biseriate, hyaline, oval to ellipsoidal, 12-18.5 x 9-12.5 pm.

On leaves of Cordia gharaf (Forssk.) Ehrenb. ex Asch. (Boraginaceae), Karur, Tiruchirapalli dist., Tamil Nadu, Jan. 15, 1980, S. Manian HCIO, New Delhi.

So far four species of the genus Phyllachora are known to be parasitic on the members of the family Boraginaceae (Parbery, 1973). However, the present species is distinct from the rest in having scattered stromata, cylindrical asci and in ascospore measurements. This species was reported from Philippines and is reported here for the first time from India (Bilgrami et al., 1979, 1981; Kamat et al., 1979; Sarbhoy et al., 1986 and Sydow & Petrak, 1931).

Phyllachora ramanurthyi sp. nov.

Maculae infectionis foliicolae, amphigenae, plurumque hypophyllae, 2-3 mm in diam. Stromata foliicola, amphigena, surroundibus lateobrunneae haloes, nigra, nitida, ad 1 mm diam. Perithecia innata, ovala, crateriformia, 1-3 per stromata, 257-315 x 200-300 pm. Asci numerosi, cylindrici, stipitati, paraphysati, 50-70 x 6-9.5 pm. Ascospores plurumque biseriatae, irregulariter ad maturitatem, hyalinae, ovale vel ellipsoidae, 15-20 x 3-5 pm.


Theissen & Sydow (1915) have recognised four species of the genus Phyllachora on the members of the family Annonaceae, while Parbery (1973) has listed nine species. However, the present species is distinct from rest of the recorded species in having scattered and smaller stromata surrounded by yellow haloes, distinct stipitate and cylindrical asci, oval to ellipsoidal and biseriate to irregularly arranged ascospores. Further, the host plant is known as rare and endemic to Western Ghats region of Southern India (Mohanan et al., 1984). Hence, it is proposed here as a new species.

This species is named in honour of Dr. K. Ramanurthiy, Botanical Survey of India, Coimbatore for his notable contribution towards South Indian Phanerogams.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for the encourage-
Fig. A. 1-3. *Phyllachora isonandrae* sp. nov.
1. T.S. through the stroma, 2. Ascus, 3. Ascospores

Fig. B. 1-3. *Phyllachora ramnurthi* sp. nov.
1. T.S. through the stroma, 2. Ascus, 3. Ascospores
NEW AND HITHERTO UNRECORDED PHYLLACHORA SPECIES FROM SOUTHERN INDIA

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ABSTRACT

Phyllachora isonandrae and P. ramanurthyi are described here as new species and P. javanica (Koord.) Petruk is reported here for the first time from India.

During the survey of the pathogenic microfungi in Southern India, three plants, namely Cordia gharaf (Forssk.) Ehrenb. ex Asch. (Boraginaceae), Isonandra lanceolata Wight (Sapotaceae) and Phaeanthus mala-baricus Bedd. (Annonaceae) were found infected with 'Tar spot' diseases. Critical study of these fungi revealed that they are hitherto undescribed species of the genus Phyllachora on the latter hosts, while, the species on the former host is the first report from India.

Phyllachora isonandrae sp. nov.

Maculae infectionis foliicolae, epiphyllae, dispersae, et 2 mm in diam. Stromata epiphylla, halonibus luteis cinetae et stromata in maculae necroticae, rotunda, nigra, nitida, elevata, clypeata, 1-2 loculate, ad 2 mm in diam Perithecia immersa, globosa, 257-286 x 200-286 μm. Asci numerosi, cylindrici, uniseriatae, octospori, stipitati, 93-124 x 6-8 μm. Ascosporae uniseriatae, ovale vel ellipsoidalae, hyalinae, 8-14 x 4-6 μm.

Infection spots foliicolous, epiphyllous, scattered, up to 2 mm in diameter. Stromata epiphyllous, surrounded by yellow haloes which later turn into necrotic spots leaving the stromata in the centre, round, black, shining, raised, clypeate, 1-2 loculate, up to 2 mm in diameter. Perithecia immersed, globose, 257-286 x 200-286 μm. Asci numerous, cylindrical, uniseriate, octosporous, stipitate, 93-124 x 6-8 μm. Ascospores uniseriate, oval to ellipsoidal, hyaline, 8-14 x 4-6 μm.

Holotype: On leaves of Isonandra lanceolata Wight (Sapotaceae), Dharmasthala, Karnataka State, Sept. 16, 1987, S. Manian IMI 321579.

So far six species of the genus Phyllachora are known to be parasitic on the members of the family Sapotaceae (Parbery, 1973; Rajak & Hasija, 1978) but the present species differs from them in having the centrally situated stromata in the necrotic spots, cylindrical and longer pedicellate asci and ellipsoidal ascospores. Further, there is no report of the genus Phyllachora on this host genus. Hence, it is proposed here as a new species.
3. Oidium manihoticola sp. nov. (Fig. 3)

Maculae epiphyllae, maculae corresponded ad hypophyllae luteus, ad 8 mm diam., confluentes. Coloniae epiphyllae, albae, densae, posterior cremecolour, persistent. Appressoria multilobata. Hyphae ramosae, septatae, 6–8 μm crassae. Conidia solitaria, ellipsoidea vel doliiformia, 6–8 μm crassae. Conidiophora recta, erecta, ad 95 μm longa; cellula basali recta, cylindracea, saepe leniter flexuosa, 18–31 × 6–9.5 μm, secundibus 1–2 cellula brevioribus. Conidia solitaria, ellipsoidea vel doliforma, 34–37.5 × 15–18.5 μm. Tubus germinativo apicalis, bulbosus ad apicem.

Infection spots epiphyllous, corresponding lower surface of the leaf spot turned yellow, up to 8 μm in diameter, confluent. Colonies epiphyllous, white to ash coloured, later turned to creamy white, dense, persistent. Hyphae branched, septate, 6–8 μm wide. Appressoria multilobata. Conidiophores straight, erect, up to 95 μm long; foot cells straight, cylindrical, often slightly flexuous, 18–31 × 6.9–5.5 μm, followed by 1–2 shorter cells. Conida formed singly, ellipsoid to doliform, 34–37.5 × 15–18.5 μm. Germ tube apical, bulbosus at apex.


Broader mycelium, multilobed appressoria, pseudoidium type and longer and broader conidia distinguish the present new species from the rest of the Oidium species reported on the members of the family Euphorbiaceae (1).

4. Oidium tribuli sp. nov. (Fig. 4)

Plagulae foliicolae, epiphyllae, densae, confluentes. Hyphae ramosae, septatae, 3.5–5 μm crassae. Appressoria mammaliformis. Conidiophora recta, erecta vel leniter curvula, 77.5–103.5 μm longa; cellula basali recta, cylindracea, 21.5–52.5 × 4.5–6.5 μm, secundibus cellula singularis et brevioribus. Conidia solitaria, ellipsoidea vel cylindracea, 27.5–37.5 × 10–12.5 μm.

Colonies foliicolous, epiphyllous, dense, confluent. Hyphae branched, septate, 3.5–5 μm wide. Appressoria mammaliformis. Conidiophores straight, erect to slightly curved, 77.5–103.5 μm long; foot cells straight and cylindrical, 1.5–52.5 × 4.5 6.5 μm, followed by a shorter cell. Conida formed singly, ellipsoid to cylindrical, 27.5 47.5 × 10–12.5 μm.


Leveillula taurica (Lev.) Arnaud is the only powdery mildew fungus known on the members of the family Zygophyllaceae (1).

Key words: Powdery mildews, Oidium, Uncinula, India.

5. Uncinula religiosa

T.S. Ramakrishnan, Proc. Indian Acad. Sci. 48: 124, 1959 (Fig. 5).

Colonies foliicolous, amphigenous, dense, confluent. Hyphae branched, septate, 3–6.5 μm wide. Appressoria multilobata. Conidiophores straight, erect and cylindrical, 49.5–90 μm long; foot cells straight to flexuous, 15.5–31 × 7.5–9.5 μm. Conidia formed singly, ellipsoid to cylindrical, 31–53 × 10.5–13.5 μm. Cleistothecia scattered, mostly on the lower surface of the leaves, 71–120.5 μm in diameter; peridial cells irregularly polygonal. Appendages 10–17 in number, non septate, unicinate at apex, 71–158 × 4.5–6.5 μm. Ascii many, usually stalked, oval to obvoidal, 34–46.5 × 34–40.5 μm; ascospores 3–4, ellipsoid to ovoid, 9.5–34 × 9–15.5 μm.


The fungus covered both the surfaces of leaves of all stages as a white powdery mass and the infection rarely extended to the leaf petioles. The entire leaf canopy of the infected tree was white dusty and the infected plants were easily detected even from a distance due to their white powdery appearance. A little disturbance caused by the wind to the host plants released a cloud of white spores in the air. Conidial formation was noticed on the upper surface of the leaves while cleistothecia were abundant on the lower surface of the leaves.

This species was collected from Nilgiris, Tamil Nadu, India (3) but made synonymous to U. aspera Doidge (1) reported on Ficus petersi from South Africa. The present collection shows anamorphic stages on the upper surface of the leaves and U. aspera Doidge lacks it. Hence, we prefer to retain this collection under Uncinula religiosa Ramakrishnan. Since the type material of this species was not available in any herbarium, the present collection serves as neotype.

Acknowledgements

We are grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

References

Explanation to Line Drawings

Abbreviations used:

a = Conidiophore
b = Appressorium
c = Foot cell
d = Conidia
e = Germinating conidium
f = Perithece
f = Perithecial appendage
h = Ascii
i = Ascospore
Fig. 1. *Odium granulata* sp. nov.
2. *Odium patroplanes* sp. nov.
3. *Odium mambosthoda* sp. nov.
4. *Odium tribula* sp. nov.
5. *Omicula religiosa* T.S. Ramakrishna
New or noteworthy species of Powdery Mildews from Tamil Nadu, India

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SUMMARY

The paper gives an account of five species of powdery mildews collected from Coimbatore and Nilgiris districts of Tamil Nadu. Of these, Oidium grewicola, O. jatrophae, O. mamhuticola and O. tribuli are new species which are described and illustrated. Uncinula religiosa T.S. Ramakrishnan has been illustrated and a detailed description provided.

1. Oidium grewicola sp. nov. (Fig. 1)

Plagulae foliicolae, epiphyllae, densae, confluentes. Hyphae ramosae, septatae, 4.5—6.5 μm crassae. Appressoria multilobata. Conidiophora recta, erecta, 58.5-68.5 μm longa; cellula basali recta, cylindracea, leniter curvula vel flexuosa, 15.5-31 × 6.7.5 μm, secundibus 1-2 cellula brevioribus. Conidia solitaria, ovoidae vel cylindraceae, 27.5-34 × 10.5-15.5 μm.

Colonies foliicolous, epiphyllous, dense, confluent. Hyphae branched, septate, 4.5-6.5 μm wide. Appressoria multilobed. Conidiophores straight, erect, 58.5-68.5 μm long; foot cells straight, cylindrical, slightly curved to flexuous, 15.5-31 × 6-7.5 μm, followed by 1-2 shorter cells. Conidia formed singly, ovoid to cylindrical, 27.5-34 × 10.5-15.5 μm.


2. Oidium jatrophae sp. nov. (Fig. 2)

Plagulae in delicatus, foliicolae, amphigenae, caulicolae, albae, persistetae, confluentes. Hyphae ramosae, septatae, 5-7 μm crassae. Appressoria multilobata. Conidiophora recta, erecta, ad 60 μm longa; cellula basali recta, cylindracea, leniter flexuosa, 24-37.5 × 6-8.5 μm, secundibus 1-2 cellula brevioribus. Conidia solitaria, elipsoidica vel doliformia, 24-31 × 15-18.5 μm. Tubus germinatio apicalis, longioribus, haustoria bulbosa vel lobata.

Colonies on tender leaves, amphigenous, caulicolous, white, persistent, confluent. Hyphae branched, septate, 5-7 μm wide. Appressoria multilobed. Conidiophores straight, erect, up to 60 μm long; foot cells straight, cylindrical to slightly flexuous, 24-37.5 × 6-8.5 μm, followed by 1-2 shorter cells. Conidia borne singly, ellipsoidal to doliform. 24-31 × 15-18.5 μm. Germ tube apical, long, haustoria bulbous to lobed.


The mycelium with lobed appressoria, pseudoidium type and ellipsoid to doliform conidia, bulbous to lobed haustoria distinguishes this species from the rest of the
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acknowledge the help of Dr. U. Braun, Germany and Mr. K. Sivanandan, Botanical Survey of India, Coimbatore for confirming the identity of some powdery mildew species and preparing the line drawings respectively.

References


catanata, ovala vel ellipsoidea, 18-33 x 15-18.5 um. Fibrosin corpuscles visa.

Colonies epiphyllous, dense, corresponding lower surface of the spots turned yellow, rarely confluent. Hyphae flexuous, branched, septate, 6-8 μm wide. Appressoria nipple shaped. Conidiophores straight, erect to curved, simple, up to 200 μm long (with conidia); foot cells straight to curved, 49-74.5 x 10-12 μm. Conidia in chains of 4-6, oval to ellipsoidal, 18-33 x 15-18.5 μm. Fibrosin bodies visible.

Holotype: On leaves of Solanum saefor-thianum Andr. (Solanaceae), on the way to Kadamparai, Anamalais, Coimbatore, March 28, 1990, V.B. Hosagoudar HClO 30401.

In the present collection, conidia are in chains and the conidial initials are inseparable from the conidia. Braun (1987) has recognised such species in the genus Arthrocladiella Vassilkov which is a monotypic genus. However, the present species is distinguished by its straight to curved foot cells and invariably curved conidiophores.

21. Oidium sesami (Paul & Kapoor) comb. nov.


On leaves of Sesamum indicum L. (Pedaliaceae), in the campus of Bharathiar University, Coimbatore, Feb. 20, 1990, V. Vijayanthi HClO 30472.

Paul & Kapoor (1985) divided the genus Oidium into Euoidium and Pseudoidium and are invalid because basionyms are not cited (art. 55). Braun (1987) stated that neither the morphological data nor the systematical conditions permit the proposed splitting. We agree with Braun (1987) and hence combination is affected here.

22. Oidium trichiliae sp. nov. (Fig.9)

Plagulae foliicolae, amphibigenae, dense, confluentes. Hyphae ramosae, septatae, 4-6.5 μm crassae. Appressoria papilliformia et multilobata. Conidiophora recta, erecta, 55-83.5 μm longa; cellula basali recta, erecta vel cylindracea, 27-40.5 x 6-9.5 μm. Conidia solitaria, cylindracea, ovata vel doliiformia, 27-40.5 x 12-18.5 μm. Fibrosin corpuscles visa. Germination tubus ad apicem, simplices.

Colonies foliicolous, amphigenous, dense, confluent. Hyphae branched, septate, 4-6.5 μm wide. Appressoria nipple shaped to multilobed. Conidiophores straight, erect, 55-83.5 μm long; foot cells straight, erect and cylindrical, 27-40.5 x 6-9.5 μm. Conidia borne singly, cylindrical, oval to doliiform, 27-40.5 x 12-18.5 μm. Fibrosin bodies present. Germ tube apical, simple.

Holotype: On leaves of Trichilia connaroides (Wight & Arn.) Bentvelzen (Meliaceae), Nettakal, Kotagiri, Nilgiris, July 22, 1990, V.B. Hosagoudar HClO 30439.

Oidium azadirachtae Narayanaswamy & Ramakrishnan is the only known species on the members of Meliaceae. The present species differs from it in having lobed appressoria, straight and shorter foot cells, cylindrical to doliiform conidia with fibrosin bodies and conidial germination through germ tube from the distal end.

Acknowledgements

We are grateful to Dr. N.P. Balakrishnan, Deputy Director, Dr. A.N. Henry, Scientist SE, Mr. K. Vivekananthan, Scientist B, Botanical Survey of India, Southern Circle, Coimbatore for their encouragement and help in the identification of the host plants. We sincerely

Colonies epiphyllous, dense, confluent. Hyphae branched, septate, 4-6 μm wide. Appressoria in pairs, simple to lobed. Conidiophores straight, erect, 58-98 μm long; foot cells straight to curved, cylindrical, 12-25 x 4.95 μm. Conidia borne singly, oval, ellipsoidal to cylindrical, 18-37.5 x 9-12.5 μm.


The present collection slightly differs from the species description in having narrow conidia. Braun (1987) has stated that the species is widely distributed and nearly circumglobal but Bilgrami et al. (1979, 1981) and Sarbhoy et al. (1986) have not listed this species from India.


On leaves of Indigofera sp. (Fabaceae), Moyar, Nilgiris, Jan. 21, 1990, V.B. Hosagoudar HCIO 30436.


19. Oidium peltophori (Yen) Boesewinkel var. indica var. nov. (Fig. 7)

Differ var. peltophori appressoria lobata.

Colonies foliicolous, mostly epiphyllous, dense, confluent. Hyphae branched, septate, 3-4.5 μm wide. Appressoria multilobed. Conidiophores short, straight, erect, 34-83.5 μm long; foot cells straight, erect, cylindrical, 18.5-46.5 x 4-6.5 μm. Conidia borne singly, ovoid to cylindrical, 15.5-37 x 9-12.5 μm. Fibrosin bodies present.


The infected leaves were wrinkled and slight disturbance to the host released a cloud of spores in the air. Yen (1966) reported Oidium eysiphoides f. peltophori. Boesewinkel (1980) gave species status to it as O. peltophori (Yen) Boesewinkel. However, the present variety differs from the var. peltophori in having bilobed to multilobed appressoria.

This taxon was erroneously reported by Hosagoudar & Nair (1987) and Hosagoudar (1988) as erysiphe polygoni DC. and Oidium peltophori (Yen) Boesewinkel.

20. Oidium saeforthiani sp. nov. (Fig. 8)

Plagulae epiphyllae, densae, plagulae responsum hypophyllae flavescere, raro confluentes. Hyphae flexuosae, ramosae, septatae, 6-8 μm crassae. Appressoria papilliformia. Conidiophora recta, erecta vel curvula, simplices, ad 200 μm longa; cellula basali rectavel curvula, 49-74.5 μm longa. Cohidia
Colonies foliicolous, epiphyllous, dense, confluent. Hyphae branched, septate, 6-8 μm wide. Appressoria nipple shaped. Conidiophores simple, straight to curved, 102-162.5 μm long; foot cells straight, cylindrical, 40-71.5 x 9-10 μm, followed by 2-3 shorter cells. Conidia borne singly, cylindrical, oval to doliform, 24.5-40.5 x 9-15.5 μm. Fibrosin bodies present. Germination by means of simple germ tube.

