V. REVISION OF INDIAN SPECIES OF
\textit{CHEILONEURUS}

1. Genus \textit{Cheiloneurus} Westwood

\textit{Cheiloneurus} Westwood, 1833: 343. Type species \textit{Encyrtus elegans}
Dalman, by monotypy.

[\textit{Chiloneurus} Foerster, 1856: 50. Invalid emendation].


\textit{Blatticida} Ashmead, 1904: 305. Type species \textit{Blatticida pulchra}


\textit{Cristatithorax} Girault, 1911: 169. Type species \textit{Cristatithorax pulcher}
Girault, by monotypy and original designation. Synonymy by Mercet, 1921: 637.

\textit{Eusemionella} Girault, 1915a: 78. Type species \textit{Eusemionella cristata}

* Perkins (1906) has noted \textit{S. australiae} as "sp. nov. et type gen." on page 248 where the genus and species are listed. Gahan & Fagan (1923: 130) apparently overlooked this original designation, and designated the same species as type species of the genus.


Eusemionopsis Girault, 1918: 3. Type species Eusemionopsis centaurus Girault, by monotypy and original designation. Synonymy by Noyes & Hayat, 1984: 249.


Metacheiloneurus Hoffer, 1957: 329, 336. Type species
Metacheiloneurus moestus Hoffer, by monotypy and original

Lepidoneurus Hoffer, 1957: 329, 339. Type species Chiloneurus
kollari Mayr, by monotypy. [As subgenus of Cheiloneurus].

[Cristatothorax: Subba Rao & Hayat, 1981: 110; Noyes & Hayat,
1984: 249. Subsequent misspelling].

Taxonomy. Claridge, 1958: 156-161, British & Scandinavian spe-
cies, taxanomy, key, descriptions. Tachikawa, 1963: 112-118, Japanese
Hayat et al, 1975: 45-56, Indian species, key, descriptions. Noyes
& Hayat, 1984: 249-250, Indo-Pacific species, taxonomy. Noyes,
1988: 61-63, New Zealand species, key, descriptions. Trjapitzin,
1989: 305-312, Palaearctic species, key, hosts. Mani, 1989: 918-
935, Indian species, key, descriptions. Singh & Agarwal, 1993a:
35-61, Indian species, key, descriptions.

Diagnosis.

Female. Head with frontovertex convex and gradually and con-
veyly merging with face; occipital margin narrowly rounded to sharp;
antennal scrobes deep, without sharp margins, generally inverted "U"
shaped or broader than long; malar sulcus present and then fine, or
indicated by a difference in sculpture, or absent; antennal toruli near
mouth margin, their upper margins below level of lower eye margins.
Mandible with two teeth and a dorsal truncation or rarely with three pointed teeth, sometimes with dorsal tooth receding. Maxillary palp 4-segmented and labial palp 3-segmented. Antennal formula 1,1,6,3, dimensions of segments variable; clava 3-segmented, with apex either rounded or transversely truncate, or weakly to strongly obliquely truncate.

Thoracic dorsum slightly convex; pronotum always shorter than mesoscutum, with concave posterior margin; mesoscutum usually with elongate reticulate to longitudinally lineolate reticulate sculpture in about anterior half to three-fourths, and finely reticulate (cellulate to squamiform) in posterior half to fourth; axillae meeting mesally; scutellum with sculpture deeper than on mesoscutum, with subapical group of dark bristles or without such a group of bristles but with a few relatively long setae in apical third; mesopleuron variable, clearly separated from base of gaster to narrowly touching base of gaster. Fore wing, in macropterous forms, with parastigma usually strongly downcurved; marginal vein long, several times longer than broad, at least about 3 times as long as stigmal view; postmarginal vein short or equal to stigmal vein; stigmal vein either long and nearly straight, or short and curved; stigma with 4 sensilla; a hyaline naked streak adjacent to distal end of veins present, filum spinosum present; linea calva complete, broadening and open posteriorly, rarely closed posteriorly; basal triangle distinct with numerous hyaline setae and with a distinct asetose area at base. Legs with 5-segmented tarsi.
Gaster equal to, or usually longer than, thorax; cercal plates situated in about basal third of gaster; TI with an interrupted line of setae; TVII (last tergite) with apex narrowly rounded to broadly pointed; hypopygium extending at most to about two-thirds length along gaster; ovipositor length variable, not exserted or slightly to distinctly exserted; third valvulae free, articulated with second valvifers.

Body colour variable, from brown, testaceous, rufous or blackish brown to black with some metallic green, bluish green, violet or bronzy lustre; antenna generally yellow brown to dark brown with funicle segments partly or completely pale or white to completely brown to dark brown; fore wings strongly infuscate with basal third hyaline, sometimes with margin beginning distad of vention and ending at about retinaculum hyaline, or with two hyaline spots, one adjacent to venation and the other opposite.

Male. Sexual dimorphism pronounced. Antenna with a short pedicel; funicle segments longer than broad, and each with whorls of long setae; clava unsegmented.

Species and distribution. World species 116 (including the new species described here). The genus is cosmopolitan in distribution.

The total number of species known from the six zoogeographical regions is given below. The numbers given in parenthesis refer to the number of extra-limital species recorded from that particular region. Australian-Pacific, 32(1); Palaeartic, 21; Oriental, 34(5); Afrotropical, 10; Nearctic, 19(3); Neotropical, 12(3).
Prior to this revision, 23 species were known from India. In the present work, 8 species are described as new, 6 species are placed in synonymy, and 6 species are recorded for the first time from India. Thus a total of 31 species are recognised from India in this work.

Hosts. Reared from a large number of hosts belonging to several insect orders. Normally, *Cheiloneurus* species are reared as hyperparasitoids, except for *C. pyrillae* Mani which is known as a primary egg parasitoid of the Lophopidae (Homoptera) (but see under *pyrillae*, p. 54). Hosts recorded in the literature include species belonging to: Homoptera — Acleridac, Asterolecaniidae, Cicadellidae, Coccidae, Delphacidae Fulgoridae, Kermesidae, Lophopidae, Pseudococcidae, Psyllidac; Neuroptera — Chrysopidae; Diptera — Cecidomyiidae, Chamaemyiidae, Drosophilidae, Syrphidae; Coleoptera — Apionidae, Coccinellidae; Hymenoptera — Anthophoridae, Aphelinidae, Dryinidae, Encyrtidae, Eurytomidae, Platygasteridae, Pteromalidae (Noyes & Hayat, 1984; Prinsloo, 1997; Trjapitzin, 1989).

Biology. Species of *Cheiloneurus*, so far as their biology is known, are hyperparasitoids on other encyrtids via their secondary hosts, mainly belong to the Coccidae and Pseudococcidae. But one species, *C. inimicus* Compere is known to exist as a primary parasitoid in one locality (Florida) on the black scale, *Saissetia oleae* (Bernard), whereas, the same parasitoid acts as an obligatory hyperparasitoid in the another locality - California (Mc Coy & Selhime, 1970). However, in all the other species whose biologies are known, *Cheiloneurus* species are hyperparasitic on other
encyrtids. For instance: *C. noxius* Compere is a hyperparasitoid of the coccids, *Coccus hesperidum* L., and *Saissetia oleae*, its primary host being another encyrtid, *Metaphycus lounsburyi* (Howard) (Le Pelley, 1937; Weseloh, 1969). Similarly *C. paralia* (Walker) is a hyperparasitoid on *Microterys flavus* via *Coccus hesperidum* L. (Kfir & Rosen, 1981), and *C. quadricolor* (Girault) is hyperparasitoid on the pupae of *Lestodryinus pyrillae* Kieff (Subba Rao, 1957b).

**Identification of the Indian species.** The genus as defined above, is large and complex. In the past authors have proposed several genera in order to accommodate species that differ from the type species, *C. elegans*, in one or the other character.

Identification of the species in this genus is difficult because of the combination of characters exhibited by the species, the apparent variation of some characters such as colour, and more so because of the inadequate and poor descriptions of a majority of the earlier described species. For instance, it is quite impossible to know the Australian species described by Girault or the Nearctic species on the basis of the original descriptions alone and without the study of relevant type material. Even so, the present author has to rely on the original descriptions of most of the extra-limital species to decide about the identity of the Indian species. Therefore, it is very likely that some of the species described here as new may eventually prove to be synonymous with species from other regions, especially those from Australia.
Species - Groups. With 31 species recognised from India, which forms 25% of the world species, it appears to be rather premature to propose species groups in this genus. However, on the basis of some reliable characters, it is possible to propose tentatively some apparently recognizable groups of species. The author would like to emphasize that these groups are recognised on the basis of morphological characters, and that future studies based upon a cladistic analysis of characters may or may not show these species-group as valid.

GROUPS

**ELEGANS** - GROUP:
- longipennis, latifrons,
- bangalorensis, yasumatsui,
- quadricolor

**PYRILLAE** - GROUP:
- pyrilla

**CUPREICOLLIS** - GROUP:
- cupreicollis

**GONATOPODIS** - GROUP:
- gonatopodis, longicornis,
- tenuistigma

**CHRYSOPAE** - GROUP:
- chrysopae, assamensis

**DIVERSICOLOR** - GROUP:
- latiscapsus, saissetiae, diversicolor,
- udaghamundus, callidus, zeyai,
- boucekii, coimbatorensis, basiri,
- peniculoartus, malayensis, kerrichi,
- nitidulus, axillaris, nigricornis

**NOYESI** - GROUP:
- noyesi

**APENICULUS** - GROUP:
- apeniculus, lakhimpurensis,
- manipurensis
Key to Indian species of Cheiloneurus, females

1. Scutellum with a subapical tuft of a compact or loose group of black bristles (Figs. 27, 47) .............................................. 2
   - Scutellum without a tuft of black bristles, occasionally some of the setae in distal third may be black and long (Fig. 170)
   ........................................................................................................... 29

2. Frontovertex, at narrowest, at least as broad as minimum distance between toruli (Fig 14), fore wing, in macropterous form, usually infuscate to apex with basal third, and two small areas distad of venation, one opposite the other, hyaline (Figs. 32, 44, 52)
   .............................................................................................................. 3
   - Frontovertex, at narrowest, less than distance between toruli (Fig. 65); fore wing usually infuscate with hyaline basal third and a hyaline curved marginal strip of variable width, beginning just distad of venation and ending at least halfway along apex, but more usually reaching along posterior margin to or nearly to retinaculum (Figs. 60, 68, 72). Brachypterous forms unknown ...................... 10

3. Funicle segments transverse, each 1.25-2.0x as broad as long; clava longer than funicle, and strongly obliquely truncate (Fig. 11); fore wing infuscation with a subapical curved, darker band as in Anicetus (Fig. 12); third valvula not free, fused with second valvifer (Fig. 18); mandible sharply 3-dentate (Fig. 15). (Body largely yellow) ........................................ pyrillae-Group .......... pyrillae
Funicle segments at most slightly broader than long; clava at most as long as funicle and not so strongly obliquely truncate; fore wing, in macropterous forms, with infuscation normal, not enclosed subapically by a darker curved band (Fig. 32); third valvula distinctly articulated with second valvifer (Fig. 9), mandible rarely sharply 3-dentate.................................................................4

4. Fore wing with apex hyaline; linea calva begins from behind middle of marginal vein and closed posteriorly by several lines of setae (Fig. 21). (Distal funicle segments and clava slightly flattened, Fig. 19; flagellum completely dark brown to black)..................
..........................................................cupreicollis-Group ... cupreicollis

- Fore wing infuscate to apex; linea calva begins from behind junction of marginal and stigmal vein and, in macropterous forms, open posteriorly, or wings reduced...... elegans - Group.......5

5. Fore wing normally developed, reaching at least to apex of gaster ..................................................................................................................6

- Fore wing reduced, reaching not more than half length of gaster or less ........................................................................................................9

6. Funicle segments all clearly longer than broad, F1-4 each at least about 1.5 x as long as broad; pedicel shorter than F1 and F2 combined (Fig. 23); frontovertex slightly less than one-third of head width (5:17), mesoscutum completely dark-brown; scutellum polygonally
reticulate, the cells hardly elongated on sides (Fig. 27)

.......................................................... longipennis

- Funicle segments, except occasionally F1, at most very slightly longer than broad, usually quadrate to broader than long (Figs. 31, 42); if funicle segments all longer than broad then frontovertex at least one-third of head width and scutellum with polygonal reticulations, with elongate reticulate to lineolate reticulate on sides; mesoscutum not completely dark brown .............................. 7

7. Funicle and basal segments of clava dark brown to black; distal two segments of clava pale yellow (Fig. 31) occasionally second segment of clava may be infuscate to dark brown, F1 and F2 conspicuously smaller than other segments, all segments quadrate to broader than long .......................................... bangalorensis

- Either funicle and clava brown to infuscate brown or only F6 and first segment of clava brown to dark brown contrasting with yellow to yellow brown F1-5 (Figs. 42, 43); dimensions of funicle segments variable, but F1 and F2 usually not conspicuously smaller than other segments, (Figs. 42, 51) ................................................. 8

8. Funicle and clava, except rarely apex of clava, brown to infuscate brown; F1 slightly to distinctly longer than broad, other segments variable (brachypterous forms unknown) ...................... latifrons
- Only F6 and basal segment of clava brown to dark brown, F1-5 and distal two segments of clava pale yellow to brownish yellow (brachypterous forms known)..................yasumatsui quadricolor

9. Funicle and basal segments of clava dark brown to black; fore wing as in Fig.29 ................................................. bangalorensis

- F1-5 and distal two segments of clava pale yellow to brownish yellow, F6 and first segment of clava brown to dark-brown; fore wing as in Fig. 56.................................yasumatsui

10. Fore wing infuscation behind marginal vein yellowish brown, paler than the distal infuscation which appears oval in shape, the hyaline marginal band beginning distad of venation of nearly uniform width, and reaches posteriorly along wing margin to retinaculum (Fig. 68). [Propodeum densely setose on each side around spiracles (Fig. 67)] ........................................ gonnatopodis-Group......11

- Fore wing infuscation normal, whole infuscation uniform, with marginal hyaline area usually becoming narrower towards posterior margin. (Fig. 76) .................................................................13

11. Antennal clava with second suture nearly perpendicular, and apex slightly truncate, F1-5 longer than broad; clava shorter than F4-6 combined (Fig. 59). [Funicle, except partly F1, white; mesoscutum completely dark brown]............................................longicornis
- Clava with second suture oblique, and apex obliquely truncate, 
  F1 longer than broad, F2-6 quadrate to slightly broader than long 
  (Figs. 64, 71) ................................................................. 12

12. Head, in front view, rounded or subquadratic, (Fig. 65); mesoscutum 
  with posterior 0.5x or so dark brown; clava about as long as 
  F3-6 combined (Fig. 64); stigmal vein normal (Fig. 69); T1 of gaster 
  with 4-5 setae on each side (Fig. 70). [Funicle pale yellow, light 
  infuscate brown (Fig. 64); sutures of clava complete] 
  .................................................................................. gonatopodis

- Head, in front view, suboval (Fig. 2); mesoscutum completely dark 
  brown; clava longer than F2-6 combined, (Fig. 71); stigmal vein 
  thin, with 3 sensilla (Fig. 73); T1 of gaster with numerous setae 
  on each side apart from the usual sub-median row of setae. [Funicle 
  white, occasionally F1 and F2 pale brown, clava dark brown, sutures 
  of clava incomplete] .................................................. tenuistigma

13. Antennal clava large, with apex strongly obliquely truncate, the 
  truncate part more than 0.5x length of clava; clava at least a little 
  longer than funicle (Fig. 78). [Funicle white to pale yellow with 
  basal segments partly light brown to dark brown] ...................
  ............................................................................. chrysopae-Group ....... 14

- Antennal clava not large, shorter than funicle, either not trunc- 
  cate or the truncate part not more than 0.5x length of clava
(Figs. 89, 93); if clava with truncate part 0.5x or more of the remaining part of ventral margin, then clava clearly shorter than funicle .......... *diversicolor* - Group........................................ 15

14. Head subquadratic in front view; frontovertex one-eight of head width; body not completely dark brown, pronotum largely, axillae, mesosopleura yellow to testaceous; rest of body brown to dark brown; scape yellow with dorsal margin brown .......... *chrysopae*

   - Head suboval in front view, slightly longer than broad, frontovertex one-twentieth of head width; body completely dark brown to black; scape dark brown with whitish median wedge-shaped area ................................................................. *assamensis*

15. Scape flattened and expanded beneath, not more than 3x as long as broad .......................................................... 16

   - Scape cylindrical or slightly flattened, but not expanded, but if so, then clearly more than 3x as long as broad................. 17

16. Funicle white; scape with a white strip in distal half of dorsal margin (Fig. 81).................................................. *latiscapus*

   - Funicle completely dark brown to nearly black; scape with a wedge shaped white or yellow median area on inner surface .................................................................................................................... *saissetiae*
17. Funicle white with F1, or F1 and F2 and occasionally F6 partly light-brown, or funicle more or less completely pale yellow brown ................................................................. 18
   - Funicle segments brown to dark brown, and usually as dark as clava; ................................................................. 21

18. Axillae yellow, contrasting with dark brown mesoscutum and scutellum; frontovertex, at narrowest, about diameter of anterior ocellus (Fig. 99); funicle pale yellow brown ...................... 19
   - Axillae and scutellum pale yellow or yellow brown, contrasting with dark brown mesoscutum; frontovertex, at narrowest, broader than diameter of anterior ocellus (Fig. 108); funicle white with F1 completely, or F1 and F2 partly brownish .................. 20

19. Funicle segments, except F1, quadrate to broader than long; scape about 3.5 x as long as broad (Fig. 93) .................. diversicolor
   - Funicle segments, except F6, each slightly longer than broad; scape 4.5x as long as broad .................. u daghamundus

20. Scape brown, a wedge shaped area in apical 0.5 white; fore wing, with hyaline apex broad, its width 0.25x of infuscate area (Fig. 102) ....................................................................... calllidus
   - Scape pale yellow to white, dorsal and ventral margins brown, fore wing with hyaline apex very narrow, its width 0.07x of
infuscate area (Fig. 106) .............................................. zeyai

21. Thorax completely dark brown to black ......................... 22
   - Thorax not completely dark brown to black, axillae, propodeum,
     sometimes pleura and scutellum pale yellow to brownish
     yellow .......................................................... 28

22. Eyes, in front of anterior ocellus, rather strongly convergent, so
    that the narrowest part of frontovertex is at most as wide as
    diameter of anterior ocellus, usually narrower .................. 23
   - Eyes, in front of anterior ocellus, very slightly convergent, so
     that the narrowest part of frontovertex is at least slightly broader
     than diameter of anterior ocellus ................................ 27

23. Head, in front view, suboval with bulged cheeks (Fig. 112)
    ................................................................. bouceki
   - Head, in front view, subquadratic (Fig. 122) .................. 24

24. Fore wing with hyaline apex narrower, its width 0.12x of width
    of infuscate area (Fig. 116). (Ovipositor distinctly exserted, exserted
    part slightly more than one sixth of gaster length, whole ovipositor
    1.4x as long as mid tibia; head, in front view, about as in basiri,
    Fig. 118) ......................................................... coimbatorensis
   - Fore wing with hyaline apex broader, 0.15 - 0.18x of infuscate
     area (Figs. 120, 126) ........................................... 25
25. Mid femur dark brown with base pale..............................26
  - Mid femur pale yellow to white, at most with pale brown infuscation in basal half.........................................................basiri

26. Mid tibia pale yellow; hind tarsal segments 1-4 brown; Fl slightly more than 2x as long as broad, and slightly shorter than pedicel (11:14), clava as long as F4-6 combined (Fig. 125); basal triangle of fore wing with 2 lines of setae behind submarginal vein (Fig. 127) ..........................................................peniculoartus
  - Mid tibia dark brown with base (except knee) and apical third pale-yellow; hind tarsal segments 1-4 pale yellow; Fl less than 2x as long as broad, and distinctly shorter than pedicel (Fig. 128); basal triangle of fore wing with one line of setae behind submarginal vein (Fig. 130) ........................................malayensis

27. Scape slightly expanded in about middle, about 4 x as long as broad, F1-4 longer than broad, F5 and F6 quadrate to slightly broader than long (Fig. 133); fore wing with hyaline apex narrow, its width 0.10x of infuscate part; setal arrangement as in Fig. 138; marginal vein 5.5x as long as stigmal vein.......kerrichi
  - Scape very slightly expanded in about middle, about 4.5 x as long as broad; fore wing with hyaline apex broad, its width 0.27x of infuscate part; setal arrangement of fore wing as in Fig. 141;
marginal vein 3.5x as long as stigmal vein .......... nitidulus

28. Frontovertex, at narrowest, about 1/11th of head width; pleura dark brown, metallic bluish green .................. axillaris
   - Frontovertex, at narrowest, much less than 1/11th of head width; pleura pale yellow to yellow brown .................. nigricornis

29. Fore wing relatively narrow; about 3x as long as broad, with infuscation normal, the apical hyaline curved band distinct (Fig. 153) ........................................ nyesi - Group .............. nyesi
   - Fore wing relatively broad, at most 2.5x as long as broad, with infuscation diffuse, the distal curved hyaline band absent or vaguely defined (Figs. 157, 161, 165) .......... apeniculus-Group ...... 30

30. Frontovertex, at narrowest, narrower than distance between toruli (87:111); scape and pedicel pale yellow, F1-5 pale yellow to white, F6 pale brown; clava dark brown (Fig. 156); legs including fore coxae pale yellow, with hind femur dark brown; mid coxae light brown; hind coxae brown, dark in basal half. [Exserted part of ovipositor 0.3-0.4x of gaster length] ......................... apeniculus
   - Frontovertex, at narrowest, broader than distance between toruli; funicle pale brown to dark brown; legs largely dark brown ...... 31

31. Frontovertex about 0.25x of head width; exserted part of ovipositor about 0.33x of gaster length; F1-3 broader than long; scape
yellow brown, pedicel brown, funicle pale brown to brown, clava dark brown (Fig 160).

lakhimpurensis

- Frontovertex about 0.22x of head width; exserted part of ovipositor a little less than half of gaster length, F1 and F2 longer than broad, antenna completely dark brown, (Fig. 164)

.. ..... ..............................................................................manipurensis
**PYRILLAE - GROUP**

1. *Cheiloneurus pyrillae* Mani (Figs. 11 - 18)

*Cheiloneurus pyrillae* Mani, 1939: 73, ♀, ♂. Holotype ♀: India, Karnal (IARI), not examined.


