CHAPTER V

V.1 OBSERVATIONS AND DESCRIPTIONS

In the present investigation, torymids belonging to two subfamilies, viz, Megastigminae and Toryminae were studied. 52 species belonging to 17 genera were identified. Out of these one genus and 7 species are new to science. All these new species are described. The known species are redescribed since the available descriptions are inadequate for recognition of species.

Dichotomous keys to Subfamilies, Genera and Species are provided. Data matrix of seven genera of Podagrionini, Host parasite index of the species are included in this work, Check list of torymid fauna of India, Distribution map of torymid fauna of Kerala and graphical representation of percentage of distribution of torymid fauna were prepared.

The present investigation includes 15 genera from Kerala, one genus from Tamil Nadu (Genus Bootanelleus Girault) and one genus from Karnataka (genus Amoturoides Girault).

V.1 A DIAGNOSTIC CHARACTERS OF THE FAMILY TORYMIDAE

(Plate : 2)

Some species of Torymidae show close resemblance to some of the species of Pteromalidae and Agaonidae. The Family can be identified by the following characters:

1. Female with ovipositor clearly exerted, sometimes much longer than gaster
2. Presence of horse shoe like occipital carina separates all torymids from other families which have protruding ovipositor.
3. STV very short compared with the long MV (sometimes with stigma very enlarged).
4. Thirteen segmented antennae.
5. Antennal formula 11173 or 11263.
6. Relatively large hind coxa compared to the forecoxa and mesocoxa.
7. Notauli complete.
8. Body generally elongate, excluding ovipositor about 1.1 – 5.25 mm in length, including ovipositor up to 16 mm in length.
9. Cerci of the last tergite of female is exerted and longer than wide; the epipygium is present in the posterior margin of gaster as a small flap.

V.1 B  KEY TO THE SUBFAMILIES OF TORYMIDAE OF THE WORLD

1. Stigmal vein with conspicuous knob (Plate: 2:G); mesosoma with sparse but distinct pilosity; stigma of forewing higher than wide, height subequal to or greater than height of costal cell; postmarginal vein longer than or subequal in length to marginal vein; pronotal collar elongate body often more or less yellow ......................... SUBFAMILY MEGASTIGMINAE

= Stigmal vein much shorter and smaller than in alternate; stigma at the most slightly knobbed (Plate: 2:F); pilosity on the mesosoma usually dense and short; stigma of forewing subquadrate or wider than high, height less than height of costal cell; postmarginal vein usually obviously shorter than marginal vein, rarely subequal; pronotal collar usually transverse; body always metallic or sub metallic coloured ....... SUBFAMILY TORYMINAE
1 SUBFAMILY MEGASTIGMINAE

KEY TO GENERA OF SUBFAMILY MEGASTIGMINAE

1. Forewing with two blackish brown spots formed by tufts of stout hairs near stigmal and parastigmal veins (Plate:5:E); vertex raised into a sharp crest bearing occipital carina behind ocelli; rasplike sculptures present on posterior part of mesoscutum and on anterior part of scutellum; body reddish brown or yellowish; parasitic on Cecidomyiidae causing Mango leaf galls ......................................................... Mangostigmus Bouček

= Forewing without blackish brown spots near parastigmal and stigmal veins.................................................................

2. Body extensively metallic coloured, head and mesosoma metallic green; mesosoma strongly reticulate; stigmal knob large (Plate: 4:D); gaster broad and not compressed; phytophagous in the seeds of Casurina, galls of Citrus and Microcitrus .................................................. Bootanelleus Girault

= Body yellowish brown (Plate: 6:A); mesosoma shiny, mesosoma with conspicuous pubescence; if sculptured then atleast on scutum with transverse striae; scutellum only rarely engraved-reticulate; usually with frenal cross line; parasitic in bud galls of Calycopterus ........................... Megastigmus Dalman
Genus *Bootanelleus* Girault

*Bootanelleus* Girault, 1915(243): 308. Type species: *Bootanelleus viridiscutellum* Girault, by original designation.

**Diagnostic features:** Metallic green with brownish yellow gaster; mesosoma strongly reticulate; eyes reddish, scrobe deep; antennal formula 11173; clypeal margin with a median tooth; clypeal tooth sharp and well distinct in some species but weakly developed or hidden by dense pubescence in some others; hind tibial spur shorter than midtibial spur; pubescence long; ovipositor longer than body; hind femur longer than hind coxa.

**Biology:** Members of this genus are phytophagous in seeds of *Casuarina*, galls of *Citrus* and *Microcitrits* (Bouček, 1988).

**Distribution:** The genus is distributed in Australia, Tasmania, Fiji and in India (Narendran, 1994).

*Bootanelleus orientalis* (Mathur & Hussey)

*(Plate: 4)*


**Redescription:**

**Female:** Plesiotype: Length: 2.5 mm; ovipositor 4.6mm.

**Colour:** Head and mesosoma metallic bluish green; gaster brownish yellow with metallic green reflection; clypeus and ventral part of gena pale yellow; eyes reddish; antenna dark brown, scape light brown; mandibles black; legs light brown, hind coxa brownish green, often a green patch present on the outer surface of hind femur;
wings hyaline, iridescent, veins and stigma knob brown; ovipositor sheath brown, ovipositor pale yellow; pubescence on the body pale white.