Holotype: On leaves of *Cassia occidentalis* L. (Caesalpinaceae), Nettukal, Nilgiris, July 23, 1990, V.B. Hosagoudar HCIO 30452.

The present collection is close to *Oidium cassiae-siamae* Yen in having pseudoidium type of conidia but the new variety differs from the var. *cassiae-siamae* in having epiphyllous, dense, confluent colonies, appressoria nipple shaped and entire; foot cells of the conidiophores straight and cylindrical, germ tubes borne at the end, simple and short.

14. *Oidium coriandri* sp. nov. (Fig. 5)

Plagulae epiphyllae, amphigenous, confluentes, hyphae ramosae, septatae, flexuoses vel anfractuae, 5-6.5 μm crassae. Appressoria mammalliforma, integra vel lobata. Conidiophora simplicitus, recta, erecta, 49.5-136 μm longa; cellula basali recta vel flexuosa, 15.5-53 x 6-9.5 μm. Conidia catanata ad 2-3, cylindrica vel ellipsoidea, 34-46.5 x 9.5-12.5 μm. Fibrosin bodies present.

Holotype: On leaves of *Cassia occidentalis* L. (Caesalpinaceae), Nettukal, Nilgiris, July 23, 1990, V.B. Hosagoudar HCIO 30452.

The present collection is close to *Oidium cassiae-siamae* Yen in having pseudoidium type of conidia but the new variety differs from the var. *cassiae-siamae* in having epiphyllous, dense, confluent colonies, appressoria nipple shaped and entire; foot cells of the conidiophores straight and cylindrical, germ tubes borne at the end, simple and short.

15. *Oidium crotalariae* (Ciff. & Frag.) comb. nov. (Fig. 6)


Colonies foliicolous, amphigenous, dense, confluent. Hyphae branched, septate, 4-6.5 μm wide. Appressoria lobed. Conidiophores straight, erect to curved, 31-75 μm long; foot cells straight, cylindrical to flexuous, 12-46.5 x 6-9.5 μm. Conidia borne singly, cylindrical, 28-53 x 12-18.5 μm.

On leaves of *Crotalaria* sp. (Fabaceae), Manambuli estate, on the way from Sholayar power house to Valparai, Coimbatore, March 28, 1990, V.B. Hosagoudar HCIO 30395; in the campus of Govt. Arts College, Coimbatore, March 11, 1990, V. Vijayanthi HCIO 30455.

*Oidium erysiphoides* f. *crotalariae* Ciff. & Frag. reported on *Crotalaria* sp. from Dominic Republic (Braun, 1987). The present collections match well with it and hence the new combination is affected here.
According to Boesewinkel (1980) and Braun (1987), indistinct appressoria represents the genus Sphaerotheca. Sphaerotheca hibiscicola Zhao is the only species reported on Hibiscus mutabilis L. from China. However, the present species differs from it in having epiphyllous, dense colonies and elongated germ tube with lobed haustorium. It also differs from Oidium abelmoschi Thum. in having indistinct appressoria, longer foot cells and longer conidia.

The species is named in honour of Dr. N.P. Balakrishnan for his notable contributions to the field of angiosperm taxonomy.

The conidial chain was very delicate.


On leaves of Carica papaya L. (Caricaceae), P.N. Pudur, Coimbatore, Jan. 30, 1990, V.B. Hosagoudar HCIO.

The present collection slightly differs from the type description of the species in having strictly hypophyllous colonies and flexuous foot cells of the conidiophores.


On leaves of Cassia tora L. (Caesalpinioaceae), Bharathiar University Campus, Coimbatore, Nov. 10, 1988, V.B. Hosagoudar HCIO 30351.

The present collection slightly differs from the type description of the species in having strictly hypophyllous colonies and flexuous foot cells of the conidiophores.

13. Oidium cassiae-siameae Yen var. indica var. nov (Fig. 4)

Differt a var. cassiae-siameae plagulae epiphyllae, densae et confluentes, appressoria papilliformis et integratis, cellula basali erect vel cylindracea.

Holotype: On leaves of Hibiscus sp. (Malvaceae), Kodanadu, Nilgiris, July 22, 1990, V.B. Hosagoudar HCIO 30343.
Several anamorph species of the genus *Oidium* are known on the members of the host family Fabaceae. But the present species is well distinguished from the rest of the *Oidium* species in having mammaliform and lobed appressorium, pseudoidium type of conidia and straight to flexuoso foot cells of conidiophores.


Colonies foliicolous, caulicolous, amphiigenous, dense, confluent. Hyphae branched, septate, 3-5 μm wide. Appressoria nipple shaped. Conidiophores straight, erect, 40-102.5 μm long; foot cells straight to flexuous, 24.5-68.5 x 6-8 μm. Conidia borne singly and also few in short chains of 1-2, oval to ellipsoid, 21.5-34.5 x 9-10.5 μm. Fibrosin bodies present.


This is an interesting and imperfectly studied species. Apparently it is pseudoidium type but the careful observation revealed that 1-2 conidia are attached and showing the euoidium state. Braun (1987) has stated that it may be an anamorph of *Erysiphe acalyphae* (Tai) Zheng & Chen. However, in the present collection fibrosin bodies are noticed.

10. **Oidium balakrishnani** sp. nov. (Fig. 3)


On leaves of Lablab purpureus (L.) Sweet (Fabaceae), Vadavalli, Coimbatore, March 14, 1990, V. Vijayanthi HCIO 30427.

7. Oidiopsis tagetidis sp. nov. (Fig. 1)

Plagulae foliicolae, epiphyllae, densae, confluentes. Hyphae ramosae, septatae, 4-6.5 μm crassae. Appressoria papilliformia. Conidiophora projicio emergere stomata, cristata in 4-10, longa, ramosa, recta vel curvula, septata, ramosa, 164-210.5 μm longa, cellula ad ramosa magna et distincta; cellula basali cylindracea, recta vel curvula, 65-89.5 x 4-6.5 μm, cellulae consequor 2-3, breviculae. Conidium solitaria, cylindracea vel ovoidea, 49.5-65 x 13.5-18.5 μm. Germination tube simplices, longa, appressoria bulbosa ad apicem.

Colonies foliicolous, epiphyllous, dense, confluent. Hyphae branched, septate, 4-6.5 μm wide. Appressoria nipple shaped. Conidiophores arise from the stomata, in tufts of 4-10 in numbers, long, straight to curved, septate, branched, 164-210.5 μm long, the cells where branching occurs are larger and distinct from the other cells; foot cells cylindrical, straight to curved, 65-89.5 x 4-6.5 μm, followed by 2-3 shorter cells. Conidia borne singly, cylindrical to ovoid, 49.5-65 x 13.5-18.5 μm. Germination by producing simple, long, aseptate to septate germ tube, bulbous appressorium formed at the tip.

Holotype: On leaves of Tagetes erecta L. (Asteraceae), Kolthurai, Nilgiris, April 24, 1990, V.B. Hosagoudar HCIO 30428

8. Oidium abri sp. nov. (Fig. 2)

The endophytic mycelium and the emergence of conidiophores through stomata represents the anamorph genus Oidiopsis. There are two species of the genus Leveillula namely, L. simonianii Braun and L. taurica (Lev.) Arnaud reported on the members of the family Asteraceae. The present species differs from both in having indistinguishable primary and secondary conidia, in shape and size of the conidia. According to Braun (1980) the present species belongs to the section Cyllindrospora s.s. Golovin which is reported on the members of the family Chenopodiaceae. So far there is no report of the genus Oidiopsis on the members of the family Asteraceae. Hence it is proposed here as a new species.
The paper gives an account of 22 species and infra-specific taxa of the powdery mildews collected from Coimbatore and Nilgiris districts of Tamil Nadu. Of these: Oidiopsis tagetedis, Oidium abri, O. balakrishnani, O. coriandri, O. seafortiani, O. trichiliae are the new species; Oidium cassiae-siameae Yen var. indica, O. peltophori (Yen) Boesewinkel var. indica are the new varieties; Oidium crotalariae (Ciff. & Frag.) comb. nov. (Basionym: O. erysiphoides f. crotalariae Ciff. & Frag.) and O. sesami (Paul & Kapoor) comb. nov. (Basionym: Euoidium sesami Ciff. & Frag.) is affected here. Oidium hortensiae Joerst. is reported here for the first time from India; Erysiphe cruciferarum Opiz ex Junell Sv. Bot Tidsk. 61: 217, 1967.


3. Erysiphe heraclei DC., Fl. Fr. 6: 107, 1815.


On leaves of Tephrosia sp. (Fabaceae), Attakatti, Anamalais, Coimbatore, Dec. 10, 1988, V.B. Hosagoudar HCIO 30426.
ris simplicibus, ex hyphis sterilibus oriundis, ca. 140-165 x 12-15.5 μm, cellulis ad basim cylindraceis, rectis, ca. 30-50 x 6-9 μm. Conidiis catenulatis (4-8), ovoideis - doliiiformibus (- ellipsoideis, pyriformibus), 25-35 (-38) x 12-22 μm.

The present Oidium species belongs to Sphaerotheca or Cyatotheca. The filiform aerial hyphae remind of the latter genus. There are various Oidium species on hosts of the Rutaceae. O. tingitanum Carter is the only Euoidium state beside the new species. But it infects Citrus species and differs from O. murrayae by shorter conidiophores and smaller conidia. Fibrosin bodies are seemingly not present (Braun 1987).

References

**Fig 1. Oidium murrayae spec. nov.,** a - conidiophores, b - conidia, c - appressoria, d - ends of superficial hyphae. Scale 20 μm. U. Braun del.

*Mycelium amphigenum, album. Hyphis sterilibus repentinibus, hyalinis, ramosis, septatis, flexuosis, ca. 1.5-6 μm crass., vel filiformis, ca. (1-) 1.5-3.5 (-5) μm crass., appressoriis non lobatis vel leniter lobatis. Conidiopho-*
OIDIUM MURRAYAE SPEC. NOV.

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Oidium murrayae spec. nov.

Infections confined to young, tender twigs, hyphae
amphigenous, sparsely branched, septate, flexuous, hya­
line, 1.5-6 \( \mu \)m wide, long, filiform (- falcate) aerial
hyphae are present, (1-) 1.5-3.5 (-5) \( \mu \)m wide, wall cre­
nulated, appressoria nipple-shaped to slightly lobed,
conidiophores erect, straight, 140-165 x 12-15.5 \( \mu \)m,
foot-cells 30-50 x 6-9 \( \mu \)m, followed by 1-3 shorter cells,
conidia in chains (4-8), ovoid-doliform (- ellipsoid,
pyriform), with fibrosin bodies, 25-35 (-38) x 12-22 \( \mu \)m.

Holotypus: on Murraya paniculata (L.) Jack (Rutaceae),
Kovai Courtallum, Coimbatore, T.N., India, 10-1-1989, R.
Rabindran (HAL).
Oidium cryptolepidis sp. nov.

- Conidiophore
- Appressorium
- Foot cell
- Conidia

REFERENCES

OIDIUM CRYPTOLEPIDIS SP. NOV. FROM TAMIL NADU, INDIA

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*Department of Botany, Bharathiar University, Coimbatore 641046
**State Forest Service College, R.S. Param, Coimbatore 641002

During a survey of the pathogenic microfungi in the forest area of Kotagiri, Nilgiris district, Tamil Nadu, Cryptolepis buchanani Roem. & Schult. (Periploeaceae), a climbing shrub, found infected with a powdery mildew fungus. Infection was restricted to the upper surface of the leaves but rarely extended to lower surface, petioles and stems. Microscopic examination of the fungus revealed that it is hitherto undescribed species of the genus Oidium Link.

Oidium cryptolepidis sp. nov.

Colonies epiphyllae, raro hypophyllae, caulicolae, amphigenae, confluentes. Hyphae ramosae, septatae, 4.5-6.5 μm crassae. Appressoria papilliformis vel bilobatis. Conidiophora recta, erecta et cylindracea, 62-111.5 μm longae; cellula basali recta vel cylindracea, 24.5-40.5 μm × 6-9.5 μm, secundibus 1-2 cellula brevioribus vel longioribus. Conidia solitaria, ellipsoidea, cylindracea vel doliiformia, 21.5-43.5 × 9.5-13.5 μm. Corpuscles fibrosina visa.

Colonies epiphyllous, rarely hypophyllous and caulicolous, dense, confluent. Hyphae ramosae, septatae, 4.5-6.5 μm crassae. Appressoria papilliformis vel bilobatis. Conidiophores straight, erect, cylindricae, 62-111.5 μm longae; cellula basali recta vel cylindracea, 24.5-40.5 × 6-9.5 μm, followed by 1-2 shorter or longer cells. Conidia formed singly, ellipsoidae, cylindraceae vel doliiformae, 21.5-43.5 × 9.5-13.5 μm. Fibrosin bodies present.


So far there is no report of powdery mildews on any members of the family Periploeaceae (Braun, 1987). Hence, it is proposed here as a new species.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.
Infection spots foliicolous, amphigenous, scattered, up to 3 mm in diameter. Stomata amphigenous, surrounded by yellow haloes, round to oval, black, raised, clypeate, shining, 2-5 locules per stroma, up to 3 mm in diameter. Perithecia immersed, globose, 155-233 x 124-150 μm. Asci numerous, unitunicate, cylindrical, stipitate, octosporus, 49-68.5 x 6-8 μm; spores uniseriate, oval, hyaline, aseptate, 9-12.5 x 4.5-6.5 μm.

Holotype: On leaves of Croton klotzschianus (Wight) Thw. (Euphorbiaceae), Mundanthurai (Near Kariar Dam), Tirunelveli district (Tamil Nadu), Dec. 11, 1986, A. Rajendran AMH 7140.

So far three species of the genus Phyllachora have been reported on the host genus Croton viz., P. crotonis (Cooke) Sacc., P. globispora Speg. and P. gudalurensis Ramakr. & Ramakr.

A comparative account of the earlier described species of Phyllachora and the present one showing the differences in the morphology of the infection spots, stomata, and measurements of the perithecia, asci and ascospores is given below.

<table>
<thead>
<tr>
<th>Name of the species</th>
<th>Spots/stromata</th>
<th>Perithecia</th>
<th>Asci</th>
<th>Ascospore</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. crotonis</td>
<td></td>
<td>300-500 μm</td>
<td>90-100 x</td>
<td>15-17 x</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12-15 μm</td>
<td>7-8 μm</td>
</tr>
<tr>
<td>P. globispora</td>
<td>Epiphyllous</td>
<td>200-250 μm</td>
<td>75-100 x</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>10-12 μm</td>
<td>Biserate</td>
</tr>
<tr>
<td>P. gudalurensis</td>
<td>Hyphophyllous, indistinct</td>
<td></td>
<td>6-9 μm</td>
<td>up to 10 μm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>66-126 x</td>
<td>10-14 x</td>
</tr>
<tr>
<td>P. klotzschianus</td>
<td>Amphigenous</td>
<td>155-232.5 x 49-68.5 x</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>124-150 μm</td>
<td>6-8 μm</td>
<td>9-12.5 x</td>
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<tr>
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<td></td>
<td>4.5-6.5 μm</td>
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ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement.

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RAMAKRISHNAN, T.S. & K. RAMAKRISHNAN


A NEW SPECIES OF PHYLLACHORA FROM THE WESTERN GHATS OF TAMIL NADU

V.B. Hosagoudar, A. Rajendran & P. Daniel

Botanical Survey of India, Southern Circle, Coimbatore-641 003

The leaves of the plants, Croton klotzschianus (Wight) Thw. (Euphorbiaceae), collected recently from the Tirunelveli Hills of the Western Ghats of Tamil Nadu were found to have been infected with a ‘tar-spot’ disease. Microscopic examination of the infected host parts revealed the presence of a fungus belonging to the genus Phyllachora. Its critical study revealed that it is different from the already reported species of the genus Phyllachora on this host genus. Hence, a new species is proposed here.

Phyllachora klotzschianus Hosagoudar, Rajendran & Daniel, sp. nov.

Muculae infectionis foliicolae, amphigenae, dispersae, ad 3 mm diam. Stromata amphigena, rotunda vel ovala, nigra, elevata, clypeata, nitida, 2-5 loculata, ad 2 mm diam. Perithecia immersa, globose, 155-233 x 124-150 μm. Asci numerosi, unitunicati, cylindrici, stipitati, octospori, 49-68.5 x 6-8 μm; sporae uniseriatae, ovale, hyalinae, aseptatae, 9-12.5 x 4.5-6.5 μm.

Fig. Phyllachora klotzschianus sp. nov.

A. T.S. through the stroma
B. Ascus
C. Ascospores
7-9.5 μm; ascospores hyaline, aseptate, ellipsoidal, uniseriate to irregular, 10-14 x 5.6.5 μm.


The present species is close to Phyllachora ischaemi Syd. but differs from it in having smaller asci, smaller and ellipsoidal ascospores and the material did not show the spermatial stage. Parbery (1967, 1971) assigned the Phyllachora species occurring on Apluda to Phyllachora platyelliptica Parbery but the present species differs from it in having smaller ascii and ascospores. Hence, it is proposed here as a new species.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Scientist ‘D’ and Dr. P. V. Sreekumar, Research Associate for the encouragement and the host identification respectively.

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Fig. 1 (A—C). Phyllachora balakrishnani sp. nov. A. T.S. through stroma B. Ascus C. Ascospores

Fig. 2. (A—C) Phyllachora keralense sp. nov. A. T.S. through stroma B. Ascus C. Ascospores

on this host genus. Hence, it is proposed here as a new species. The species is named in honour of Dr. N. P. Balakrishnan, Scientist 'D', Botanical Survey of India, Southern Circle, Coimbatore for his notable contribution to the Angiosperm Flora of India.

Phyllachora keralense Hosagoudar, Manian & Vasuki, sp. nov.

Maculae infectionis folicolae, amphigenae, ad 2 mm diam. Stromata amphigena, nigra et halonibus luteis cincta, plerumque confluentes. Perithecia globosa, clypeata, 1-3 loculata, 100-172 x 57-186 μm. Asci numerosi, unitunicati, cylindrici, leviter stipitati, paraphysati, 52-68 x 7-9.5 μm; ascosporae hyalinae, aseptatae, ellipsoidae, uniseriatae vel irregularae, 10-14 x 5-6.5 μm.