**Redescription.**

**Female.** Length, about 1.0mm. Body largely yellow, pronotum with a round brownish patch in centre; gaster brownish; scape yellow, pedicel pale brown, funicle and clava dark brown; fore wing infuscate with hyaline in basal third, save extreme base, and with marginal curved band beginning distad of venation and ending at about retinaculum, subhyaline, and with a submarginal circular darker band as in *Anicetus* Howard (Fig. 12); hind wing hyaline, distally faintly infuscate; legs pallid, hind femur except base and apex, brownish.

* There are many references to this species mostly in lists of parasitoids of sugarcane pests. Only some of these are listed here.
**Head.** Dorsum, about 1.5 x as broad as long. Frontovertex about 0.33x of head width and, with occiput perpendicular, 1.5x as long as broad, ocellar triangle with apical angle slightly acute, slightly less than 90°; head, in front view, slightly broader than long (Fig. 14); scrobes inverted "U" shaped, with sharp margins; distance between toruli clearly less than minimum width of frontovertex; head, in lateral view, with the frontovertex slightly convex; head reticulate with mostly transversely drawn out cells on frontovertex, those on malar space regularly polygonal. **Mandible** with 3 pointed teeth (Fig. 15). **Antenna** (Fig. 11) with a slightly flattened, but unexpanded scape, transverse funicle segments, slightly broader than long (F1) to nearly 2.0x (F6) as broad as long; clava large, longer than funicle, with second suture strongly oblique, apex obliquely truncate, truncate part extending from second segment to apex. **Relative measurements** (from slide): HFW, 42; FVO, 16; HFL, 41; EL, 23.5; MSL, 15; TRL, 4.5; TRD, 10; MFW, 14; SL, 24; SW, 6; PL, 8; PW, 5; FNL, 16.5; CLL, 23.

**Thorax.** Normally convex; pronotum dorsally narrow with concave posterior margin; mesoscutum as long as scutellum; axillae slightly raised above level of scutellum; scutellum (if not pressed by coverslip) about as long as broad with rounded apex; mesoscutum sparsely setose with about 24 setae, setae pale; scutellar bristles forming a more or less compact bundle, the longest bristle slightly less than 0.5 x of scutellum length (Fig. 17), propodeum with 4 setae adjacent to each spiracle; mesoscutum finely, polygonally reticulate (Fig. 16); scutellum largely with hexagonal cells which became elongated on sides and to-
wards apex (Fig. 17), these cells deeper and prominent than those on mesoscutum. **Fore wing** 2.65 - 2.80x as long as broad, with venation and setation as in Fig. 13. *Relative measurements* (from slide): TL, 58; TW, 39.5; PRL, 9; MSCL, 16; MSCW, 24; STL, 22; STW, 24; PPL, 3; FWL, 117; FWW, 44; MFL, 2.5; HWL, 86; HWW, 19; MFL, 5.

**Gaster.** Triangular, pointed at apex, subequal in length to thorax; ceraceous plates situated proximad of middle of gaster; ovipositor at most very slightly exserted, third valvula fused with second valvifer (Fig. 18). *Relative measurements* (from slide): GL (distended), 60; GW, 40; LTL, 30; EOL, 3; OVL, 57; [MTL, 48, MBL, 12; MSL, 11.5; DBS, 30].

**Male.** As described by Mani (1939). I have not seen any males of this species.

**Hosts.** *Pyrilla* spp. (including *P. perpusilla*) on sugarcane (*Saccharum officinarum* L.). Bred from eggs of *Pyrilla* sp. (Mani, 1939). The primary host is probably the dryinid, *Dryinus pyrillae*.

**Distribution.** India: Uttar Pradesh, Haryana, Delhi, Jammu & Kashmir.


**Comments.** Types, in the IARI, are not available but the figure given
by Mani (1939; Fig. 2, reproduced in Pruthi & Mani, 1940) and the host record (Pyrilla eggs) leave no doubt that the material listed above is correctly determined.

Apart from the Anicetus-like infuscation of the fore wing, *pyrillae* has at least three characters which at the least suggest the placement of this species in a separate species-group: Mandibles sharply 3-dentate; the third valvula not articulated but fused with the second valvifer; and mesoscutum sparsely setose, setae about 24. These characters together with the transverse funicle segments and large, strongly obliquely truncate clava, clearly separate *pyrillae* from all the other Indian species of this genus.

**CUPREICOLLIS - GROUP**

2. *Cheiloneurus cupreicollis* (Ashmead) (Figs. 19-22)

*Cheiloneurus cupreicollis* Ashmead, 1886: 131, ♂. U.S.A., Florida (USNM)


**Redescription.**

**Female.** Length, about 1.75 mm. Head rufous with slight bronzy and violet lustre; pronotum and mesoscutum dark brown to nearly black with dull violet lustre; tegulae dark brown; axillae and about apical half of scutellum rufous, rest of scutellum yellowish; metanotum and propodeum dark brown to nearly black as mesoscutum; mesopleuron
rufous with faint bronzy lustre in anterior half; gaster dark brown with bronzy to violet lustre; exserted ovipositor sheaths brownish yellow; antenna with radicle and scape infuscate brown, pedicel and flagellum dark brown to nearly black; fore wing infuscate as in Fig. 20; legs, including coxae, infuscate brown to dark brown, basal half or so of fore femur, margin of fore tibia, mid coxae, mid tibia, hind femur, hind tibia except narrowly at base, basal half of hind basitarsus and last segments of all tarsi, dark brown; rest of parts infuscate brownish yellow, mid tibial spur white. Setae on cheeks and eyes are golden; on mesoscutum white, and on axillae and scutellum appear golden, brush black; propodeal setae on sides and distad of spiracles silvery white.

**Head.** In front view, very slightly longer than broad (Fig. 22); frontovertex 0.3x of head width across anterior ocellus; frontovertex cellulate reticulate, face and the area between lower eye margin and scrobes with irregular, hexagonal cells; ocellar triangle with apical angle acute, ocelli very small, posterior ocelli slightly more than one diameter to eye margin, and at least 3 diameters to occipital margin; scrobes horse - shoe shaped. **Mandible** with three pointed teeth. **Antenna** (Fig. 19) with scape almost cylindrical, 6.7x as long as broad, pedicel 2 x as long as broad, F1-F5 longer than broad, F6 broader than long; clava flattened and slightly transversely truncated. **Relative measurements** (from carded specimen): HDW,41; FVO,13.5; ODA, 1.75; POL: AOL:OCL, 8:2:6; HFL, 39; EL, 30; MSL:12; TRD,12; MDS, 19; (from slide): HFW, 64; FVO, 22; HFL, 65; MSL, 21.5; TRL,10; TRD,13.25; MFW, 13; SL, 44; SW, 6.5; PL,12; PW, 6; FNL, 75; CLL, 27.
Thorax. Entire mesoscutum with irregular polygonal cells, axillae and scutellum with reticulate sculpture, deeper than on mesoscutum; propodeum distad of spiracles moderately setose. Fore wing 3.1x as long as broad, venation and setation as in Fig. 21; marginal fringe 0.07x of wing width; hyaline part 0.10x of infuscate part. Relative measurements (from carded specimen): TL, 60; PRL, 10; MSCL, 21; MSCW, 37; STL, 20; STW, 22; PPL, 8; (from slide): TL, 102; TW, 56; PRL, 12; MSCL, 43; MSCW, 51; STL, 35; STW, 33; PPL, 12; FWL, 171; FWW, 54; MFL, 4; I: H, 95:10; HWL, 154; HWW, 30; MFL, 5.

Gaster. Shorter than thorax (55:60, from carded specimen); ovipositor very slightly exserted, about 0.05x of gaster length. Relative measurements (from slide): LTL, 60; OVL, 87; VAL, 19.75; [MTL, 86; MBL, 25.25; MSL, 27; DBS, 42].

Male. Unknown.

Hosts. Unknown.

Distribution. India: Assam. (U.S.A.; Argentina, Mexico; West Indies; Australia).

Specimen examined. 1♀: INDIA: Assam, North Lakhimpur, 1♀ (on slide under 7 coverslips), 27.iv.1988 (Sudhir Singh No.127).

Comments. This is a distinctive species, differing from all the other species of the genus by a combination of characters pertaining to the elongate funicel segments, completely dark flagellum, somewhat flattened distal funicel segments and clava; posteriorly closed linea
calva of the fore wing and the polygonally reticulate sculpture of the mesoscutum and scutellum. The Indian specimen referred to this species does not appear to differ much from the redescription of cupreicollis given by De Santis (1964), and is, therefore, identified as this species.

**ELEGANS - GROUP**

The following four species (longipennis, bangalorensis, yasumatsui, latifrons) are all very closely related, and belong to a group which should include C. elegans (Dalman), the type species of the genus. These species together with several species described from other regions of the world, may be placed in a separate group, the elegans - group. Of the extra-limital species, the following definitely belong to elegans - group: antipodis Noyes, 1988; bimaculatus Hoffer, 1970b; kuisebi Prinsloo, 1985.

The four Indian species of this group have a more or less similar body colour (except longipennis in which the mesoscutum is completely dark chocolate brown; see details under longipennis): The mesoscutum on sides and usually also in posterior third to half metallic dark brown with white setae, the mesal area enclosed in this semi-circular dark band is orange-brown to yellow or golden brown; pronotum elongate, at least 0.33x of mesoscutum with a paler or transparent collar (hence posterior margin difficult to see in slide mounted specimens); propleuron with a dark streak just anterior to fore coxae; and the extreme tips of ovipositor sheaths are black (this is likely to be overlooked!).
leg colour more or less similar, as illustrated in Figs. 172-180. The other characters, including the relative dimensions of the funicle segments and to some extent their colour appear to vary; but in the present work, these four species are distinguished on characters which should enable their easy identification.

3. *Cheiloneurus longipennis Fatma & Shafee* (Figs. 23-27, 172-174)


**Redescription.**

**Female.** Length, 1.42 - 1.50mm. Head, pronotum orange yellow to yellow brown, mesoscutum dark chocolate brown with green lustre; axillae and scutellum orange yellow; metanotum and propodeum brown to dark brown; gaster dark brown with base (except sides) brownish yellow to largely brownish yellow in middle with sides dark brown; ovipositor sheaths yellow; scape pale yellow to yellow brown, pedicel and flagellum yellow brown with F6 and clava dark brown; fore wing infuscate as in Fig. 25; legs, including coxae, white with yellow to infuscate brown as follows: mid tibia yellow brown except in basal fourth, longitudinal streak in distal half and extreme apex of hind femur, hind tibia except basal third infuscate brown, (as in Figs. 172-174).
Head. In front view broader than long (Fig. 24); frontovertex 0.3x of head width across anterior ocellus; frontovertex with raised reticulate sculpture, cells small, and the area between lower eye margins and scrobes with transversely drawn out cells, malar region with transversely lineolate reticulations. Mandible with two pointed teeth and a truncation. Antenna (Fig. 23) with scape more or less cylindrical, 6x as long as broad, pedicel 1.8x as long as broad, and shorter than F1 and F2 combined, F1-6 longer than broad, F1 1.8-2x as long as broad, F6 slightly longer than broad. Relative measurements (from carded specimen): HDW, 34; FVO 10; POL : AOL : OCL : OOL, 6 : 6 : 6 : 1; (from slide, Holotype): HFW, 49.5; FVO, 15; ODA, 3.5; HFL, 47; TRL, 5.5; TRD, 11; SL, 30; SW, 5; PL, 9; PW, 5; FNL, 39; [F1 L (W), 6 (3); F6 L (W), 7 (6.5)]; CLL, 21.5.

Thorax. Mesoscutum in about anterior 0.5 with longitudinally lineolate reticulations and posterior 0.5 with irregular polygonal cells; sculpture of scutellum as in Fig. 27; propodeum with a few setae distad of spiracles. Fore wing 3.2x as long as broad, venation and setation as in Fig. 26. Relative measurements (from slide, Holotype): TL, 66; TW, 36; PRL, 7; MSCL, 20; MSCW, 34; STL, 32; STW, 22.5; PPL 7; FWL, 128; FWW, 39.

Gaster. Longer than thorax (107: 66, from slide, Holotype); ovipositor long, originating from base of gaster and slightly exserted at apex. Relative measurements (from slide, Holotype): GL, 107; GW, 44; LTL, 66; EOL, 12; OVL, 110; VAL, 23; [MTL, 63; MSL, 22; MBL, 20; DBS, 34].
Male. Unknown

Hosts. Unknown

Distribution. India: Tamil Nadu, Uttar Pradesh.

Specimens examined. Type specimen: Holotype ♂ (with left antenna and both wings on one slide, rest of body on a second slide) with data as given in the original description, except as noted under comments (ZDAMU).

Additional specimens. 4♀: INDIA: Uttar Pradesh, Aligarh, 1♀ (on slide, EH-672), 28. iii. 1979 (M. Verma); 1♀, xi. 1979 (M. Verma); 1♀, 9. xii. 1979 (M. Hayat). Tamil Nadu, 3km E. of Manjaler Dam, 1♀, 15-18.x. 1979 (J.S. Noyes), BM: 1979-518.

One additional female with the data same as BM specimen is doubtfully identified as this species, as it has the frontovertex broader (HW : FVO, 34: 12); ocellar triangle in about an angle of 90°, mesoscutum with about anterior third testaceous yellow; and gaster slightly longer than thorax.

Comments. C. longipennis: The original description of this species was based upon a single female, the holotype, collected by S.A. Shafee. It is on two slides; right antenna and both fore wings on one slide and rest of body (flagellum of right antenna missing) on a second slide. Both the slides bear correct name, and data except the name 'Fatima' was given as the collector, though in the original description S.A. Shafee's name was given as the collector of the specimen. The slides bear Fatima's collection No. 923.
C. longipennis appears related to latifrons and may be confused with that species. However, it differs from latifrons (also yasumatsui and bangalorensis) in having a relatively narrow frontovertex (HW: FVO, 49.5: 15), ocellar triangle with apical angle slightly acute, mesoscutum completely dark chocolate brown; scutellum with polygonally reticulate sculpture, with the cells small, and funicle segments all longer than broad, F1 nearly 2x as long as broad, and F6 slightly longer than broad; and setae of the scutellar brush relatively shorter (compare Figs. 27 and 47).

4. Cheiloneurus bangalorensis (Subba Rao)

(Figs. 1, 3-8, 28-41, 175-177)


Redescription.

Female. Macropterous form: Length, 1.3 - 1.5mm. Frontovertex yellow brown, scrobes above brown, interscrobal area yellow, tip of mandible dark brown; pronotum yellow brown; sides and posterior third of mesoscutum dark; tegulae yellow brown, in distal half brown; axillae yellow brown; scutellum yellow becoming yellow brown in posterior third; metanotum and propodeum dark brown; pleura yellow brown; gaster dark brown, metallic with dark violet and bronzy lustre on proximal half and bronzy lustre on distal half; radicle yellow to yellow brown, scape yellow, pedicel yellow brown to brown, funicle and clava with first, rarely partly the second segments dark brown to black; fore wing infuscate as in Fig. 32; all coxae white, legs pale yellow with dark brown as follows: basal half of fore tibia, apical third of mid femur, base of mid tibia, dorsal longitudinal streak of hind femur and tibia as in Figs. 175-177. Setae on collar of pronotum dark and on mesoscutum silvery white; scutellar tuft with bristles relatively short compared to those in latifrons and yasumatsui (compare Fig. 30 with 47 and 58).
**Head.** In front view broader than long (Fig. 34): frontovertex 0.35x of head width across anterior ocellus; ocelli arranged in a slightly obtuse triangle. **Mandible** with one pointed and two blunt teeth (Fig. 35). **Antenna** (Fig. 31) with scape slightly flattened and unexpanded, slightly more than 4x as long as broad, pedicel about 2x as long as broad, F1 and F2 smaller than F3 - F6 individually, quadrate to broader than long, clava with apex rounded, with a slight transverse or oblique truncation. **Relative measurements** (from carded specimen): HDW, 34; FVO, 12; POL : AOL : OCL : OOL, 8 : 5 : 5.5 : 1.5; EL, 23; EW, 16; (from slide): HFW, 49; FVO , 17; HFL, 45; EL, 32.5; TRL, 6; TRD, 10; SL, 21; SW, 5; PL, 8.5; PW, 4; FNL, 27; CLL, 18.5.

**Thorax.** Anterior 0.5 - 0.6 of mesoscutum with longitudinally lineolate reticulations, rest with fine irregular reticulate sculpture; scutellum with reticulate sculpture, cells elongate; propodeum sparsely setose; propodeum medially 0.17x as long as scutellum. **Fore wing** 3.05x as long as broad, venation and setation as in Fig. 33. **Relative measurements** (from carded specimen): TL, 36; (from slide): TL, 65.5; TW, 46.5; PRL, 10; MSCL, 24.5; MSCW, 34; STL, 26; STW, 29; PPL, 4.5; FWL, 122; FWW, 40; MFL, 5.

**Gaster.** Ovipositor very slightly exserted, exserted part 0.11 - 0.16x of gaster length. **Relative measurements** (from carded specimen): GL, 46; EOL, 7.5; (from slide): GL, 81; GW, 39; LTL, 55; EOL, 9.5; OVL, 91; VAL, 22; [MTL, 52; MSL, 16.5; MBL, 17; DBS, 31].

**Male.** Similar to female except basal half of gaster yellow: frontovertex 0.4 - 0.5x of head width; toruli slightly above the level of lower eye.
margins. ocellar triangle with apical angle obtuse. Antenna and fore wing as in Figs 36 and 39, and size-dependent variations in antennal segments and fore wing venation are shown in Figs 37, 38 and 40, 41. Relative measurements (from carded specimen) HDW, 30, FVO, 16, POL, AOL, OCL, OOL, 6 1 5 2 5 2 5, (from slide) HFW, 44 5, FVO, 21 5, HFL, 38 5, EL, 25 5, SL, 19, SW, 4 5, PL, 7, PW, 4, FNL, 92, CLL, 22, FWL, 110, FWW, 37, MFL, 3 75

Female. Brachypterous form. Length, 1.00 - 1.3mm. Similar to macropterous forms in colour and various dimensions of body parts and antennae except for the mesothorax which is relatively narrower (compare Fig 6 with 30), and reduced wings. Antenna and fore wing as in Figs 28 & 29.

Head. In front view, broader than long, frontovertex 0.35x of head width across anterior ocellus. Antenna with scape 4.7x as long as broad, pedicel 2x as long as broad, F1 and F2 smaller than F3 - r6, clava transversely truncate. Relative measurements (from card) HDW, 30, FVO, 10 5, POL, AOL, 4 3, (from slide) HFW, 45, FVO, 16, HFL, 42, EL, 31, SL, 19, SW, 4, PL, 8, PW, 4, FNL, 23 5, CLL, 17 5.

Thorax. Sculpture of both mesoscutum and scutellum similar to macropterous forms, but propodeum medially 0.16x as long as scutellum. Fore wing 3.22x as long as broad, marginal fringe absent, venation and setation as in Fig 29. Relative measurements (from card) TL, 24, (from slide) TL, 54, TW, 34, PRL, 12, MSCL, 14, MSCW, 29, S1L, 24, S1W, 20, PPL, 4, IWI, 29, FWW, 9.
Gaster. Ovipositor slightly exserted, about 0.15x of gaster length.

Relative measurements (from carded specimen): GL, 40; EOL, 6; (from slide): GL, 71; GW, 29; LTL, 49; EOL, 10; OVL, 82; VFL, 62.5; VAL, 19.5; [MTL, 42; MBL, 12; MSL, 14; DBS, 27].

Male. Similar to female. Relative measurements (from carded specimen): HDW, 22; FVO, 12; POL : AOL : OCL : OOL, 4.5 : 2 : 2 : 2; TL, 32; TW, 21; MSCL, 12; MSW, 19; STL, 14; STW, 14; GL, 21; (from slide): SL, 17; SW, 5.5; PL, 6; PW, 4; FNL, 83.25; CLL, 21.5; TL, 49.5; TW, 35; MSCL, 20; MSCW, 31; STL, 22.5; STW, 21; PPL, 3.25; MTL, 42; MBL, 12; MSL, 13; GL, 52; GW, 33.


Distribution. India: Andhra Pradesh, Assam, Delhi, Karnataka, Kerala, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Specimens examined. Type specimen. Cheiloneurus angustifrons Fatima & Shafee: Holotype ♀: INDIA: Uttar Pradesh, Aligarh, 22.viii. 1985 (Anis Fatma), on one slide. The slide carries the correct data, and bears Fatima's collection No. '924'.

Additional specimens. 67♀, 80♂:(From BMNH coll.): INDIA: Karnataka, Bangalore, 1 ♀ M, 3 ♀ B, 1 ♂ M, 1 ♂ B, 29 vii 82 ex Antonina graminis on grass (det. B.R. Subba Rao); 2 ♀ M, 1 ♀ B, 2 ♂ M, 4 ♂ B, 19-23. ix.1979 (J.S. Noyes); 1 ♂ M. iii.1979 (T. Sankaran);
Bannerghatta N.P., 1 ♀ M, 1 ♂ M, 5.x.1979 (Boucek & Noyes). Tamil Nadu, Coimbatore, 1 ♀ M, 2 ♂ M, 3 ♀ B, 25.ix – 1.x.1979 (J.S. Noyes); Siruvani forest, 2 ♀ B, 30.ix.1979 (J.S. Noyes); 3km. E. Manjaler Dam, 3 ♂ M, 15 - 18.x.1979 (J.S. Noyes); Mudumalai A. Sanctuary, 1 ♂ M, 1 ♂ B, 23 - 24.x.1979 (J.S. Noyes); Kerala, Walayar Forest, 1 ♀ B, 26.ix - 1.x.1979 (J.S. Noyes); Periyar A. Sanctuary, 1 ♂ M, 5 - 15.x.1979 (J.S. Noyes). West Bengal, Calcutta, 1 ♀ M, 1.xi.1979 (Boucek). Delhi, IARI area, 1 ♀ M, 1 ♂ B, x.79; 1 ♀ M, 26.x.79 (Boucek). Uttar Pradesh, Dehra Dun, 1 ♀ M, 1 ♂ B, 21.x.1979; 1 ♂ M, x.79; 1 ♂ M, 22.x.79 (Boucek); Aligarh, 1 ♀ M, 4 ♀ B, 15 ♂ M, 4 ♂ B, 8 - 10.xi.1979 (J.S. Noyes).