**Head:** Head 1.2x as long as breadth in anterior view and 2.3 x as broad as length in dorsal view; vertex, frons and gena reticulate; occipital carina weak; relative measurements of AOL: OOL: POL =12:10:25; POL 2.5x OOL; scrobe deep; scrobe finely reticulate; antennal formula 11173; relative measurements of L:W of antennal segments = scape 20:5, pedicel 10:4, F1 10:5, F2 10:5, F3 10:5, F4 5:4, F5 5:4, F6 5:4, F7 5:4, clava 16:8; scape 2x as long as pedicel; first three funicular segments subequal, F5- F7 subequal and somewhat shorter; clava subequal to preceding three funicular segments; clypeus with a median lobe.

**Mesosoma:** Strongly reticulate; notaulices complete; scutellum finely reticulate, strongly margined; propodeum finely reticulate, slightly elevated posterior medially, coarsely beset with white hairs on sides; forewing 2.14x as long as broad (75:35); relative measurements of L: W of hind leg = coxa 34:12, femur 38:10, tibia 45:4, tarsi 32:2.5; hind femur 1.1x as long as hind coxa; hind tibial spur shorter than mid tibial spur; forewing 2.5x as long as broad; relative measurements of SMV: MV: PMV: STV = 32:10:17:8; forewing 2.5x as long as its maximum width (75:30); forewing with PMV 1.7x MV; stigmal club large, oval without surrounding infuscation; stigmal stalk 2x as long as stigmal club; basal vein short, distinct.

**Metasoma:** Gaster moderately compressed; weakly reticulate, row of pubescence from T3 onwards; ovipositor 3.6x as long as gaster, curved upwards; ovipositor 1.8x as long as body.

**Male:** Unknown.

**Variation:** Length 2.3-2.8mm; ovipositor 4.4-4.7mm.

**Host:** Phytophagous in the seeds of *Casuarina equisetifolia* (Family: Casuarinaceae).

**Distribution:** India: Orissa, Tamil Nadu: Coimbatore.

**Remarks:** This is the only one species of *Bootanelleus* represented in the Oriental region. It is not represented in Kerala. This species is included here since it is likely to be encountered in Kerala as the host plant is widely distributed in Kerala. The species is redescribed for including more characters for the easy determination of the species.
Genus *Mangostigmus* Bouček


**Diagnostic features:** Generally brownish black in colour; eyes brick red; legs pale yellow; forewing with two brownish hair tufts near stigma and parastigmal veins; transverse crest on head behind ocelli, rasp-like sculpture on thoracic dorsum; antennal formula 11173; gaster petiolate.

**Biology:** Parasitic in Cecidomyiid causing galls on leaves of *Mangifera indica* Linnaeus (Family: Anacardiaceae).

**Distribution:** This genus is found in India to Borneo (Bouček, 1988).

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**Key to species of *Mangostigmus* Bouček**

1 Gaster compressed from sides; gaster 1.25x as long as mesosoma; gaster with 4 tergites visible; POL 2x OOL; F₁ length equal to length of pedicel (fig.2) …………………………………………………… *M. amraeus* Kurian

= Gaster not compressed from sides; gaster 1.06x as long as mesosoma; gaster with 5 tergites visible; POL 4.4x OOL; F₁ shorter than pedicel (Plate:5:F)…..

…………………………………….. *M. malabaricus* Narendran & Vijayalakshmi

**Mangostigmus amraeus** (Kurian)

(Figures:1-3)


**Diagnosis:** (Based on redescriptions of Narendran, 1994)

**Female:** Length : 2.5 mm; reddish brown or yellow; antennae pale brownish yellow with clava slightly darker; eyes brick red with margins paler; front ocellus pale reflecting yellow; hind ocelli pinkish red; legs pale yellow with hind coxa black and hind femur brownish black with base and apex paler, pretarsus blackish brown; forewing with two dark spots formed by tufts of stout hairs, touching the stigma and parastigmal veins; ovipositor pale brown with apex black; head in dorsal view length two–fifth its breadth; head nearly smooth except for a faint cross-striae on lower face; POL 2x OOL; scrobe shallow; antennae inserted slightly below centre of face, above lower ocular line; toruli separated by a distance almost 2x diameter of torulus; interantennal space hardly raised; antenna slender, formula 11173; scape hardly reaching vertex level; scutellum lozenge-shaped, with apical part nearly smooth; forewing with two dark spots formed by tufts of stout hairs; gaster nearly 1.25x as long as mesosoma, petiolate, short.

**Biology:** parasitic of the Cecidomyiid, *Procontarinia echinogalliperda* (Mani) causing echinate galls on leaves of *Mangifera indica* Linnaeus (Family: Anacarciaceae).

**Remarks:** *Mangostigmus amraeus* (Kurian) differs from *Mangostigmus malabaricus* Narendran & Vijayalakshmi in having:

1. Gaster compressed from sides (in *M. malabaricus* gaster not compressed from sides);
2. Gaster 1.25x as long as mesosoma (in *M. malabaricus* gaster 1.06x as long as mesosoma);
3. Gaster with 4 tergites visible (in *M. malabaricus* gaster with 5 tergites visible);
4. MV 0.92x PMV, PMV 2.45 x STV (in *M. malabaricus* MV 1.7x PMV, PMV
2.16x STV);
5. Pronotum two fifths as long as whole mesosoma (in *M. malabaricus* pronotum one fourth whole length of mesosoma);
6. POL 2x OOL (in *M. malabaricus* POL4.4x OOL);
7. Apex of scutellum nearly smooth (in *M. malabaricus* apex of scutellum reticulate);
8. F₁ equal to pedicel (in *M. malabaricus* F₁ shorter than pedicel).