Infection spots foliicolous, amphigenous, up to 2 mm in diameter. Stromata amphigenous, black, surrounded by yellow haloes, often confluent, up to 1 mm in diameter. Perithecia 1-3 per stroma, spherical, 100-172 x 57-186 μm. Asci numerous, cylindrical, stipitate, octosporous, paraphysate, 52-68 x
MISCELLANEOUS FUNGI FROM SOUTH INDIA—IV

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ABSTRACT

*Phyllachora balakrishnanii* and *P. keralense* are the two new species described from the Western Ghat forests of Tamil Nadu and Kerala States respectively.

During the survey of the ‘tar-spot’ diseases in the Western Ghat forests of Tamil Nadu and Kerala States, authors came across two hitherto undescribed species of the genus *Phyllachora* Nits. ex Fuckel which are described here.

*Phyllachora balakrishnanii* Hosagoudar,  
Manian & Vasuki, *sp. nov.*

Maculae indistinctae; stromata foliicola, epiphylla, ad 3 mm diam., raro gregarius, subcuticularia, nigra, nitida, elevata, ad 1 mm diam. Perithecia plerumque globosa et lanceolata, clypeata, 1-3 loculata, 157-243 x 57-157 μm. Asci numerosi, unitunicati, obclavati, octospori, paraphysati, leviter stipitati, 32.5-46.5 x 9-12.5 μm; ascospores hyalinae, single celled, obovatae vel fusiformae, biseriatae, compactae, 10-12.5 x 4-6.5 μm.

Holotype: On leaves of *Osbeckia* sp. (Melastomataceae), Attakatti, Coimbatore, Tamil Nadu, Sept. 6, 1987, V.B. Hosagoudar & S. Manian MH 82156.

Ramakrishnan and Sundaram (1954) have described *Trabutia osbeckiae* from Wynaad. According to von Arx and Muller (1954) *Trabutia* is bitunicatae but the present fungus shows thin and single walled asci and mainly differs from it in the morphology and measurements of perithecia, asci and ascospores. Further, in cotton blue, ascospores densely stained in the middle and imparted that they are two celled. Presence of the stromata, unitunicate and paraphysate asci assigned the present fungus to the genus *Phyllachora*.

There is no report of *Phyllachora* species...


brown to deep brown, often with a hyaline band at the centre, 18-28 X 9-12.5 μm.

Holotype: On leaves of *Daphniphyllum neilgherrense* (Wight) K. Rosenthal (Daphniphyllaceae), Madikettan sholai, Kodaikanal, Tamil Nadu, Oct. 18, 1991, K. Ravikumar HCIO 40859

*Asterina daphniphylli* Yamam. has been recorded on *Daphniphyllum* species from Formosa and Japan (Hino & Katumoto, 1957). The new species differs from it in having a very compactly reticulate mycelium and the presence of an anamorph.

8. *Lembosia malabarensis* (Sydow & Sydow) comb. nov.


This species was collected by E.J. Butler from Kanouth of the Malabar region of the Western Ghats. Our collection is also from the Western Ghats region of Karnataka. Elongated thyrothecia with a central longitudinal slit and the presence of hyphopodia are characteristic of the genus *Lembosia*, justifying the new combination. This species has been relocated after a lapse of several decades.

ACKNOWLEDGEMENTS

We are thankful to Dr. N.P. Balakrishnan, Joint Director and Mr. S.R. Srinivasan, Scientific Assistant, Botanical Survey of India, Southern Circle, Coimbatore, for their critical perusal of the manuscript and for their association in the field. One of us (VBH) is grateful to the Scientists' Pool Scheme of CSIR, New Delhi, for financial assistance. We are very grateful to Dr. F.A. Uecker for his pre-submission review of the manuscript.

REFERENCES

Colonies hypophyllous, subdense, spreading. Hyphae crooked, branching irregular at acute angles, closely reticulate, cells 12-15 X 3-4.5 μm. Hyphopodia unicellular, often scattered, ovate, ampulliform, mammiform, entire to sublobate, 9-12.5 X 6-8 μm. Pycnidia scattered, stellately dehisced to widely opened, up to 100 μm in diameter, margin crenate. Pycnidiospores unicellular, ovoid, ellipsoid, brown, acutely rounded at both ends, 24-26 X 9-15.5 μm.

Holotype: On leaves of Ixora lanceolata Night forma anfractuosa (Clarke) Jeuken (Sapotaceae), Seithur Hills, Kamarajar dist., Tamil Nadu, Nov. 14, 1992, V.B. Hosagoudar HCIO 40858.

This new species differs from other anamorphs of Asterina species reported on Sapotaceae in the infection pattern and in the morphology of hyphae, hyphopodia and pycnidiospores (Stevens & Ryan, 1939; Doidge, 1942).

7. Asterostomella daphniphylli V.B. Hosagoudar et K. Ravikumar, sp. nov. (Fig. 13-15).

Colonies amphigenous, plerumque epiphyllae, crustosae vel velutinae, ad 2 mm diam., confluentes. Hyphae rectae, flexuoseae, raro anfractuaseae, alternate anguliter acuteae ramosae, hyphae in cursum parallelis, compactae, cellulae 9-15.5 X 4.5-7.5 μm. Hyphopodia alternata et positus externa in hyphis compactis modo, recta vel leniter curvula, unicellularia, ovata vel globosa, integra, 6-12.5 X 6-9.5 μm. Pycnidia numerosa, laxe aggregata, circularia vel ovata, 130-190 μm diam., membrana amicta brunnea, nigra et opaca in maturitate, stellatiter dehiscentes ad centrum vel perlate patulata. Pycnidiosporae ovalae, ellipsoideae, piriformiae, rectae vel leniter curvulae, pallide brunneae vel profunde brunneae, taenia hyalina ad centrum, 18-28 X 9-12.5 μm.

Colonies amphigenous, mostly epiphyllous, crustose to velvety, up to 2 mm in diam., confluent and covering the entire upper surface of the leaves. Hyphae straight, flexuous, often crooked when solitary, branching alternate to irregular at acute angles, several hyphae running closely parallel and forming a compact mycelial mat, cells 9-15.5 X 4.5-7.5 μm. Hyphopodia alternate and produced only on the outer surface of the compact hyphae, mostly straight but rarely curved, unicellular ovate to globose, entire, 6-12.5 X 6-9.5 μm. Pycnidia numerous, loosely crowded, circular in outline, often ovate, 130-190 μm in diameter, covering membrane initially brown, later becoming dark and opaque, splitting stellately at the centre or having a wide opening. Pycnidiospores oval, ellipsoid, pyriform, straight to slightly curved, pale
alternate to irregular at acute angles, loosely reticulate, cells 30-37 X 3-5 \( \mu \text{m} \). Hyphopodia alternate, scattered, mostly unicellular, rarely two celled, mammiform, entire to subiobate, 3-22 X 5-7 \( \mu \text{m} \). Thyrothecia grouped at the centre of the colony, stellately dehisced and widely opened, margin crenate, up to 60 \( \mu \text{m} \) in diameter. Ascospores conglobate, brown, 1-septate, deeply constricted, upper cell larger, lower cell smaller, 10-22 X 12-14 \( \mu \text{m} \), wall smooth.

**Holotype:** On leaves of *Meliosma simplicifolia* (Roxb.) Walp. subsp. pungens (Wall. ex Blight & Arn.) Beus (Sabiaceae), Seithur Hills, Kamarajar dist., Tamil Nadu, Nov. 14, 1992, V.B. Hosagoudar HClO 40850.

The new species can be compared with *Asterina meliosmaticola* Petrak & Ciff. reported on *Meliosma* sp. from which it differs in having unicellular to bi-cellular hyphopodia, and smaller thyrothecia, asci and ascospores (Petrak & Cifferi, 1932).


On leaves of *Eranthemum capense* L. (Acanthaceae), Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 14, 1992, V.B. Hosagoudar HClO 40851.

This taxon has not been previously recorded on this host genus.


On leaves of *Toddalia asiatica* (L.) Lam. (Rutaceae), Seithur Hills, Kamarajar dist., Tamil Nadu, Nov. 12, 1992, V.B. Hosagoudar HClO 40852.

This species was recorded from West Bengal and is reported here for the first time from southern India (Kar & Maity, 1986). In our collection, the colonies were subdense and hypophylic.

6. *Asterostomella isonandrae* sp. nov. (Fig. 10-12)

Coloniae hypophylaceae, subdense, putentiae. Hyphae anfractuae, irregulariter acuteque ramosae, dense reticulatae, cellularae 12-15 X 3-4.5 \( \mu \text{m} \). Hyphopodia unicellulara, saepe dispersa, ovata, ampullacea, mammiforma, integra vel subiobata, 9-12 X 6-8 \( \mu \text{m} \). Pycnidia dispersa, stellato dehiscentes vel perlate patulata, ad 100 \( \mu \text{m} \) diam., margo crenatus. Pycnidiosporae unicellulariae, ovoideae, ellipsoidae, brunnea, acute rotundatae ad apicem ambo, 24-26 X 9-15.5 \( \mu \text{m} \).
Colonies amphigenous, caulicolous, ramicolous, dense, velvety, widely confluent. Hyphae straight to substraight, rarely crooked, branching alternate to irregular at acute angles, loosely to closely reticulate, cells 21-25 X 4.5-6.5 μm. Hyphopodia continuous, mammiform, obvoid to cylindrical, rounded at the apex, entire to rarely sublobate, 6-37 X 5-7 μm. Thyrothecia scattered to loosely grouped, round, margin crenate to rarely fringed, stellately dehisced at the centre, often upper portion dissolved and widely opened, up to 110 μm in diameter. Ascii many, globose, octosporous, 55-75 μm in diameter. Ascospores conglobate, 1-septate, deeply constricted at the septum, upper cell ovate, lower cell globose, 31-34 X 14-16 μm, wall verrucose. Pycnidia few, similar to thyrothecia, slightly smaller; pycnidiospores brown, globose, pyriform, often slightly beaked, 18-25 X 14-16 μm.

Holotype: On leaves of *Euonymus* crassulus Wall. ex Wight & Arn. (Celastraceae), Seithur hills, Kamarajar dist., Tamil Nadu, Nov. 12, 1992, V.B. Hosagoudar HCIO 40849.

*Asterina dissiliens* (Sydow) Doidge is the only species of *Asterina* reported on members of the family Celastraceae (Doidge, 1942). The new species differs from it in having numerous hyphopodia, scattered thyrothecia and larger ascospores.

3. *Asterina sabelaecearum* sp. nov. (Fig. 6-9).
Figs. 1-5. Asterina euonymi sp. nov. 1. Mycelium. 2. Thyrothecium. 3. Asci. 4. Ascospores. 5. Pycnidiospores.
SOME ASTERINA, ASTEROSTOMELLA AND LEMBOSIA SPECIES FROM SOUTHERN INDIA

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Abstract

The paper gives an account of eight taxa of epiphyllous fungi from India. Asterina euonymi, A. sabiacearum, Asterostomella daphniphylli and A. isonandrae are described as new species, while Lembosia malabarensis is listed as a new combination, based on Asterina malabarensis. Other species listed are Asterina dissiliens, A. tertia, and A. toddalae.

Key Words: Asterina, Asterostomella, Lembosia, Southern India


On leaves of Pleurostylia opposita (Wall.) Alston (Celastraceae), Kaka Sholai, Yercaud, Salem dist., Tamil Nadu, Feb. 1992, A.A. Ansari HCIO 40848

This is the first report of this species on this host genus.

2. Asterina euonymi sp. nov. (Fig. 1-5).

Coloniae amphigenae, caulicolae, ramicolae, densae, velutinae, plerumque confluentes. Hyphae rectae vel subrectae, raro anfractuae, alternate vel irregulariter acuteque ramosae, laxae vel dense reticulatae, cellulae 21-25 X 4.5-6.5 μm. Hyphopodia continua, mammiformia, ovoidea vel cylindracea, rotunda ad apicem, integra vel raro sublobata, 6-37 X 5-7 μm. Thyrothecia dispersa vel laxae aggregata, rotunda, margina crenata vel fimbriata, stellate dehiscencia ad centrum, toties portio superior...
of two species of Cirsosia collected on Calamus species from India and the first record of this genus from India (Jamaluddin & Rizwi 1979, 1981; Sarkar, Acharjya & Vartney, 1986), the earlier records being from the Philippines (Müller & Arx, 1962).

The genus Cirsosia is characterized by the mycelium being superficial, brown, branched and septate; hyphopodia round to oval, intercalary or slightly lateral on the hyphae. Haustoria produced into the host cells from the ascogenous hyphae, either directly or via a hyphopodium, the ascogenous hyphae terminating in a lateral or terminal ascus. The ascospores are thin-walled, uninucleate, and generally 8-spored, dark brown, 1-septate. The ascospores of the two species described differ in size, with C. arecacearum having spores 43–59 × 15–24 μm and C. globulifera having spores 64–74 × 24–35 μm.

Type species: Cirsosia arecacearum (1962).

Cirsosia arecacearum V. B. Hosagoudar & M. Pillai sp. nov.


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We are grateful to Professor K. M. Kaveriappa and Mr. B. V. Shetty (Emeritus Scientist of BSI), Mangalore University, Mangalore for encouragement, and one of us (V. B. H.) is also grateful to the ‘Scientists’ Pool Scheme’ of CSIR, New Delhi for financial assistance. We are thankful to Mr. A. T. Durgadas, Botanical Survey of India, Coimbatore for the line drawings.

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Two interesting *Cirsosia* species on *Calamus* from India

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Cirsosia *americana* sp. nov. and *C. globulifera* (Pat.) Arx isolated from *Calamus* in India are described. The genus is reported for the first time from India.

Arnold (1958) simultaneously published three generic names: *Cirsosia* Arn., *Cirsosella* Arn., and *Hallemania* Arn. Stevens & Ryman (1980) recognized *Cirsosia* with one species and *Cirsosella* with three species. *Cirsosella* was differentiated in having paraphyses. Müller & Arx (1962) treated *Cirsosella* and *Hallemania* as synonymous with *Cirsosia* and included four species in the genus, namely, *C. americana* (Henn.) Arn., *C. globulifera* (Pat.) Arx, *C. transversalis* Sydow & P. Sydow Bat. & Mian and *C. irregulata* (Sydow & P. Sydow) Arx. Of these, *C. globulifera* and *C. transversalis* have been reported on *Calamus* species. However, the host identity of the latter species has been questioned by Müller & Arx (1962). Subsequently, Eriksson & Hawksworth (1980) reduced two other genera, *Lampiophora* Bat. & Mian and *Xylophora* Bat. & Mian to synonymy with *Cirsosia*. The present paper gives an account...
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Conidiophores micronematous, mononematous, unbranched, straight, light brown, arise laterally from the hyphae, smooth, paler towards apex, 9-20 x 6-6.5 μm; conidiogenous cells integrated, mostly terminal, monoblastic, determinate, cylindrical; conidia simple, dry, solitary, acrogenous, subglobose, smooth, brown to dark, slightly constricted at the septa, cells 4-6, circinate arranged, 24-31 x 21-25 μm.


This species is named in honour of Dr. S.J. Hughes for his excellent contributions towards this group.

ACKNOWLEDGEMENTS
We are thankful to Dr. N.P. Balakrishnan, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement. One of us (VBH) is grateful to the "Scientists Pool Scheme" of C.S.I.R., New Delhi for the financial assistance.
The pleomorphic genus *Schiiffnerula* Hohnel (Ascomycetes) having Synanamorphs: *Sarcinella* Sacc., *Questieriella* Arn. ex Hughes, *Mitteriella* H. Sydow, and *Digitosarcinella* Hughes. The genus *Clypeolella* is considered congeneric to the genus *Schiiffnerula*. Schiiffnerulous fungi are world wide in distribution, occur mostly in the tropics and subtropics, reported on about 50 dicotyledon families (Hughes, 1983, 1984). The morphological differences between species are very small and convenient method of their determination is based on their hosts (Hansford, 1946). The present collection of schiiffnerulous fungus on *Nothopodytes foetida* (Wight) Slumer (ICACINACEAE) is having *Sarcinella* and *Questieriella* synanamorphs and is the first report on the members of the family Icacinaceae. Hence, it is proposed here as a new species of one of the synanamorph genus *Sarcinella* Sacc.

*Sarcinella hughesii* V.B. Hosagoudar et P. Venkanna, sp. nov.

Coloniae plerumque hypophyllae, nigrae, subdensae, confluentes. Hyphae subrectae vel flexuosae, acutaeque ramosae, densae reticulatae, cellulae 15-22 x 5-6.5 μm. Hyphopodia alternata vel unilateralia, unicellula, leniter brunnea, globosa, glabra, integra, 5-6.5 x 9-10 μm.

*Questieriella* synanamorph

Conidia producentes a hypha, cellula conidiogena hyalina, rotunda, sessilia, cicat rix persistenta, conidia fusiformia, curvula 3-septata, cellula centralis leniter brunnea cellula distalis dilute brunnea et acutae vel obrousae ad apicem, 36-40.5 x 6-8 μm.

*Sarcinella* synanamorph

Conidiophora macronemata, mononemata simplices, recta vel curvula, leniter brunnea producentes lateralibus a hyphae, glabra palide ad apicem, 9-20 x 6-6.5 μm; cellula conidigena integrata, plerumque terminalia monoblastica, determinata, cylindracea conidia simplicibus, sicca, circinatei, constricti ad septa, cellula 4-6, circinata, 24-31 x 21-25 μm.

Colonies on the lower surface of the leaves, often found on the upper surface, black subdense, confluent. Hyphae closely appressed to the leaf surface, subrectae vel flexuous branching irregular at acute angles, closely reticulate, cells 15-22 x 5-6.5 μm. Hyphopo
Fig. 3. *Pseudocercospora chloroxyllica*. A–C, Sections showing stromata and conidiophores; C, young conidiophores embedded in a gelatinous substance; D, conidia.
of both Cercosporea and Pseudocercosporea (Deighton, 1976) and found to be different. The newly formed lesions and developing conidiophores remain embedded in a gelatinous substance, a feature unique to the present species.