\( M = \text{Macropterus specimen(s)}, \ B = \text{Brachypterus specimen(s)} \)
3♂ M (slide no. EH. 779, 780), 24.xi.1976 (M. Hayat).

Also examined the material referred to this species by Hayat (1972), Aligarh, 25.x.1969, ex *Antonina* spp. [= *A. graminis*] on grass, it has coll. No. "372.MA".

**Comments.** *Chrysopophagus bangalorensis* and *Ectromatopsis indica*: Types stated to have been deposited in the IARI, New Delhi, were not available. Therefore, the identity of this species and the synonymy of *E. indica* with *C. bangalorensis* are based on specimens (examined) bred from *Antonina* spp. and determined by Hayat (1972).

*C. angustifrons* Fatima & Shafee: The original description of this species was based upon a single female, the holotype (in ZDAMU).

This is a distinctive species. It differs from the other related Indian species (*longipennis, yasumatsui, latifrons*) mainly in the characters given in the key. *C. bimaculatus* Hoffer (1970b) is extremely close to *bangalorensis*, but differs in such minor characters as the colour of flagellum (flagellum black), and presence of two dark spots one on each side of mesoscutum.

**5. Cheiloneurus latifrons** Hayat, Alam & Agarwal

(Figs. 42-50, 178-180)


Redescription.

**Female.** Length, 0.97 - 1.8 mm Body largely testaceous, sides and posterior third of mesoscutum, gaster except base, dark brown, shiny, scape yellow to yellow brown with dark brown ventral margin, flagellum brown to dark brown with apex of clava sometimes pale, fore wing infuscate as in Fig 44, leg colour as in yasumatsui (Figs 178-180)

**Head.** In front view, slightly broader than long, frontovertex 0.35x of head width across anterior ocellus, ocelli arranged in a slightly obtuse triangle, frontovertex with reticulate sculpture **Mandible** with two teeth and a truncation (Fig 46) **Antenna** (Fig 42), with scape about 5x as long as broad, pedicel longer than F1 and F2 combined, F1 at least slightly longer than broad, F2-6 usually quadrate, F1-2 or 1-3 generally smaller than distal funicle segments, clava with apex rounded or slightly transversely truncated **Relative measurements** (from carded specimen) HDW, 34, FVO, 12, POL, A01, OCL, 6, 5, 5, HFL, 31. (from slide) HFW, 53, FVO, 19, HFL, 54, MSL, 16, TRL, 6, TRD, 12, MFW, 19, SL, 27, SW, 5, 5, PL, 9, PW, 4, FNL, 31, 5, CLL, 20
**Thorax.** Mesoscutum with fine longitudinally lineolate reticulations, which become rather wide-meshed in about posterior fourth, sculpture of scutellum as in Fig 47. **Fore wing** 32x as long as broad, veination and setation as in Fig 45. **Relative measurements** (from carded specimen) TL, 36, MSCL, 11, STL, 19.5, (from slide) TL, 70, TW, 46, PRL, 10, MSCL, 24, MSCW, 40, STL, 31, STW, 30, PPL, 5.

**Gaster.** Longer than thorax (49.36, carded specimen), ovipositor slightly exserted about 0.04 - 0.08x of gaster length. **Relative measurements** (from carded specimen) GL, 49, EOL, 4, (from slide) GL, 106, GW, 50, LTL, 76, EOL, 5, OVL, 106, VFL, 86.5, VAL, 21 [MTL, 61, MBL, 20, MSL, 21.5, DBS, 38]

**Male.** Similar to female, head testaceous, area between ocelli dark, pronotum and mesoscutum dark brown to blackish brown with bluish green lustre, scutellum at centre, propodeum and apical half of gaster dark brown to blackish brown. Antenna and fore wing as in Figs 49 and 50. **Relative measurements** (from carded specimen) HDW, 23, FVO, 14, POL : AOL : OCL : OOL, 5 : 5 : 2 : 4 : 3, HFL, 22.5, TL, 30, TW, 22, MSCL, 10, MSCW, 19, STL, 16, STW, 14, GL, 28, GW, 18, (from slide) FVO, 26.5, HFL, 44, HFW, 48, TRL, 7, TRD, 5.5, MSL, 15, MDS, 13, MFW, 23, SL, 18.5, SW, 5, PL, 7, PW, 4.5, FNL, 89.5, CLL, 22, TL, 70, TW, 45, MSCL, 30.5, MSCW, 41, STL, 30, STW, 38, PPL, 4, FWL, 136.5, FWW, 47, MFL, 4, HWL, 99, HWW, 29, MFL, 5, MTL, 54, MSL, 17.5, MBL, 15, GL, 73, GW, 49
Hosts. (with) *Peliococcus* sp (= *Phenacoccus indicus* (Avasthi & Shafee), on *Prosopis spicigera*), Hayat et al., 1975, Avasthi & Shafee, 1979, Shafee & Avasthi, 1983, ['^']"Eggs of Neorthacris" (present record)

Distribution. India Delhi, Himachal Pradesh, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh

Specimens examined. Type specimens *C. latifrons* Holotype ♀, was in alcohol in a vial with parts (left antenna, fore wing, legs) mounted on slide by S A Shafee The slide carries Shafee's collection No 228D The rest of the specimen has became translucent white due to long preservation in alcohol It was mounted on a slide by M Hayat

*C. montanus* Holotype ♀, on a card with parts (left antenna, fore wing, part of right mid leg, maxilla, one mandible) on a slide under 2 cover slips), India, Himachal Pradesh, Simla, 25 × 1980 (Kiran Kaul)

Additional specimens. 66♀, 14♂ (From BMNH coll ) INDIA Karnataka, Bangalore, 4 ♀, 4♂, 19-23 ix 1979 (J S Noyes), Hebbal, 1♀, 1♂, v 1985, ex eggs of *Neorthacris* (det J S Noyes 1986 - CIE - 17731) Tamil Nadu, Coimbatore, 2 ♀, 25 ix - 1 x 1979 (J S Noyes) Delhi, IARI area, 1 ♀, 26 × 79 (Boucek) Uttar Pradesh, Aligarh, 18 ♀ M, 9♂ (1♂ on slide, no EH 939), 8 - 10 xi 1979 (J S Noyes) (1 rom ZDAMU coll ) INDIA Uttar Pradesh, Aligarh, 1 ♀, 2 vii 1984, 1 ♀, 10 × 86, 1♀ vii 80, 1♀, 24 vi 1984, 1♀, 13 i 80, 2♀, 4 × 80 (M Hayat), 9♀, x-79 (M Verma), 2♀, 4 i 80 (Hayat & Verma) Kerala.

Comments. *C. latifrons* is closely related to *yasumatsui*, from which it differs mainly by the characters given in the key to species.

The males associated with this species are determined on the basis of a comparison of host bred, female and male and determined as *C. (?) latifrons* by J.S. Noyes.

6. **Cheiloneurus quadricolor** (Girault). Doubtful Record.


Hosts. Dryinid species via *Pyrilla* sp.

Distribution. India: Delhi. (Pakistan, Australia).
Comments. *C. quadricolor* was recorded from India by Mani (1939)

The author was unable to see the specimens on which this record was based. However, the original description and study of a specimen from Australia collected by Dr. J.S. Noyes and made available to Dr. M. Hayat, clearly show that this species is very close to, if not a senior synonym of, *yasumatsui* Trjapitzin (1971). It is, therefore, included in the key along with *yasumatsui*. A final decision on *quadricolor* is deferred till the time the holotype could be examined.

7. *Cheiloneurus yasumatsui* Trjapitzin (Figs. 51-58, 181-183)


*Cheiloneurus brevipennis* Fatima & Shafee, 1994: 29-30, ♀. Holotype ♀: India, Aligarh (ZDAMU), examined. SYN. NOV.


Redescription.

**Female.** Macropterous form: Length, 1.3 - 1.6mm. Body largely testaceous, sides and posterior half of mesoscutum, propodeum and gaster dark brown; antenna yellow brown with F6 and basal segment of clava dark brown; fore wing infuscate as in Fig 52, legs, including
coxae, pale yellow to white with yellow to infuscate brown as follows: fore femur, and tibia, apical half of mid femur, knee, mid tibia and hind femur except their bases, hind tibia except base and apex (Figs 181-183) Setae on pronotum, on anterior mesoscutum and on axillae dark brown, and dark region of mesoscutum with silvery white setae, the scutellar bristles long and dark brown.

**Head.** In front view, broader than long (Fig 54), frontovertex about 0.38x of head width across anterior ocellus, ocelli arranged in a slightly obtuse triangle, distance between toruli clearly less than width of frontovertex, frontovertex with reticulate sculpture, cells polygonal and transversely drawn out Mandible with two pointed teeth and a truncation Antenna (Fig 51) with scape flattened and slightly expanded, about 3.8x as long as broad, pedicel 2x as long as broad, F1 and F2 smaller, quadrate, F6 large and slightly broader than long, clava with apex rounded Relative measurements (from carded specimen) HDW, 34, FVO, 12, POL AOL OCL OOL, 6, 5, 5, 15, (from slide) HFW, 49, FVO, 19, ODA, 2, HFL, 44, MSL, 12, TRL, 6, TRD, 11, MFW, 21, SL, 21, SW, 5, 5, PL, 8, PW, 4, FNL, 25, CLL, 18.

**Thorax.** Mesoscutum with longitudinally lineolate reticulations, centre or posterior fourth or so with reticulate sculpture, sculpture of scutellum similar to that of lanfrons, propodeum with a few setae (approx 8) on sides and distad of spiracles Fore wing about 3x as long as broad, venation and setation as in Fig 53 Relative measurements (from carded specimen) TL, 40, MSCL, 12. STL, 20. (from
Gaster. Slightly longer than thorax (46 40, carded specimen), ovipositor very slightly exserted, about 0.06 - 0.07x of gaster length. 

Relative measurements (from carded specimen) GL, 46, EOL, 3.5, (from slide) GL, 82, GW, 42, LTL, 59, EOL, 5, OVL, 82.5, VFL, 62, VAL, 19.5, [MTL, 48, MBL, 14, MSL, 17.5, DBS, 30]

Female. Brachypterous form. Length, 0.97 - 1.3mm. Body colour similar to macropterous forms, wings rudimentary as in Figs 56 and 57. Body dorsal as in Fig 58.

Head. In front view, broader than long, frontovertex 0.4x of head width across anterior ocellus, ocelli forming an obtuse triangle. Antenna (Fig 55) with scape 3.4x as long as broad, pedicel 1.5x as long as broad. Relative measurements (from carded specimen) HDW, 30, FVO, 12, POL, AOL, 6.5

Thorax. Sculpture similar to macropterous forms, propodeum sparsely setose, propodeum medially 0.20x as long as scutellum. Forewing 3.4x as long as broad, venation and setation as in Fig 56. Relative measurement (from slide) TL, 51, TW, 32, PRL, 7, MSCL, 20, MSCW, 29, STL, 19.5, STW, 17, PPL, 4, FWL, 29, FWW, 8.5

Gaster. Ovipositor slightly exserted, about 0.08x of gaster length. Relative measurements (from slide) GL, 69, GW, 38, LTL, 49, EOL, 6, OVL, 72, VFL, 53.5, VAL, 18.25, [MTL, 43, MBL, 12, MSL, 15, DBS, 24.75]
Hosts. Unknown.

Distribution. India: Andhra Pradesh, Andaman & Nicobar Islands, Delhi, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh. (Afghanistan, Russia, Turkmenia, Tadzhikistan, Egypt; Trjapitzin, 1989).


Comments. *C. yasumatsui* is closely related to *latifrons* from which it differs mainly in the characters given in the key.

The macropterous forms identified here as *yasumatsui* are very close to *kuisebi* Prinsloo (1985), and the later species may eventually prove to be a synonym of *yasumatsui* or *quadricolor* (see comments under *quadricolor*).

**GONATOPODIS - GROUP**

8. *Cheiloneurus longicornis* Hayat, Alam & Agarwal

(Figs. 59-63)


Holotype ♀: India, Arkanam (BMNH), not examined.

Redescription.

**Female.** Length, 1.58mm Most of head, mesoscutum, TI and apex of gaster dark brown, mesoscutum with green and violet lustre, lower half of malar space, posterior half of pronotum, propodeum and rest of gaster pale yellow, axillae yellow, scutellum pale brownish yellow, mesopleuron brownish yellow, scape yellow, with dorsal margin brown, pedicel yellow, pale brown basally, F1 partly brown, rest of funicle segments white, clava dark brown, fore wing infuscate as in Fig 60, legs, including coxae, yellow to pale yellow except apices of mid and hind femora brown. Setae on mesoscutum white.

**Head.** Frontovertex 0.10x of head width across anterior ocellus and 0.03x of head width at narrowest, 0.8x of diameter of anterior ocellus, distance between toruli clearly more than minimum width of frontovertex, scrobes shallow, broader than long, upper margin rounded and slightly below lower level of eyes, frontovertex with raised reticulations, the cells very small, malar space with relatively weak obliquely elongate cells. **Mandible** with two pointed teeth and a truncation (Fig 62) **Antenna** (Fig 59) with scape unexpanded, 6.2x as long as broad, F1-F5 longer than broad, F6 quadrate, clava with second suture not oblique, apex slightly obliquely truncate. **Relative measurements** (from slide) HFW, 25.5, FVW, 1, FVO, 2.75, ODA, 1.25.
Thorax. Mesoscutum slightly longer than scutellum, mesoscutum with irregular, 'scaly' sculpture (Fig 63), scutellum with raised reticulate sculpture as in _pyrillae_, mesoscutum densely setose, scutellum with the bunch of setae in posterior half, propodeum with numerous silvery white setae on each side anterior to and distad of spiracles.

Fore wing 2 8x as long as broad, venation and setation as in Fig 61, width of apical hyaline part of fore wing about 0 14x of infuscate part. Relative measurements (from slide) TL, 66, TW, 54, MSCL, 35, MSCW, 46, STL, 31, STW, 30, FWL, 131, FWW, 45 25, MFL, 5, 1 H, 74 10 5, HWL, 110, HWW, 25 5, MFL, 5

Gaster. TI of gaster with reticulate sculpture in posterior half on dorsum and whole of sides, dorsum with medially interrupted row of setae, and sides densely setose. Relative measurements (from slide) LTL, 58, OVL, 88 5, VFL, 66, VAL, 21 5, [MTL, 70, MBL, 21, MSL, 26]

Male. Unknown


Distribution. India Tamil Nadu

Specimen examined Type specimen Paratype ♀ (on slide) Ref

Comments. *C. longicornis* appear related to *quercus* (Mayr) (=tenuicornis Ishii is a synonym; see Trjapitzin, 1989: 305), but differs in having the frontovertex nearly 1/26 of head width; mandibles with two teeth and a truncation; anterior half of pronotum brownish, axillae yellow, scutellum pale brownish yellow; propodeum pale yellow and gaster with TI and apex of TVII brownish, rest yellow, pedicel yellow, basally brown, F1 partly brown, and in the pattern of infuscation of the fore wing. (In *quercus*: frontovertex 1/7th to 1/6th of head width; mandible with a small tooth and broad truncation; thorax dark brown to black with axillae and propodeum dark yellowish red brown; gaster black with violet lustre; pedicel dark brown, apical half whitish, funicle white; and fore wing infuscation normal).

9. **Cheiloneurus gonatopodis** Perkins (Figs. 64-70, 167)


Redescription.

**Female.** Length, 1.00 - 1.12mm. Body largely pale orange yellow; occiput above and on sides of foramen and pronotum mesally brownish; about posterior half of mesoscutum with greenish/bluish green lustre; posterior third of scutellum, and metanotum pale brown; propodeum brownish on sides; dorsum of gaster brownish to dark brown with sides or centre of basal tergites yellow; scape, pedicel and funicle yellow to yellow brown, clava dark brown; fore wing with an apical hyaline curved broad band beginning distad of venation, reaching posteriorly along wing margin to retinaculum (Fig. 68); legs, including coxae, yellow to pale yellow. Setae in posterior half of mesoscutum silvery white, scutellar tuft dark brown, rest of setae on disc pale golden brown.

**Head.** In front view, slightly broader than long (Fig. 65); frontovertex 0.2x of head width; ocelli arranged in acute triangle, apical angle about 43°; OCL slightly less than OAL; distance between toruli clearly more than minimum width of frontovertex. Frontovertex with fine polygonal reticulations, those on malar space slightly longitudinally drawn out. **Mandible** with three pointed teeth, dorsal tooth receding (Fig. 65). **Antenna** (Fig. 64) with scape 5.30x as long as broad, pedicel 2.20x as long as broad, F6 broader than long; clava with second suture strongly oblique, apex obliquely truncate. **Relative measurements** (from carded specimen) : HDW, 33; FVO, 7; AOL : OCL, 6 : 5; (from slide): HFW, 48.5; FVO, 10.75; HFL, 47; MSL, 17; TRL, 6; TRD, 15; SL, 29.5; SW, 5.5; PL, 10; PW, 4.5; FNL, 29; CLL, 20.5.
Thorax. Mesoscutum anterior fourth and posterior third with fine polygonal reticulations, medial half with raised longitudinal to lincolate reticulate sculpture (Fig 66), sculpture of scutellum about as in other species, slightly raised reticulate in middle and longitudinally reticulate on sides, propodeum densely setose around spiracles (Fig 67)

Fore wing 2 70x as long as broad, with venation and setation as in Fig 69, marginal fringe 0 13x of wing width Relative measurements (from slide) TL, 65, TW, 43, PRL, 10, MSCL, 23, MSCW, 37, STL, 29, STW, 28, PPL, 3, FWL, 125, FWW, 46, MFL, 6

Gaster. In carded specimen nearly as long as thorax (32 30), pointed at apex, TI with reticulate sculpture in posterior fourth on dorsum and with a few setae, cercal plates situated proximal of middle of gaster, ovipositor not exserted Relative measurements (from slide) GL, 70, GW, 46, LTL, 46, OVL, 48, VFL, 35, VAL, 12 5, [MTL, 52, MBL, 16, DBS, 38]

Male. Unknown from India

Hosts. ex pupa of Richarsidryinus on sugarcane

Distribution. India Karnataka, Kerala, Uttar Pradesh (Australia, New Zealand, Mauritius, Madagascar, Noyes and Hayat, 1984, Noyes, 1988)

Specimens examined. 4 ♀ INDIA Kerala, Silent valley, 1 ♀, 30 xii 1988 (M Hayat) Uttar Pradesh, Aligarh, 1 ♀ (on two slides, EH 519a, b), 21 xii 1979 (M Verma) (ZDAMU) Karnataka, Pravaranagar, 2 ♀, 3 x 1984, ex pupa of Richarsidryinus on sugarcane (R B Jadha\(\)),
CIE A 19977, det C gonatopodis by J S Noyes 1989 (BMNH)

**Comments.** This species differs from other species of the genus mainly the type of fore wing infuscation, specific sculpture of the mesoscutum, strongly obliquely truncate clava, clava shorter than funicle, and the presence of numerous setae on propodeum around each spiracle. It differs from tenuistigma in the characters given in the key.

10. *Cheiloneurus tenuistigma* sp. nov (Figs 2, 71-74)

**Description.**

**Female.** Length, 1.42mm. Head dark brown, pronotum and mesoscutum blackish brown, axilla and scutellum orange, metanotum and propodeum pale yellow, mesopleuron white, gaster dark brown, scape and pedicel brown, funicle white, clava dark brown, fore wing infuscate as in Fig 72, legs, including coxae, pale yellow to white with infuscate brown as follows: extreme apex of mid femur and apical 0.33 of hind femur. Setae on mesoscutum and propodeum silvery white.

**Head.** In front view, slightly longer than broad, suboval (Fig 2), frontovertex 0.18x of head width across anterior ocellus and 0.15x at narrowest, 0.54x of diameter of anterior ocellus, head with raised irregular reticulations and the cells small, interscrobal area with relatively weak reticulations and the area above toruli with transversely lineolate reticulations. **Mandible** with three pointed teeth, dorsal tooth receding as in gonatopodis **Antenna** (Fig 71) with scape 5.20x as
long as broad, pedicel 2.40x as long as broad, F1 and F2 longer than broad, F5 and F6 quadrate, clava nearly as long as F2-6 combined, second suture of clava strongly oblique, and apex obliquely truncate. 

Relative measurements (from carded specimen): HDW, 32; FVW, 5; FVO, 6; POL : AOL : OCL, 2.5 : 6 : 4; HFL, 38; HFW, 34; HLL, 36; HLW, 12; MDS, 14; MSL, 18; TRD, 8; (from slide): HFW, 50; FVW, 7.75; FVO, 9, HFL, 57; MSL, 27; TRL, 7; TRD, 12; MFW, 21.5; SL, 34; SW, 6.5; PL, 12; PW, 5; FNL, 34; CLL, 29.

Thorax. Whole of mesoscutum with longitudinally lineolate reticulations; scutellum with raised reticulate sculpture as in other species; propodeum with numerous setae around each spiracle usually more than in C. gonatopodis (Fig. 74). Fore wing 2.75x as long as broad, venation and setation as in Fig. 73; marginal fringe 0.1x of wing width; width of apical hyaline part 0.15x of infuscate part. Relative measurements (from carded specimen): MSCL, 22; MSCW, 29; STL, 20; STW, 20; (from slide): TL, 80.5; TW, 56; PRL, 10; MSCL, 29.5; MSCW, 45; STL, 35; STW, 32; PPL, 5; FWL, 137.5; FWW, 50; MFL, 5; I : H; 80 : 12.5; HWL, 120; HWW, 27.5; MFL, 4.5.