*Mangostigmus malabaricus* Narendran & Vijayalakshmi

(Plate: 5)

*Mangostigmus malabaricus* Narendran & Vijayalakshmi, 2007:60(1):7-10; Holotype, F., NZSI.

Redescription:

**Female: Plesiotype:** Length: 2.3 mm; ovipositor 2.2 mm.

**Colour:** Mesosoma and metasoma black; head brown with occiput and vertex slightly darker; antennae pale brownish yellow with clava slightly darker; eyes brick red with margins paler; front ocellus pale reflecting yellow; hind ocelli pinkish red; legs pale yellow with hind coxa black and hind femur brownish black with base and apex paler, pretarsus blackish brown; forewing with two dark spots formed by tufts of stout hairs, touching the stigma and parastigmal veins; ovipositor pale brown with apex black; pubescence on head and body brown.

**Head:** Head width 1.15x its median length upto lower clypeal tooth; head width in dorsal view 2.88x its median length; eyes bare; relative measurements of POL 4 x OOL; relative measurements of AOL:POL:OOL= 8:20:5; frons and vertex smooth with a cross striation on lower half with scattered stout bristles; maximum width of eye about 1.8x malar space; malar groove distinct and straight; lower margin of clypeus bilobed in the middle; mandibles tridentate; antennal formula 11173; relative measurements of length : breadth of antennal segments : Scape  40:12,

**Mesosoma:** pronotum length 1.45x its width, with distinct semiarcuate anterior dorsal carina; area anterior to dorsal pronotal carina smooth and shiny without pubescence; posterior part with transverse reticulations; reticulation stronger on laterodorsal side on anterior half; median and posterior part of pronotum with a weak reticulation; pronotum with scattered, sparse setae; mesoscutum length slightly shorter than pronotum, anteriorly transversely and coriaceously sculptured, posteriorly with a raised rasp like sculpture consisting of tooth like tubercles; notauli deep; scapulae and notauli with strong cross striae; anteriorly scutellum separated from mesoscutum by an alveolate groove; proximal part with a rasp like raised tubercles; posterior half not smooth but with distinct reticulations; propodeum with silvery white pubescence on sides, spiracles spherical; hind coxa reticulate on sides and strongly striate on dorsal side; L:W of hind leg = coxa 20:9, femur 30:7, tibia 21:2, tarsi 12:1; length of forewing 2.51x its maximum width (88:35); length of costal cell 2 x length of marginal vein; relative measurements of L:W of SMV:MV:PMV:STV= 30:22:13:6, MV 1.7x PMV, PMV 2.16 x STV; parastigmal and stigmal infumation very distinct. speculum present; cubital line of setae not extending to basal cell; SMV with nine dorsal setae.

**Metasoma:** Gaster not laterally compressed, with a very short petiole; length of petiole 0.08x length of gaster in dorsal view; gaster with a basal pit and a median distinct pit on T₁; length of gaster 1.06x length of mesosoma; five tergites distinctly visible; T₁ largest; T₁ and T₂ fused on dorsal side but distinct laterally; ovipositor as long as gaster.

**Male:** Similar to female in size and colour, but differs in the shape of metasoma (with distinct petiole).

**Variation:** Length varies from 2.2-2.4 mm; ovipositor 2.2-2.4 mm.

**Host:** Leaf galls of *Mangifera indica* Linnaeus (Family: Anacardiaceae).
**Distribution:** Kerala: Kozhikode, Wayanad.


**Remarks:**

*Mangostigmus malabaricus* Narendran & Vijayalakshmi differs from other species of Kerala, viz, *Mangostigmus amraeus* (Kurian) in having:

1. Gaster not compressed from sides (in *M. amraeus* gaster compressed from sides);
2. Gaster 1.06x as long as mesosoma (in *M. amraeus* gaster 1.25x as long as mesosoma);
3. Gaster with 5 tergites visible (in *M. amraeus* gaster with 4 tergites visible);
4. MV 1.7x PMV, PMV 2.16 x STV, (in *M. amraeus* MV 0.92x PMV, PMV 2.45x STV);
5. Pronotum one-fourth as long as whole mesosoma (in *M. amraeus* pronotum two-fifths whole length of mesosoma);
6. POL 4.4x OOL (in *M. amraeus* POL 2x OOL);
7. Apex of scutellum reticulate (in *M. amraeus* apex of scutellum nearly smooth);
8. F₁ shorter than pedicel (in *M. amraeus* F₁ equal to pedicel).

This species is redescribed for including more characters for the easy determination of the species.
Genus *Megastigmus* Dalman

*Megastigmus* Dalman, 1820: 178, Synopsis (2) (as subgenus of *Torymus* Dalman),
Type species: *Pteromalus bipunctatus* Swederus designated by Crosby, 1913.

*Xanthosomoides* Girault, 1913 (148): 220-221, Type species *Xanthosomoides maculatipennis* Girault; synonymized by Girault 1915(243):297.

*Epimegastigmus* Girault, 1915(243):307 (as subgenus of Megastigmus Dalman),
Type species *Xanthosomoides fulvipes* Girault: Synonymized by Milliron, 1949:263.