Cercosporea chlorarya T. S. Ramakr. & Reddy reported on Chalosporium-sativae Deighton, type collection from Kallar, Madras, India by G. S. Reddy on 1 Jan. 1951 (Ramakrishnan, 1952), is not a true species of Cercosporea Fres., such as C. apii Fres., and needs to be transferred to Pseudocercosporea. It differs from the new species in having comparatively broader conidia; the authors' measurements were conidiophores 21 x 5 (12-33 x 5-7) μm and conidia 45 x 5 (31-62 x 6-7) μm, 1-4 septate. Thirumalachar & Govindu (1956) redescribed C. chlorarya based on a study of a topotype, collected by H. C. Govindu, on 25 Jan. 1953, as the type was not available, and provided measurement as conidiophores 21-42 x 2-8-5-7 μm and conidia 14-64 x 2-8-4-2 μm, 1-8 septate. The conidial measurements provided by Thirumalachar & Govindu (1956) are closer to the species described here.

Fig. 2. Cercosporella acuminata: Apical portions of conidiophores and conidia.

One of the authors, R. K. Verma is thankful to CSIR, New Delhi for providing financial assistance under 'Scientists' Pool' scheme of the Government of India.

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New Species of *Cercospora* and *Pseudo cercosporella* from South India

*Fig. 1. Cercospora amamathic. Section showing stroma and conidia.*

of the leaf, 2-10 mm wide. *Cercospora* amamathic, but more commonly hypogenous, spread over the spots as blackish dots in concentric zones. *Stroma* sub-epidermal, pseudo-arenchymatous, 21-30 x 18-30 μm. *Hyphae* internal: hyaline to slightly olivaceous, 5-2-5 μm wide. *Conidiophores* short, initially embedded in a gelatinous substance on the leaf surface, hardly projecting beyond the peculiar, ornamented epidermal cells of the host, straight to slightly geniculate, pale-olivaceous, smooth, simple, ±1 septate, 9-17 x 20-30 μm. Conidiogenous cells integrated, polyblastic, scars inconspicuous to obscure, unthickened. *Conidia* holoblastic, acicular-cylindrical to slightly obclavate, straight to slightly curved, pale olivaceous, smooth 3-9 x 7-17 μm. The fungus described above shows similarity with *cercosporella*-like fungi previously placed in *Cercospora* Petrak (small dense fascicles of conidiophores and somewhat aciculate, coloured conidia). Deighton (1987) considered *Cercospora* synonymous with *Pseudo cercosporella* Speg. The present species, therefore, has been compared with previously reported species.
New species of **Cercosporella** and **Pseudocercospora** from South India

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**Cercosporella anamirtae** Hosagoudar & R. K. Verma, sp. nov.

During surveys of parasitic foliicolous fungi in Southern India, two cercospora-like fungi, causing leaf lesions were collected by the senior author in 1980–7 from Andhra Pradesh and Tamil Nadu. The present paper describes and illustrates these fungi, designated as *Cercosporella anamirtae* and *Pseudocercospora chloroxylicola*, collected on *Anamirta cocculi* Wight & Arn. and *Chloroxylon swietenia* DC., respectively.

**Cercosporella anamirtae** Hosagoudar & R. K. Verma, sp. nov. (Figs. 1–2)


In foliis vivis *Anamirta cocculi* (L.) Wight & Arn., (Menispermaceae), Padukadu, Valparai, Tamil Nadu, India, 17 Jan. 1987 V. B. Hosagoudar, IMI 337250a isotypus; FR1, Dehra Dun, Mycol. Herb. 8038 holotypus.

Leaf spots hypogenous indistinct, sub-ornicular, colonies small scattered over the leaf surface, white, floccose, corton, 1–3 mm wide. *Caespituli* hypogenous, densely floccose, white. *Mycelium* internum: hyphae branched, septate, densely cellular, colourless, 2–0–3–5 μm wide. *Stromata* loose, composed of pale-olivaceous hyphae, 12–27 × 9–25 μm. Conidiophores very long in a loose divergent tangled fascicle, arising from a compact group of 5–15 moderately olivaceous parallel hyphae, which emerge through the stoma, fuscous, pale and almost colourless towards the apex, septate, smooth, geniculate, simple, rarely branched, smooth, up to 532 μm long, 4–0–6–5 μm wide. *Conidiogenous cells* integrated in the upper half of conidiophores, sympodial, polyblastic, scars conspicuous, convex 2–3 μm wide. *Conidia* holoblastic, cylindrical to obclavate, straight, curved or sigmoid, simple, 8–septate, smooth, colourless, 36–(75)–120 × 0–5–9–5 μm; hilo conspicuous, circular; apex obtuse to rounded.

This new species is close to *Cercosporella ugandensis* Deighton and C. *virgatae* (Thümen) Allescher (Deighton, 1973) with respect to size of conidia, the former measuring 42–66 × 5–6–5 μm and the latter 26–117 × 3–6–5 μm. However, it differs in the size of conidiophores. The conidiophores never exceed 250 μm in *C. ugandensis* or 100 μm in *C. virginatae*.

**Pseudocercospora chloroxylicola** Hosagoudar & R. K. Verma, sp. nov. (Fig. 3)


In foliis vivis *Chloroxylon swietenia* DC. (Rutaceae), Mahanadi, Kurnool, Andhra Pradesh, India, 10 Feb. 1980, V. B. Hosagoudar, IMI 337244 isotypus; FR1, Dehra Dun, Mycol. Herb. 8638 holotypus.

Leaf spot hypogenous, rounded to irregular with concentric zones, dull brown on upper and pale-grey on the lower surface.
2 *Foveostroma indica* (Pawar & Kulkarni) comb. nov.


On leaves of *Ficus benghalensis* L., Kolhapur, Maharashtra, AMH.

3. *Foveostroma suttonii* (Yadav & Rao) comb. nov.


On *Kickxia ramosissima* (Wall.) Janchen, Poona, Maharashtra AMH 3388

Sutton (1980) in his monograph on *Coelomycetes* gives the generic description based only on the type species, *F. drupacearum* (Lev.) Di Cosmo without taking into consideration the other species. Hence a thorough revision of this genus is needed to establish the present wider generic limits and generic synonymy.

**ACKNOWLEDGEMENTS**

We are grateful to Dr. A. N Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for the valuable suggestions.

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THE GENUS _MICROPERA_ LEVEILLE IN INDIA

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ABSTRACT

The genus _Micropera_ Lev. is the later homonym of _Micropera_ Lindley. Hence, Di Cosmo proposed new generic name _Foveostroma_ to _Micropera_ Lev. Adopting the new generic name _Foveostroma_ Di Cosmo, the new combinations for the three species reported from India as _Foveostroma dahliae_ (Died.) comb. nov., _F. indica_ (Pawar & Kulkarni) comb. nov. and _F. suttoianum_ (Yodav & Rao) comb. nov. are proposed here.

The genus _Micropera_ with the type species _M. drupacearum_ Lev. was proposed by Leveille in 1946 to accommodate the Coelomycetes fungus. However, the name _Micropera_ was earlier applied to a genus of the family Orchidaceae by Lindley in 1932. According to the International Code of Botanical Nomenclature, article 64, Leveille's generic name _Micropera_ is the later homonym and hence illegitimate. While revising the genus _Cornicularia_ Di Cosmo (1978) pointed out the fact and proposed a new generic name _Foveostroma_ for _Micropera_ Lev. and also made new combinations for two species.


_On Prunus sp._


_On Abies balsamea L. and _Tsuga canadensis_ (L.) Car._

Of the 40 species so far attributed to the genus _Micropera_ Lev. three species are from India. Adopting the new generic name, _Foveostroma_ Di Cosmo, the new combination for the three species reported from India are proposed here.

1. _Foveostroma dahliae_ (Died.) comb. nov.


_On dead stems of _Dahlia variabilis_ Desf., Pusa, Bihar HCIO._
been reported so far on the members of the family Betulaceae (Braun, 1987). But the present collection is known only in its anamorph state and differs from the rest in having pseudoidium type of conidia and mostly non septate basal cell which narrows towards the base and is very narrower and often flexuous, near its attachment to the mycelium.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Deputy Director and Dr. A.N. Henry, Scientist SE, Botanical Survey of India, Southern Circle, Coimbatore for their encouragement.

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A NEW POWDERY MILDEW FUNGUS FROM TAMIL NADU, INDIA

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Alnus nepalensis D. Don (Betulaceae), a temperate Himalayan species was introduced in the Experimental garden of Botanical Survey of India, Yercaud, Salem district of Tamil Nadu as an avenue tree. This plant was found severely infected with a powdery mildew fungus. Microscopic examination of the infected leaves revealed the presence of an undescribed species of the genus Oidium and hence is described here as a new species.

Oidium betulacearum sp. nov.


Colonies epiphyllous, rarely very few colonies hypophyllous, crustose, persistent, confluent and covering the entire upper leaf surface, mycelium 3-5 μm wide. Appressoria mammelliform and bilobed. Conidiophores straight, erect, 45-59 μm long; basal straight, cylindrical, narrowed towards the base, straight to flexuous at base, mostly non septate, 27-31 x 8-9.5 μm. Conidia formed singly, mostly cylindrical, 30-35 x 9-12.5 μm. Germ tube simple, produced at distal portion.


Fig. 1-3. Oidium betulacearum sp. nov.

Phyllosticta coryleae Pers. has been reported on this host genus from India (Bilgrami et al. 1978, 1981) but the present collection differs from it by the superficial mycelium and the conidiophores arise on it. About nine taxa of powdery mildews have
Latter host forms a new host record.


On the leaves of Thunbergia alata Bojer (ACANTHACEAE), Yercaud, February 7, 1985, V.B. Hosagoudar BS1/1SV/82147.

The fungus was collected in uredial stage only. The morphology and measurements of the uredinia and urediniospores perfectly match with P. thurbergiae-alatae P. Henn.

The fungus is recorded for the first time from India.

ACKNOWLEDGEMENTS

Thanks are due to Prof. C.V. Subramanian, Centre for Advanced Studies in Botany, University of Madras, Madras; to Dr. U. Braun, DDR-4090, Halle-Neustadt, Bl. 149/2/40; Dr. G. Bhagyanarayana, Osmania University, Hyderabad for their help in confirming the identity of Hyphomycetes and powdery mildews. The first author is grateful to the Department of Environment, Government of India for financial assistance.

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On the leaves of Ixora parviflora Vahl (RUBIACEAE), Maruthamalai, Coimbatore, November 25, 1984, V.B Hosagoudar BSI/ISV/82120.


Ramakrishnan (i.e.) has mentioned the host Ochna sp. While, Kamat, et al. (i.e.) after verifying the type material, have stated the host may be Ochna pumila B. Ham.

The pathogen forms a new host record from India.


The pathogen is recorded for the first time from Karnataka.

Phyllachora sp.

On the leaves of Ficus tomentosa Roxb. (MORACEAE), Maruthamalai, Coimbatore, November 18, 1984, V B. Hosagoudar BSI/ISV/82115.

The pathogen forms a new host record.


On the leaves of Alnus nepalensis D. Don (BETULACEAE), National Orchidarium, Yercaud, February 6, 1985, V.B. Hosagoudar BSI/ISV/82150.

Bilgrami et al. (1979, 1981) have listed this species as Phyllactinia corylea (Pers.) Karst. The present species collected in anamorph only.


On the leaves of Cyrtococcum patens (L.) Camus (GRAMINEAE), Cauvery peak of Shevaroy hills, February 8, 1985, V.B. Hosagoudar BSI/ISV/82140.

The pathogen forms a new host record.


On the leaves of Ficus benghalensis L. and F. nervosa Heyne ex Roth (MORACEAE), Cauvery peak of Shevaroy hills, V.B. Hosagoudar BSI/ISV/82130 & 82131.
Amazonia butleri (Syd.) Stev., l. c.  25: 415, 1927.

On the leaves of *Citrus aurantium* L. (RUTACEAE), Maruthamalai, Coimbatore, November 25, 1984, V.B. Hosagoudar BSI/ISV/82116.

The pathogen is recorded for the first time from Tamil Nadu.


On the leaves of *Caryya orborea* Roxb. (LECYTHEDACEAE), Tropical Botanic Garden, Trivandrum, September 1, 1984, V. S. Raju BSI/ISV/82124.

The fungus is recorded for the first time from Kerala.

Oidium caricar Naock. in Chona & Lall, Indian Phytopath. 12: 186, 1959.

On the leaves of *Carica papaya* L. (EUPHORBIACEAE), Pudur, Coimbatore, February 2, 1985, Hosagoudar BSI/ISV/82129.

The pathogen is recorded for the first time from Tamil Nadu.


On the leaves of *Eucalyptus globulus* Labill. (MYRTACEAE), Cauvery peak of Shevaroy hills, February 8, 1985, V. B. Hosagoudar BSI/ISV/82139.

The fungus was earlier recorded from Karnataka and Kerala (Sharma & Mohanan, 1981; Hosagoudar, 1985). It is evident from the available records that all the species, cultivated on hills as well as on plains, are susceptible to this disease and responsible for considerable loss.

The pathogen is recorded for the first time from Tamil Nadu.


On the leaves of *Memeleia umbellata* Burm. f. (MELASTOMATACEAE), Cauvery peak of Shevaroy hills, February 8, 1985, V.B. Hosagoudar BSI/ISV/82142.

The pathogen is recorded for the first time from Tamil Nadu and forms a new host record.


On the leaves of *Diospyros peregrina* Gurke (EBENACEAE), Srikakulam District (A.P.), May 25, 1979, G.V. Subba Rao, MH No. 110230, 110231.

The pathogen is recorded for the first time from Andhra Pradesh and forms a new host record.


On the leaves of *Ficus asperrima* Roxt. (MORACEAE), Cauvery peak of Shevaroy hills, February 8, 1985, V.B. Hosagoudar BSI ISV/82133.

The fungus is recorded for the first time from Tamil Nadu.

On the leaves of *Dipsocoria glaucescens* Diils (=*Cocculus macrocarpus* Wight & Arn.) (Menispermaceae), Cauvery peak of Shivaroy hills, Salem District, February 8, 1985, V.B. Hosagoudar BSI/ISV/82139.

The fungus is recorded for the first time from Tamil Nadu and forms a new host record from India.

*Claviceps* sp.

In the inflorescence of *Cloris quinque- setica* Bhide (Gramineae), Ekashila, Warangal (A. P.), V. B. Hosagoudar BSI/ISV/82126.

New host record from India.


On the leaves of *Ipomoea nil* (L.) Roth (Convolvulaceae), Yercaud, February 7, 1985, V. B. Hosagoudar BSI/ISV/82144.

The pathogen forms a new host record.


On the leaves of *Bauhinia purpurea* L. (Caesalpiniaceae), Vidhan Soudh, July 8, 1984, V. B. Hosagoudar BSI/ISV/82103.

The pathogen forms a new host record.

*E. polygoni* DC. *in* M. W. Khan, Malik & A. M. Khan, Indian Phytopath. 28: 200, 1975.

On the leaves of *Peltophorum pterocarpum* (DC.) Backer *ex* Heyne (Caesalpiniaceae), TNAU Campus, Coimbatore, February 6, 1985, V. B. Hosagoudar BSI/ISV/82152.

The pathogen forms a new host record.


On the young leaves and tender growing shoots of *Vaccinium neilegherrense* Wight (Vacciniaceae); National Orchidarium, Yercaud, February 6, 1985, V. B. Hosagoudar BSI/ISV/82132.

Earlier, the fungus was recorded from Nilgiris (Ramakrishnan, T. S. & Ramakrishnan, K. 1949).


On the leaves of *Dioscorea tomentosa* Heyne (Dioscoreaceae), Srikakulam (A.P.), August 19, 1984, N. Rama Rao BSI/ISV/82107.

The pathogen is recorded for the first time from Andhra Pradesh and forms a new host record from India.


On the leaves of *Solanum torvum* Sw. (Solanaceae), Pudur, Coimbatore, February 6, 1985, V. B. Hosagoudar BSI/ISV/82127; on the leaves of *S. hispidum* Pers., Yercaud, February 8, 1985, V. B. Hosagoudar BSI/ISV/82149.

Both are new host records.

Infection was restricted to the lower surface of the leaves. Severely infected leaves turned yellow and resulted in defoliation. The fungus was persisted in anamorph stage.

The pathogen forms a new host record.
MISCELLANEOUS FUNGI FROM SOUTH INDIA

V.B. Hosagoudar & N.C. Nair

Botanical Survey of India, Southern Circle, Coimbatore-641 003

ABSTRACT

This paper presents 28 species of fungi collected from Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. *Aecidium justiciae* P. Henn. and *Puccinia thunbergiae-auctae* P. Henn. are recorded for the first time from India. While, 3 pathogens from Andhra Pradesh, 2 pathogens from Karnataka, 1 pathogen from Kerala and 7 pathogens form Tamil Nadu have been recorded for the first time and 15 pathogens form new host records from India.

During the casual visits to various parts of South India, authors have collected good number of pathogenic micro fungi. Of those, 28 species have been recorded here. Distributional records of the fungi presented here are based on the recent list on Fungi of India by Bilgrami et al. (1979, 1981).


On the leaves of *Phlebophyllum versitolor* (Wight) Bremk. (= *Strobilanthus cuspidata* (Benth.) T. Anders.) (ACANTHACEAE), Maruthamalai, Coimbatore, November 25, 1984, V. B. Hosagoudar BSI/ISV/82119. The fungus was earlier recorded from Burliar, Nilgiris (Ramakrishnan et al., 1953).


On the leaves of *Hibiscus ovalifolius* (Forsk.) Vahl (MALVACEAE), Maruthamalai, Coimbatore, November 18, 1984, V. B. Hosagoudar BSI/ISV/82114. The pathogen forms a new host record.

TAXONOMIC NOTES ON SOME POWDERY MILDEWS OF VARIOUS GENERA

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14. Oidium caesalpiniacearum V. B. Hosagoudar & U. Braun
spec. nov.

stereilis - antibus, hyalinis, cornetis, con- 
tatis, 2.5-8 μm crass., appress. non lobulis. Conio- 
phoris simplicibus, ex hyphis sterilibus oriundis, cellu- 
lis ad basis cylindraceis, rectis, ca. 30-55 x 5.5-8 μm. 
Conidias solitariae, ellipsoideae - cylindraceae (- dolli- 
formibus, - ovoidalis), 24-43 x 11-20 μm.

Holotypus: hospes - Bauhina spec., India, Bangalore, 
Karnataka, 1984, Hosagoudar (HAL).

The new species is well characterized by the appearance 
of the infections (hypophyllous, definite patches, infec-
ted parts of the leaves discoloured, yellow or brown pat-
ches). The appressoria are nipple-shaped or only slightly 
lobed. Oidium bauhiniae Gorter & Eicker, recently descri-
bred from South Africa, is clearly distinguished by multi-
lobed appressoria and a distinct appearance of the infec-
tions.