Gaster. Gaster nearly as long as thorax (81:80.5, from slide), T1 with reticulate sculpture in posterior half on dorsum, and numerous setae on sides (Fig. 74); ovipositor not exserted. Relative measurements (from carded specimen): GL, 40; GW, 28. (from slide): GL, 81; GW, 54; LTL, 50; OVL, 72; VFL, 52, VAL, 18, [MTL, 79, MBL, 22, MSL, 23, DBS, 44]
Male. Unknown

Hosts. Unknown

Distribution. India Delhi, Kerala

Specimens examined. HOLOTYPE ♀ (on slide under 4 coverslips, slide no EH 937) INDIA Kerala, Periyar A Sanctuary, 5-15 x 1979 (J S Noyes) PARATYPE 1 ♀ (on slide under 4 coverslips, slide no EH 936) Delhi, IARI Area, x 1979 (Z Boucek)

Comments. C tenuistigma sp nov runs to C phenacocci Trjapitzin in the key to species given by Trjapitzin (1989), but differs by the type of fore wing infuscation, large and strongly truncate clava with incomplete sutures, and in the thin stigmal vein with 3 sensilla [C phenacocci fore wing infuscation normal with base and apex hyaline, clava though large, with apex transversely truncate, not obliquely truncate, and stigmal vein normal with 4 sensilla, see Trjapitzin, 1964, 1989, Tachikawa, 1971] It differs from gonatopodis by the characters given in the key

CHRYSOAPE - GROUP

11. Cheiloneurus chrysopae Fullaway (Figs 75-77)

Cheiloneurus chrysopae Fullaway, 1946 207, ♀, ♂ Mariana Island Merizo (USNM), not examined

Cheiloneurus chrysopae Fullaway Noyes & Hayat, 1984 249, taxonomy
Redescription.

Female. Length, 1.25 - 1.45mm. Vertex dark, with faint violet lustre; frons infuscate brown to as dark as vertex; temples dark brown with green luster; occiput above foramen dark brown, rest of head yellow; interantennal prominence dark brown; pronotum with a brownish patch in centre; mesoscutum anterior half dull violet, posterior half with faint green lustre; axillae yellow testaceous to ochraceous; scutellum brown, dull violet; tegulae white to pale yellow with brown infuscation; propodeum brown to dark brown; mesopleura yellow to brownish; gaster brown to blackish brown; basal tergites with bronzy violet lustre; venter yellow brown; scape with pale brown dorsal margin, pedicel brown, funicle pale yellow, occasionally F1 and F2 pale brown, clava dark brown; fore wing infuscate as in Fig. 76; legs, including coxae, pale yellow to white, with infuscate brown as follows: apex of mid femur, slightly more than basal half (except base) of mid tibia, apical 0.25 - 0.33 of hind femur, and hind tibia except base and apex.

Head. In front view, almost as long as broad; frontovertex about 0.18x of head width across anterior ocellus, about 0.12x at narrowest and 1.6x of diameter of anterior ocellus; posterior ocellus separated from eye margin by nearly 0.5 its diameter and from occipital margin slightly more than one ocellus diameter; frontovertex with fine, raised reticulate sculpture, the cells small, on face just above scrobes and on malar space, finely lineolate reticulate; scrobes deep, broadly convex
above, with rounded margin, distance between toruli clearly more than minimum width of frontovertex. **Mandible** with two pointed teeth and a dorsal truncation. **Antenna** (Fig 75) scape slightly flattened and expanded in proximal half, about 4 1x as long as broad, pedicle 1 8x as long as broad, funicle segments at most broader than long, sometimes F2 and F3 partly fused, clava slightly longer than funicle, about 1 6x as broad as F6, with second suture strongly oblique, apex obliquely truncate, truncate part extending from base of third segment to apex. **Relative measurements** (from carded specimen) HDW, 32, FVW, 4, FVO, 6, ODA, 2 5, AOL POL OCL, 5 5 4 3 5, HFL, 32, HFW, 33, HLL, 35, HLW, 19 5, EL, 23, MSL, 7 5, (from slide) FVW, 5, FVO, 9, MSL, 24, TRL, 7, TRD, 15 5, SL, 25, SW, 6, PL, 9, PW, 5, FNL, 22 5, CLL, 25

**Thorax.** Mesoscutum as long as scutellum, mesoscutum finely longitudinally reticulate in anterior two third, posterior third finely polygonally reticulate, scutellum with raised reticulate sculpture deeper than on mesoscutum, sides and apex with cells elongated, mesoscutum densely setose, setae slightly flattened, scale like, propodeum with numerous setae on each side but setae not extending mesad of each spiracle. **Fore wing** 2 64x as long as broad, venation and setation as in Fig 77. marginal fringe 0 06x of wing width, width of apical hyaline part 0 12x of infuscate part. **Relative measurements** (from carded specimen) TL, 48, TW, 36, MSCL, 19 5, MSCW, 30, STL, 18, STW, 19.
Gaster. Shorter than thorax (36 : 48, carded specimen). T1 of gaster with the usual broadly interrupted line of setae and with several setae on each side; ovipositor not exserted. Relative measurements (from carded specimen) : GL, 36; GW, 28; (from slide) : LTL, 46; OVL, 71; VFL, 55; VAL, 15.5; [MTL, 55; MBL, 24].

Male. Unknown from India.

Hosts. ex *Mallada bonnensis* (Okamoto), Guava scale and L [Larva] of *Chrysopa*.

Distribution. India : Karnataka, Maharashtra (Mariana Island)


Comments. This species comes closest to *assamensis*, and the two can be separated mainly by the characters given in the key
12. *Cheiloneurus assamensis* Singh & Agarwal

(Figs. 78-80)


Redescription.

**Female.** Length, about 1.5mm. Body dark brown to black, mainly with dull violet lustre; propodeum dark brown with sides slightly violet bluish green; pleura blackish brown; gaster violet, T1 shining metallic violet bronzv; scape dark brown with median whitish strip, pedicel, F1, base of F2 and clava, dark brown, rest of funicle segments pale yellow; fore wing infuscate as in Fig. 79; legs white with infuscate brown as follows: apical 0.33 of mid femur dorsally, knee, a patch in basal third of mid tibia, apical 0.5 to 0.66 of hind femur, knee, and a small patch at basal third of hind tibia; fore femur yellow brown. Setae on mesoscutum silvery white; scutellar brush dark brown to black.

**Head.** In front view, longer than broad, oval in shape; frontovertex 0.078x of head width across anterior ocellus and about 0.046x at narrowest or about diameter of anterior ocellus; distance between upper margin of scrobe and lower margin of an eye 2x of frontovertex width at narrowest; distance between toruli more than minimum width of frontovertex; frontovertex with raised reticulations. **Antenna** (Fig. 78) with scape slightly flattened and expanded in proximal half, about 3.3x as long as broad; all funicle segments broader than long; clava slightly longer than funicle, about 1.6x as broad as F6. with a rela-
tively longer seta on the dorsal surface of first segment, second suture strongly oblique, apex obliquely truncate. Relative measurements (from carded specimen) HFW, 32, FVW, 1.5, FVO, 2.5, POL, AOL, OCL, 344, HFL, 35, TRD, 9, DSE, 5, (from slide) SL, 27, SW, 8, PL, 11, PW, 5, FNL, 26, CLL, 28

Thorax. Propodeum with a few white setae, distad of spiracles. Fore wing 2.73x as long as broad, venation and setation as in Fig 80, marginal fringe 0.07x of wing width, width of apical hyaline part 0.11x of infuscate part. Relative measurements (from carded specimen) TL, 43, MSCL, 22, MSCW, 33, STL, 19, STW, 19, (from slide) FWL, 145, FWW, 53, MFL, 4, H, 100 11, HWL, 125, HWW, 32, MFL, 4, MTL, 71, MBL, 24, MS1, 30

Gaster. Shorter than thorax (39 43, from carded specimen), cercal plates situated proximad of middle of gaster, ovipositor slightly exerted

Male. Unknown

Hosts. Unknown

Distribution. India Assam

Specimen examined. Holotype♀, (right antenna, wings and legs on a slide), head and left wings detached, all on a card, the card with the following data on a ticket "LOC Haflong Assam, India, date 18 iv 1988, coll Sudhir Singh" The slide has the data "North Lakhimpur (Assam) 27 iv 88 Sudhir Singh" scratched with a diamond pencil, which must be incorrect
Comments. This species is extremely close to *chrysopae* but differs mainly by the characters given in the key, especially colour of the scape, and completely dark brown metallic body. [It may be noted that the figures given by Singh & Agarwal (1993a; Fig. 9 C,D) are erroneous with regard to the setae shown on the propodeum and in basal third of the fore wing: propodeum has a few silvery setae on each side and distad of each spiracle, and basal hyaline area of fore wing with setae as shown in Fig. 80, not as in Fig. 9 D given by the authors].

Note. It is not possible to give relative measurements of ovipositor and third valvula from the carded holotype.

**DIVERSICOLOR - GROUP**

13. *Cheiloneurus latiscapus* (Girault) (Figs. 81-85,184-186)

*Cristatithorax latiscapus* Girault, 1916: 481, ♀. Holotype ♀: Indonesia, Java, Salatiga (USNM), examined.

*Cheiloneurus albifuniculus* Hayat, Alam & Agarwal, 1975: 48 - 50, ♀. Holotype ♀: India, Kancheepuram (BMNH), not examined. SYN. NOV.


Redescription.

Female. Length, 1 16 - 1 40mm Body completely black, shiny, vertex with green lustre, axillae and scutellum with green lustre, gaster with violet lustre, scape blackish brown, white area in upper half, base of pedicel blackish brown, funicle white, clava blackish brown, fore wing infuscate as in Fig 82, legs, including coxae, pale yellow to white, with infuscate brown as follows basal half of fore tibia, mid femur with a small patch at apex, basal 0 33 of mid tibia, apical 0 5 of hind femur in about upper half and basal 0 5 - 0 6 of hind tibia (Figs 184-186) Setae on mesoscutum, scutellum, except dark setae of the brush, and on sides of propodeum silvery white

Head. Frontovertex 0 11x of head width across anterior ocellus, 0 08x at narrowest and 1 14x of diameter of anterior ocellus, frontovertex and face with raised, irregular reticulations, the cells small, malar region with transversely lineolate reticulate sculpture Mandible with a ventral pointed tooth, a small middle tooth and a dorsal truncation (Fig 84) Antenna (Fig 81) with scape expanded, about 2 8x as long as broad, pedicel 1 87x as long as broad. F1 slightly longer than broad, F6 broader than long, clava with second suture slightly oblique, apex obliquely
truncate, truncate part about half length of clava. Relative measurements (from carded specimen) HDW, 32, FVW, 3, FVO, 4, POL, AOL, OCL, 2, 6, 4, MSL, 12, (from slide) FVW, 4, FVO, 6, TRL, 6, SL, 23, SW, 8, PL, 7.5, PW, 4, FWL, 24.5, CLL, 24

**Thorax.** Mesoscutum on anterior 0.5-0.6 with raised, linolate reticulate sculpture, and posterior 0.4-0.5 with shallow reticulations, cells irregular, scutellum on anterior 0.66 with raised reticulations, and on posterior 0.33, and sides with longitudinal reticulations, propodeum with several setae (about 35) around each spiracle. Fore wing 2.8x as long as broad, venation and setation as in Fig 83, marginal fringe 0.09x of wing width, width of apical hyaline part 0.16x of infuscate part. Relative measurements (from carded specimen) TL, 38, FW, 40, MSCL, 20, MSCW, 32, STL, 16, STW, 14, (from slide) TL, 65, MSCL, 32, MSCW, 38, STL, 29.5, STW, 32, PPL, 3, FWL, 119, FWW, 42, MFL, 4, 1, H, 67, 11, HWL, 100, HWW, 23.25, MFL, 4

**Gaster.** Slightly longer than thorax (42-38, carded specimen), Ti with sculpture as in Fig 85, ovipositor slightly exerted, about 0.14x of gaster length in carded specimen. Relative measurements (from carded specimen) GL, 42, EOL, 6, (from slide) OVL, 87, VFL, 62.5, VAL, 24, [MTL, 56, MBL, 20, MSL, 23, DBS, 40.5]

**Male.** Similar to female. Head frontal as in Fig 88, Antenna as in Fig 86, Fore wing venation and setation as in Fig 87. Relative measurements (from carded specimen) HDW, 28, FVO, 12, ODA, 4, AOL, POL, OCL, 3, 7, 2, MSL, 7, TL, 32, TW, 36, MSCL, 14, MSCW, 30, SIL, 17, STW, 20
**Hosts.** [with] *Nipaecoccus* sp. on *Casuarina equisetifolia*; Indet. coccids on *Citrus* sp.; *Nipaecoccus viridis*; *Rastrococcus iceryoides* on *Acacia* sp. (Hayat et al., 1975; see also Avasthi and Shafee, 1977; Shafee and Avasthi, 1983; Noyes and Hayat, 1994); with Indet. pseudococcids (Hayat, 1989).

**Distribution.** India: Andhra Pradesh, Kerala, Tamil Nadu. (Indonesia: Java; Malaysia).

**Specimens examined.** Type specimens: Holotype ♀ of *C. latiscapus*: on a slide under a single coverslip; labelled "*Cristatithorax latiscapus* Girault ♀ type" and USNM type No. 19895, (USNM). Paratypes of *C. albifuniculus*: INDIA: Tamil Nadu, Kancheepuram, 3 ♀ (1 ♀, on slide), 3 ii.1967, ex *Nipaecoccus* sp., on *Casuarina equisetifolia* (M. Hayat). Andhra Pradesh, Ponnur, 1 ♀ (on slide), 29 i.1967, ex coccids on *Citrus* sp.; Nellore, 1 ♀, 28 i.1967, ex *Nipaecoccus* sp.; on *C. equisetifolia* (M. Hayat); Ranipet, 1 ♀, 5 ii.1967, ex *N. vastator* (Maskell) (M. Hayat). (ZDAMU).

**Additional specimens.** Kerala, Calicut University campus, 2 ♀, 1♂, 20 i.1988 (Narendran & party) (det. M. Hayat).

**Comments.** *C. latiscapus*: The "type series" consists of 9 females, 8 females on 3 cards and one female on a slide. Girault stated that the carded specimens are paratypes and the one on slide, the [holo] type.

The holotype has been examined. It is conspecific with *albifuniculus*, and the synonymy is implemented here.
This is a distinctive species, differing from all the other Indian species of the genus by the expanded scape, its colour pattern, white funicle segments, and the white to pale yellow legs with only some brownish infuscations.

14. **Cheiloneurus saissetiae** Noyes & Chua (Figs 89-92)

*Cheiloneurus saissetiae* Noyes & Chua, 1977 541, ♀, ♂ Holotype
♀ Malaysia, Selangor (BMNH), not examined

*Cheiloneurus insulus* Kaul & Agarwal, 1986 13, ♀ Holotype
♀ India, Port Blair (ZDAMU), examined SYN. NOV.

*Cheiloneurus insulus* Kaul & Agarwal  Singh & Agarwal, 1993a 39, key Fatima & Shafee, 1994 29, key

*Cheiloneurus saissetiae* Noyes & Chua Noyes & Hayat, 1984 250, taxonomy

**Redescription.**

**Female.** Length, 1 64mm Body completely black, shiny, head dark with bluish green lustre, maxillae and basal half of labium dark brown, distal half white, maxillary palp, with segments 1-3 and base of 4th segment white, distal 2/3 of 4th segment dark brown, labial palp with 1st and 2nd segments white, 3rd segment dark brown, frontovertex and mesoscutum with greenish lustre, axillae with bronzy violet lustre, scutellum and sides of propodeum greenish, gaster with violet and bluish-green lustre, apical third of 3rd valvula pale yellow to white, scape dark brown, with a wedge-shaped area in distal half or so white,
pedicel, funicle and clava black, fore wing infuscate as in Fig 90, fore leg dark brown with femur distally white, tarsus brown, mid leg brownish, inner surface of coxae, most of femur except apex, tibia distally and spur brown, tarsal segments 1-4 white, hind leg dark brown except base and narrowly the apex ventrally of femur, tarsal segments 1-4 white, fifth tarsal segments of mid and hind legs pale brown. Setae on anterior third of mesoscutum golden brown and rest of setae silvery white.

**Head.** In front view, subquadratic, nearly as long as broad (Fig 92), frontovertex 0.08x of head width across anterior ocellus and 0.05x at narrowest, narrowest part almost equal to the diameter of anterior ocellus. **Mandible** with two pointed teeth and a truncation. **Antenna** (Fig 89) with scape flattened, and strongly expanded, 2.88x as long as broad, pedicel 1.6x as long as broad, funicle longer than clava, apex of clava slightly obliquely truncate, truncate part extending from near base of third segment to apex. **Relative measurements** (from carded specimen): HDW, 40, FVW, 2.5, FVO, 3.5, ODA, 2, POL, AOL, OCL, 2.5, 4, HFL, 42, HFW, 40, HLL, 40, HLW, 28, EL, 30, MSL, 18, TRD, 15, (from slide) HFW, 63, FVW, 2.75, FVO, 5, HFL, 65, TRL, 10, TRD, 22, SL, 36, SW, 12.5, PL, 10, PW, 6, FNL, 52, CLL, 30.5

**Thorax.** Mesoscutum with scaly sculpture, in posterior fourth with shallow reticulate sculpture, scutellum with longitudinally lineolate sculpture, on sides and on anterior region, raised reticulations, apex with transversely lineolate sculpture, propodeum with a few setae on
each side distad of spiracles. **Fore wing** 2 7x as long as broad, ve-
nation and setation as in Fig. 91; width of apical hyaline part 0.06x
of infuscate part. **Relative measurements** (from carded specimen) : TL, 50; MSCL, 23; MSCW, 44; STL, 22; STW, 20; (from slide) : TL, 81;
TW, 66.5; MSCL, 38; MSCW, 57; STL, 37; STW, 34; PPL, 6.5: FWL, 151; FWW, 55; MFL, 4; I : H, 99 : 6; HWL, 128, HWW, 36.5; MFL, 5.

**Gaster.** Shorter than thorax (44 : 50, carded specimen); oviposi-
tor slightly exserted, about 0.13x of gaster length. **Relative measure-
ments** (from carded specimen) : GL, 44; GW, 38; EOL, 6; (from slide)
LTL, 74; OVL, 109, VFL, 82; VAL, 27; [MTL, 86; MBL, 23; MSL, 28; DBS, 50].

**Male.** Unknown from India.

**Hosts.** Indet. coccids on wild bushes. (*Parasaisselia nigra* (Nietner) in Malaysia).

**Distribution.** India : Andaman & Nicobar Islands. (Malaysia)

**Specimens examined.** Type specimens *C. insulus* · Holotype ♀ (dis-
sected and mounted on a slide). INDIA : Andaman & Nicobar Islands,
Port Blair, 6.iii.1982 (Kiran Kaul) (ZDAMU). Paratype : 1 ♀ on card,
with same data as holotype. *C. saissetiae* · 1 ♀ paratype with data

**Variation.** There is a very little variation, except in the colour of maxillary
palps and the legs. In *C. saissetiae* (paratype), maxillary palps are
completely dark brown, and legs, including coxae, completely dark
brown to chocolate brown except basal 0.33 and apex of mid femur (except base), and mid tarsal segments 1-5, white

**Comments. C insulus** The original description of this species is based on a holotype female and 20 female paratypes. I found only a holotype (on slide) and a single paratype (on card), the other paratypes were not located in ZDAMU collection and are probably lost.

*C insulus* is indistinguishable from *C saissetiae* Noyes & Chua, the differences noted between these two species are very few and are here regarded as falling within the range of variation of this species. *insulus* specimens differs from *saissetiae* in having only the last segment of maxillary and labial palps dark, further differences are noted under variation I, therefore, place *insulus* in synonymy with *saissetiae*.

**Note.** The relative measurements are from the holotype and a paratype of *insulus*.

15. *Cheiloneurus diversicolor* Hayat, Alam & Agarwal

(Figs 93-95)

*Cheiloneurus diversicolor* Hayat, Alam & Agarwal, 1975 56,

♀ Holotype ♀ India, Tamil Nadu, Sri Rangam (BMNH), parts examined

Redescription.

Female. Length, 1.23 mm. Frontocortex dark with bluish and bronzy lustre, scrobe with greenish and bronzy lustre, malar space at lower half and intertorular prominence orange yellow, mesoscutum in anterior third yellow, rest with bluish green lustre, scutellum dark, axillae testaceous to orange yellow, scape white except dorsal and ventral margins, pedicel at base and funicle dusky pale yellow, clava dark brown, fore wing infuscation as in Fig 94, mid coxa, mid femur pale yellow to white, mid tibia (except base) and tarsal segments brown, spur white.

Head. Frontocortex 0.03 x of head width at narrowest, and about the diameter of anterior ocellus, ocellar triangle with apical angle acute. Mandible with two pointed teeth and a truncation. Antenna (Fig 93) with scape flattened and slightly expanded, 3.5 x as long as broad, pedicel 1.5 x as long as broad, F1 - F3 smaller than F4 - F6, clava nearly as long as F3 - F6 combined. Relative measurements (from Holotype) HDW, 64, FVW, 2, (from slide) SL, 28, SW, 8.5, PL, 9, PW, 6, FNL, 32.5, CLM, 22.

Thorax. Fore wing about 2.5 x as long as broad, venation and setation as in Fig 95, marginal fringe 0.08 x of wing width, width of apical hyaline part 0.13 x of infuscate part. Relative measurements (from Holotype) TL, 80, MSCL, 40, MSCW, 56, STL, 32, STW, 32, (from slide) FWL, 120, FWW, 47.5, MFL, 4, IH, 65, 9, MTL, 66, MBL, 23, MSL, 24.
Gaster. Slightly shorter than thorax (74–80, from Holotype), 
c\xserted part of ovipositor about 0.10x of gaster Relative measurements (from holotype) GL, 74, EOL, 8

Male. Unknown

Hosts. (with) Ceroplastodes sp (Hayat et al., 1975), and with coccids on Zizyphus (present record)

Distribution. India Tamil Nadu, Orissa

Specimen examined. Type specimen Parts of holotype on slide, bearing Hayat's collection No 38 MI (BMNH)

Additional specimens. INDIA Orissa, Puri, 7 ♀ (on card), 3 III 1994, with coccids on Zizyphus (S B Zeya & S I Kazmi)

Comments. This species appears related to C udaghamundus, from which it differs by the key characters

Note. The relative measurements of the holotype were taken by M Hayat before the specimen was deposited in the BMNH The additional specimens from Orissa agree with the holotype in all respects, including the relative measurements

16. Cheiloneurus udaghamundus sp. nov. (Figs 96-100)

Description.