**Diagnostic characters:** Body usually yellow with black or blackish brown markings, occasionally green above; head wider than long anteriorly; eyes round, small; genae slightly bulging; vertex wide; antennae inserted at middle of frons; some species of very small size of around 1 mm have the short antennae inserted very low on face, below the lower eye margin; antennal formula 11173; mesosoma either shiny or if sculptured, then atleast on scutum with transverse striae, scutellum only rarely engraved-reticulate, usually with frenal cross-line; forewing rarely darkened at stigma, then cloud delimited; STV expanded markedly; pubescence on mesosoma usually conspicuous atleast in yellowish species; gaster compressed laterally; posterior margin of T1 with slight median incision; ovipositor long, curved.

**Biology:** Most species are phytophagous in seeds, but some are parasitic in galls.

**Distribution:** Members of this genus are found in Asia, Australia, Africa, Europe and North America (Grissell,1995).

**Key to species of *Megastigmus* Dalman**

1. Ovipositor less than 2x as long as gaster ; POL 2.3- 2.5x OOL; SMV 1.92-2.33x as long as MV, STV 0.44 - 0.52 x as long as MV; clava 2.3- 2.6x as long as preceding segment; scape 2.17- 2.6x as long as pedicel; propodeum with cross carina; scape not reaching front ocellus; propodeal spiracle
separated, by its own diameter from hind margin of metanotum; malar space 0.32x as long as eye; mesoscutum 1.13x as long as broad; forewing 2.41x as long as broad; forewing with cubital hairline complete, speculum present; ovipositor sheath 1.78x as long as gaster (fig.4), 3.23x as long as hind tibia. Host: tender leaf and stem galls of Eucalyptus. India: Karnataka


Megastigmus dharwadicus Narendran and Vastrad

(Figures: 4-9)

Megastigmus dharwadicus Narendran et al., 2010:1-6. Holotype: F., India (NZSI).

Diagnosis: (Based on original descriptions of Narendran et al., 2010).

Female: Length 1.67 mm, ovipositor length 1.15 mm; general body colour yellowish brown with small brownish black patches scattered on head and thorax; gaster mostly black with pale yellow on sides of T₁ and T₂, tegula concolorous with thorax; ovipositor sheath brownish black; antenna brown with scape and pedicel
yellowish beneath; eyes pale reddish brown; ocelli reflecting yellow; wings hyaline with veins and pubescence brown, stigma dark brown, uncus transparent; legs concolorous with the body; vertex, frons and face below antenna finely striate reticulate; occipital carina distinct; POL 2.5x OOL(10:4); gena smooth and shiny; scape not reaching front ocellus, pedicel plus flagellum 3.8x as long as scape, F₁ shorter than pedicel and ring segment combined (8:10); clava 2.6x as long as preceding segment, 3x or a little more than 3x as long as wide; mesosoma with rather weak cross striations except on pronotal collar and midlobe of mesoscutum a little coarser, with brown bristles; dorsellum smooth; propodeum medially 0.6x as long as scutellum; median area irregularly and finely reticulate; median carina present; cross carina present; callus with dense white hairs, base of each hair with reddish brown spot; mesopleuron and metapleuron finely striate reticulate; forewing 2.41x as long as broad; basal vein distinct, running obliquely to SMV, almost half as long as MV; cubical hair line complete; costal cell hairy in distal area; speculum present, closed below; stigma 1.9x as long as broad (excluding uncus); SMV 1.84x as long as MV; STV 0.4x as long as MV; hind coxa dorsally hairy; gaster sessile, smooth, 1.8x as long as hind tibia (34:19), 0.97x as long as mesosoma; ovipositor 1.72x as long as gaster; 3.23x as long as hind tibia; ovipositor shorter than body (57:71).

**Biology:** Emerged from the tender stem and leaf galls of *Eucalyptus* (Family Myrtaceae).

**Distribution:** INDIA: Karnataka, Dharwad.

**Remarks:** This species comes close to *Megastigmus kashmiricus* Sureshan, 2009 in the key to Indian species of *Megastigmus* by Narendran et al., 2010, but distinctly differs from it in having: 1) Propodeum with a cross carina (in *M.kashmiricus* no such cross carina on propodeum); 2) Scape not reaching front ocellus (in *M.kashmiricus* scape exceeds level of vertex); 3) Propodeal spiracle separated by its own diameter from hind margin of metanotum (in *M. kashmiricus* spiracle separated by 1.5x its own diameter from hind margin of metanotum); 4) Mesoscutum 1.13x as long as broad (in *M. kashmiricus* mesoscutum 1.5x as long as
broad); 5) Forewing with cubital hairline complete, speculum present (in *M. kashmiricus* cubital hairline incomplete, speculum very narrow, almost absent); and 6) Ovipositor sheath 1.72x as long as gaster, 3.23x as long as hind tibia (in *M. kashmiricus* ovipositor sheath 1.5x as long as gaster, 2.3x as long as hind tibia).

This species also comes close to *Megastigmus albizziae* Mukerji, 1950 in the key to Indian species of *Megastigmus* by Narendran *et al.*, 2010, but distinctly differs from it in having: 1) POL 2.5x OOL (in *M. albizziae* POL as long as OOL); 2) SMV 1.92x as long as MV (in *M. albizziae* SMV about 7x as long as MV; 3) STV 0.44x as long as MV (in *M. albizziae* STV as long as MV); 4) antenna] clava 2.6x as long as preceding segment (in *M. albizziae* clava about 1.7x as long as preceding segment); and 5) scape 2.17x as long as pedicel (in *M. albizziae* scape 3.75 x as long as pedicel).