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tions.
D-E. *Mycoselosielia* *gmelinae-arboreae* sp. nov.
D. Branched conidiophores
E. Septate conidia
F-G. *Verrucispora bridiae* sp. nov.

F. T.S. through the stromata showing the conidiophores.

G. Straight to curved conidia.
Cicatrices conspicuae. Conidia solitaria, raro in catenas, recta vel curva, subhyalina vel olivaceo-brunnea. laevia, 1-9 septata, raro usque ad 12 septata, 72-88 × 4-6 μm.

Colonies hypophyllous, greyish brown, velvety, 1-4 mm in diameter, often confluent. Mycelium superficial, olivaceous brown, septate, 6-8 μm broad. Conidiophores macronematous, repeatedly branched, flexuous, intertwinning, olivaceous brown, 72-88 × 4-6 μm. Conidiogenous cells terminal, sympodial, scars conspicuous. Conidia solitary, rarely in chains, straight or curved, subhyaline to olivaceous brown, smooth, 1-8 septate, rarely up to 12 septate, 72-88 × 4-6 μm.


There is no earlier record of the genus Mycovellosiella on the members of the family Verbenaceae. Hence, the present fungus has been accommodated in a new species.

Verrucispora brideliae sp. nov. (Fig. F-G).

Coloniae foliocolae, hypophyllae, fuscae, diffuseae, pagina folii pro parte maxima obtengentes. Stroma moderate effectum, profunde brunneum. Conidiophora stromate orientia, macronematata, mononematata, caespitosa, 3-6 in fasciculis, non ramosa, recta vel flexuosa, latver geniculata et ad spicem amplificata, septata, olivaceo - brunnea, 50-66 × 4-6 μm. Cellulae conidiogenae polyblastae, integratae apicales et intercalares; cicatrices conspicuae. Conidia solitaria, simplicia, 1-5 septata, recta vel curva, cylindrica, fusiformia, olivaceo-brunnea, 20-32 × 6-10 μm, paries verrucosus.

Colonies foliicolous, hypophyllous, dark, diffused, confluent, covered most of the leaf surface. Stroma moderately developed, deep brown. Conidiophores arise from the stroma, macronematous, mononematous, caespitose, 3-6 in fascicles, unbranched, straight or flexuous slightly geniculate and enlarged at the tip, septate, olivaceous brown, 50-102 × 4-9 μm (av. 50-56 × 4-6 μm). Conidiogenous cells polyblastic, integrated, terminal and intercalary, scars conspicuous. Conidia solitary, simple, 1-5 septate, mostly 3-4 septate, straight to curved, cylindrical, fusiform, olivaceous brown, 20-32 × 6-10 μm, wall verrucose.


The present species differs from Verrucispora proteacearum Shaw & Alcorn in smaller and verrucose conidia.

ACKNOWLEDGEMENTS

We are grateful to Dr. N. C. Nair, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for encouragement; to Dr. V. J. Nair and Mr. K. Vivekananthan of the same organisation for Latin translation and host identification respectively. We are also thankful to Dr. G. Sekar, CAS in Botany, Madras University, Madras for his valuable suggestions. One of us (VBH) is grateful to the Department of Environment, New Delhi for financial assistance.
OBSERVATIONS ON A GALL-INDUCING RUST AND IT'S HYPERPARASITE

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The paper presents the occurrence of Tuberculina costaricoana Syd. on Aeolidium elaeocarpi-tuberoulatus Hosagoudar which induces gall formation on Elaeocarpus tuberoulatus Roxb. The uredinicolous hyperparasite appears to be systemic and does not cause any damage to the angiospermic host. The Observations made in the present study show that if the hyperparasite comes in contact with theaecia when it is at its early stages of development then the young aecia does not develop further and appears completely aborted. However, if the association of the two mycoorganisms should take place when theaecia is somewhat developed then the hyperparasite enters into the developing aecia without attacking either the peridial cells or the mycelium of the rust. It is only when the aeciospores and formed the same are attacked. The inability of the aeciospores to be liberated out of theaecium is due to the aggressiveness of the hyperparasite and blocking the aecial opening with the formation of the sporodochium having compactly arranged conidiophores. The observations presented in this paper are illustrated by photomicrographs.

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(Presented in the 13th Annual Meeting of Mycological Society of India held between 3 & 6th December, 1985 at Pune)
NYSSOPSORA SCHEFFLERAE SP. NOV. FROM INDIA

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During a mycological survey at Shevaroy hills, Yercaud, Tamil Nadu, Schefflera stellata (Gaertn.) Harms, a member of the family, Araliaceae was observed showing rust infection mostly on young leaves. The sori were amphigenous, powdery and blackish brown in colour. Microscopic examination of the infected material revealed that the rust fungus belonged to a species of Nyssopsora Arth. The morphological characters of the teliospores particularly the glochidiate spines showing variation in branching and the presence of 3 or 4 germ pores in each teliospore cell warranted consideration of this rust as a new species of Nyssopsora and the same is described here.

Nyssopsora schefflerae Ramachar, Bagyanarayana, Subbalakshmi et Hosagoudar sp. nov. (figure 1).

Spermogonia, acris et uredinis ignotis. Teliae amphigenous, anthracina, subepidermalibus, erumpentis; teliosporis 28–40 × 22–30 μm, tricellulceis, turtiae cellulce ad basalem, cinnaamomeo-brunniae vel fuscae. Parietis fuscus 2–3 μm crassus; spineae glochidiatae 6–8, subbrunneae, obtusa vel bi, tri, tetra vel pentafurcatae ad apices, 10–16 μm longa; poris germinationis 3 vel 4; pedicello hyalino vel subbrunneae, 40–70 μm longo, 3–5 μm crossa, persistantae.

Telia amphigenous, charcoal black, 3-celled, two parallel and the third cell at the bottom, 28–40 × 22–30 μm; wall dark brown 2–3 μm thick; spines glochidiate, 6–8 per cell. Pale brown, simple, obtuse to pentafurcate at the apex. 10–16 μm long; germ pores 3 or 4 in each cell; pedicel hyaline to pale brown. 40–70 × 3–5 μm, persistent.

Holotype: In the living leaves of Schefflera stellata (Gaertn.) Harms (Araliaceae), near National Orchidarium, Yercaud (Salem District), February 6, 1985, V. B. Hosagoudar BSI/ISV/82143.

The type specimen is deposited in the Botanical Survey of India, Southern Circle, Coimbatore (MH).

According to Cummins and Hiratsuka¹ there are nine species of Nyssopsora known so far. Monoson² presented a key to these based on the type of branching of the spines on the teliospores which is specific to each species. N. schefflerae differs from the previously known species in having simple to pentafurcately branched spinose teliospores. In addition the presence of 3, rarely 4 germ pores in each cell of the teliospore adds to its distinctness.

VBB thanks Dr N. C. Nair, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for encouragement. He is grateful to the Department of Environment, Government of India for financial assistance.

29 January 1987; Revised 21 March 1987

OVULARIOPSIS LAWSONIAE SPEC. NOV.

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Lawsonia inermis L. is known as host of Leveillula taurica s.l. from India and Saudi Arabia. Phyllactinia guttata s.l. has been recorded on Lagerstroemia indica from the U.S.A. (Amano 1986). Lawsonia and Lagerstromeia belong to the family Lythraceae. Recently a conidial state belonging to Phyllactinia (Ovulariopsis) has been collected in Hyderabad (India). The foot-cells of the conidiophores are twisted. Phyllactinia dalbergiæ on legumes is the only known species in this genus with twisted foot-cells of the conidiophores (Braun 1987). The fungus on Lawsonia is different and must be described as new species.

Ovulariopsis lawsoniae spec. nov.

Mycelium hypophyllous, whitish-greyish, hyphae internal and external, hyphae straight to flexuous, subnodulose, subgeniculate, septate, 2-7.5 μm wide, appressoria solitary or in pairs, opposite, nipple-shaped, curved or irregularly lobed, ca 2-5 μm, conidiophores arising from the outer mycelium, erect, long and slender, (100-) 120-200 (-250) x 5-10 μm, composed of a very long foot-cell and (0-) 1-2 (-3) shorter apical
cells, terminal conidiogenous cell occasionally swollen, basal part of the foot-cells undulate to helically twisted, basal septum occasionally somewhat away from the branching point of the mycelium, conidia formed singly, + clavate, 50-120 x (13-) 16-23 (-28) μm, apex obtuse or occasionally subacute, germ tubes 1 or 2 per conidium, subapical or near the base, twisted, 10-100 x 2-5 μm, simple, rarely branched. Fig. 1.

Mycelium hypophyllum, griseolo-albidum, effusum. Hypheae rectae vel undulatae, subnoduloseae, subgunculatae, septatae, 2-7.5 μm latae. Appressoria non lobata vel lo-
bata. Conidiophora hyalina, (100-) 120-200 (-250) x 5-10 µm, 0-3-septata, recta, prope basim flexuosa-tortuosa. Conidia solitaria, clavata, 50-120 x (13-) 16-23 (-28) µm. Tubi germinativi prope apicem vel basim oriundi, 10-100 x 2-5 µm.


Literature


TWO NEW OIDIUM SPECIES FROM INDIA

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(1) Oidium santalacearum spec. nov.

Mycelium amphigenous, album. Hyphis sterilibus repentibus, hyalinis, ramosis, septatis, flexuosis, ca. 3-8 μm crass., appressoriis lobatis. Conidiophoris simplicibus, ex hyphis sterilibus oriundis, ca. 60-110 μm longis, cellulis ad basim cylindraceis vel subcylindraceis, subrectis vel flexuosis, ca. (20-) 35-80 x 6-9.5 μm. Conidiis solitariis, ellipsoideis - ovoideis, cylindraceis, 20-42 x (9-) 12-16 (-20) μm. Fig. 1 B.

Holotypus: on Santalum album (Santalaceae), India, Coimbatore, Botanical Garden, 13-10-1988, V. B. Hosagoudar (HAL).

Mycelium amphigenous, dense patches or covers, white, severe infections may cause premature leaf fall, hyphae branched, septate, flexuous, ca. 3-8 μm wide, appressoria lobed, often in opposite pairs, conidiophores erect to substraight, flexuous, ca. 60-110 μm long, apically often enlarged, up to 12 μm wide, foot-cells ca. (20-) 35-80 x 6-9.5 μm, often narrowed towards the base, followed by 0-2 shorter cells, conidia formed singly,
Fig. 1. Conidiophores, conidia, appressoria, A - *Oidium pentatropidis*, B - *Oidium santalacearum*. U. Braun del.
ellipsoid-ovoid to cylindric, without fibrosin bodies, 20-42 x (9-) 12-16 (-20) μm, germ tubes subapical.

This Oidium resembles the conidial state of Uncinula buckleyae Nomura & Tanda. However, the foot-cells of the conidiophores in the latter species are characteristically curved.

(2) Oidium pentatropidis spec. nov.

Mycelium epiphyllum, griseo-album, effusum. Hyphis sterilibus repentibus, hyalinis, ramosis, septatis, 3-7 μm crass., appressoriis non lobatis vel lobatis. Conidiophoris simplicibus, ex hyphis sterilibus oriundis, ca. 60-85 x 6-9.5 μm, rectis vel curvatis (-flexuosis), cellulis ad basim ca. 25-75 x 6-8 μm. Conidiis solitariis, ellipsoidoideis-doliiformibus, cylindraceis, (25-) 30-40 (-43.5) x (10-) 12-16 (-18) μm. Fig. 1 A.


Mycelium epiphyllum, greyish-white, diffuse patches, sometimes covers, thin, hyphae branched, septate, 3-7 μm wide, appressoria nipple-shaped to slightly lobed, conidiophores erect, straight to curved, sometimes somewhat flexuous, ca. 60-85 x 6-9.5 μm, foot-cells about 25-75 x 6-8 μm, followed by 0-2 shorter cells, conidia formed singly, without fibrosin bodies, ellipsoid-doliiform, cylindric, mature conidia long and slender, (25-) 30-40 x (10-) 12-16 (18) μm.

Oidium leptadeniae Prasad & Tyagi possesses long, cylindric, straight conidiophores composed of 4-6 cells. The other Oidium species on hosts of the Asclepiadaceae are Euoidium states (conidia in chains) - cf. Braun (A monograph of the Erysiphales (powdery mildews), Beih. Nova Hedwigia 89: 1-700, 1987).
Occurrence of sooty mould on the noxious weed *Lantana camara* in Western ghats: its evaluation as a biocontrol agent

As an important forest-weed in India, *Lantana camara* L. (Verbenaceae) impedes natural and artificial regeneration of forests\(^1\). It is also an important source of fire hazard in deciduous forests\(^3\). In the course of our field visits to Anaimalai hills during June-November 1987, *Lantana* bushes were observed to be heavily covered by a sooty mould caused by *Capnodium* sp. Sooty moulds are generally injurious to the plants as they hinder assimilation and obstruct the respiration of the leaves\(^4\).

The colonies of *Capnodium* sp. were foliicolous, caulicolous, amphigenous but mostly epiphyllous, black, carbonaceous, velvety, covering the entire plant-parts associated with insects. Mycelia were brown, irregularly branched, loosely to closely reticulate and the cells gave beaded appearance, 12-22 x 3.5 \(\mu\)m. Pyenidia were black, simple to branched, bulged just above the base, tapering towards the apex and striated, up to 200 \(\mu\)m long; up to 14.5 \(\mu\)m broad at the base, up to 28.5 \(\mu\)m broad at the bulged portion and up to 14 \(\mu\)m at the apex. Pycnidiospores were not seen.
TABLE 1: Incidence of coccids on *Lantana* and the relative intensity of the sooty mould on the upper surface of randomly selected leaves from the infested bushes over varying altitudes as observed in the first week of September, 1987

<table>
<thead>
<tr>
<th>Altitude (Meter)</th>
<th>Bushes in the open</th>
<th>Bushes under shade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coccid infested (%)</td>
<td>Sooty mould** intensity</td>
</tr>
<tr>
<td>350</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>750</td>
<td>6.25</td>
<td>1.4 ± 1.3</td>
</tr>
<tr>
<td>900</td>
<td>39.39</td>
<td>3.2 ± 0.9</td>
</tr>
<tr>
<td>930</td>
<td>87.50</td>
<td>3.5 ± 1.6</td>
</tr>
<tr>
<td>980</td>
<td>83.33</td>
<td>4.3 ± 1.0</td>
</tr>
<tr>
<td>1040</td>
<td>40.00</td>
<td>1.5 ± 0.8</td>
</tr>
<tr>
<td>1440</td>
<td>54.55</td>
<td>1.4 ± 1.1</td>
</tr>
</tbody>
</table>

*Graded 0-5 where, 0 denotes no sooty mould while 5 indicates 100% sooty cover.

**Each figure is the mean grade of 500 leaves ± Standard Deviation.

@Completely defoliated due to heavy coccid infestation and subsequent sooty mould development. The healthy bushes remained unaffected.

The development of the sooty mould was always preceded by the infestation of the *Lantana* bushes by the scale insect, *Orthezia insignis* Browne (Coccoidea : Ortheziidae). The nymphal stages of the coccid were restricted to the ventral side of the leaves, mostly along the midrib. The adults were frequently found on the twigs and shoots and migrated to the newer leaves when formed.

The incidence of coccid infestation and sooty mould was observed over an altitude range of 750-1,440 m M.S.L. (Table 1). However, intense attack was noticed around 800-980 m M.S.L. The potential of *Capnodium* sp., in combination with the coccids, in controlling *Lantana* is promising as it resulted in complete defoliation in a number of bushes. Generally, the bushes growing under shades were severely affected probably due to their poor nutritional status caused by the total curtailment of photosynthesis by the sooty cover.

The authors are grateful to Prof. R. Jayarajan, Head, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore for critical perusal of the manuscript.

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Received: 21 November, 1988.

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Phyllachora andamanica, a new fungus species from Andamans

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Botanical Survey of India A & N Circle, Port Blair - 744 102

During a survey of the pathogenic microfungi of Andaman Islands, the senior author came across Dinochloa scandens (Bl. ex Nees) O. Kuntze, a climbing bamboo found infected with a tar-spot disease. Microscopic examination of the infected parts by the junior author revealed that it is hitherto an undescribed species of the genus Phyllachora, the details of which are given below.

Phyllachora andamanica sp. nov. (Figs. A-C)

Description: Maculae infectionis amphigenae, brunneae, elongatae, dispersae, raro confluentes, ad 2 mm in diam. Stromata ad centro in macula, nigra, nitida ad 1 mm in diam. Perithecia innata, uniloculata, globosa vel crateriformia, 160 - 200 x 70 x 80 μm. Asci numerosi, cylindrici, stipitati, paraphysati, 86-97 x 15-17 μm; paraphyses hyaline, non-septate, filamentous; ascosporae uniseriatae vel biseriatae, hyalinae, ovatae vel pyriformiae, 18-22 x 4.5 - 6.5 μm.

Holotype: On leaves of Dinochloa scandens (Bl. ex Nees) O. Kuntze (Bambuseae), South Andaman, near Dhanikhari Dam, Aug. 1990, P. V. Sreekumar HClO No. 30727 New Delhi.

Remarks: The new species is close to Phyllachora maculans (Karst.) Theiss. & Sydow reported on Dinochloa sp. from Philippines (Parbery, 1967) in the morphology of asci and ascospores, but differs from it in having smaller asci (86-97 x 15-17 μm) and ascospores (18-22 x 4.5 - 6.5 μm).
contrast to *P. maculans* bearing asci 90-180 μm and ascospores 24-35 x 5.5-8 μm.

ACKNOWLEDGEMENTS

We thank Dr. N.P. Balakrishnan, Deputy Director and Dr. A. N. Henry, Scientist SE, Botanical Survey of India, Coimbatore and Mr. K.C. Malick, Scientist SD, Botanical Survey of India, Port Blair, for encouragement and valuable suggestions.

REFERENCE


Fig. A-C. *Phyllachora andamanica* sp. nov.
A- T. S. through the stroma showing perithecium and asci,
B- Ascus with ascospores,
C- Ascospores.
SOME INTERESTING FUNGI FROM THE INDUSTRIAL WATER COOLING TOWERS OF MADRAS—II

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ABSTRACT

The paper gives an account of nine new taxa. Of these, four are new genera, namely, *Anekabeeja lignicola* gen. et sp. nov., *Mukhakesa lignicola* gen. et sp. nov., *Neetakesa lignicola* gen. et sp. nov., and *Phialogangliospora lignicola* gen. et sp. nov. while, *Chaetomium lunosporium*, *Didymosphaeria pittospora*, *Leptosphaeria dimidiata*, *Mycosphaerella aquatica* and *Pleospora subramaniil* are the new species. All the cultures of the type materials have been deposited in the Centre for Advanced Studies in Botany, University of Madras, Madras.