Female. Length, 1.32mm Head dark brown, frontovertex blackish brown to black with bluish green lustre, pronotum yellow brown, mesoscutum and scutellum blackish brown to black with green lustre, axillae.
metanotum and propodeum brown, mesopleuron yellow brown, T1 blackish brown to black, shiny, rest of terga dark brown to brown, scape pale yellow, pedicel completely, F1, most of F2 and partly F3 - F6, pale yellow brown, otherwise funicle segments white, clava dark brown, fore wing infuscate as in Fig 97, legs pale yellow to white with infuscate brown as follows: apex of mid femur, basal 0.5 of mid tibia, except base and apex, apical 0.33 of hind femur in upper half, hind tibia except base and apical 0.25 - 0.33

**Head.** In front view, nearly as long as broad, with swollen cheeks (Fig 99). Frontovertex 0.10x of head width across anterior ocellus, 0.03x at narrowest, and 0.5x of diameter of anterior ocellus, OCL equal to OAL, distance between toruli clearly more than minimum width of frontovertex, scrobes broader with rounded upper margins, frontovertex with raised reticulate sculpture, cells hexagonal, space between lower eye margin and upper margin of scrobe with transversely drawn-out cells, malar region with transversely lineolate reticulations

**Antenna** (Fig 96) with scape, about 4.5x as long as broad, pedicel 2.25x as long as broad, F1 - F3 slightly longer than broad, F4 and F5 quadrate, F6 slightly broader than long, second suture of clava transverse, apex of clava slightly obliquely truncate

*Relative measurements* (from carded specimen) HDW, 32, FVW, 1.5, FVO, 4, POL, AOL OCL, 3.66, (from slide) HFW, 48.5, FVW, 1.5, FVO, 5, ODA, 3, HFL, 49, MSL, 23, TRL, 6, TRD, 15, MFW, 20, SL, 25, SW, 5.5, PL, 9, PW, 4, FNL, 32; CLL, 23
**Thorax.** Mesoscutum with fine lineolate reticulations in anterior half, with fine polygonal reticulations in posterior half, scutellum with raised reticulate sculpture, cells polygonal, sides with slightly longitudinally drawn out cells, propodeum with a few setae on sides and around each spiracle. **Fore wing** 2.6x as long as broad, with venation and setation as in Fig 98, marginal fringe 0.08x of wing width, width of apical hyaline part 0.09x of infuscate part. Relative measurements (from slide) TL, 59.5, TW, 53, PRL, 3.5, MSCL, 23, MSCW, 46, STL, 31, STW, 29, PPL, 4, FWL, 120, FWW, 46, MFL, 4, 1 H, 76 7. HWL, 107, HWW, 29, MFL, 4

**Gaster.** Longer than thorax (70 59.5, from slide), TI of gaster in about posterior half with distinct transversely drawn out cells to transversely lineolate reticulate sculpture, otherwise smooth, ovipositor exerted, exerted part 0.14x of gaster length. Relative measurements (from slide) GL, 70, GW, 40, LTL, 52, EOL, 10, OVL, 88, VFL, 62 25, VAL, 25 5, [MTL, 63, MBL, 21, MSL, 25 5, DBS, 39]

**Male.** Unknown

**Hosts.** Unknown

**Distribution.** India Tamil Nadu

**Specimen examined.** HOLOTYPE ♀ (on slide under 4 coverslips, slide no EH 933), INDIA Tamil Nadu, Ooty [=Udaghamundalam], 6 III 1993 (S B Zeya) (ZDAMU)

**Comments.** *C udaghamundus* is very close to *diversicolor*, but differs mainly by the characters given in the key.
17. *Cheiloneurus callidus* sp. nov. (Figs 101-104)

**Description.**

**Female.** Length, 0.975mm  Body dark and yellow, vertex blackish brown to black with bluish green lustre, frons and face brownish yellow, scrobes dark brown, malar space dark brown with dull violet lustre, becoming brownish yellow ventrally, pronotum dark brown, with collar testaceous yellow, axillae, scutellum and propodeum testaceous yellow, mesoscutum and gaster dark brown, mesoscutum with bluish green lustre, mesopleuron white, gaster with T1 intense bluish green, rest of gaster brownish yellow to brown, scape dark brown to black with a wedge-shaped area in apical 0.5 white, pedicel and base of F1 dark brown, rest of F1, F2 - F6 white, clava dark brown to black, fore wing infuscate as in Fig 102, legs pale yellow to white with lightly infuscate brown as follows: apex of hind femora and hind tibiae except their bases and apices

**Head.** In front view, broader than long, frontovertex 0.13x of head width across anterior ocellus and 0.06x at narrowest, frontovertex with raised reticulations, cells small, face with shallow hexagonal cells, malar region with longitudinally lineolate reticulations. **Antenna** (Fig 101) with scape unexpanded, 4.5x as long as broad, pedicel 2.2x as long as broad, F3 longer than F1 and F2 and as long as F4 and F5, individually, F6 quadrate, second suture of clava transverse, apex slightly obliquely truncate. **Relative measurements** (from carded specimen) HDW, 29, FVW, 2, FVO, 4, POL, AOL, OCL, 1, 4, 3, HFL, 24,
Thorax. Mesoscutum nearly as long as scutellum, sculpture of both mesoscutum and scutellum similar to C. udaghamundus; propodeum with a few setae around spiracles (Fig. 104). Fore wing 2.6x as long as broad, venation and setation as in Fig. 103; marginal fringe 0.06x of wing width; width of apical hyaline part 0.25x of infuscate part. Relative measurements (from carded specimen) : MSCL, 12; MSCW, 20; STL, 11; STW, 10; (from slide) : TL, 51; TW, 43; PRL, 14; MSCL, 12; MSCW, 37; STL, 22.5; STW, 22.5; PPL, 3; FWL, 98.75; FWW, 37.5; MFL, 2.5; I : H, 40 : 10.

Gaster. Longer than thorax (67:51, from slide); TI of gaster with raised hexagonal cells on sides, and very shallow transversely lineolate reticulations narrowly along posterior margin in middle third, and 3-4 setae on each side; ovipositor slightly exserted, about 0.05x of gaster length. Relative measurements (from carded specimen) : GL, 32; GW, 18; (from slide) : GL, 67; GW, 40; LTL, 50; EOL, 4; OVL, 69; VFL, 51; VAL, 17; [MTL, 52; MBL, 16; MSL, 17; DBS, 32].

Male. Unknown.

Hosts. Unknown.

Distribution. India: Karnataka.

Specimens examined. HOLOTYPE ‡ (on slide under 4 coverslips; EH. 935); INDIA : Karnataka, Bannerghatta N.P., 5.xi.1979 (Boucek & Noyes). (BMNH).
Comments. *C. callidus* very close to *C. zeyai*, but differs mainly by the colour pattern of scape and funicle, and a broad hyaline area along wing margin.

This species also appears related to *C. quercus* (Mayr), but differs by having frontovertex very narrow, about one-fourteenth of head width, testaceous yellow scutellum, distal funicle segments at most slightly longer than broad, broader hyaline apex of fore wing, and mandibles with two teeth and a truncation (*C. quercus* frontovertex 1/7 - 1/6th of head width, scutellum dark brown as mesoscutum, funicle segments all clearly longer than broad, distal segment about 1.5x as long as broad, hyaline apex of fore wing narrow, about one-seventh of infuscated area, and mandibles with one tooth and a broad truncation (see Tachikawa, 1963, for details).

18 *Cheiloneurus zeyai* sp. nov. (Figs 105-109)

Description.

Female. Length, 1.35mm Head dark brown, frontovertex blackish brown, pronotum brownish, mesoscutum blackish brown, with bluish green and violet lustre, axillae and scutellum yellow, metanotum and propodeum pale yellow, mesopleuron white, gaster yellow brown, basal third and sides narrowly to distal two-thirds dark brown, T1 with green lustre, scape pale yellow to white with basal third and dorsal and ventral margins brown, pedicel yellow brown, F1 and F2 partly brown, partly pale yellow, F3-F6 white, clava dark brown, fore wing infuscate as in Fig 106,
legs, including coxae, pale yellow to white, with apices of mid and hind femora lightly infuscate brown.

**Head.** In front view, nearly as long as broad (Fig. 108), frontovertex 0.14x of head width across anterior ocellus, 0.09x at narrowest and 1.6x diameter of anterior ocellus; OCL equal to OAL, frontovertex with reticulate sculpture, cells small; space between lower eye margin and upper margin of scrobe with transversely drawn out cells; malar region with transversely lineolate reticulations. **Mandible** with ventral and middle teeth pointed, dorsal tooth blunt. **Antenna** (Fig. 105) with scape 4.6x as long as broad; pedicel 2.5x as long as broad, all funicle segments longer than broad, second suture of clava transverse, apex very slightly truncate. **Relative measurements** (from carded specimen): HDW, 36; FVO, 6; POL: AOL: OCL, 4: 6: 6; EL, 24; EW, 20; (from slide): HFW, 51; FVW, 5; FVO, 7.5; ODA, 3; HFL, 52; MSL, 21; TRL, 7; TRD, 15; MFW, 20.5; SL, 28; SW, 6; PL, 10; PW, 4; FNL, 34.5; CLL, 20.5.

**Thorax.** Mesoscutum shorter than scutellum, sculpture similar to *C. udaghamundus*; propodeal setae as in Fig. 109. **Fore wing** 2.9x as long as broad, venation and setation as in Fig. 107; marginal fringe 0.06x of wing width; width of apical hyaline part 0.07x of infuscate part. **Relative measurements** (from slide): TL, 58.5; TW, 48; PRL, 4; MSCL, 21; MSCW, 41; STL, 29; STW, 25; PPL, 4.5; FWL, 118; FWW, 40; MFL, 2.5; 1: H, 70: 5.5; HWL, 100; HWW, 20.5
Gaster. Longer than thorax (79 : 58.5, from slide). TI, with raised reticulate sculpture except in middle third where the reticulations are faint; ovipositor slightly exserted, about 0.06x of gaster length. Relative measurements (from slide): GL, 79; GW, 40; EOL, 5; OVL, 83; VFL, 62.5; VAL, 20; [MTL, 65; MBL, 22; MSL, 23.5; DBS, 37].

Male. Unknown.

Hosts. Unknown.

Distribution. India: Kerala, Delhi.

Specimen examined. HOLOTYPE ♂ (on slide under 4 coverslips; EH. 934); INDIA: Kerala, Calicut University, 2.iii.1993 (S.B. Zeya). (ZDAMU).

Additional specimen. 1 ♂, (on card), INDIA: Delhi, IARI area, x.1979 (Z. Boucek). (BMNH).

Comments. C. zeyai is close to C. callidus, but differs mainly by the characters given in the key.

19. Cheiloneurus bouceki sp. nov. (Figs. 110-114, 168)

Description.

Female. Length, about 1.5mm. Body completely blackish brown to black; frontovertex with bluish green lustre; palps dark brown; tips of ovipositor sheaths pale; scape white with dorsal margin and 0.6 ventral margin dark brown; pedicel and flagellum dark brown to black; fore wing infuscate as in Fig. 111; legs, including coxae, dark brown
to black except apex of mid tibia, spur and tarsal segments pale yellow. Setae on anterior half of mesoscutum dark brown and on posterior half silvery white.

**Head.** In front view, (Fig. 112) longer than broad, oval in shape; frontovertex 0.10x of head width across anterior ocellus, 0.02x at narrowest, and 0.30x of diameter of anterior ocellus; vertex with raised reticulate sculpture, the cells small; on face transversely lineolate reticulations and on malar space raised irregular polygonal reticulations. **Mandible** with two pointed teeth and a truncation. **Antenna** (Fig. 110) with scape 5.39x as long as broad; pedicel 2.2x as long as broad; F1-F5 longer than broad, F6 quadratc, or slightly broader than long, clava nearly as long as F3-F6 combined, second suture slightly oblique, apex slightly obliquely truncate. **Relative measurements** (from carded specimen) : HDW, 36; FVW, 1; FVO, 3; POL : AOL : OCL, 3 : 6 : 4; HFL, 39; HFW, 32; HLL, 34; HLW, 29; MSL, 10; TRD, 6; DMS, 8; (from slide): HFW, 50; FVW, 1; FVO, 5; ODA, 3.25; HFL, 60; MSL, 26; TRL, 7; TRD, 17; MFW, 23; SL, 31; SW, 5.75; PL, 10; PW, 4.5; FNL, 38.5; CLL, 27.

**Thorax.** Mesoscutum with shallow longitudinally lineolate reticulations on anterior region and on sides, posterior region with shallow polygonal reticulations; scutellum with raised reticulate sculpture similar to other species; propodeum moderately clothed with setae anterior to and distad of spiracles. **Fore wing** 2.9x as long as broad, venation and setation as in Fig. 114; marginal fringe 0.10x of wing width; width of apical hyaline part 0.14x of infuscate part. **Relative measurements**
Gaster. TI on sides, and on centre with transversely lineolate reticulations, and with a row of setae (Fig 113), ovipositor slightly exserted, about 0.07x of gaster length. Relative measurements (from slide) GL, 85, GW, 60, LTL, 61, EOL, 6, OVL, 85 5, VFL, 65, VAL, 21, [MTL, 70, MBL, 22 5, MSL, 25 5, DBS, 44]

Male. Unknown

Hosts. Unknown

Distribution. India Karnataka

Specimen examined. HOLOTYPE ♀ (on slide no EH 932, under 4 coverslips), INDIA Karnataka, Bannerghatta N P, 5 xi 1979 (Boucek & Noyes) (BMNH)

Comments. C bouceki comes close to coimbatorensis and basiri, but differs mainly in the shape of the head

20. Cheiloneurus coimbatorensis sp. nov. (Figs 115-118)

Description.

Female. Length, about 1.7mm Body completely black, metallic violet and bluish green, frontovertex bluish green up to posterior ocelli, about apical third of ovipositor pale, antenna black, scape with a narrow white wedge-shaped strip in distal half, fore wing infuscate as in Fig 116. legs, including coxae, dark brown with white to pale yellow as fol-
lows: apex of fore femur, apical fourth or so of fore tibia, largely mid femur except brownish infuscation in about distal two-thirds, base and apical one-third of mid tibia, mid spur and tarsi of all legs.

**Head.** In front view, slightly longer than broad, subquadratic (Fig. 118); frontovertex 0.13x of head width across anterior ocellus, 0.05x at narrowest, diameter of anterior ocellus 1.5x of frontovertex at narrowest; frontovertex with cells small; malar region with transversely lineolate reticulate sculpture. **Mandible** with two pointed teeth and a truncation. **Antenna** (Fig. 115) with scape about 5.0x as long as broad; pedicel 2.0x as long as broad, equal or slightly shorter than F1 and F2 combined; F1-4 slightly longer, F5 and F6 quadrate to broader than long; clava with apex slightly obliquely truncate. **Relative measurements** (from carded specimen): HDW, 42; FVW, 2.5; FVO, 5.5; ODA, 3.5; POL : AOL : OCL, 4 : 10 : 6; (from slide) : HFW, 63; FVW, 2; FVO, 7.25; ODA, 3.75; HFL, 67; MSL, 28; TRL, 9.25; TRD, 20; MFW, 21; SL, 35; SW, 7; PL, 11; PW, 5.5; FNL, 40.5; CLL, 26.

**Thorax.** Sculpture of both mesoscutum and scutellum similar to *bouceki*. **Fore wing** 2.6x as long as broad, venation and setation as in Fig. 117; marginal fringe 0.06x of wing width; width of apical hyaline part 0.09x of infuscate part. **Relative measurements** (from carded specimen): TL, 42; (from slide) : TL, 81.5; PRL, 7; MSCL, 29; STL, 41.5; STW, 31; PPL, 4.5; FWL, 155 (approx.); FWW, 57.5; MFL, 4; 1:H, 88:8.5 (approx.); HWL, 129.5; HWW, 35; MFL, 4.

**Gaster.** Longer than thorax (50 : 42, carded specimen); ovipositor distinctly exserted, slightly more than one-sixth of gaster length.
Relative measurements (from slide): GL, 92; LTL, 71; EOL, 16; OVL, 116; VFL, 86 (approx.); VAL, 30; [MTL, 79; MBL, 27; MSL, 35].

Male. Unknown.

Hosts. Unknown.

Distribution. India: Tamil Nadu.

Specimen examined. HOLOTYPE ♀ (on slide no. EH. 931, under 4 coverslips); INDIA: Tamil Nadu, Coimbatore, ix.1987, N. 8283 (Narendran & party). (ZDAMU).

Comments. This species is extremely close to basiri but differs mainly by the characters given in the key, especially the narrow hyaline apex of the fore wing and the distinctly exserted ovipositor.


(Figs. 119-124, 187-189)


Redescription.

**Female.** Length, about 1.90 mm. Body completely dark brown, shiny; radicle yellow, scape dark brown with a median white strip, pedicel funicle and clava dark brown; fore wing infuscate as in Fig. 120; fore and hind legs, including coxae, dark brown, mid coxa yellow brown to yellow, mid femur and tibia pale yellow to white, and mid and hind tarsal segments 1-4 white to pale yellow (Figs. 187-189).

**Head.** In front view, slightly longer than broad Fig. 112; frontovertex 0.11x of head width across anterior ocellus and 0.03x at narrowest, 0.6x of diameter of anterior ocellus; frontovertex with raised reticulations, cells small; area between lower eye margin and scrobe with transversely drawn out cells (Fig. 123); malar region with longitudinally lineolate reticulations. **Mandible** with two pointed teeth and a truncation. **Antenna** (Fig. 119) with scape slightly flattened, 4.16x as long as broad; pedicel 2.3x as long as broad; F1 at most 1.5x as long as broad and distinctly shorter than pedicel; clava longer than preceding three funicle segments combined, apex of clava transversely truncate. **Relative measurements** (from slide): HFW, 50; FVW, 1.5; FVO, 5.5; ODA, 2.5; HFL, 53; MSL, 22; TRD, 18; MFW, 21; SL, 25; SW, 6; PL, 9.5; PW, 4; FNL, 32; CLL, 20.

**Thorax.** Mesoscutum on anterior third with elongate lineolate reticulations, rest with shallow irregular cells; sculpture of scutellum similar to other species, other details as in Fig. 124. **Fore wing** 2.8x as long as broad, ventation and setation as in Fig. 121; width of apical
hyaline part 0.14x of infuscate part. **Relative measurements** (from slide): TL, 57; TW, 50; MSCL, 28; MSCW, 42; STL, 27.5; STW, 28; PPL, 2; FWL, 115; FWW, 41; MFL, 4.75; I : H, 66 : 9.5.

**Gaster.** Ovipositor slightly exserted, about 0.04x of gaster length (i.e. one-tenth of gaster length). **Relative measurements** (from slide): GL, 72; GW, 42; LTL, 51; EOL, 7; OVL, 80; VFL, 60; VAL, 20; [MTL, 66; MBL, 19; MSL, 25; DBS, 36].

**Male.** Unknown.

**Hosts.** (with) *Saissetia coffeae* Walker on ornamental plants; *Ceroplastes actiniformes* Green on *Mangifera indica* (Hayat *et al.*, 1975).

**Distribution.** India: Goa, Kerala.


**Comments.** This species is extremely close to *peniculoartus* and *malayensis* and differs by the characters given in the key.

**22. Cheiloneurus peniculoartus** Singh & Agarwal

(Figs.125-127)

*Cheiloneurus peniculoartus* Singh & Agarwal, 1993a: 43. ♀. Holotype ♀: India, Manipur (ZDAMU), examined.
Redescription.

Female. Length, 1.66 - 1.87mm. Body completely black; frontovertex with bluish green lustre; temples, malar space, intertorular prominence, mouth margin with bluish violet lustre; scrobes with bronzy green lustre; pronotum and mesoscutum violet with bronzy and golden lustre; axillae and scutellum with faint green lustre; propodeum with violet lustre and T1 with bluish violet lustre; scape with dorsal and ventral margins dark brown to blackish brown, distal half white and proximal half yellow; pedicel, funicle and clava dark brown to blackish brown; fore wing infuscate as in Fig. 126; legs, includng coxae, dark brown to blackish brown with violet lustre on coxae, except as follows: apex of fore femur and apex of fore tibia brownish yellow; base and extreme apex of mid femur, mid tibia white; mid spur and tarsus pale yellow brown; fore and hind tarsi brownish yellow to brown. Setae on anterior half of mesoscutum golden brown and on posterior half silvery white.

Head. Frontovertex 0.1x of head width across anterior ocellus and 0.05x at narrowest, 0.6x of diameter of anterior ocellus; the distance between posterior ocellus and occipital margin 2x of diameter of an ocellus; frontovertex with raised reticulate sculpture, cells small. Antenna (Fig. 125) with scape 4.5x as long as broad; F1-F5 longer than broad, F1 equal to F2, F6 quadrate; apex of clava transversely truncate. Relative measurements (from carded specimen): HDW, 40 FVW, 2; FVO, 4; ODA, 3; AOL : POL : OCL, 6 : 2 : 6, HFL, 45; TRD
Thorax. Fore wing 2.7x as long as broad, venation and setation as in Fig. 127; length of marginal fringe 0.07x of wing width; width of apical hyaline part 0.13x of infuscate part. *Relative measurements* (from carded specimen): TL, 60; TW, 42; MSCL, 27; MSCW, 38; STL, 23; STW, 22; (from slide): FWL, 176; FWW, 64; MFL, 5; I : H, 102 : 14; HWL, 146; HWW, 45 (approx.); MFL, 6; MTL, 91; MBL, 29; MSL, 34.5.

Gaster. Longer than thorax (72 : 60, carded specimen); exserted part of ovipositor about 0.13x of gaster. *Relative measurements* (from carded specimen): GL, 72; GW, 44; EOL, 10.