**Megastigmus karnatakensis** Narendran

*(Figures: 10-13)*


**Diagnosis:** (Based on original descriptions of Narendran *et al.*, 2003)

**Female:** Length: 3.15 mm (excluding ovipositor sheath); ovipositor sheath length 3.52 mm; general body colour pale brownish yellow with metasoma a little darker; ovipositor sheath black; wings hyaline; stigma of forewing dark brown; veins pale brown; pubescence in general pale brownish yellow with stouter setae on head and mesosoma darker;head width in dorsal view 2.2 x its maximum dorsal length, in anterior view head width 1.3 x its median length; vertex convex, cross striate, with bristles black; lateral ocellus 1.2 x OOL; POL 2.3 x OOL, occiput moderately emarginate; vertex with four brown setae on occipital margin submedially; frenum longitudinally rugose ; lower clypeal margin incised in the middle ; F₁ shorter than F₂; length of clava subequal to combined length of two preceding segments, with area of micropilosity almost extending from tip to base of clava; pronotum 1.7 x as
broad as long, transversely striate; mesoscutum anterior one third smooth and shiny, remaining part striate- reticulate; striae weaker than those on pronotum; scutellum as long as broad; frenal groove distinct, frenum longitudinally rugose; surface of propodeum transversely and irregularly reticulate; forewing length 3.17x its maximum width; costal cell narrow with pubescence on dorsal and ventral sides; MV a little shorter than half length of SMV, MV sequal to PMV; PMV 2x STV; stigma 1.5 x as long as broad; legs with minute pubescence; hind tibia with a row of setae dorsally; metasoma longer than (excluding ovipositor sheath) mesosoma; T₁ deeply emarginate on posterior margin; ovipositor sheath distinctly longer than combined length of mesosoma and metasoma (88 : 107); ovipositor 2.7x as long as mesosoma , 2.16x as long as gaster and 1.1x as long as body.

**Biology:** Emerged from Psychid (*Pteroma* sp.) larvae in *Rhizophora mucronata* Lamark (Family: Rhizophoraceae) parasitizing on seed borers of *Sonneratia* (Family: Lythraceae).

**Host:** Psychid larvae (*Pteroma* sp.) (Lepidoptera: Psychidae) and seed borers of *Sonneratia*. (Family: Lythraceae).

**Distribution:** India: Karnataka.

**Remarks:** This species comes near to *Megastigmus viggianii* Narendran & Sureshan in the key to Indian species of *Megastigmus* by Narendran *et al.* (2010) but differs from it in having 1) Frenum longitudinally rugose (in *M. viggianii* frenum nearly smooth) ; 2) lower clypeal margin incised in the middle (in *M. viggianii* lower clypeal margin not incised in the middle) ; 3) F₁ shorter than F₂ (in *M. viggianii* F₁ longer than F₂; 4) POL 2.3x OOL (in *M. viggianii* POL 2 x OOL) ; 5) ovipositor 2.16x as long as gaster (in *M. viggianii* ovipositor about 2.2x as long as gaster); and 6) forewing 3.17x as long as broad (in *M. viggianii* forewing 2.28 x as long as broad).
**Megastigmus viggianii** Narendran & Sureshan

(Plate: 6)


Redescription:

**Female: Plesiotype:** Length: 1.67-2.13mm plus ovipositor 1.26-2.13mm.

**Colour:** Generally testaceous with brownish bands on gaster; antenna brown with scape and pedicel testaceous; eyes brownish red; ocelli reddish; tegulae concolorous with body; wings hyaline with venation and pubescence brown, stigma dark brown; all legs concolorous with body; ovipositor sheaths brown, ovipositor testaceous.

**Head:** About 2.25x as long as pronotal collar in dorsal view; vertex and frons nearly smooth, striations weak and more distinct on sides of lower face; malar groove distinct; vertex broad; each lateral ocellus with a pigmented brownish patch above and more or less in line, oblique to lateral margin of compound eyes (these patches faint or indistinct in some specimens); occiput bordered by a weak carina. scrobe deep; relative measurements of head in dorsal view: W 60, L 36; in front view: W 67, height 47, W of frons 28; malar space 14; POL twice OOL; relative measurements of POL 12; OOL 6; AOL 4; temples 12; eye 29:20 (in anterior view) and 29:23 (in profile); antenna with scape never reaching front ocellus; all funicular segments elongated and covered with moderate pubescence; club broader than funicle; anellus elongated; antennal formula 11173; relative measurements of L:W of antennal segments: scape 20:5; pedicel 7:5; F₁ 10:5; F₂ 7:5; F₃ 7:5; F₄ 7:5; F₅ 7:5 ; F₆ 7:6 ; F₇ 6:6; club15:5.