*Anekabeeja* gen. nov.

(*Etym.: Anka—Many, beeja—spores*)

Plectomycetes. Microascales. Microascaceae. Colonies effusae, canae vel fusco-grisae. Cleistothecia dispersa, solitaria vel aggregata, demi vel absolute immersa in substrata, hyalina ad initio et phaeo-brunnea vel nigella ad maturitata, globosa vel sub-globosa, non-ostiolata et ostiolar primordia visa; peridium 2-4layered, peridial cells ellipsoidal to irregulariter rotundata et lumina magnioribus. Asci unitunicati, globosi, ovalae vel elongatae, bacillarum et often curved, not of bivalve type, unicellular, brunnea.

Type species: *Anekabeeja lignicola* (Fig. 1)

Colonies effusae, canae vel fusco-grisae. Cleistothecia dispersa, solitaria vel aggregata, demi vel absolute imme in substrata,

grey. Cleistothecia scattered, solitary to aggregated, partly or completely immersed in the substratum, hyaline when young and becoming dark brown to blackish at maturity, globose to sub-globose, non-ostiolate but ostiolar primordia present; peridium 2-4-layered, peridial cells ellipsoidal to irregularly rounded with large lumina. Asci unitunicate, spherical to ovate to broadly clavate, borne on branched ascogenous hyphae; 32-spored, spores two types, oval to elongate, bacillar and often curved, not of bivalve type, unicellular, brown.

*Botanical Survey of India, Southern Circle, Coimbatore-641 003*
Fig. 1. *Amskabecja lignicola* gen. et sp. nov.

- **N** — Ascocarp
- **O** — Ascocarp with scattered asci
- **P** — Peridial wall
- **Q-S** — Asci on its ascogenous hyphae
- **T** — Ascospores

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hyalina ad initio et phaeo-brunnea vel nigella ad maturitata, globosa vel subglobosa, non-ostiolata et ostiolum primordia visa, 255-555 µm in diam. Peridia 10-12.5 µm crassa, cellula peridiales ellipsoidea vel irregulariter rotundata, crassitunicata, lumina magna, textura angularis. Aci unitunicati, globosi, ovati et late clavati, producentes in ascogenous hyphae ramosi, ascosporae 32, 13.5-24 x 10-13.5 µm in diam. Ascosporae variabilis, ovalae, vel elongatae, bacillariae et curvulae, non bivalvae, unicellulariae, brunneas, ascosporae breviorae 4-7 (5.5) x 2.5 x 3.5 (3.0)µm, ascosporae magniorae 8.5-10 (9.0) x 2.5-3.5 (3.0) µm.

Colonies effuse, grey to dark blackish grey. Cleistothecia scattered, solitary to aggregated, partly or completely immersed in the substratum, hyaline when young and becoming dark brown to blackish at maturity, globose to subglobose, non ostiolate but ostiolar primordia present, 255-555 µm in diam. Peridium 10-12.5 µm thick, composed of 2-4 layers of ellipsoidal to irregularly rounded thick walled cells with large lumina, forming a textura angularis. Ascii unitunicate, spherical to ovate to broadly clavate, borne on branched ascogenous hyphae, 32-spored, 13.5-24 x 10-13.5 µm in diam. Ascospores variable in shape being short oval to elongate, bacillar and often curved, not of bivalve type, unicellular, brown, two types: small and large, small ascospores 4-7 (5.5) x 2.5-3.5 (3.0) µm; large ascospores 8.5-10 (9.0) x 2.5-3.5 (3.0) µm.

Type: On untreated beech test block submerged in sewage affluent, cooling tower pond, thermally polluted water in the collecting lagoon and placed among the timber packing of the cooling tower immediately below the inlet spray nozzle and on the treated service timber packing of cooling tower at Basin Bridge Power Generating Station Madras.

The present new genus is close to the genus Microascus Zukal which also occurs regularly on beech wood blocks at the Basin Bridge Power Generating Station cooling tower water system but differs from it in having only the primordia of an ostiole peridium is pseudoparenchymatous and 2-cells thick; ascus globose to subglobose scattered within the ascocarp and appears produced from the branched ascogenous hyphae. Each ascus having usually 3 ascospores. The ascospores are very variable in shape being short oval or elongate bacillar and often curved (Benney & Kimbrough, 1980; Fennel, 1973).

Mukhakesa gen. nov.

(Etym. Mukha = face, Kesa = hair)


theia superficial, solitary to gregarious, osti­
olate, without a distinct neck; appendages
around the neck and ostiole present, pale to
dark brown. Appendages are of two kinds;
short, non-septate, thick walled type forming
an inner circle and elongate, septate, rela­
tively thin walled type forming an outer circle.
Peidium prosenchymatous, but somewhat
fleshy and pale coloured. Asci unitunicate,
conspicuously stipitate, long, fusiform, often
curved, each with a characteristic amyloid
apical apparatus at the tip. Ascospores uni­
iseriate, short fusiform, hyaline, smooth, 3­
septate.

Type species: Mukhakesa lignicola sp. 
nov. 

Perithecia superficialia, solitaria vel gregaria,
oriola, column indistincta; append-
des juxta column et ostiola, pallida et
fusca, 125-150 (144) x 90-100 (95) μm. Appen-
dices bitypi : appendices in circulus interio-
re brevis, non-septatis, cassitunicatis; appen-
dices in circulus externus elongati,
septatis, tenuitunicatis. Peidium prosenchy-
matous, leniter carnosa, pallida. Asci un-
tunicati, stipitati, fusiformi, curvuli, appara-
tus amyloideus ad apices, octospori, 56-71.5
x 6.5-8.5 μm. Ascospore uniseriate, leniter
fusiforme, hyalinae, glabrae, 3-septatae.
11.5-17 x 3.5-7 μm.

Perithecia superficial, solitary to gregarious,
oriola, without a distinct neck; appendages
around the neck and near the ostiole pale to
dark brown, 125-150 (144) x 90-100 (95) μm. Appendages are of
two kinds: short, non-septate, thick walled
type forming an inner circle and elongate,
septate, relatively thin walled type forming
an outer circle. Peridium pseudoparenchy-
matous, but somewhat fleshy and pale in
colour. Asci unitunicate, conspicuously
stipitate, long, fusiform, often curved, each
with a characteristic amyloid apical apparatus
at the tip, 8-spored, 56-71.5 x 6.5-8.5 μm.
Ascospores uniseriate, short, fusiform, hya-
line, smooth, 3-septate, 11.5-17 x 3.5-7 μm.

Type: On beech test blocks placed at
the inlet point of the cooling tower from
the Basin Bridge Power Generating Station,
Madras.

This new genus is placed in Amphisphae-
riaceae because of the characters of amyloid
apical apparatus of the asci. However, the
present new genus differs from the other
known genera of the Amphisphaeriaceae in
having the asccarps produced on the sur-
face of the wood are superficial, ostiolate
and with appendages around the neck and
near the ostiole. The appendages are of two
kinds: short but nonseptate, thick walled
structures forming an inner circle and elon-
gate, septate relatively thin walled appenda-
ges forming an outer circle. The peridium
is pseudoparenchymatous but some what
fleshy and pale in colour. The asci are
conspicuously stipitate, long, fusiform, often
curved with a characteristic amyloid apical
apparatus at the tip, octosporus; ascospores
fusiform, 3-septate and uniseriate. Conidial
state was not observed (Mueller & Arx,
1973).

Neelakesa gen. nov.

(Etym. Neela = long, Kesa = hair)

Plectascales. Pseudoeurotiaceae. Clei-
stothecia superficialia, solitaria vel gregaria,
on-oriola, glabra ad apicem, dehisco
Fig. 2. *Mukhakesa lignicola* gen. et sp. nov.

P — Perithecium with appendages around the neck
Q — Outer appendages
R — Inner appendages
S — Peridial cells
T — Asci
U — Ascospores
sutura vel linea conspicua ad maturitata, nigra, indumentum crassus luteus villosus ad initio. Asei unitunicati, irregulariter dispersi in centrum, deliqueo in stata pristinus, globosi, octospori. Ascosporeae brunnecae, unicellulæ, ellipsoidæ vel renoïdæ.

Plectascales. Pseudoeurotiaceae. Cleistothecia superficialis, solitary to gregarious, non-ostiolata, apically glabrous, with conspicuous sutures or lines of dehiscence at maturity, black, covered with coarse yellow villous when young. Asei unitunicati, irregulariter distributed in the centrum, deliquesce at early stage, globose, 8-spored. Ascosporeæ brown, not bivalve type, single celled, ellipsoidæ vel renoïdæ.

Type species: Neelakesa ligi icola sp. nov. (Fig. 3)

Cleistothecia superficialia, gregaria vel gregaria, non-ostiolata, glabia ad apicem, dehisco sutura vel linea conspicua ad maturitata, nigra, indumentum crassus luteus villosus ad initio, 100-200 μm in diam. Asei unitunicati, irregulariter dispersi in centrum, deliqueo in stata pristinus, globosi, octospori, 7-10.5 μm in diam. Ascosporeae brunnecae, unicellulæ, ellipsoidæ vel renoïdæ, 4.5-5.5 (5.0) x 2-3.5 (3.0) μm.

The present new genus differs from rest of the known genera of the family Pseudoeurotiaceae in having non-ostiolate and globose ascocarps, having simple septate appendages which are curved or flexuous towards the tip. The ase are globose, 8-spored, with the ascospores somewhat short-cylindrical to oval in shape. Ascosporeæ unicellularæ, dark and not bivalve type (Benny & Kimbrough, 1980; Fennel, 1973). Conidial state not known.

Phialogangliospora gen. nov.


Hyphomycetes. Moniliaceae. Hyphae branched, septate. Conidia two types; gangliar and phialidic. Gangliar conidia produced in acropetal, branched or unbranched, true chains on undifferentiated con-
Fig. 3. *Neelakesa lignicola* gen. et sp. nov.

M — Developing cleistothecium on wood
N — Cleistothecium with appendages
O — Shields of peridium
P' — Appendages
Q — Asci
R — Ascospores
diophores, each conidium separated from adjacent one by a disjunctor cell, barrel shaped, truncate at both ends, mostly unicellular rarely one septate, hyaline, thin walled, smooth. Conidia freed by lysis of disjunctor cells. Phialides arising singly or in penicillus, stalked with a broad base and narrow neck. Conidia solitary, oval to cylindrical, non-septate, hyaline, slimy, thin walled, produced in basipetal succession and accumulated in the gelatinous mass.

_Type species_: Phialogangliospora lignieola sp. nov. (Fig 4)

Coloniae lacteola in PDA ad centre et alba ad margino; griseola in MEA. Hyphae ramosae, septatae, tenutunicatae, 1-3.5 \( \mu m \) crassae. Conidia bi-typi: gangliar et phialidic. Conidia gangliarlis producentes acroptalis ramosa et non-ramosa, catenata in conidiophora non-differentia, conidia connectae e cellula disjunctoria, doliformiae, truncata ad ambi-terminata, plerumque unicellularia, raro uniseptata, hyalina, tenutunicata, glabra, 7.5-15.5 (9.5) \( \times \) 3-6.5 (5.0) \( \mu m \). Conidia freed by lysis of disjunctor cells. Disjunctor cells are of variable length, 3-16.5 (8.0) \( \times \) 1-3.5 (2.5) \( \mu m \). Phialides arising singly or in a penicillus, stalked, with a broad base and a narrow neck, 6.5-27.5 (16) \( \times \) 2-3.5 (2.5) \( \mu m \). Conidia solitary, oval to cylindrical, non-septate, hyaline, slimy, thin walled, 2-3.5 \( \times \) 1.5-2 \( \mu m \), produced in basipetal succession and accumulated in gelatinous mass.

_Type_: On pine, beech and treated service timber packing of cooling tower from Madras Fertilizers Ltd., Manali, Madras.

The present new genus is close to _Montiilla_ Stock & Dakin which occurs as a colonizer of pine and beech wood blocks in the Madras Fertilizers cooling tower system and also on dilution plates of water from that system. The present fungus produces two kinds of conidia namely gangliar conidia formed in acroptal chains in which each conidium is linked to the next one by an isthmus or disjunctor cell very much like what is found in _Amblyosporium_ Fries (Pirozynski, 1969). In addition, the present fungus produces phialides which are characteristically subulate; the phialoconidia are
Fig. 4. Phialogangliospora lignicola gen. et sp. nov.
A-11 — Conidium ontogeny
I — Gangliar type of conidia
J-M — Phialides and phialoconidia
small, one celled and solitary. The fungus is moniliaceous. *Moniliella* also produces two kinds of conidia but these are not gangliar and phialidic as in the present genus. On the other hand, in *Moniliella* the conidia are typically arthric as in *Geotrichum* Link ex Fries or blastic as in *Chulosporium* Link ex Fries. In view of this, the present fungus has been accommodated in a new genus.

**Chaetomium lunasporium** sp. nov. (Fig. 5)

Colonies in PDA albae, puniecus and maturitatae. Perithecia superficialia, solitaria, dispersa, globosa vel subglobosa, ostiolata, 82-135 x 75-135 μm et producentes rhizoidae ad basim. Capilla ad apicem rigida, distinctae septata, 3.5-5 μm in diam. ad basim, 1-3 convolutus ad apicem, capilla ad lateralis et terminalis granulata, granula bruneola. Asci unitunicati, clavati, leniter stipitati, evanescenti, octospori, 34-44 x 10-14 μm. Ascospores lunatae, germin porus singularis ad unus apicem, unicellulae, olivaceus brunneus, glabrae, 8.5-10 x 5-7 μm, biseriatae, extrudita in cirrus.

**Type**: On untreated beech test blocks placed among the timber packing of the cooling tower immediately below the inlet spray nozzle at the Madras Fertilizers Ltd., Manali, Madras and also from the soil immediately adjacent to the cooling tower.

Lunate ascospores are hitherto unknown among the species of the genus *Chaetomium* Kunze ex Fries (Ames, 1963; Udagawa & Cain, 1969). Hence it is proposed here as a new species.

**Didymosphaeria pittospora** sp. nov. (Fig. 6)

Pseudothecia dispersa, demi immersa, globosa, ostiolata, clypeata et column protrudere, 250-430 x 220-355 μm. Asci in hymenia, pseudoparaphysati, bitunicati, clavati, pedicella brevioribus, 120-175 x 25-30 μm. Ascospores brunnea, foveolatae, bicellulatae, verrucosae, constrictae, ad septae, 30-36 (32) x 12-18 (14.5) μm.

Pseudothecia scattered, partly immersed in the beech test blocks, globose, ostiolata, with a clypeus and a projecting neck, 250-430 x 220-355 μm. Asci arranged in a hymenium, intermixed with pseudoparaphyses, bitunicati, clavati, with a short stalk 120-175 x 25-30 μm. Ascospores brown, pitted, 2 celled, verrucosae, constrictae ad septae, 30-36 (32) x 12-18 (14.5) μm.

**Type**: On beech test blocks submerged in raw water at the storage tank and cooling tower water at The Madras Fertilizers Ltd., Manali, Madras.
Fig. 5. Chaetomium lanasporeum sp. nov.

M-N — Peritheciun with terminal and lateral hairs
O-P — Ascospores
Fig. 6. *Dilysosphaeria pittospora* sp. nov.

**D** — Perithecium

**E** — Asci with septate paraphyses

**F** — Verrucose ascospores
Pale coloured pseudothecia, relatively transparent peridium, larger asci and very characteristically pitted thickening on the ascospore wall are the distinguishing features of this new species (Scheinflug, 1958; Mueller & Arx, 1962; Booth, 1968).

Leptosphaeria dimidiata sp. nov (Fig. 7)

Pseudothecia immersa vel superficialia, solitaria vel aggregata, subglobosa vel piriformia, papillata, subcoriacea, nigra, 275-400 x 250-300 μm, cellula peridiales 4-5 stratosa, ellipsoidae vel irregulariter rotundata, crassitunicata, lumina magna, textura angularis, 10-12.5 μm crassa. Papilla peritheciales subconica, brevioribus, 50-90 μm in diam., canalis ostiolum periphysatis. Pseudoparaphyses 3-4 μm crassa, septata, ramose. Asci bitunicati, subclavati vel subcylindrici, leniter stipitati, crassitunicati, octo et quadri spori, 100-125 (110) x 15-20 μm. Ascospores subcylindraceae vel subfusiformae, 3-septatae, constrictae ad septae, tuteus brunneae, 40-45 x 7.5-10 μm, juxta mucrosae, biseriatae.

Type: On beech test blocks submerged in raw water, cooling tower pond and placed among the timber packing of the cooling tower immediately below the inlet spray nozzle from The Madras Fertilizers Ltd., Manali, Madras.

The present species differs from the known species of the genus Leptosphaeria (Sacc.) Hara in its morphology and measurements (Mueller, 1950; Mueller & Dennis, 1965; Holm, 1957).

Mycosphaerella aquatica sp. nov. (Fig. 8)

Pseudothecia immersa, ostiolata, papillata, membranacea, supra nigra et infra pallida, glabra, dispersa, 525-755 x 300-400 μm. Peridia crassa, cellula in strata numerosa, fusca vel pallida, angulata. Papilla peritheciales obtusa. Pseudoparaphyses nullae. Asci bitunicati, fasciculati, subcylindrici, late rotundati ad apicem, attenuati et nodosi ad basim, plerumque curvuli, octo spori, 45-60 x 12.5-15 μm. Ascospores ellipsoidae vel fusiformiae, leniter curvulae, unisepatae ad medietae, leniter constrictae ad septae, erasitunicatae, brunneae, 15-18.5 x 5-7 μm.

Pseudothecia immersed, ostiolate, papillate, membranous, black above and pale below, glabrous, scattered, 525-755 x 300-400 μm. Peridium thick, composed of several layers of dark brown to pale coloured angular cells. Perithecial papilla blunt, reaching the surface of the epidermis. Pseudoparaphyses absent. Asci bitunicati, fasciculare,
Fig. 7. *Leptosphaeria dimidiata* sp. nov.

G — Perithecium
H-J — Asci with septate paraphyses
K — Aseospores with gelatinous sheath
L — Matured aseospores
Fig. 8. *Mycosphaerella aquatica* sp. nov.