Male. Unknown.

Hosts. Unknown

Distribution. India : Manipur.

Specimens examined. Type specimens. *C. peniculoartus*: Holotype ♀ (on card); INDIA : Manipur, Imphal, 20.x.1987 (Sudhir Singh). Paratypes : 2 ♀ on card and parts of a third female on two slides, all with same data as holotype.

Comments. This species is extremely close to *basiri*, but differs in the relative dimensions of funicle segments, and in colour of the hind tarsi. It differs from *malayensis* by the characters given in the key.
23. *Cheiloneurus malayensis* Noyes & Chua

(Figs. 128-132)


**Redescription.**

**Female.** Length, about 1.52mm. Body completely blackish brown to black, frontovertex with bluish green lustre; scape blackish brown, with a wedge-shaped median white area in distal 0.5 - 0.6; pedicel and flagellum blackish brown; fore wing infuscate as in Fig. 129; legs, including coxae, dark brown, with pale yellow to white as follows: extreme apex of fore femur, apex of fore tibia, basal 0.33 of mid femur, base (narrowly) and apical 0.33 of mid tibia, mid spur, and tarsal segments 1-4 of all legs.

**Head.** In front view, slightly longer than broad (Fig. 131) with divergent eyes; frontovertex 0.14x of head width across anterior ocellus and 0.07x at narrowest, narrowest area equal to the diameter of anterior ocellus; frontovertex with reticulate sculpture, cells small; area between lower eye margin and scrobe with irregular polygonal reticulations. **Antenna** (Fig. 128) with scape flattened and 4.7x as long as broad; pedicel 2.2x as long as broad and distinctly shorter than F1 and F2 combined; F1-5 longer than broad, F6 quadrate; clava with second suture very slightly oblique, apex of clava obliquely truncate. **Relative measurements** (from carded specimen): HFW, 54; HDW, 38; FVW, 3; FVO, 6; POL : AOL : OCL, 4 : 8 : 6; EL, 28; EW, 24; (from slide):
Thorax. Mesoscutum on anterior third with longitudinally lineolate reticulations, rest with shallow irregular polygonal cells, sculpture of scutellum similar to other species, propodeum with a few setae on sides of spiracles. **Fore wing** 2.5x as long as broad, venation and setation as given in Fig 130, length of marginal fringe 0.06x of wing width, width of apical hyaline part 0.18x of infuscate part. *Relative measurements* (from carded specimen) TL, 50, (from slide) TL, 78.5, TW, 65, PRL, 5, MSCL, 36, MSCW, 55, STL, 35, STW, 35, PPL, 3, FWL, 146 (approx.), FWW, 57, MFL, 3.5, I, H, 81.15 (approx.), HWL, 118, HWW, 32, MFL, 4

**Gaster.** As long as thorax (in carded specimen), TI with transversely lineolate reticulations, ovipositor slightly exserted, about 0.08x of gaster length (i.e. nearly one-twelfth of gaster length). *Relative measurements* (from slide) GL, 81, GW, 53, LTL, 61, EOL, 7, OVL, 92.5, VFL, 69, VAL, 23, [MTL, 76, MBL, 23, MSL, 27, DBS, 47]

**Male.** Unknown

**Hosts.** Unknown (The type specimens from Malaysia were reared from pupae of Syrphidae)

**Distribution.** India Kerala, Uttar Pradesh (Malaysia)

**Specimens examined.** INDIA Kerala, Calicut University campus, 1♀ (on slide no EH 930), 29 xii 1988 (M Hayat) Uttar Pradesh, Mussoorie, 1♀, 11 iv 1978 (M Verma)
Comments. The Indian specimens referred to malayensis agree well with the original description of this species. This species is extremely close to basiri and differs mainly by the characters given in the key and also in the sculpture of head in the area between lower eye margin and scrobe, and the colour of coxae and mid leg: frons, between lower margin of eyes and scrobes with irregular polygonal sculpture, mid femur except pale basal third and hind tibia except base and apical third, dark brown. (In basiri: frons, between lower margins of eyes and scrobes with transversely elongate reticulate sculpture; mid legs more or less completely pale yellow).

The specimen from Musoorie is a relatively smaller species (1.2mm). It has the hyaline apical band of fore wing slightly broader, 0.2x of infuscate part; and the exserted part of ovipositor 1/7th of gaster.


(Figs. 133-138, 190-192)

Cheiloneurus kerrichi Hayat, Alam & Agarwal, 1975: 55, ♀, ♂. Holotype ♀: India, Tamil Nadu, Arkonam (BMNH), not examined.

Redescription.

Female. Length, 1.7mm. Body completely dark brown to black; frontovertex with green and bronzy lustre; scrobes with bronzy lustre; metanotum and propodeum brown; scape pale yellow, apical 0.5 white, dorsal and ventral margins of scape, pedicel and funicle brown; clava dark brown to blackish brown; fore wing infuscate as in Fig. 134; legs, including coxae, pale yellow, with infuscate brown as follows: apical half of fore femur, fore tibia (except base), basal half of mid femur, basal half of mid tibia, apical third of hind femur and hind tibia (except base) (Figs. 190-192).

Head. In front view, as long as broad (Fig. 136); frontovertex 0.14× of head width across anterior ocellus and 0.08× at narrowest, 1.2× of diameter of anterior ocellus; frontovertex with raised reticulate sculpture, cells small; area between lower eye margin and scrobes with small irregular cells. Mandible with two pointed teeth and a truncation. Antenna as in Fig. 127 given by Hayat et al., (1975). In the figure given here (Fig. 133) the antennal segments have collapsed and hence the differences between these two figures. Relative measurements (from slide): HFW, 69; FVW, 6; FVO, 10; ODA, 5; HFL, 69; TRL, 8.5; TRD, 23; SL, 31; SW, 8; PL, 11; PW, 6; FNL, 36.5; CLL, 22.

Thorax. Sculpture of both mesoscutum and scutellum similar to nitidulus; propodeum densely setose on each side, anterior to and on sides of spiracles. Fore wing 2.4× as long as broad, venation and setation
as in Fig. 135; width of apical hyaline part 0.10x of infuscate part.

Relative measurements (from slide): TL, 83; TW, 68; MSCL, 35; MSCW, 61; STL, 43; STW, 41; PPL, 4; FWL, 152; FWW, 59; MFL, 3.5; I : H, 90 : 9.

Gaster. Relative measurements (from slide): OVL, 99; VFL, 79.5; VAL, 19.5; [MTL, 77; MBL, 25; MSL, 29; DBS, 54].

Male. Body dark brown; scape white, pedicel dark brown, flagellum pale yellow with dark setae; wings hyaline; legs, similar in colour to female, the infuscate brown parts still paler. Antenna as in Fig. 137.

Relative measurements (from slide): HFW, 58; FVO, 25, ODA, 5; HFL, 50; TRL, 7.5; TMMD, 14; SL, 16; SW, 8; PL, 6; PW, 6; FNL, 73.5; CLL, 19, MSCL, 35; MSCW, 53; STL, 31.5; STW, 35; PPL, 2.

Hosts. Anomalococcus crematogasteri Green on Acacia arabica (Hayat et al., 1975).

Distribution. India: Tamil Nadu.

Specimens examined. Type specimens. C. kerrichi: Paratypes: 1 ♀, 1♂, and parts of one female and one male (on 6 slides).

The holotype was deposited in the BMNH (not examined), and three female paratypes in the USNM. Of the remaining material, only 1 ♀, 1♂, and parts of a female and male are available. The remaining specimens are lost.

Comments. This species is close to nitidulus, but differs by the characters given in the key.
25. *Cheiloneurus nitidulus* sp. nov. (Figs. 139-142)

**Description.**

**Female.** Length, about 1.05mm. Body blackish brown to black; frontovertex, temples and scrobal region with bluish green lustre; mesoscutum, axillae, scutellum, propodeum blackish brown; mesoscutum with bluish green lustre; metanotum yellow; gaster blackish brown, TI with bluish green lustre; scape blackish brown to black with a wedge-shaped area white; pedicel, funicle and clava dark brown to blackish brown; fore wing infuscate as in Fig. 140; mid and hind coxae, mid leg white, basal 0.33 of hind femur, hind tibia except base and apex dark brown.

**Head.** In front view, as long as broad (Fig. 142); frontovertex 0.14x of head width across anterior ocellus, 0.07x at narrowest, and 0.83x of diameter of anterior ocellus; frontovertex and area between lower eye margins and scrobes with raised reticulate sculpture, cells small, malar area with transversely lineolate reticulations. **Mandible** with three pointed teeth. **Antenna** (Fig. 139) with scape unexpanded, about 4.5x as long as broad; pedicel 2.14x as long as broad; F1 and F2 long, equal in length, and shorter than F3, F3 and F4 longer than broad, F5 and F6 quadrate to broader than long; second suture of clava transverse, apex very slightly truncate. **Relative measurements** (from carded specimen) : HDW, 26; FVW, 2; FVO, 4; POL : AOL : OCL, 2 : 4 : 4; HFL, 26; HFW, 26; HLL, 24; HLW, 16; MSL, 12; TRD, 10; MDS, 8; (from slide): HFW, 38; FVW, 3; FVO, 5.5; ODA, 2.5; HFL,
Thorax. Anterior 0.25 and sides of mesoscutum with lineolate reticulations, cells elongate, rest of mesoscutum with reticulate sculpture, cells irregular; sculpture of scutellum similar to other species; propodeum with a few setae (about 11 setae) around each spiracles. Fore wing 2.73x as long as broad, venation and setation as in Fig. 141; marginal fringe 0.1x of wing width; width of apical hyaline part 0.27x of infuscate part. Relative measurements (from carded specimen): MSL, 14; MSCW, 24; STL, 12; STW, 12; (from slide): TL, 49; TW, 41.5; MSL, 20; MSCW, 36; STL, 24; STW, 22; PPL, 2.5; FWL, 102.5; FWW, 37.5; MFL, 3.75; H, 53.75 : 15; HWL, 80; HWW, 20; MFL, 3.

Gaster. Sides of TI with reticulate sculpture, cells hexagonal, centre with transversely lineolate reticulations; ovipositor slightly exserted, about 0.14x of gaster length. Relative measurements (from slide): GL, 61; GW, 38; LTL, 45; EOL, 9; OVL, 66.5; VFL, 48; VAL, 18.5; [MTL, 52; MBL, 15.5; MSL, 19; DBS, 32.5].

Male. Unknown.

Hosts. Unknown.

Distribution. India: Karnataka.

Specimen examined. HOLOTYPE ♀ (on slide no. EH. 929, under 4 coverslips); INDIA: Bangalore, iii.1979 (T. Sankaran). (BMNH).

Comments. C. nitidulus sp. nov. appears related to kerrichi, but dif-
fers in several characters, especially in the broader hyaline apex of
the fore wing, shorter marginal vein which is 3.5x as long as stigmal
vein; and in the shape and dimensions of antennal scape.

26. *Cheiloneurus axillaris* Hayat, Alam & Agarwal
(Figs. 143-145)

*Cheiloneurus axillaris* Hayat, Alam & Agarwal, 1975: 56, ♂

Holotype ♂: India, Maharashtra, Lonavla (BMNH), parts
examined.

*Cheiloneurus axillaris* Hayat, Alam & Agarwal: Khan & Agarwal,
Fatima & Shafee, 1994: 29, key.

Redescription.

**Female.** Length, about 1.3mm. Body dark; frontovertex and temples
with bluish green lustre, malar space in basal third fuscous yellow;
mesoscutum dark with violet lustre; axillae and metanotum pale brown;
gaster dark brown, shiny; scape brown, with an apical white area, pedicel
yellow, funicle brown, clava dark brown; fore wing infuscate as in
Fig. 144; legs pale yellow to white with infuscate brown as follows:
mid femur with a dorsal narrow patch at apex, apex of hind femur,
base and apex of hind tibia.
Head. Frontovertex at narrowest 0.09x of head width (2.5 : 26), and more than the diameter of anterior ocellus. Antenna (Fig. 143) with scape unexpanded, about 5x as long as broad; pedicel 2.25x as long as broad; F1-F6 longer than broad; apex of clava transversely truncate. Relative measurements (from slide): SL, 25; SW, 5; PL, 9; PW, 4; FNL, 36; CLL, 20.

Thorax. Fore wing 2.8x as long as broad, venation and setation as in Fig. 145; marginal fringe 0.09x of wing width, width of apical hyaline part 0.23x of infuscate part. Relative measurements (from slide): FWL, 115; FWW, 40; MFL, 3.75; I : H, 60 : 14; MTL, 60; MBL, 19; MSL, 23.25.

Gaster. Slightly longer than thorax (40:37, from original description), exserted part of ovipositor about 0.12x of gaster (1/8 of gaster length).

Male. Unknown.

Hosts. ex Icerya sp., on Mangifera indica (Hayat et al., 1975).

Distribution. India: Maharashtra.

Specimen examined. C. axillaris: Holotype parts on a slide examined.

Comments. The above description and a few measurements are based upon the original description, rest of the measurements have been taken from the available parts on slide.

C. axillaris comes close to nigricornis, but differs in the relatively broader frontovertex; dark brown colour of the mesopleuron;
colour of scape and the presence of a dark strip on distal end of mid femur (see key to species).

27. Cheiloneurus nigricornis Hayat, Alam & Agarwal
(Figs. 146-151, 169)


SYN. NOV.


Redescription.

Female. Length, 1.06 - 1.09mm. Head in upper half blackish brown to black, lower half yellow to yellow brown, dark brown patch between toruli and mouth margin with bluish green lustre; pronotum yellow brown with central dark brown patch or sometimes with posterior region dark; mesoscutum, and gaster blackish brown to black with bluish green lustre; scutellum varies from yellow brown to dark brown; axillae,
metanotum and propodeum yellow brown; scape yellow to pale yellow with dorsal and ventral margins dark and ventral margin in apical third white, pedicel light brown to infuscate brown, funicle and clava dark brown to black; fore wing infuscate as in Fig. 147; legs, including coxae, yellow to pale yellow, with infuscate brown as follows: extreme apex of mid femur and mid tibia, most of hind femur and hind tibia (except base).

**Head.** In front view, about as long as broad (Fig. 149); frontovertex 0.11x of head width across anterior ocellus, and 0.06x at narrowest, and 1.23x of diameter of anterior ocellus; frontovertex with raised reticulate sculpture, cells small; area between lower eye margins and scrobes with polygonal, irregular cells; malar region with transversely lineolate reticulations. **Antenna** (Fig. 146) with scape unexpanded, 5.2x as long as broad; pedicel 2.5x as long as broad; F1-5 longer than broad, F6 quadrate; apex of clava tranversely truncate. **Relative measurements** (from carded, non-type specimen): HDW, 34; FVW, 1; FVO, 4; POL, : AOL : OCL, 1.5 : 6 : 4; HFL, 38; HFW, 34; HLL, 38; HLI, 24; MSL, 16; DMS, 16; (from slide, Paratype): HFW, 52; FVO, 6.25; ODA, 4; HFL, 54; MSL, 23; TRL, 9; TRD, 7; MFW, 21; SL, 29; SW, 5.5; PL, 10; PW, 4; FNL, 42; CLL, 20.

**Thorax.** Mesoscutum in anterior 0.25 with longitudinally lineolate reticulations, rest with shallow, irregular cells; propodeum moderately setose on sides and on anterior region. **Fore wing** 2.75x as long as broad, venation and setation as in Fig. 148; marginal fringe 0.08x of wing width; width of apical hyaline part 0.20 - 0.25x of infuscate part.
Relative measurements (from carded, non-type specimen): TL, 43 (approx); MSCL, 18; MSCW, 34; STL, 19; STW, 9; (from slide, Holotype): TL, 51; TW, 36; PRL, 3; MSCL, 20; MSCW, 34; STL, 24.25; STW, 23; PPL, 2.75; (from slide, Paratype): FWL, 128; FWW, 46.5; MFL, 4; I : H, 67 : 14.

Gaster. Slightly longer than thorax (48 : 43 approx., carded specimen); ovipositor slightly exserted, about 0.12x of gaster length. Relative measurements (from carded, non-type specimen): GL, 48; GW, 36; EOL, 6; (from slide, Holotype): GL, 71; LTL, 47; EOL, 7.5; (from slide, paratype): OVL, 83; VFL, 61.5; VAL, 21.5; [MTL, 66; MBL, 20; MSL, 24; DBS, 42].

Male. Unknown.

Hosts. (with) Indet. coccids on Mangifera indica and on wild plants (Hayat et al., 1975).

Distribution. India: Assam, Bihar, Uttar Pradesh.


C. indicus: Holotype ♀ (on card, with right antenna, wings and legs on a slide); INDIA: Assam, North Lakhimpur, 27.iv.1988 (Sudhir Singh) (ZDAMU).
Additional Specimens. INDIA: Uttar Pradesh, Dehra Dun, 2 ♀ (one on slide no. EH. 928), 20.x.79 and x.1979 (Boucek). (BMNH).

Comments. There are very few differences between nigricornis and indicus. C. nigricornis has the scutellum dark brown; fore wing relatively narrow, about 2.75x as long as broad; scape relatively slender, about 5.5x as long as broad. In the holotype of indicus the scutellum is brownish yellow; fore wing relatively broad, about 2.63x as long as broad; and scape relatively less slender, about 4.75x as long as broad. These characters are considered here as falling within the expected range of variation of nigricornis, and hence indicus is synonymized with nigricornis.

C. nigricornis differs from axillaris mainly by the characters given in key.

NOYESI - GROUP

28. Cheiloneurus noyesi sp. nov. (Figs. 152-155, 170)

Description.

Female. Length, 1.3 - 1.59mm, Holotype 1.40mm. Head dark brown to black, cheeks in lower half testaceous, interscrobal area dark; sides of face testaceous with bronzy lustre; frontovertex with violet and bronzy lustre; thoracic dorsum dark brown to black; mesoscutum and scutellum with dull bluish violet lustre; axillae testaceous; thoracic pleura and venter testaceous; propodeum dark brown and shiny; gaster with violet and bronzy lustre; exserted part of ovipositor yellowish; scape, pedicel, F1 - F4 yellow to light brown; F5-F6 and clava dark
brown; fore wing infuscate as in Fig. 153; legs testaceous, hind femur and tibia yellowish brown, mid and hind tarsal segments 1-4 white, 5th of all legs brown. Setae on mesoscutum and sides of propodeum silvery white, on scutelum pale to white.

**Head.** Dorsum 1.33x as broad as long; frontovertex 0.28x of head width across anterior ocellus, 0.26x at narrowest; frontovertex finely reticulate, the cells small, isodiametric; between lower eye margins, and scrobes and on malar region transversely reticulate sculpture; head with pale setae, eyes with setae transparent, and each about as long as a facet. **Mandible** with two pointed teeth and a truncation. **Antenna** (Fig. 152) with scape about 6x as long as broad; pedicel 2.2x as long as broad; F1 longer than broad, F2 and F3 quadrate, F4 and F6 broader than long; apex of clava obliquely truncate. **Relative measurements** (from Holotype): HDW, 31.5; HDL, 25; FVW, 8.5; FVO, 9; POL : AOL : OCL, 5 : 5 : 2.75; HFL, 30; HFW, 31.5; EL, 20; MSL, 12, (from slide, Paratype): HFW, 46; FVW, 13; FVO, 14; HFL, 43.5; MSL, 20; TRL, 6; TRD, 14; MFW, 10; SL, 26; SW, 5; PL, 9; PW, 5; FNL, 26.5; CLL, 22.5.

**Thorax.** Mesoscutum on anterior 0.25 with elongate reticulate sculpture, the cells obliquely oriented, rest with squamiform reticulate sculpture; scutellum with raised reticulate sculpture; propodeum moderately setose on sides and anterior to spiracles. **Fore wing** 3.0x as long as broad, venation and setation as in Fig. 154; length of marginal fringe 0.06x of wing width; width of apical hyaline part 0.13x of infuscate part **Relative measurements** (from Holotype): TL, 40; PRL, 6; PRW,
Gaster. Ovipositor exserted, about 0.16x of gaster length. Relative measurements (from Holotype): GL, 50; EOL, 8; (from slide, Paratype): GL, 86; GW, 44; LTL, 53; EOL, 11.5; OVL, 93; VFL, 62; VAL, 31; [MTL, 53; MBL, 16; MSL, 17; DBS, 31].

Male. Unknown.

Hosts. Unknown.


Specimens examined. HOLOTYPE ♀. INDIA: Uttar Pradesh, Aligarh, 8-10.xi.1979 (J.S. Noyes), BM. 1979-518. PARATYPES. 2♀ : 1♀, with same data as holotype (on slide no. EH. 922, under 4 coverslips); 1♀, (slide no. EH. 921, under 4 coverslips); Aligarh, 27.iv.1980 (M. Hayat). Holotype and one paratype in BMNH, one paratype in ZDAMU.

Comments. In addition to the absence of scutellar brush of setae, this new species differs from the other Indian species by the characters given in the key.