**Mesosoma:** Pronotum with neck very short, collar bell shaped, distinctly narrower than mesoscutum, weakly cross-striate, collar about 2.5x as broad as long and a little shorter than half of midlobe of mesoscutum in dorsal view; midlobe of mesoscutum with fine reticulation, slightly shorter than head dorsally; notauli deep and groove like ; side lobes of mesoscutum with reticulation weak; scutellum similarly
reticulated as mesoscutum, more or less flat, about as long and broad; frenum nearly smooth, without groove; posterior margin of scutellum ‘V’ shaped; dorsallum smooth; propodeum weakly reticulate with a weak median carina and costula, plicae more or less indistinct, callus with 4-6 hairs; propodeum about 0.88x as long as scutellum in dorsal view; mesopleuron with reticulation fine; mesepimeron clearly marked off; metapleuron nearly smooth; prepectus broad triangular and weakly reticulated; all legs normal, covered with brown hairs; hind coxa longest; relative lengths of fore coxa 18, mid coxa 11, and hind coxa 32; mid and hind femora almost equal in length; fore femur slightly shorter; hind tibia nearly equal to mid tibia; fore tibia shorter; about 0.74x as long as mid tibia; tarsi slender, fore tarsi shorter; mid and hind tarsi equal in length; forewing 2.28x as long as broad (80:35); forewing with basal vein distinct and running obliquely to SMV, half as long as MV (9:18); PMV about as long as MV; stigma conspicuous and oval with uncus distinct; STV about half as long as MV; relative length of SMV:MV:PMV:STV=35:18:17:9.

**Metasoma:** Sessile, smooth, about 1.6x as long as hind tibia in lateral view; in dorsal view about 3.26x as long as propodeum; ovipositor sheaths with uniform covering of brownish hairs; ovipositor about 2.2x as long as gaster (laterally), curved, distal tip sharply pointed.

**Male:** Length: 1.56-2.04mm. Very similar to female in general body colour and body structure. But it differs from the female in the presence of distinct petiole, brownish bands of the gaster which are more clear and antennae with scape little longer and pedicel shorter.

**Biology:** Phytophagous in the bud galls of *Calycopterys floribunda* Lamark (Family: Combretaceae).

**Distribution:** Kerala.


**Biology:** All emerged from bud galls of *Calycopterys floribunda* Lamark (Family: Combretaceae).

**Remarks:** This species comes near *M. albizziae* Mukerji in the key to Indian species of *Megastigmus* by Narendran (1994) in general appearance but differs from it in having: 1) Head about 2.25x as long as pronotal collar in dorsal view (in *M. albizziae* head subequal to length of pronotal collar in dorsal view); 2) ovipositor about 2.2x as long as gaster laterally (in *M. albizziae* ovipositor about 1.4 x as long as gaster laterally); and 3) STV about half as long as MV (in *M. albizziae* STV about 0.3x of MV).

This species comes near to *Megastigmus karnatakensis* Narendran in the key to Indian species of *Megastigmus* by Sureshan (2009) in general appearance but differs from it in having: 1) Frenum nearly smooth (in *M. karnatakensis* frenum longitudinally rugose); 2) Lower clypeal margin not distinctly bilobed or incised in the middle (in *M. karnatakensis* lower clypeal margin incised in the middle; 3) Ovipositor 2.2x as long as gaster (in *M. karnatakensis* ovipositor 2.7x as long as gaster); 4) F₁ longer than F₂ (in *M. karnatakensis* F₁ shorter than F₂); 5) Forewing 2.28 x as long as broad (in *M. karnatakensis* forewing 3.17x as long as broad); and 6) POL 2x OOL (in *M. M. karnatakensis* POL 2.3x OOL). This species is redescribed to include more characters for the easy determination of the species.
## II SUBFAMILY TORYMINAE

### KEY TO GENERA OF SUBFAMILY TORYMINAE

1. Ovipositor more than 3x as long as body; gaster petiolate; hind femur with slender subapical tooth (Plate: 8: E); PMV about as long as MV (Plate: 8: F)  
   - Ovipositor less than 3x as long as body; other characters partly or completely different ......................................................... 2

2. Gaster sessile; propodeum with rather rough sculpture; frenal area on scutellum distinctly separated and smooth ........................................ 3
   - Characters partly or completely different ........................................ 4

3. Hind femur with distinct subapical tooth (Plate:30:E) ........Torymus Dalman
   - Hind femur without subapical tooth ........................................ 10

4. Hind femur greatly swollen and on ventral margin with two or more teeth; sometimes a whole comb of teeth ........................................ 5
   - Hind femur moderately broadened, slender, ventral margin rarely with fine irregular serrations ........................................ 13

5. Annulus longer than wide, not ring like; between hind coxae two separate carina present (usually hidden by coxa); propodeum nearly horizontal with deep reticulation and usually without carinae; clava very large (Plate:10:H); gaster shortly petiolate ........................................ Palmon Dalman
   - Annulus wider than long, ring like; only one median carina between hind coxa; propodeum often with distinct carina in form V or Y; clava usually small but sometimes large; gaster sessile ........................................ 6

6. Hind tibia produced into a curved apical spine about a quarter length of tibia (Plate: 18: E); hind tibial spur close to the base of tibial spine ..........  
   - Hind tibia with apical spine less than quarter length of tibia; other characters partly or completely different ........................................ 7