A — Perithecium
B — Asci
C — Ascospores
Fig. 9. Pleospora subramanianii sp. nov.

M — Perithecium
N — L.S. of the perithecium
O-P — Asci
Q — Horizontal and vertical septate ascospores
sub-cylindrical, broadly rounded at the apex, attenuated into a short nodose peduncle at the base, mostly curved, 8-spored, 45-60 x 12.5-15 μm. Ascospores ellipsoidal to fusi-
form, slightly curved, 1-septate near the middle, slightly constricted at the septum, thick walled, brown, 15-18.5 x 5-7 μm.

Type: On untreated pine and beech test blocks submerged in the cooling tower water and effluent collecting lagoon from the Madras Fertilizers Ltd., Monali, Madras.

The aquatic nature of this species warrants its placement in a new species.

Pleospora subramanianii sp. nov. (Fig. 9)
Pseudothecia immersa vel erumpentia, gregaria, ostiolata, leniter papillata, anthracina, 200-300 μm in diam. Asci bitunicati, late clavati vel elongate-ellipsoidi, saepe curvuli, leniter stipitati, octospori, 56-104 x 10-14 μm. Ascospores biseriatae, ellipsoidae vel ovoideae, muriformae, 3-transversalis et 2-longitudinalis septaeae, constrictae ad centro et constrictae ad septae, laxare ad superiorem quam inferiorem, fulvae et cinna-
momaeae, 17-20.5 x 8-9 μm.

Pseudothecia immersa vel erumpentia, gregaria, ostiolata, Shortly papillata, carbona-
ceous black, 200-300 μm in diam. Asci bitunicati, broadly clavate or elongate-
elipsoidi, often bent parallel curvature, Shortly stipitate, 8-spored, 56-104 x 10-14 μm. Ascospores biseriatae, ellipsoidae or elongate-
ovoideae, muriform with 3-transverse and 2-
longitudinal septa, strongly constricted at the centre and slightly at the other septa, with upper part of the spore usually wider than the lower, yellowish brown to golden-
brown, 17-20.5 x 8-9 μm.

Type: On treated service timber packing of the cooling tower from the Madras Fertilizers Ltd., Monali, Madras.

The present species differs from the known species of the genus Pleospora Rabenh. ex Ces. & de Not. in its morphology and measurements (Wehmeyer, 1961).

ACKNOWLEDGEMENTS

We are grateful to Prof. C.V. Subra-
manian, Emeritus Scientist, CIMAP, Luck-
now for the guidance. One of us (K.U.) is thankful to UGC for the award of Teacher Fellowship under Faculty Improvement Programme. The helps rendered by the Plant Managers of the Basin Bridge Power Generating Station, and the Madras Fertilizers Ltd. Manali, Madras are also gratefully acknowledged.

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SOME INTERESTING FUNGI FROM THE INDUSTRIAL WATER COOLING TOWERS OF MADRAS-III.
THE GENUS \textit{CHAETOMIUM} \textit{KUNZE} \textit{EX} \textit{FRIES}

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\textbf{ABSTRACT}

The paper gives an account of 23 species of the genus \textit{Chaetomium} \textit{Kunze} \textit{ex} \textit{Fries} isolated from the industrial water cooling towers of Madras, Tamil Nadu, India. A key and detailed description of the species are given with notes on their substrata.

\textbf{INTRODUCTION}

The ecology of fungi growing on pine (\textit{Pinus patula}) and beech (\textit{Fagus rhuminifolia}) test blocks submerged or placed at various points in the cooling tower water systems and copper-chrome-arsenate preservative treated service timber packing of the cooling towers of the Madras Fertilizers Ltd., Manali, Madras and the Basin Bridge Power Generating Station, Madras was studied during the period from March 1978 to April 1980. The taxonomic account of the fungi of this ecosystem was dealt by Udaiyan (1991) and Udaiyan and Ilosagoudar (1991). This is the third of its kind dealing with the genus \textit{Chaetomium}. \textit{C. cochliodes} \textsc{Pulliser}, \textit{C. elatum} \textit{Kunze} \textit{ex} \textit{Fries} and \textit{C. globosum} \textit{Kunze} \textit{ex} \textit{Fries} have been reported from the cooling towers from other countries (Duncan, 1960, a, b; Courtosis, 1963; Eaton and Jones, 1971 a,b). There are several sporadic reports of the genus \textit{Chaetomium} isolated from soil, decaying wood, decomposing straw, dead leaves, dung and excreta of domestic and wild animals from India (Bilgrami et al. 1979,1981; Sarbhoj et al., 1986) and this is the first detailed report of the genus \textit{Chaetomium} from the water cooling Towers of India.

\textbf{TAXONOMY}

\textit{Chaetomium Kunze ex Fries}, \textit{Systema Mycologicum} 3:253, 1829. Perithecium superficial, sessile or stalked, spherical, subglobose, elongated to veriform, translucent when young, more or less opaque or transparent at maturity, ostiolate, often beaked at the apex, periphysate, perithecium wall cellular, ornamented with terminal and lateral hairs, hairs simple to branched roughened with small spines or granules. Perithecia attached to the substratum by variously coloured rhizoids. Aeciospores, chlamydospores, rarely bulbils and/ or conidia produced. Asci stipitate, club shaped to cylindrical, unitunicate, persistent to evanescent, mostly 8-spored, few 4-spored, paraphyses absent, periphyses present. Ascospores unicellular, pale to dark coloured, shape varies, often apiculate (Ames, 1963). Type species: \textit{Chaetomium globosum} \textit{Kunze} \textit{ex} \textit{Fries}

\textbf{KEY TO THE SPECIES}

1. Terminal hairs simple and/or branched
2. Terminal hairs branched
   2. Terminal hairs simple
      3. Asci cylindrical
      3. Asci club shaped
      4. Branchlets of the terminal hairs coiled
      4. Branchlets of the terminal hairs not coiled
      5. Ascospores more than 10 \(\mu\text{m}\) long
      5. Ascospores less than 10 \(\mu\text{m}\) long
      6. Terminal hairs arcuate at base
      6. Terminal hairs straight at base
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7. Ascospores apiculate at both ends
7. Ascospores apiculate at one end
8. Terminal and lateral hairs not persistent at maturity
8. Terminal and lateral hairs persistent at maturity
9. Perithecia stalked
9. Perithecia sessile
10. Terminal hairs coiled or convoluted
10. Terminal hairs straight, undulate and sinuous
11. Terminal hairs loosely compact and form column
11. Terminal hairs not forming column
12. Perithecia transparent
12. Perithecia opaque
13. Perithecia golden yellow
13. Perithecia brown, black or brownish black
14. Terminal hairs hyaline at the tip
14. Terminal hairs not hyaline at the tip
15. Perithecia stalked
15. Perithecia sessile
16. Terminal hairs spirally coiled from the base
16. Terminal hairs coiled at terminal half only
17. Terminal hairs smooth
17. Terminal hairs roughened with granules or barbules
18. Ascosporos apiculate only at one end
18. Ascosporos apiculate at both ends
19. Perithecia 300-400 μm in diameter
19. Perithecia 120-140 μm in diameter
20. Terminal hairs ornamented with copper coloured granules
20. Terminal hairs ornamented otherwise
21. Lateral hairs loosely and irregularly twisted
21. Lateral hairs straight to flexuous
22. Perithecia more than 300 μm in diameter
22. Perithecia less than 300 μm in diameter
23. Ascospores more than 10 μm long
23. Ascospores less than 10 μm long


Perithecia solitary, superficial, sessile, globose, dark brown, ostiolate, without a distinct neck, peridial wall 3-4 layers of polyhedral cells, 200-250 x 200-240 μm, attached to the substratum by rhizoids. Terminal hairs simple, persistent, loosely aggregated around the ostiole, stout, brownish black to olivaceous black, verrucose, septa obscure, 4.5-6 μm wide in the middle, rounded at tips, straight to arcuate below, 2-3 times spiraled at the tip, 61-77 μm in diam. Lateral hairs straight to slightly flexuous, persistent, brownish black, stout, gradually tapering towards the apex, septa obscure, verrucose, up to 5 μm broad near the base. Asci club shaped, slightly stipitulate, evanescent, octosporous, 40-55 x 11-14 μm. Ascospores irregularly arranged in the asci, unicellular, dark olivaceous brown, smooth, ovoid to globose, sharply apiculate at one end, 5-7.5 x 4.5-6 μm.

Habitat: On pine blocks placed among the timber packing below the inlet spray nozzle and service timber of the cooling tower, The Madras Fertilizers Ltd., Manali, Madras.
Fig. 1. Chaetomium abuense Lodha,
E-Peritheciun with lateral and terminal hairs, F-Young ascii, G-Matured asci. H-Ascospores

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Perithecia solitary, superficial, sessile, globose to subglobose, opaque, golden yellow, ostiolate, 150-225 x 125-200 μm, attached to the substratum by rhizoids. Terminal hairs simple, gray, persistent, straight to slightly recurved but not coiled, septate. Lateral hairs slender, simple, persistent, straight to flexuous, septate, up to 3.5 μm wide, arched at the tip, yellow. Ascii club shaped, octosporous, evanescent, 38-42 x 9-11 μm. Ascospores irregularly arranged in the ascii, olive brown, broadly ovate, apiculate at both ends, 8-11 x 4-7 μm.

Habitat: On pine test blocks placed among the timber packing immediately below the inlet spray nozzle point of the cooling tower at the Madras Fertilizers Ltd., Manali, Madras.

3. Chaetomium biapiculatum Lodha, Indian Bot. Soc. 43:124, 1964 (Fig. 2)

Perithecia superficial, sessile, subglobose to ovoid, brown to dark brown, opaque, 275-340 x 225-310 μm, ostiolate, ostiolar surrounded by a collar, perithecia attached to the substratum by brown, dense rhizoids. Terminal hairs dense on the ostiolar collar, persistent, mostly branched but few unbranched, dark brown, verrucose, moderately thick walled, septate, 2-3.5 μm wide, coiled and rounded at the tips, straight below, coils up to 15. Lateral hairs straight, persistent, dark.

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**Fig. 2. Chaetomium biapiculatum Lodha**

I-Perithectum with lateral and terminal hairs and accumulated spore mass, J-Branchcd, coiled and verrucose terminal hairs, K-Asci, L-Ascospores

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pale above, attenuated at the apex, septate, persistent, dark, pale above, attenuated at the apex, septate, smooth, up to 3 μm near the base. Ascii club shaped, slightly stipitate, evanescent octosporous, 25-35x8-11 μm. Ascospores irregularly arranged in the ascii, unicellular, light brown, smooth, globose to subglobose, distinctly apiculate at both ends, 7-8 x 4.5-6.5 μm.

_Habitat:_ On pine and beech test blocks from both stations.

This species is close to _C. gracile_ Udagawa and _C. indicum_ Corda but differs from the former species in having straight base and from the latter species in having verrucose surface of the terminal hairs.

4. _Chaetomium brasiliense_ Batista & Pontual, Biol. Sci. Agric. Pernambuco 15:70. 1948. (Fig. 3)

Perithecia superficial, sessile, dark olivaceous brown, opaque, subglobose to ovoid, 157-212 x 150-185 μm, ostiolate, attached to substrata by rhizoids. Terminal hairs simple, persistent, dark olivaceous brown.

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Fig 3. _Chaetomium brasiliense_ Batista & Pontual

M- Asci with terminal and lateral hairs, N- Apically coiled terminal hairs, O-P-Asci, Q-Ascospores
man, smooth, septate, 3-4 μm wide in the middle, light to flexuous below, spirally coiled above, coils tip rounded. Lateral hairs persistent, straight to flexuous, sepalate, olivaceous brown, finely rugose, tips anded, up to 3 μm wide at base. Asci cylindrical, apically narrowed at the base, stipitate, evanescent, sporous, 42-51 x 5-8.5 μm. Ascospores uniseriate, cellular, olivaceous brown, smooth walled, broadly ellipsoid, slightly apiculate at one end, 8.5-12 x 5-8.5 μm.

**Situation:** On beech test blocks and copper-chrome-arsenate preservative treated service timber packing of both the cooling towers. Perithecia develop only when the test blocks were incubated at 45°C.

5. *Chaetomium brevipilum* Ames, A monograph of the Chaetomiaceae, p.15, 1963. (Fig. 4)

Perithecia superfi cial, sessile, ostiolate, ochraceous to light yellowish brown, opaque, bright when young, brownish with age, oval to elongated, 300-400 x 200-235 μm, attached to the substrata by rhizoids. Terminal hairs dense, simple, persistent, straight to coiled at the tip, sepalate, up to 5 μm wide at the base, verrucose, tapering towards apex, pale ochraceous to slightly yellowish brown at base, apical portion pale to brown. Lateral hairs simple, persistent, shorter, sparse. Asci octosporous, club shaped, evanescent, 120-180 x 14-16 μm. Ascospores brown.

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**Fig. 4 Chaetomium brevipilum** Ames
A- Peritheium with terminal and lateral hairs, B-Apically coiled and verrucose terminal hairs, C-D-Asci, E-Ascospores
thick walled, oval to broadly globose, apiculate at both ends, 7-9 x 6-8 μm. 

**Habitat:** Copper-chrome-arsenate preservative treated service timber packing of the Madras Fertilizers cooling tower.

6. *Chaetomium britannicum* Ames, A monograph of the Chaetomiaceae, p. 16, 1963. (Fig. 5)

Perithecia solitary, superficial, sessile, scattered, ovoid to elongated, versiform, transparent, ostiolate, 210-337 x 165-240 μm, rounded at the base and narrowed towards apex, attached to the substratum by rhizoids. Terminal and lateral hairs covering the perithecia are simple, slender, gray, septate, straight to wavy, pointed at the tip, nonpersistent at maturity. Ascii club shaped, octosporous, 50-112.5 x 20-25 μm. Ascospores irregularly arranged in the asci, roughly oval, rounded at apices, brown, 20-25 x 12.5-15 μm. 

**Habitat:** On beech test blocks placed among the timber packing of the cooling tower and submerged in the collecting lagoon, Basin Bridge Power Generating Station.


Perithecia superficial, sessile, solitary, scattered, globose to subglobose, opaque, ostiolate, 318-360 x 273-310 μm, attached to substratum by stout, dark olive brown to black rhizoids. Terminal hairs

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**Fig. 5. Chaetomium britannicum** Ames,
F-Transparent perithecia with terminal and lateral hairs (Above); glabrous perithecia devoid of hairs at maturity (below),
G-II-Asci, I-Ascospores

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numerous, persistent, densely arranged at the lip of the perithecia, roughening throughout, and are of two types: 1. thick, stout, coiled and 2. slender, rarely coiling in spirals and rarely irregularly twisted or undulated, 2.5 µm thick at base. Lateral hairs numerous, persistent, sparsely separate, roughened with fine projections, straight to bent, 5.5 µm thick at the base, dark olive brown to black, hyaline at the tip, often loosely and irregularly twisted throughout their entire length. Ascii club shaped, octosporous, 85-95 x 13-13 µm. Ascospores irregularly arranged in the ascii, dark, apiculate at both ends, 10-12 x 8-10 µm.

**Habitat:** On pine and beech test blocks placed among the timber packing in the cooling tower of the Madras Fertilizers.


Perithecia superficial, sessile, globose to ovate, ostiolate, opaque, 110-135 x 85-100 µm, attached to substratum by rhizoids. Terminal hairs simple, persistent, rigid, septate, 4.5-6 µm wide at the base, 1-3 convolutions at the apex, ornamented with copper coloured granules. Lateral hairs numerous, persistent, slender, septate, 3.5-3.5 µm broad at the base with 1-2 convolutions at the apex, ornamented with copper coloured granules. Ascii clavate, octosporous, 35-45 x 14-16 µm. Ascospores arranged irregularly in the ascii, brown, oval to subglobose, 11-14 x 6-8.5 µm.

**Habitat:** On beech test blocks placed among the timber packing of the cooling tower of Basin Bridge Power Generating Station.

9. *Chaetomium elatum* Kunze ex Fries, Systema Mycologicum 3: 254, 1829. (Fig. 6)

Perithecia solitary, superficial, sessile, brown, opaque, ostiolate, 200-250 x 200-250 µm, attached to the substratum by brown rhizoids. Terminal hairs simple, persistent, straight, slender, hyaline at the tip, 5 µm wide at the base. Lateral hairs numerous, persistent, straight at base and undulating at the apex, 2.5-3.5 µm wide at the base. Ascii club shaped, irregularly arranged in the ascii, evanescent, 25-34 x 8-17 µm. Ascospores light brown, ovate at one end, rounded at the other, 7.5-8.5 x 6.5-8.5 µm.

**Habitat:** On beech test blocks placed among the timber packing of cooling tower, The Madras Fertilizers.


Perithecia superficial, sessile, yellowish brown, opaque, ostiolate, ovate to subglobose, 200-300 x 185-285 µm, attached to the substratum by delicate rhizoids. Terminal hairs brown, simple to repeatedly branched, persistent, septate, 2-3.5 µm wide at the base, tapering towards the apex. Lateral hairs brown, septate, persistent, straight at base and undulating at the apex, 2-3.5 µm wide at the base. Ascii club shaped, irregularly arranged in the ascii, octosporous, evanescent, 25-34 x 8-17 µm. Ascospores light brown, ovate at one end, rounded at the other, 7.5-8.5 x 6.5-8.5 µm.

**Habitat:** On pine and beech test blocks placed among the timber packing of the cooling tower of the Madras Fertilizers.


Perithecia superficial, sessile, solitary, black, opaque, ostiolate, ovate to globose, 130-160 x 100-160 µm, attached to the substratum by dark olive to black rhizoids. Terminal hairs dense, compact, all dichotomously branched, persistent, rarely constricted, brown to black, up to 6 µm wide at the base, pale to colourless at tips. Lateral hairs numerous, persistent, smooth to irregularly roughened with short blunt projections, mostly hyaline and crumpled at the tip, up to 4 µm broad at the base. Ascii club shaped, octosporous, evanescent, 32-36 x 7-9 µm. Ascospores brown, oval to globose, apiculate at both ends, 5.5-6.5 x 3.5-5 µm.

**Habitat:** On pine and beech test blocks placed among the timber packing and copper-chrome-arsenate preservative treated service timber packing of cooling tower from The Madras Fertilizers.