The specimen from Aligarh (coll. 27.iv.1980) is a relatively larger specimen, and differs from the holotype in having the truncate part of clava only slightly longer than the rest of ventral margin; otherwise it is conspecific with holotype.
**APENICULUS - GROUP**

29. *Cheiloneurus apeniculus* Singh & Agarwal

(Figs 156-159)

*Cheiloneurus apeniculus* Singh & Agarwal, 1993a 50, ♀ Holotype

♀ India, Assam, North Lakhimpur (ZDAMU), examined

**Redescription.**

**Female.** Length, 1.92mm Body completely black, head dorsum violet with bluish green lustre, frontovertex with bluish green and violet lustre, scrobe, malar space and intertorular prominence with bluish green lustre, mesoscutum, axillae and scutellum with faint bluish green lustre, propodeum with violet lustre, gaster with violet and bronzy lustre, exserted part of ovipositor pale yellow, radicle dark, scape brownish yellow dorsal margin infuscate brown, pedicel brownish yellow upper surface brown, F1-5 pale yellow to white, F6 pale brown, clava dark brown, fore wing infuscate as in Fig 157, legs, including coxae, pale yellow with mid coxae light brown, hind coxae brown, darker in basal half, hind femur dark brown except apex ventrally pale yellow

Setae along collar of pronotum and on mesoscutum white, on scutellum pale brown

**Head.** In front view, slightly broader than long, frontovertex 0 15x of head width across anterior ocellus, and 0 14x at narrowest, ocellar triangle with apical angle acute, posterior ocelli touching eye margins and removed from occipital margin by slightly more than one diameter of an ocellus, head with raised reticulate sculpture
(Fig 156) with scape about 4x as long as broad, pedicel 2 2x as long as broad, F1 and F2 slightly longer than broad, F3-F6 broader than long, F5 and F6 distinctly larger than F4, apex of clava slightly obliquely truncate. Relative measurements (from Holotype) HDW, 41, VW, 6, FVO, 6 5, POL, AOL, OCL, 2 75 5 5 3 5, HFL, 37, EL, 27, EW, 26, MSL, 10, TRL, 8 5, DMS, 17 5. (from slide, Holotype) SL, 28, SW, 7, PL, 11, PW, 5, FNL, 35, CLL, 27 5

**Thorax.** Propodeum sparsely setose on each side (not as densely setose as shown in Fig 11C by Singh & Agarwal) Fore wing 2 3x as long as broad, venation and setation as in Figs 158 and 159 Relative measurements (from carded specimen) TL, 46, MSCL, 18. MSCW, 38 5, STL, 20, STW, 23 5 (measurements of mesoscutum and scutellum have been taken from non type material, because of the distorted thorax of the holotype), (from slide, Holotype) FWL, 146, FWW, 62, MTL, 64, MBL, 22, MSL, 24

**Gaster.** Longer than thorax (53 46, carded specimen), ovipositor exserted, about 0 37x of gaster length Relative measurements (from Holotype) GL, 53, EOL, 20

**Male.** Unknown

**Hosts.** Unknown

**Distribution.** India Assam

**Specimens examined.** Type specimen Holotype ♂, on card (right antenna, wings and legs on slide), INDIA Assam, North Lakhimpur, 2 xi 1987 (Sudhir Singh) (ZDAMU)
Additional specimens. 2♀ found in a vial in Dr. Sudhir's collection, probably collected from the same locality as holotype (now mounted on a card). (ZDAMU).

Comments. C. apeniculus is related to the other two species of this group (lakhimpurensis, manipurensis), but differs from both by the characters given in the key.

30. Cheiloneurus lakhimpurensis Singh & Agarwal

(Figs.160-163)

Cheiloneurus lakhimpurensis Singh & Agarwal, 1993a: 58, ♀

Holotype ♀: India, Assam, North Lakhimpur (ZDAMU), examined.

Redescription.

Female. Length, 1.17mm. Body completely dark brown; frontovertex with dull bluish green and bronzy lustre, face violet with faint bluish green and malar space with bluish green and violet lustre; mesoscutum and axillae violet with bronzy lustre, scutellum with faint green lustre; mesospleuron pale testaceous, slightly infuscate anteriorly; gaster with violet and green lustre, exerted part of ovipositor pale yellow; scape yellowish brown, pedicel and funicle pale brown, clava dark brown; fore wing infuscate as in Fig. 161; legs dark brown, with the following pale yellow to nearly white: fore trochanter, apical fourth of fore femur, largely fore tibia, mid trochanter, base and apex narrowly of mid femur, base and distal half of mid tibia, and apical part
of hind tibia, fore and hind tarsi yellow, with distal segments brown; mid tarsus and spur white. Setae on mesoscutum slivery white; scutellum with golden brown setae.

**Head.** In front view, slightly broader than long; frontovertex 0.22x of head width across anterior ocellus. **Mandible** with two pointed teeth and a truncation. **Antenna** (Fig. 160) with scape slightly flattened and very slightly expanded, about 3.6x as long as broad; pedicel 1.6x as long as broad; F1-3 broader than long, F4-6 quadrate, each larger and longer than F1-3 individually; apex of clava obliquely truncate. **Relative measurements** (from Holotype): HFW, 36; FVO, 8; HFL, 33; TRD, 8; (from slide, Paratype): SL, 22; SW, 6; PL, 8; PW, 5; FNL, 24; CLL, 19.5.

**Thorax.** **Fore wing** 2.2x as long as broad, venation and setation as in Figs. 162 and 163. **Relative measurements** (from Holotype): TL, 42; MSCL, 18; STL, 16; (from slide, Paratype): FWL, 111; FWW, 49; MFL, 2.75; HWL, 87; HWW, 24; MFL, 3.

**Gaster.** Shorter than thorax (38:42), TI with transversely lineolate reticulations on sides and on its posterior region; ovipositor exserted part 0.21x of gaster length. **Relative measurements** (from Holotype): GL, 38; EOL, 8; (from slide, Paratype): OVL, 88.5; VFL, 58; VAL, 30.5; [MTL, 53; MBL, 18; MSL, 19].

**Male.** Unknown.

**Hosts.** Unknown.
**Distribution.** India: Assam.

**Specimens examined.** Type specimens: Holotype ♀, on card, INDIA: Assam, North Lakhimpur, 23.v.1986 (Sudhir Singh). (ZDAMU). Paratype ♀ (right antenna, middle leg, wings and dissected gaster on slide, head and thorax, as noted by the author, were used for SEM), data same as for holotype.

**Comments.** *C. lakhimpurensis* comes very close to *manipurensis*, but differs by the characters given in the key.

### 31. *Cheiloneurus manipurensis* Singh & Agarwal

(Figs. 164-166)

*Cheiloneurus manipurensis* Singh & Agarwal, 1993a: 52, ♀. Holotype ♀: India, Manipur, Imphal (ZDAMU), examined.

**Redescription.**

**Female.** Length, about 1.5mm. Body completely black with faint violet and bronzy lustre; gaster with violet lustre, exserted part of ovipositor pale brown; radicle and scape blackish brown, pedicel, flagellum and clava black; fore wing infuscate as in Fig. 165; legs, including coxae, blackish brown, with brownish yellow as follows: apex of fore femur, apex of mid femur, base of mid tibia, base and apex of hind femur, fore tibia brownish with paler base and apex, fore tarsus and tarsal segments 1-4 of mid and hind legs pale brown to brownish yellow, 5th segment of mid and hind tarsi dark brown. Setae on mesoscutum
Head. In front view, broader than long, frontovertex 0.24 x of head width across anterior ocellus and slightly more than distance between toruli, frontovertex with deep, reticulate sculpture. **Antenna** (Fig 164) with scape 4.6 x as long as broad, pedicel 2.4 x as long as broad, F1 longer than F2, F3-F6 quadrate, F5 and F6 each distinctly larger than F1-4 individually, apex of clava slightly obliquely truncate. **Relative measurements** (from Holotype) HDW, 38, FVO, 9, POL, AOL, OCL, 8, 10, 8, HFL, 36, HFW, 38, EL, 26, MSL, 14, TRD, 6.5, MDS, 18, (from slide) SL, 28, SW, 6, PL, 12, PW, 5, FNL, 36, CLL, 25

Thorax. Mesoscutum finely reticulate, sculpture of axillae about as in mesoscutum, sculpture of scutellum shallow, but similar to mesoscutum, propodeum on each side with a few setae (approx 10). **Fore wing** 2.5 x as long as broad, venation and setation as in Fig 166. **Relative measurements** (from Holotype) MSCL, 42, MSCW, 20, STL, 48, STW, 20 (from slide) FWL, 145, FWW, 58

Gaster. **Relative measurements** (from slide) OVL, 165.5, VFL, 106, VAL, 59.5, [MTL, 61, MBL, 22, MSL, 24]

Male. Unknown

Hosts. Unknown

Distribution. India Manipur

Specimens examined. Type specimen Holotype ♀ (head and thorax
on card and rest of the parts, i.e. right antenna, both wings, legs and dissected gaster, on slide); INDIA: Manipur, Imphal, 29 x. 1987 (Sudhir Singh). (ZDAMU).

**Comments.** *C. manipurensis* is closely related to *lakhimpurensis*, but differs mainly in the characters given in the key.
2. Genus *Cheiloneuropsis* gen. nov.

Type species *Cheiloneuropsis hadrodorys* sp. nov

**Diagnosis.** Similar to *Cheiloneurus*, but differs as follows: scutellum normally setose, setae not forming a compact brush, fore wing with linea calva closed posteriorly by several lines of setae, basal cell setose, without a bare triangular area, stigmal vein thin, almost parallel to anterior wing margin and with 3 sensilla, ovipositor long, with the second valvifer basally enlarged (Fig 197)

1. *Cheiloneuropsis hadrodorys* sp. nov. (Figs 171, 193-202)

**Description.**

**Female.** Length, 1.52 - 2.1mm Frontovertex orange brown, interscrobal area yellow, mouth margin brown, pronotum brown with collar pale yellow to white, mesoscutum dark brown with slight bluish green and violet lustre, tegulae nearly white, faint brown in distal half, axillae, scutellum, and metanotum yellow to pale yellow, axillae and posterior half of scutellum with slight brownish tinge, sides of propodeum brownish, pleura pale yellowish brown, gaster dark brown with bronzy violet lustre on dorsum, brownish yellow on sides and on venter, basal I or II segments pale yellow, exserted part of ovipositor pale yellow brown, radicle pale brown, scape yellowish, sometimes with or without basal 0.6 of ventral margin slightly brown, pedicel, F1, F2 and largely F6 brownish, sometimes F3, F6 pale brown, F4 and F5 nearly white, clava dark brown, fore wing infuscate as in Fig 194, legs, including coxae, pale yellow to white except apex of hind femur brown
Head. In front view, nearly as long as broad, rounded (Fig 196), frontovertex 0.30x of head width across anterior ocellus and slightly more than distance between toruli, frontovertex with reticulate sculpture, cells small, on face and on malar region transversely lineolatereticulate sculpture. Mandible with three pointed teeth. Antenna (Fig 193) with scape 4.0 - 4.5x as long as broad, pedicel 2x as long as broad, F1-F4 longer than broad, F5 quadrate, F6 broader than long, second suture of clava vertical and apex transversely truncate. Relative measurements (from Holotype) HDW, 34, FVO, 10.5, POL, AOL, OCL, 10.85, 11, HFL, 33, EL, 22, EW, 16, MSL, 12, TRD, 9, (from slide, Paratype) HFW, 52, FVO, 15, HFL, 52, MSL, 17, TRD, 14, MFW, 22.5, SL, 25, SW, 6, PL, 9.5, PW, 4.5, FNL, 48.5, CLL, 23.

Thorax. Mesoscutum in anterior fourth with longitudinally lineolate reticulate sculpture, rest with irregular polygonal cells, scutellum with reticulate sculpture, propodeum densely setose on sides. Fore wing 3.2x as long as broad, venation and setation as in Fig 195, marginal fringe 0.11x of wing width. Relative measurements (from Holotype) TL, 43, MSCL, 18, MSCW, 32, STL, 18, STW, 20.5, (from slide, Paratype) TL, 73.5, TW, 51.5, PRL, 7, MSCL, 29.5, MSCW, 40, STL, 31, STW, 30, PPL, 5, FWL, 143, FWW, 43.5, MFL, 5, HWL, 126, HWW, 26.5, MFL, 9.

Gaster. TI of gaster with reticulate sculpture on sides, cells small, irregular, posteriorly with faint, transversely lineolate reticulate sculpture, ovipositor exserted about 0.15x of gaster length. Relative measurements (from Holotype) GL, 60, EOL, 9, (from slide, Paratype) GL,
Male. Head dark brown to black, frontovertex with faint bronzy and green lustre, area below eye, intertorular prominence and cheeks with bluish green lustre, mouth margin brownish yellow, pronotum brownish yellow, mesoscutum dark as head with violet and bluish green lustre, axillae and scutellum brownish yellow, metanotum and sides of propodeum dark, metapleuron brownish yellow, gaster in apical two-thirds dark brown, basal third yellow, scape pale yellow, flagellum infuscate brown, fore wing infuscate as in Fig 199, legs, including coxae, pale yellow to white with infuscate brown as follows mid tibia except base and apex, hind femur and tibia except their bases. Relative measurements (from carded specimen, Paratype) HDW, 34, FVO, 13, HFL, 32, HFW, 34, TL, 46, MSCL, 20, MSCW, 34, STL, 20, STW, 20, GL, 43, (from slide, Paratype) HFW, 52, FVO, 23, HFL, 49 5, MSL, 16 5, TD, 6, MFW, 24, SL, 23, SW, 5, PL, 7 75, PW, 5, FNL, 117 5, 'CLL, 32, TL, 77, TW, 52, PRL, 6, MSCL, 39 5, MSCW, 44, STL, 33, STW, 30 5, PPL, 5, FWL, 145, FWW, 47 5, MFL, 5, HWL, 122, HWW, 26, MFL, 4, MTL, 71, MBL, 22 5, MSL, 25 5, GL, 76, GW, 72

Hosts. Non-type material reared from Saccharicoccus sacchari and indet mealybugs on sugarcane

Distribution. India Tamil Nadu, Maharashtra (Nepal, Sri Lanka, Pakistan)

Specimens examined. HOLOTYPE ♀ NEPAL Bardia, 10-24 III 1983
(M.G. Allen). PARATYPES: 1♀, 3♂ (female on slide, EH. 924; one male on slide EH. 923), with same data as holotype. INDIA: Tamil Nadu, 3 km. E. Manjaler Dam, 1♀, 1♂ (on slides EH. 926, EH. 925), 15 - 18.x.1979 (J.S. Noyes), BM. 1979-518. (BMNH).

Not designated as types: INDIA: Maharashtra, Nagpur, 1♀ (on slide, EH. 927), 1973 "ex mealy bug on sugarcane". CEYLON (=SRI LANKA): Peradeniya, 1♀, 2♂, 1964, ex Saccharicoccus sacchari, CIE, No. 19990. PAKISTAN: Lahore, 3♀, 1♂ (one ♀ with antennae missing, one female gaster only, male with head missing), 3.i.1976, ex pseudococcids, No. 3116, CIE. A3584 (BMNH).

3. Genus Ectroma Westwood

Ectroma Westwood, 1833: 344. Type species Ectroma fulvescens Westwood, by monotypy.


Idiococcophilus Tachikawa & Gordh, 1987: 307 Type species Idiococcophilus japonicus Tachikawa & Gordh, by monotypy and original designation. Synonymy by Sharkov, 1988 833
Diagnosis.

**Female.** Head with frontovertex convex, anteriorly rounded and gradually merging with face, about one-third of head width, occipital margin rounded, scrobes shallow, with rounded margins, toruli about one torulus diameter to mouth margin. **Mandible** with two teeth and a truncation. **Antennal** formula, 1, 1, 6, 3, scape cylindrical or very slightly flattened, funicle segments longer than broad to quadrate or broader than long, clava at most with apex transversely truncate. **Thoracic** dorsum slightly convex, mesopleuron posteriorly extending to base of gaster thus separating metapleuron from hind coxa. **Gaster** variable, about as long as thorax or longer, ovipositor either exserted or unexserted at apex. Body not completely dark, fore wing hyaline in brachypterous forms, infuscate in macropterous forms.

**Male.** Similar to female.

**Species and Distribution.** World, 12 species, represented in India by one undetermined brachypterous specimen (Noyes & Hayat, 1984).

**Hosts.** Unknown. Possibly Eriococcidae or Coccidae (Noyes et al., 1997). One species (*E japonicus*) reared from Pseudococcidae (Homoptera).

**Comments.** The above diagnosis is based on British specimens of *E fulvescens* Westwood present in the collection of M. Hayat.

*Ectroma*, as noted by Noyes & Hayat (1984) appears to be extremely close to *Cheiloneurus*, and the two genera are difficult to separate, (see key to genera)
4. Genus *Diversinervus* Silvestri

(Figs. 203-209)

*Diversinervus* Silvestri, 1915a: 301. Type species *Diversinervus elegans* Silvestri, by monotypy and original designation.

*Cheiloneuroides* Girault, 1915a: 96. Type species *Cheiloneuroides bicristatus* Girault, by monotypy and original designation.

Synonymy through synonymy of the type species by Girault, 1917: 37.

Diagnosis.

**Female.** Head with the frontovertex more or less entirely in a horizontal plane; frontovertex usually less than one-third of head width, face strongly inclined with fronto-facial margin sharp; vertexo-occipital margin notched in the middle. **Mandible** with two teeth and a truncation. **Antennal** formula, 1, 1, 6, 3; scape flattened and at least slightly expanded, funicle segments cylindrical, slightly longer than broad to slightly broader than long, clava with apex rounded or transversely truncate, second suture almost slightly oblique. **Thoracic** dorsum with mesoscutum with a transverse depression in posterior third bearing white setae and with or without mid longitudinal line(s) of dark bristles forming a brush; axillae elevated above level of scutellum, with posterior margins declivous; scutellum convex with sides and apex declivous and with a brush or bundle of dark setae; mesopleuron separated from base of gaster by metapleuron and hind coxa. **Fore wing** in macropterous forms with a naked streak adjacent to distal vein; marginal vein, subequal
in length to stigmal vein; parastigma generally strongly down-curved; basal cell with a large asetose area; linea calva open posteriorly and proximally bounded by a line of setae, and 2-3 lines of setae behind parastigma, thus the wing with a distinct speculum; (In one Indian species, marginal vein twice as long as stigmal vein; parastigma not down-curved; linea calva narrow, closed posteriorly, and proximad of linea calva densely setose, except for an asetose area in basal triangle). Gaster slightly longer than thorax; cerical plates situated at middle or at basal third of gaster; ovipositor not exserted or very slightly exserted. Body colour variable, from orange yellow to brown in parts to completely dark brown with metallic lustre. Fore wing infuscate with basal third and usually two spots distad of venation, one opposite the other, hyaline.

Male. Sexual dimorphism pronounced, male differs from the female, in having broader frontovertex (at least one-third of head width); thoracic dorsum rather strongly convex; and in antennal structures. Antenna with a short, triangular pedicel; funicle segments each distinctly longer than pedicel, and each with two whorls of long setae; clava short and unsegmented.

Species and distribution. World, 12 species; cosmopolitan. Three species from India: *D. cervantesi* (Girault, 1933); *elegans* Silvestri, 1915a; and *madgaoensis* Hayat et al., 1975.

Hosts. Primary parasitoids on Coccidae. Detailed biologies are known for *D. elegans* Silvestri (Compere, 1931; Bartlett & Medved, 1966);
D. cervantesi (Girault) (Rosen & Alon, 1983); and D. smithi Compere (Flanders, 1952).

Comments. Diversinervus is a distinctive genus and differs from Cheiloneurus in several characters as noted in the key, and especially the shape of the head with the frontovertex being in a horizontal plane, separated from face by a transverse curved ridge; head in profile, subtriangular, with the anterio-posterior length of eye greater than height; presence of a transverse depression in about posterior third of the mesoscutum having silvery white setae and fore wing venation; marginal vein not longer than stigmal, and the arrangement of setae on disc proximad of the linea calva. One Indian species (D. madgaoensis) differs from the other species in having the parastigma straight, not down-curved, narrow and posteriorly closed linea calva and disc densely setose proximad of the linea calva.

Diversinervus species, except madgaoensis, appear to be intermediate between Cheiloneurini and Cerapterocerini. This genus together with Lakshaphagus Mahdihassan, Bolangera Hayat & Noyes, Cheilopsis Prinsloo, Atropates Howard, and Anisopheps Fidalgo, appear to form a distinct group, which may eventually be accomodated as a subtribe of the Cerapterocerini, or be given a tribal rank. For the present, the author, following Trjapitzin (1989) and Noyes & Hayat (1984), retains Diversinervus in the Cheiloneurini.
5. Genus *Zaomma* Ashmead

(Figs. 210-212)

*Zaomma* Ashmead, 1900: 401. Type species *Encyrtus argentipes* Howard, by monotypy and original designation.


*Chiloneurinus* Mercet, 1921: 646. Type species *Chiloneurus microphagus* Mayr, by monotypy and original designation. Synonymy by Gordh & Trjapitzin, 1979: 34.

*Richardsius* Alam, 1957: 439. Type species *Apterencyrtus thomsoniscae* Alam, by original designation. [As subgenus of *Apterencyrtus*].


**Diagnosis.**

**Female.** Head with frontovertex slightly convex; frontovertex less than one-third of head width; occipital margin sharp. **Mandible** with two
teeth and a truncation. **Antennal** formula, 1,1,6,3; funicle segments short to transverse; clava with apex rounded, slightly shorter to distinctly longer than funicle. **Thoracic** dorsum slightly convex; mesoscutum at least in posterior half with silvery white setae; scutellum with subapical tuft of setae present or absent; mesopleuron separated from base of gaster by metapleuron and hind coxa. **Fore wing** with marginal vein slightly shorter to less than twice as long as stigmal vein; parastigma normal not strongly down-curved; linea calva open posteriorly; basal triangle with an asetose area. **Gaster** triangular, pointed at apex, at most slightly longer than thorax; ovipositor slightly exserted; TI and TV with gland like structures. Body completely dark brown, metallic. Fore wing hyaline; antennal funicle usually with dark and pale segments.

**Male.** Sexual dimorphism pronounced. Antenna with a subtriangular pedicel; funicle segments longer than broad, and each with two whorls of long setae; clava shorter, and unsegmented.

**Species and distribution.** World, 13 species; cosmopolitan. One species from India: *Z. lambinus* (Walker) (Hayat *et al.*, 1975).

**Hosts.** Hyperparasitoids of Diaspididae (Homoptera) through Encyrtidae (Hymenoptera).

**Comments.** The genus is probably best placed in Cheiloneurini, although Noyes (1990b) placed it in Habrolepidini on the basis of the presence of a long setae on mandible. It appears closely related to *Achalcerinys* Girault, from which it differs by the structure of the mandibles (two
teeth and a broad truncation); and marginal vein clearly longer than stigmal vein. In *Achalcerinys* mandibles are with three teeth; and marginal vein not longer than stigmal vein. It may be noted that the type species, *Z. argentipes*, is rather unusual in having transverse funicle segments, each much broader than long, and a large clava which is longer than funicle. Also it is not known whether the gland like structures on TI and TV are present or not. It is, therefore, very likely that *Zaomma* may eventually prove to be generically different from rest of the species.