7. Hind tibia with apical spine less than twice as long as the tibial breadth; hind tibial spur close to the distal end of tibial spine (Plate: 14:G); ovipositor
much longer than gaster .........................................................  Podagrion Spinola
8  Characters partly or completely different .........................................................  8
  Lower half of frons and face with silvery setal scales (Plate:11: C); midtibia with spur thickened, shorter than basitarsus, mostly setose; metasternum with two submedian carinae (fig.52) .................  Podagrionicron gen. nov.
  Lower half of frons without silvery setal scales; other characters partly or completely different ......................................................................................  9
9  Propodeum without distinct neck; marginal vein atleast half as long as costal cell; ovipositor longer than body; gaster laterally compressed; hind margin of atleast some basal tergites excised in middle ..................  Palachia Bouček
  Propodeum with a distinctly protruding neck exceeding base of hind coxae; marginal vein shorter than half the costal cell (fig.89); gaster not laterally compressed; hind margin of anterior tergites not excised in middle ............  ..........................................................  propalachia Bouček
10 Propodeum steep with deep reticulation, but without median carina, rarely with two week submedian carinae; hind femur broad, ovate, but not much longer than the large hind coxa ventral margin of hind femur with a comb of several small regular teeth (Plate: 32: D); hind tibia at apex often with a narrow spine; ovipositor hardly protruding; body densely pubescent ..........
  Propodeum with strong median carina; other characters partly or completely different..........................................................  Chrysochalcissa Girault
11 Hind femur large, ventral margin with comb like minute teeth (fig.18); tibial spur long; ovipositor small and strongly protruded; body densely pubescent (Plate: 4) ...............................................  Anneckeida Bouček
  Characters partly or completely different ...........................................................................  12
12 Propodeum with strong median carina, usually intersecting large anterior depression which is subdivided and foveolate; hind femur ventrally with several broad teeth (Plate: 23: G); ovipositor in female distinctly shorter than half of body (Plate: 23:A) ...........................................  Rhynchoticida Bouček
Propodeum with median alveolate area tapering posteriorly and subdivided by a median carina; hind femur with a conspicuous tooth on ventral margin of distal half (fig.15); ovipositor barely exserted, very short; scutellum without separated frenal area; sculptures and pubescence extend to apex.......................................................... *Amoturoides* Girault

13  Antenna with one ring segment and seven funicular segments (fig.95) .................................................................................................................................................................................. *Pseudotorymus* Masi

=  Antenna with two ring segments and six funicular segments (Plate: 26:D) ........................................................................................................................................................................... *Torymoides* Walker
Genus *Amoturoides* Girault

*Amoturoides* Girault, 1932 /439 (2)( unpaged); Type species: *Amoturoides breviscapus* Girault, by monotypy (QMB).

**Diagnostic features:**

Head with clypeus almost flat, its margins truncate; malar space without swelling behind linear malar groove; antennial formula 11173; mesosoma elongate, notauli conspicuous, not parallel, posteriorly converging; dorsum of mesosoma and hind femur densely pubescent; hairs on thoracic dorsum arising from elevated points of squamose reticulations; frenal line absent; frenal area evident on sides of scutellum only and much reduced; mesoscutum relatively short; not longer than scutellum; propodeum with strong median carina intersecting large triangular depression which is subdivided by secondary carina, sublateral areas smooth or finely sculptured, delimited externally by oblique post-spiracular furrow; hind coxa, larger than half of hind femur; hind femur moderately wide, with a subapical tooth on ventral margin; straight hind tibia with truncated apex and with two spurs; forewing extensively pubescent on distal two-third region; gaster with margins of tergites entire; ovipositor sheath broad and short, subexserted.

**Biology:** Members of this genus are parasitic in the nest of Polistine wasps and on Tettigonid eggs (Bouček, 1988).

**Distribution:** They are present in Africa, India and Australia (Bouček, 1988).

*Amoturoides breviscapus* Girault

 *(Figures:14-15)*

*Amoturoides breviscapus* Girault, 1932: 439:2, Holotype, F., AUSTRALIA (QMB).


**Diagnosis:** (Based on Bouček, 1978 and Narendran, 1994).

**Female:** Head and mesosoma mainly green, gaster black; eyes bare, small; head with clypeus almost flat, its margins truncate; antennal formula 11173; scape 2x as long as F₁; F₁ quadrate; F₂ to F₇ wider than long; clava a trifle longer than combined length of preceding two funicular segments; mesosoma elongate, notaulli conspicuous, dorsum of mesosoma and hind femur densely pubescent; frenal line absent; propodeum with foveate spiracular sulcus; sublateral areas dull, deeply cross-reticulate; propodeum with strong median carina intersecting large triangular depression which is subdivided by secondary carina; hind coxa, larger than half of hind femur; hind femur moderately wide, with a subapical tooth on ventral margin; straight hind tibia with truncated apex and with two unequal spurs; forewing extensively pubescent on distal two-third region; gaster with margins of tergites entire; ovipositor sheath broad and short, subexserted.

**Host:** Parasitic on Koralliomyia portentosa Mesnil (Tachinidae) in nests of wasps in India; parasitic in the nest of polistine wasp of Ropalidia plebiana Richards (in Australia) (Bouček, 1988).

**Distribution:** INDIA (Karnataka, Dharwar), Australia, Africa (Narendran, 1994).

**Remarks:** Only one species of the genus is reported from India.
Genus *Anneckeida* Bouček

*Anneckeida* Bouček, 1978:111; Type species: *Anneckeida watshami* Bouček; Holotype, F., BMNH.

**Diagnostic features:** Recognised by the presence of frenal groove; the enlarged hind femur having an outer row of regular, saw like teeth and an inner row of similar but much reduced teeth; the curved hind tibia that is apically truncate; ovipositor sheath and ovipositor strongly protruded as a spine, reaches up to the tip of gaster; convex clypeus and a malar keel; mesepisternum moderately reticulate; metapleuron densely hairy, slightly depressed and reticulate; forewing densely pubescent; antennal formula 11173.