Perithecia superficial, sessile, brown, opaque, 230-260 x 190-210 µm, attached to the substratum with brown rhizoids. Terminal hairs simple, persistent, numerous, septate, covered with barbules, straight at base, coiled at the tip, up to 4 µm wide at base. Lateral hairs slender, persistent, up to 4 µm wide at base, septate, gradually attenuated towards the apex. Ascii clavate, octosporous, evanescent, 48-52 x 17-20 µm broad at the base, hyaline at the tip. Lateral hairs numerous, persistent, slender, spinulate, dark at base, up to 3.5 µm wide. Ascospores olive brown, ovate to globose, unispicate to subapiculate, 10-15 x 8-10 µm.

**Habitat:** On pine test blocks placed among the timber packing at the inlet spray nozzle point of the cooling tower of The Madras Fertilizers.

13. *Chaetomium globosum* Kunze ex Fries, Systema Mycologicum 3: 225, 1829. (Fig. 7)

Perithecia superficial, sessile, ostiolate, subglobose, black, opaque, 200-320 x 200-280 µm, attached to substrata by thick mass of olive to black rhizoids. Terminal hairs simple, persistent, dense,
slender, undulating, roughened with spines, up to 3.5 μm broad at the base, hyaline at the tip. Lateral hairs numerous, persistent, slender, spinulose, dark at base, up to 3-5 μm wide, pale yellow at tip. Asci mostly club shaped, octosporous, evanescent, 62-66 x 12-14 μm. Ascospores dark, broadly ovate to globose, ends apiculate, 9-13 x 6-9.5 μm.

Habitat: On pine and beech test blocks submerged at the collecting basin and preservative treated service timber packing of both stations.

14. Chaetomium incomptum Ames, A monograph of the Chaetomiaceae, p 27, 1963. (Fig. 8)

Perithecia superficial, sessile, brown to black, opaque, ostiolate, subglobose to ovate, 180-320 x 180-250 μm, attached to the substratum by dark to brown rhizoids. Terminal hairs black, arcuate at the base, simple to branched at the tip, persistent, septate, 4-5.5 μm wide at base, tip obtuse. Lateral hairs light brown, straight to incurved, persistent, septate, smooth, 3-4 μm wide as base. Asci club shaped, octosporous, evanescent, 46-48 x 10-12 μm. Ascospores olive brown, ellipsoidal, 12-14 x 8-10 μm, slightly apiculate at both ends.

Habitat: On beech test blocks placed among the timber packing of the cooling tower, immediately below the inlet spray nozzle of The Madras Fertilizers.


Perithecia superficial, stalked, solitary, globose, ostiolate, golden yellow, 120-140 μm in diam., attached
terminal hairs loosely tufted, persistent, predominantly simple, rarely straight, spirally coiled to wavy, attenuated towards the tip, septate, bulbous at the base, 1.5-2 μm broad, rarely branched. Lateral hairs simple, persistent, awl-shaped, bulbous at the base, 1.5-2 μm broad, septate, attenuated towards apex. Asci octosporous, cylindrical, evanescent, 48-52 x 7-9 μm. Ascospores brown, oval to globose, slightly attenuated at one or both ends. 8.5-10 x 6.5-8.5 μm.

Habitat: On beech test blocks placed among the timber packing of the cooling tower of The Madras Fertilizers.

The present isolate resembles C. aureum Chivers in having cylindrical asci and bulbous base of the terminal and lateral hairs. However, it has been accommodated in C. incomptum Ames because of its
cylindrical asci and bulbous base of the terminal and lateral hairs though it differs in having mostly simple and straight terminal and lateral hairs with pointed ends and stalked perithecia.

16. Chaetomium indicum Corda, Icones 4:38, 1840. (Fig. 9)

Perithecia superficial, sessile, dark, globose to subglobose, opaque, ostiolate, 150-200 x 150-180 μm, attached to substratum by dark rhizoids. Terminal hairs persistent, two types: 1. unbranched hairs few, short, dark brown, verrucose, 3-4 μm wide; 2. dichotomously branched hairs brown, verrucose, septate, 5-6 μm wide. Lateral hairs few, persistent, straight, brown, smooth, up to 3 μm wide at base, tapering towards the apex. Ascii club shaped, octosporous, evanescent, 28-32 x 9-10 μm. Ascospores dark, ovoid to globose, slightly apiculate, 6-7 x 5-5.5 μm.

Habitat: On pine and beech test blocks placed among timber packing and copper-chrome-arsenate treated service timber of cooling tower at The Mida Fertilizers.

17. Chaetomium longirostre (Farrow) Ames, A monograph of the chaetomiaceae, p. 29, 1963. (Fig. 1)

Perithecia superficial, sessile, ostiolate, ovoid, brownish black, opaque, 100-120 x 50-60 μm, attached
to substratum by dark rhizoids. Terminal hairs long persistent, brown, borne around ostiole, loosely compact and appear like a column, simple, septate, up to 3-5 μm wide at the base. Lateral hairs brown, persistent, simple, septate, 200-630 μm long, 3.5-5 μm broad at the base, mostly straight. Asci club shaped, octosporous evanescent, 34-40.5 x 17-19 μm. Ascospores blackish brown, subglobose, apiculate at both ends, 8.5-11 x 6.5-8.5 μm.

**Habitat**: On beech test blocks submerged in the cooling tower pond at Madras Fertilizers.


Perithecium superficial, sessile, ostiolate, globose, brown, opaque, 300-400 μm, lightly attached to the substratum by gray rhizoids. Terminal hairs simple, smooth, compact, nonseptate, persistent, irregularly sinuous to loosely coiled, 1.5-2 μm broad at base.
Lateral hairs simple, persistent, shorter, brown, mostly nonseptate, up to 3.5 μm broad at base. Asci clavate, octosporous, evanescent, 25.5-30.5 x 8.5-10.5 μm. Ascospores olive brown, ovoid to globose, slightly apiculate at both ends, 6.5-8.5 x 5-7 μm.

Habitat: On beech test blocks placed among the timber packing of cooling tower of the Basin Bridge Power Generating Station.

19. Chaetomium longirastre (Farrow) Ames

Perithecia superficial, sessile, dark, ostiolate, globose to subglobose, opaque, 250-310 x 210-300 μm.
attached to substratum by pale brown rhizoids. Terminal hairs simple, densely arranged, persistent, olive brown, finely roughened, septate, 3-4 μm wide in the middle, straight to flexuous at base and undulated above, tip rounded. Lateral hairs straight, simple, persistent, olive brown, septate, 3-4 μm wide. Asci club shaped, slightly stipitate, octosporous, evanescent, 30-35 x 10-12 μm. Ascospores ovate to globose, brown, slightly apiculate at both ends, 8.5-12 x 8-10 μm.

Habitat: On pine and beech test blocks submerged in cooling tower pond and copper-chrome-arsenate preservative treated timber packing at cooling tower of The Madras Fertilizers.


Perithecium superficial, sessile, globose to ovate, brown to black, opaque, 90-180 μm in diam., attached to the substratum by yellowish brown rhizoids. Terminal hairs simple, persistent, dark, ornamented with spines and warts, paler towards the apex, straight to slightly bent, 4-6 μm at base, spirally coiled from the base. Lateral hairs long, persistent, straight to slightly flexuous, tapering towards the tip, septate, 3-5.5 μm at base, pale yellow at tip. Asci club shaped, slightly
Fig. 12. Chaetomium spirale Zopf
A-Perithecium with terminal and lateral hairs and accumulated spore mass, B-Spirally coiled terminal hair, C-F-Asci, G-Ascospores

stipitate, 42-60 x 8-11.5 μm. Ascospores dark, oval, spherical to ellipsoidal, slightly apiculate, 8-10.5 x 5-8.5 μm.

Habitat: On pine and beech test blocks placed among the timber packing at the inlet point and preservative treated service timber packing of cooling tower, The Madras Fertilizers.


Perithecium superficial, sessile, gregarious, brown, opaque, ostiolate, 75-172 μm in diam., attached to the substratum by brown, rhizoids. Terminal hairs persistent, dichotomously branched and the branchlets entangled, constricted throughout the length, tortuous, covered with granules, brownish, septate, 2-4 μm wide, branches and branchlets reflexed, tip hyaline. Lateral hairs simple to branched, persistent, pale yellow, covered with granules. Asci mostly cylindrical, slightly stipitate, 50-57 x 7-8 μm. Ascospores uncertain, rarely irregular, brown, globose to subglobose, apiculate at one end, 8-10 x 6-8 μm.

Habitat: On beech test blocks submerged in the hot return water collecting lagoon and placed among the timber packing of the cooling tower at the inlet spray nozzle point.
Fig. 13. Chaetomium undulatum Bainier
H-Perithecia with terminal and lateral hairs and accumulated spore mass, I - Granulate terminal hair, J-Young ascus, K-Matured asci, L-Ascospores


Perithecia superficial, sessile, scattered, brown, opaque, ostiolate, ovoid to globose, 120-140 x 105-135 μm, attached to the substratum by pale yellow rhizoids. Terminal hairs simple, persistent, dark, septate, smooth, arcuate, 7-8 μm wide at the base, tip obtuse. Lateral hairs septate, persistent, smooth, pale yellow, up to 3 μm broad, hyaline at the tip. Asci clavate, octosporous, evanescent, 20-22 x 9-11.5 μm. Ascospores brown to dark, ovate to globose, slightly apiculate at both ends, 7-10.5 x 5-6.5 μm.

Habitat: On copper-chrome-arsenate preservative treated service timber packing of the cooling tower. The Madras Fertilizers.

of the Basin Bridge Power Generating Station.

Perithecium superficial, sessile, scattered, subglobose to broadly ellipsoidal, brown, transparent, 110-135 x 85-110 μm, attached to the substratum by light brown rhizoids. Terminal hairs simple, persistent, light brown, undulate above, granulate, septate, bulbous at the base, up to 4 μm broad, narrowed towards the tip. Lateral hairs straight to flexuous, often mixed with the terminal hairs, persistent, light brown, septate, bulbous at the base, up to 4 μm wide at the base. Ascospores olive brown to green, oval to ellipsoid, 11-13.5 x 7-8.5 μm, subapiculate at both ends.

Habitat: On beech test blocks placed among the timber packing of the cooling tower at The Madras Fertilizers.

We agree with Lodha (1964) in placing this species as distinct entity.

ACKNOWLEDGEMENTS

We are thankful to Prof. C.V. Subramanian, Emeritus Scientist, CIMAP, Lucknow for the valuable guidance and suggestions. The help rendered by the chemists of The Madras Fertilizers Ltd., Manali and Basin Bridge Power Generating Station, Madras are gratefully acknowledged. One of us (KU) is thankful to the U.G.C. for the award of Teacher Fellowship under F.T.P.

REFERENCES


A NEW POWDERY MILDEW FUNGUS FROM TAMIL NADU, INDIA

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During a survey of the powdery mildews in Kodaikanal hills of Tamil Nadu, *Trema orientalis* (L.) Blume, a small tree in the dry deciduous forest, found infected with a powdery mildew fungus. Critical microscopic study of the fungus revealed that it was hitherto undescribed species of the genus *Oidium* Link.

*Oidium udaiyanii* sp. nov.

Maculae infections epiphyllae, coloniae albae, densae, ad 6 mm in diam., confluentes. Hyphae ramosae, septatae, 4.5-9 μm crassae. Appressoria lobata et positus opposita. Conidiophora simplices, recta, 58.5-90 μm longa. Cellula basali plerumque recta et raro leniter flexuosa, 22.5-40.5 x 8.5-9.5 μm. Conidia solitaria, cylindracea, 27-38 x 9-13 μm. Corpusculae fibrosina visa.

Infection restricted to the upper surface of the leaves. Colonies white, dense, up to 6 mm in diameter, often coalesced. Hyphae branched, septate, 4.5-9 μm wide. Appressoria lobed, often opposite. Conidiophores simple, straight, 58.5-90 μm long. Foot cells mostly straight but rarely slightly flexuous and directly bear conidia, 22.5-40.5 x 8.5-9.5 μm. Conidia borne singly, cylindric, 27-38 x 9-13.5 μm. Fibrosin bodies present.

*Holotype:* On leaves of *Trema orientalis* (L.) Blume (Ulmaceae), Kodaikanal, Tamil Nadu, March 22, 1992, M. Bappammal HCIO, New Delhi.

Several powdery mildews in their teleomorphs have been reported on the members of the family Ulmaceae of these, *Phyllaeinia Pteroceltidis* Yu and Han an endemic species to China, has been reported on this host (Braun, 1987). However, the present species warrants its placement under the new species because of its epiphyllous infection and anamorph state.

This species is named in honour of Prof. K. Udaiyan, Bharathiar University, Coimbatore for his notable work on the thermophilic fungi of cooling towers.
ACKNOWLEDGEMENTS

We thank Dr. M. Aruchami, Principal and Prof. A. Thomas, Head, Botany Department, Kongunadu Arts and Science College, Coimbatore for their helpful suggestion and encouragement.

REFERENCE


*Oidium udaiyanii* sp. nov.

a. Conidiophores
b. Appressorium
c. Conidia

![Diagram of Oidium udaiyanii](image)
ENDOCONOSPORA INDICA SPEC. NOV.

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Endoconospora indica spec. nov.

Leaf spots absent, conidiomata (sporodochia) amphigenous, mainly hypophyllous, whitish, punctiform, often confluent, mycelium internal, hyaline, septate, branched, ca. 1.5-4 μm wide, forming well developed stromata, substomatal to intraepidermal, colourless, ca. 40-90 μm diam. Conidiophores in dense, rich fascicles, arising from stromata, through stomata or erumpent through the cuticle, 10-30 x 2-5 μm, simple, straight to flexuous, continuous, hyaline, smooth, subcylindric or somewhat attenuated or enlarged towards the tip, occasionally somewhat constricted below the apex, conidiogenous cells enteroblastic, monophialidic. Conidia ellipsoid, ovoid, subcylindric, occasionally somewhat curved, aseptate, 6-16 x 2-4 μm, hyaline, smooth, apex obtuse, base rounded, conidia sometimes adhering to each other. Fig. 1.
Fig. 1. *Endoconospora indica* spec. nov., conidia, conidiogenous cells, conidiomata, fascicles, stroma. Scale 20 μm. U. Braun del.
Holotypus: on *Leucaena latisiliqua* (L.) Gill. (Fabaceae), India, Coimbatore, 10-12-1991, V. B. Hosagoudar (MH).

Isotypus: HAL.

*Endoconospora* Gjaerum (1971) is the only appropriate genus for the present species. *E. indica* is a phytoparasitic fungus, well characterized by sporodochial conidiomata, monophialidic conidiogenous cells and one-celled conidia. All structures are hyaline. The European *E. caraatii* type species of *Endoconospora*, differs from the new species by larger conical conidia.

**Literature**

A NOTE ON NEW AND LESS KNOWN POWDERY MILDEWS FROM COIMBATORE, INDIA

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During the survey of the diseases on nursery and garden plants in Coimbatore, Ocimum tenuiflorum L. (Lamiaceae) and Parkinsonia aculeata L. (Caesalpiniiaceae) were found infected with the powdery mildew fungi. Microscopic examination of both the materials revealed that they are in the anamorph state of the genus Oidium Link. The species on the former host is studied in detail while the species on the latter host is described here as a new species.

*Oidium ocimi* Narayanaswamy & Ramakrishnan, The Madras Univ. J. 37:38-37, 1967-68. (Fig. 1)

Colonies amphigenous, mostly hyphophyllous, caulicolous, white, dense, persistent, coalesced and covered the entire tender portions of the plant. Hyphae branched, septate, 5-8 µm wide. Appressoria indistinct and represented by its just bulged portions in the hyphae. Conidiophores simple, straight to curved, up to 155 µm long; basal cells straight, erect, cylindrical, 31-43.5 x 13-15.5 µm. Conidia in chains of 6-8 spores, oval, doliiform, 27-37.5 x 15-22 µm. germination apical, germ tubes slightly bulbous at the apex.


Narayanaswamy & Ramakrishnan (l.c.) described this species from Coimbatore. Repeated collections of this species during different seasons revealed its anamorph state only. Braun (1987) stated that it is insufficiently known species and it may belong to *Erysiphe biocellata* Ehrenb. or to *E. galeopsidis* DC. In the absence of its telemorph, it is difficult to assign it to any of the above taxa and is preferred here to retain it under *O. ocimi* Narayanaswamy & Radhakrishnan.
1. *Oidium ocimi* Narayanaswamy & Ramakrishnan
   a. Conidiophores
   b. Foot cell
   c. Appressoria
   d. Conidia

2. *Oidium parinsoniae* sp. nov.
   a. Conidiophores
   b. Foot cell
   c. Appressoria
   d. Conidia
Oidium parksonite sp. nov. (Fig. 2)

Maculae infections foliicolae, amphigenae, rachidicolae, confluentes et amictus aerius caudieulae. Hyphae ramosae, septatae, 6-7 μm crassae. Appressoria singularis vel germinata, multilobata. Conidiophora simplices, recta, erecta, ad 68.5 μm longa; culula basali recta, cylindracea, leniter, flexuosa, 21-31 x 6-9.5 μm, consequor 0-2 cellularae brevioribus. Conidia solitaria, ovala, ellipsoidia, doliiformia, 27-37.5 x 12-15.5 μm.

Infection foliicolous, amphigenous, on rachis, often cover the entire tender aerial portion. Hyphae branched, septate, 6-7 μm wide. Appressoria single but often in pairs, multilobed Conidiophores simple, straight, erect, up to 68.5 μm long; basal cells straight, cylindrical, slightly flexuouas, 21-31 x 6-95 μm, followed by 0-2 smaller cells. Conidia solitary, oval, ellipsoidal, doliiform, 27-37.5 x 12-15.5 μm.

Holotype: On leaves, stems, petioles, and rachis of Parkinsonia aculeata L. (Caesalpiniaceae), Bharathiar University Seedling Plots, Coimbatore, Tamil Nadu, India, Jan. 17, 1992, K. Udaiany HCIO, New Delhi.

More than 10 species of Oidium have been reported on the members of the family Fabaceae (s.l) (Braun, 1987; Hosagoudar, 1989) but the present species is distinct from them in having pseudoidium type of conidia, straight to flexuous foot cells, multilobed appressoria in pairs and in the measurements.

ACKNOWLEDGEMENTS

We are grateful to Dr. N.P. Balakrishnan, Joint Director, Botanical Survey of India, Southern Circle, Coimbatore for the encouragement and one of us (VBH) is grateful to "Scientists Pool Scheme" of CSIR, New Delhi for the financial assistance.

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