### 6. Genus *Cheiloneurella* Girault

(Figs. 217-220)

*Cheiloneurella* Girault, 1915a: 177. Type species *Cheiloneurella binotativentris* Girault, by monotypy, and original designation.

**Diagnosis.**

**Female.** Head with frontovertex convex, anteriorly rounded and convexly merging with face; slightly more than one-third of head width; antennal toruli slightly more than their own lengths from mouth margin, and with their upper margins slightly above level of lower eye margins; malar sulcus present. **Mandibles** with two teeth and a truncation. **Antennal** formula, 1, 1, 6, 3; scape cylindrical; pedicel longer than F1; funicle segments slightly longer than broad (F1-3) to quadrate or broader than long (F4-6); clava with apex rounded. **Thoracic** dorsum nearly flat; pronotum conically elongated, at least 0.75x as long as mesoscutum; mesoscutum with setae bilaterally symmetrically arranged;
scutellum with two submedian lines of setae; both mesoscutum and scutellum with fine, polygonally reticulate sculpture, that on scutellum not deeper than on mesoscutum; propodeum medially at least one-fifth length of scutellum. **Fore wing** long, narrow; hyaline or infuscated; marginal vein at least as long as stigmal; stigma with 4 sensilla; postmarginal vein shorter than stigmal vein; linea calva open posteriorly; basal triangle with a distinct asetose area. **Gaster** not longer than thorax; ovipositor at most slightly exserted. Body largely yellow or orange.

**Male.** Unknown.

**Species and distribution.** One species only (*binotativentris*) from Australia. Represented in the Indian fauna by at least one species (Noyes & Hayat, 1984; present record).

**Hosts.** Unknown.

**Comments.** *Cheiloneurella*, though appears related to *Cheiloneuromyia*, actually is quite different, not only in having an elongate conical pronotum, but also the shape of the head with its broader frontovertex; higher location of the antennal sockets; the disposition of the malar sulcus (which strongly reminds of the head of *Coccidencyrtus* Ashmead, a genus of the Habrolepidini); and presence of 4 sensilla on the stigmal vein. But *Cheiloneurella* lacks the very characteristic sculpture of the sides of propodeum and lacks the peg-like setae of the mandibles, which are characteristics of the Habrolepidini genera.
7. **Genus Cheiloneuromyia** Girault

(Figs. 221-224)

_Cheiloneuromyia_ Girault, 1915a: 178. Type species _Cheiloneuromyia simpliciscutellum_ Girault, by monotypy and original designation.

**Diagnosis.**

**Female.** Head dorsum with frontovertex very slightly convex to nearly flat, anteriorly convexly merging with face; frontovertex narrow, less than one-quarter of head width; occipital margin rounded; scrobe inverted "V" or "U" shaped, with rounded margins; malar sulcus present; head in profile, nearly subtriangular in shape; eyes with anterio-posterior length greater than dorso-ventral length (=height). **Mandible** with two teeth and a truncation. **Antennal formula, 1, 1, 6, 3; scape cylindrical;** funicle segments generally longer than broad, gradually broadened distally; clava shorter than funicle, very slightly broader than F6 and with apex rounded or transversely truncate. **Thoracic dorsum** very slightly convex; pronotum transverse, not more than one-third length of mesoscutum; axillae meeting mesally, elevated above the level of scutellum, with posterior margins declivous; mesoscutum with shallow reticulate sculpture, the cells elongate on sides; scutellum with several prominent black setae, irregularly arranged; mesopleuron separated from base of gaster by metapleuron and hind coxa. **Fore wing** with marginal vein longer than stigmal vein; postmarginal vein shorter than stigmal vein, stigmal vein with 3-sensilla; linea calva complete.
neither closed nor interrupted. **Gaster** triangular, about as long as thorax; ovipositor slightly exserted. Body yellow or orange coloured with some dark markings; fore wing with two infuscate patches and a hyaline fascia distad of venation, the proximal margin of distal infuscation convex in middle.

**Male.** Unknown.

**Species and distribution.** Three species; Oriental and Australian regions: *C. javensis* Girault, 1916, from Indonesia and Hawaiian Islands; *C. simpliciscutellum* Girault, 1915a, from Australia; and *C. planchoniae* (Howard, in Howard & Ashmead, 1896) from Sri Lanka; known from Solomon Islands and India, including the Andaman & Nicobar Islands, from undetermined material (Noyes & Hayat, 1984; present record).

**Hosts.** Coccidae and Asterolecaniidae (Noyes & Hayat 1984; Prinsloo, 1997).

**Comments.** *Cheiloneuromyia* is apparently closely related to *Cheiloneurella* Girault from which it can be separated by the shorter and transverse pronotum which is less than one-third the length of mesoscutum (see under *Cheiloneurella*).

**8. Genus Achalcerinys Girault**

(Figs. 213-216)

*Achalcerinys* Girault, 1915a: 98. Type species *Achalcerinys triclavata* Girault, by monotypy and original designation.

*Ecthrobacomymia* Girault, 1920b: 142. Type species *Ecthrobacomymia*


Diagnosis.

Female. Head with frontovertex convex and rounded anteriorly; occipital margin rounded; occiput with a groove from upper margin of occiput to upper margin of foramen; frontovertex less than one-third of head width. Mandible with three sharp teeth. Antennal formula, 1, 1, 6, 3; scape cylindrical; pedicel longer than F1-F3 combined; funicle segments quadrate to slightly broader than long; clava with apex rounded. Thoracic dorsum slightly convex; mesoscutum largely with white setae; mesopleuron clearly separated from base of gaster by metapleuron and hind coxa. Fore wing hyaline or with a yellowish tinge; postmarginal vein shorter than stigmal vein; stigmal vein usually subequal in length to marginal and with 4 sensilla; linea calva open posteriorly; basal triangle with an asetose area. Gaster elongate, triangular, apex pointed; longer than thorax; TI and TV with gland like structures. Body colour completely dark brown and with metallic lustre in parts.

Male. Similar to female, except for a relatively broader frontovertex and structure of the antenna. Antenna with pedicel subtriangular, shorter than F1; funicle segments longer than broad and each with whorls of long setae; clava unsegmented.
Species and distribution. World, 4 species; India, 2 species, possibly synonymous: *A. gorodkovi* (Myartseva, 1983); *lindus* (Mercet, 1921).

Hosts. Hyperparasitoids on Eriococcidae and Pseudococcidae (Homoptera).

Comments. *Achalcerinys* is apparently extremely close to *Mahencyrtus*, but differs mainly by having sharply 3-dentate mandibles; parastigma normal, not triangularly expanded proximally; narrow propodeum; presence of a groove on occiput connecting foramen with upper margin of occiput; and presence of gland-like structures on T1 and TV of gaster.

In *Mahencyrtus* mandibles with two teeth and a truncation; parastigma triangularly expanded proximally and with a long, erect seta; occiput without such a groove; propodeum longer with some carinae, and gland-like structures absent on gasteral terga.

9. Genus *Echthrogonatopus* Perkins

(Figs. 225-228)


Diagnosis.

Female. Head with frontovertex convex and anteriorly convexly merging with face, and one third of head width or less; occipital margin narrowly rounded, not sharp. Mandible with 3-sharp teeth, middle tooth longer.
Antennal formula, 1,1,6,3; scape cylindrical; funicle segments cylindrical, slightly longer than broad to broader than long; clava large, nearly as long as funicle to longer than funicle, with sutures oblique and apex strongly obliquely truncate. Thoracic dorsum nearly flat to very slightly convex; mesoscutum with silvery white setae; mesopleuron enlarged posterioly, almost touching base of gaster, thus separating metapleuron from hind coxa. Fore wing hyaline or with faint yellow tinge, and without a hyaline naked streak at distal end of veins; stigma with 3-sensilla; marginal vein about three times as long as stigmal vein; linea calva narrow, open posteriorly; postmarginal vein shorter than stigmal vein; disc proximad of linea calva setose, with a small asetose area at base. Gaster atmost as long as thorax, ovipositor atmost very slightly exserted, usually not exserted. Body dark brown, with metallic lustre; scutellum generally matt.

Male. Unknown.

Species and distribution. World, 4 species. Two species from India: E. nigricornis (Hayat, 1980); parvus (Hayat, 1980).

Hosts. Hyperparasitoids of leaf hoppers (Homoptera: Auchenorrhyncha) via Dryinidae (Hymenoptera).

Comments. Echthrogonatopus is apparently very close to Cheiloneurus and may be difficult to separate from species of Cheiloneurus which lack a scutellar brush. But the two genera can reliably be separated on the characters given in the key.
10. Genus *Mahencyrtus* Masi
(Figs. 229-233)


**Diagnosis.**

**Female.** Head with frontovertex slightly convex, not more than one-third of head width; occipital margin narrowly rounded; eye with posterior margin slightly concave, appearing kidney shaped; toruli with their upper margins at least in line with lower eye margins. Mandible with two teeth and a truncation. Antennal formula, 1,1,6,3; scape cylindrical or only slightly flattened; funicle segments short, slightly longer than broad to quadrate; apex of clava rounded or very slightly transversely truncate. Thoracic dorsum nearly flat or very slightly convex; mesoscutum with white to brown setae; scutellum with punctate reticulate sculpture, much deeper than on mesoscutum; propodeum medially longer, at least about one-fifth of scutellum length and with
some carinae; mesopleuron not enlarged posteriorly, separated from base of gaster by metapleuron and hind coxa. *Fore wing* hyaline or at most with a wedge-shaped mark; parastigma conspicuously swollen and with a distinct triangular expansion bearing a long, erect seta; marginal vein subequal to or shorter than stigmal vein; stigma with 3 sensilla; postmarginal vein shorter than stigmal vein, linea calva open posteriorly; from base to proximad of linea calva setose, without a distinct asetose area in basal triangle. *Gaster* elongate triangular, with apex pointed, at least slightly longer than thorax; ovipositor usually slightly exserted; TI with a curved ridge on each side. Body colour dark brown and at least in part with metallic lustre.

**Male.** Similar to female except for a relatively broader frontovertex and antennal structures. Antenna with a short pedicel, funicle segments all clearly longer than broad and with whorls of long setae.

**Species and distribution.** World, 10 species; cosmopolitan. Three species from India: *M. assamensis* Singh & Agarwal, 1993a; *indicus* Singh & Agarwal, 1993a; *ranchiensis* (Fatima & Shafee, 1994). (See Hayat, 1999).

**Hosts.** Known for 2 Palaearctic species, and these belong to Asterolecanidae, Pseudococcidae and Coccidae (Homoptera). It is very likely that these are hyperparasitoids on other chalcidoids through their homopteran hosts.

**Comments.** Although earlier confused with *Parechthrodryinus*, the genus *Mahencyrtus* can be separated from the former by the relatively
long, slender body; a flattened thorax; longer gaster; fore wing with basal triangle setose to base, without a distinct speculum; propodeum medially longer, with some sculpture, and T1 of gaster with a curved ridge on each side (see key to genera).

The differences between *Mahencyrtus* and *Achalcerinys* are discussed under *Achalcerinys*.

11. Genus *Tyndarichus* Howard

*(Figs. 238-240)*

*Tyndarichus* Howard, 1910: 5. Type species *Tyndarichus navae* Howard, by monotypy and original designation.

**Diagnosis.**

**Female.** Head with frontovertex slightly convex; anteriorly gradually rounded and merging with face; frontovertex about one-third of head width; occipital margin sharp; eyes over-reaching occiput behind; toruli with upper margins far below level of lower eye margins. **Mandible** with two teeth and a truncation. **Antennal formula, 1,1,6,3; scape at least slightly flattened, and at least slightly expanded; funicle segments slightly broader than long to transverse; clava at least about as long as funicle, with second suture oblique, and apical segment strongly obliquely truncated, the truncate part at most slightly shorter than the remaining part of ventral surface. **Thoracic** dorsum slightly convex; propodeum medially narrow, less than one-fifth of scutellar length, and without carinae; mesopleuron separated from base of gaster
by metapleuron and hind coxa. **Fore wing** hyaline; parastigma proximad with a triangular expansion bearing a long, erect seta; stigmal vein about as long as marginal vein; stigma with 3 sensilla; postmarginal vein at most as long as stigmal vein; linea calva open posteriorly, and proximad with a complete or incomplete line of setae; speculum distinct; basal triangle with 1-3 curved lines of setae from behind parastigmal expansion, and thus basal triangle with a large asetose area. **Gaster** triangular, about as long as thorax; ovipositor at most very slightly exserted. Body dark brown with metallic lustre; wings hyaline.

**Male.** Similar to female, except for a broader frontovertex, and antennal structures. Antenna with a subtriangular pedicel, shorter than F1, funicle segments all longer than broad, and each with two whorls of long setae, clava short and unsegmented.

**Species and distribution.** World, 6 species; nearly cosmopolitan. One species from India: *T. melanacis* (Dalman, 1820). Also one undetermined species from India (Hayat coll.).

**Hosts.** Hyperparasitoids of larvae of Lepidoptera through Encyrtidae (Hymenoptera).

**Comments.** *Tyndarichus* is extremely close to *Parechthrodryinus*, and the two may eventually prove to be synonymous. But for the present these two genera are regarded as separate solely on the basis of the following characters: *Tyndarichus* : occipital margin sharp; scutellum slightly convex, at most slightly declivous on sides and apex; mesopleuron clearly separated from base of gaster by metapleuron and
hind coxa; fore wing proximad of linea calva with one, rarely two lines of setae; speculum broad and open posteriorly, and basal triangle with 1-3 lines of setae and with a large asetose area at base; scape short and at least slightly flattened and expanded; funicle segments broader than long to transverse. Hyperparasitoids of larvae of Lepidoptera.

_Parechthrodryinus_: occipital margin narrowly rounded; scutellum strongly convex and with sides and apex strongly declivous; mesopleuron enlarged posteriorly, either touching base of gaster or very narrowly separated; fore wing proximad of linea calva with 2-3 lines of setae; speculum narrow, closed posteriorly; at least 3 curved lines of setae in basal triangle behind parastigmal expansion and thus basal triangle with a relatively smaller asetose area; scape long cylindrical or slightly flattened, but not expanded; funicle segments longer than broad to quadrate. Parasitoids of Coccidae (Homoptera).

**Note.** The synonymy of _Blatticidella_ Gahan & Fagan (1923) (replacement name for _Blatticida_ Girault, 1915a, not Ashmead, 1904) is not cited above. From the figures given for _B. ashmeadi_, the type species of _Blatticidella_, by Dahms and Gordh (1997); it appears that the species was misplaced in _Tyndarichus_, and may eventually prove to belong to _Zaomma_ Ashmead; and appears to be related to _Z. argentipes_ (Howard).
12. Genus *Parechthrodryinus* Girault

(Figs. 234-237)

*Parechthrodryinus* Girault, 1916: 480. Type species *Parechthrodryinus convexus* Girault, by monotypy and original designation.

**Diagnosis.**

**Female.** Head with frontovertex slightly convex, gradually merging with face anteriorly; frontovertex not more than one-third of head width, usually much less; occipital margin narrowly rounded; toruli with upper margins at least slightly below lower margins of eyes. **Mandible** with two teeth and a truncation. **Antennal** formula, 1.1.6.3; scape cylindrical, at most very slightly flattened; funicle segments cylindrical, longer than broad to quadrate; clava with second suture slightly oblique, and apical segment slightly obliquely truncate, not longer than funicle. **Thoracic** dorsum convex, the scutellum rather strongly convex with sides and apex declivous; propodeum medially short, less than one-fifth of scutellar length, and without sculpture; mesopleuron either enlarged, nearly touching base of gaster and thus separating metapleuron from hind coxa, or very slightly separated. **Fore wing** hyaline; parastigma proximad with a distinct triangular expansion bearing a long, erect seta; marginal vein not longer than stigmal vein; stigma with 3-sensilla; postmarginal vein shorter than stigmal vein; linea calva open posteriorly, and proximad with 3-4 lines of setae; thus clearly separated from 2-3 curved lines of setae originating from behind parastigmal expansion; thus the wing with a dis-
tinct, though sometimes narrow, speculum; basal triangle with a distinct, though sometimes small, asetose area. **Gaster** triangular, pointed at apex, only slightly longer than thorax; ovipositor slightly exserted. Body dark brown to black, and with metallic lustre; wings hyaline.

**Male.** Similar to female, except for broader frontovertex and antennal structures. Antenna with a short pedicel; funicle segments longer than broad, each with whorls of long setae.

**Species and distribution.** World, 11 species, old world. Four species from India: *P. albiclavatus* (Shafee *et al.*, 1975); *clavicornis* (Cameron, 1913); *hemiaspidoproctis* (Subba Rao, 1967); *nigriclavatus* (Shafee *et al.*, 1975).

**Hosts.** Parasitoids of Coccidae and Kerridae (Homoptera).

**Comments.** See under **Tyndarichus**, and the key to genera.

### 13. Genus *Pasulinia* Noyes & Hayat

*Pasulinia* Noyes & Hayat, 1984: 320. Type species *Pasulinia gentha* Noyes & Hayat, by monotypy and original designation.

**Diagnosis.**

**Female.** Head with frontovertex convex, about one-fourth of head width; head in profile, with the eyes large, and with posterior margin nearly straight; malar sulcus present; antennal scrobes shallow, meeting above.

**Mandible** with one small lower tooth and a very broad truncation.

**Maxillary** palps 3-segmented, labial 2 - segmented. **Antennal** for-
mula, 1,1,6,3; scape subcylindrical; funicle segments slightly longer than broad (F1-3) to broader than long; clava with apex obliquely truncate. 

**Thoracic** dorsum flat; posterior margin of pronotum concave, and strongly angled medially; propodeum medially about one-fourth length of scutellum; mesopleuron narrowly separated from base of gaster by metapleuron and hind coxa. **Fore wing** with marginal vein 4-5x as long as broad, longer than stigmal vein; postmarginal almost absent; linea calva open posteriorly; disc proximad of linea calva setose to base. **Gaster** about as long as thorax, cercal plates in anterior half; ovipositor hardly exserted. Body dark brown, with metallic lustre; fore wing hyaline.

**Male.** Unknown.

**Species and distribution.** One species, *P. gentha*, from the Oriental region, including India.

**Hosts.** Unknown.

**Comments.** The present author has not seen specimens of *P. gentha*. Although doubtfully placed in Cheiloneurini by Noyes & Hayat (1984), the present author, on the basis of the original description and figures, considers it as a bonafide member of the Cheiloneurini. It, however, differs from the other Cheiloneurini genera mainly by the fore wing venation (postmarginal vein absent), and the mandibular dentation (one small tooth and a broad truncation).
Incertae sedis

14. Genus Prochiloneurus Silvestri

(Figs.241-243)

Prochiloneurus Silvestri, 1915b: 350. Type species Prochiloneurus pulchellus Silvestri, by monotypy and original designation.

Achrysopophagus Girault, 1915a: 89. Type species Achrysopophagus oviductus Girault, by original designation. Synonymy by Viggiani, 1966: 91.

Parachrysopophagus Agarwal, 1965: 65. Type species Achrysopophagus insolitus Alam, by original designation. [As subgenus of Achrysopophagus].


Diagnosis.

Female. Head with frontovertex convex, of variable width, occipital margin sharp; scrobes deep, delimited above and on sides by a sharp or narrowly rounded margin. Mandible tridentate with teeth sharp or blunt. Antennal formula, 1,1,6,3; scape variable, cylindrical to
distinctly flattened and expanded beneath; dimensions of funicle segments variable, but generally slightly longer than broad (basal segments) to broader than long; clava large, and obliquely truncated. Thoracic dorsum convex; mesoscutum with silvery white setae in at least posterior half; scutellum either with a subapical group of long dark setae forming a bundle or brush, or with sparse black setae, or without a brush; mesopleuron enlarged, nearly touching base of gaster. Fore wing infuscate with basal third and apex hyaline, with a hyaline streak adjacent to stigmal vein; parastigma slightly swollen and strongly down-curved; marginal vein at least about three times as long as stigmal vein; postmarginal vein shorter than stigmal vein; stigmal vein with 4 sensilla; linea calva open; basal cell with a large asetose area. Gaster usually about as long as thorax, almost rectangular in shape with a broad apex; TVII of gaster with posterior margin truncate; hypopygium reaching to apex of gaster or beyond; ovipositor strongly exserted, exserted part at least one-third length of gaster; outer plates of ovipositor reflected (turned) upwards at apex of gaster. Body colour variable, completely dark brown with metallic lustre to partly the thorax and head yellow, orange or yellow brown.

Male. Sexual dimorphism pronounced; males generally with bodies dark brown; frontovertex broader; antenna with pedicel shorter, subtriangular, funicle segments long, each with whorl of long setae, clava unsegmented. Genitalia with elongate tubular phallobase, with distinct parameres, each digitus with 2-3 denticles; aedeagus rather thin and elongate.
Species and distribution. World, 28 species; cosmopolitan. Seven species from India: aegyptiacus (Mercet, 1929); agarwali Hayat, 1981a (= albifuniculus Shafee et al., 1975); albifuniculus (Hayat et al., 1975); comperei Viggiani, 1970 (= P. clavatus Compere, 1938, not Achrysopophagus clavatus Girault, 1915a); insolitus (Alam, 1961); javenicus (Ferriere, 1951); testaceus (Agarwal, 1965). (See Hayat, 1981a, 1999, for key to species and notes on Indian species).

Hosts. Hyperparasites of other Encyrtidae (Hymenoptera), via, mainly Coccidae and Pseudococcidae (Homoptera), and also Coccinellidae (Coleoptera).

Comments. Prochiloneurus is superficially similar to Cheiloneurus especially in having more or less similar fore wings (venation, setation, infuscation), but the structure of the gaster, shape of the hypopygium (Shafee et al., 1975; Fig. 118), extention of the hypopygium to apex of gaster or beyond, the truncate apex of TVII of gaster (Fig. 242), the longer, strongly exserted ovipositor and the shape of male genitalia, especially the narrow aedeagus and presence of 2-3 denticles on each digitus; clearly show that this genus is misplaced in Cheiloneurini. I, therefore, consider its placement in Cheiloneurini as doubtful. The genus probably requires a separate tribe.