**Host:** Unknown.

**Distribution:** Oriental & Afrotropical (Bouček, 1978).

*Anneckeida indica* Sureshan and Narendran

(Plate: 7 & Figures: 16-21)


**Redescription:**

**Female:** **Holotype:** Length: 2mm.

**Colour:** Body black with metallic bluish violet reflection; eyes dark cupreous; ocelli pale yellow; antenna testaceous, with clava slightly darker; all coxae and hind femora concolorous with body; fore and mid femora and all tibiae dark brown; tarsi testaceous, with tips dark brown; tegulae dark brown; wings hyaline with pubescence and veins pale brown.

**Head:** Uniformly microreticulate, with dense pubescence; in dorsal view head 2x as wide as long (25:12.5); relative measurements of POL:OOL:AOL= 8:1:6; POL 8x
OOL; maximum diameter of ocellus 4; in front view head width 1.3x height (29:23); width of fronto vertex at median ocellus 0.31x head width (9:29); malar space length 0.38x eye length; inner orbits converging upwards; ocelli in acute angular triangle, lateral ones nearly touching the eyes; anterior part of clypeus slightly convex, smooth, anterior margin rounded; relative L:W of antennal segments = scape 11:3, pedicel 7:4, annulus 2:2.5, F₁ 2:3, F₂ 2.5:5, F₃ 3:6, F₄ 2:7, F₅ 4:7.5, F₆ 4:8, F₇ 4:8.5, clava 10:8.5; length of clava equal to combined length of preceding 2.5 funicular segments; length of scape equal to combined length of pedicel plus annulus plus F₁; pedicel plus flagellum nearly half of head width (19:37).

**Mesosoma:** Dorsum of mesosoma with dense squamose reticulate sculpture and dense pubescence; collar nearly as broad as mesoscutum, anterior edge rounded, lateral panel depressed; mesoscutum width 2.3x length, with notauli complete, shallow; scutellum almost as long as broad, anterior margin separated by a deep groove; smooth frenal area taking up one third length; propodeum shiny, width 4.1x median length, with large reniform spiracles; median carina strong, intersecting broad triangular foveolate depression; callus densely hairy; mesepimeron smooth and shiny, with a crenate vertical furrow in the middle; mesepisternum moderately reticulate, slightly depressed posteriorly and delimited anteriorly by a sharp edge; prepectus small, shiny; metapleuron densely hairy, slightly depressed and reticulate; fore and mid legs normal; relative L:W of hind leg = coxa 22:16, femur 42:20, tibia 32:7, tarsi 32:4; tibial spine 7; hind coxae large, lateral face flat and bare with moderately raised reticulation, dorsal and ventral edge hairy; hind femur very large, length 2.1x width, reticulate, ventral edge with a comb of teeth, minute upto middle, larger and wider towards tip, length of long spur about 0.7x the breadth of tibial apex; hind tarsi length equal to length of hind tibia; forewing densely pubescent, length 2x width (80:40); relative L: of SMV: MV: PMV: STV= 24 :11 : 5.5 : 2; MV 2x PMV.

**Metasoma:** Gaster sessile, convex, length 1.8x width in dorsal view and length 1.2x that of hind femur in profile; T₁ large and bare; T₂ and T₃ visible only laterally; T₄
large and hairy, apical edge bare; ovipositor sheath and ovipositor strongly protruded as a spine, reaches up to the tip of gaster.

**Male:** Length 1.8-1.9mm; similar to female, but body slightly shorter with bluish violet gloss on mesosoma; T₁ less prominent and apex of gaster slightly different.

**Material examined:** 1F (Holotype) & 1M (from depository); INDIA: Kerala, Kannur, Kottiyoor, 11°58’N 75°45’E, 2.i.1995, Coll. P. M. Sureshan.

**Distribution:** Kerala: Kannur (Kottiyoor).

**Remarks:** This species differs from all other oriental species in the absence of conspicuous large tooth at the beginning of the comb of teeth on hind femora; It differs from *A. angustifrons* Bouček in having: 1) length of long spur of hind tibia about 0.7x the breadth of tibial apex (in *A. angustifrons* length of long spur of hind tibia about 1.1x the breadth of tibial apex); 2) frontovertex 0.31x head breadth (in *A. angustifrons* frontovertex 0.25x head breadth); 3) smooth frenal area of scutellum taking up one third length (in *A. angustifrons* smooth frenal area of scutellum taking up only a quarter of the length); 4) tip of T₄ only bare and apex of T₁ and base of T₄ not being in the same plane (in *A. angustifrons* apical third of T₄ bare, apex of T₁ and base of T₄ almost in the same plane); and 5) smaller in size (2mm) (in *A. angustifrons* size larger (2.5mm). Only one species is reported in this genus from India. This species is redescribed to include more characters for the easy identification of the species.
Genus *Chrysochalcissa* Girault

*Chrysochalcissa* Girault, 1915: 245: 327. Type species: *Chrysochalcissa olivacea* Girault, monotypic and original designation (QMB).

**Diagnostic Features:** Head and body stubmetallic; rounded; occipital carina distinct; scrobe shallow; lateral ocelli often nearer to median ocellus than to eye; malar space very short with fine groove; antennae inserted at or hardly below centre of face, antennal formula 11263; scape not reaching front ocellus; mesosoma with notauli shallow or vague; scutellum without frenal area; propodeum with deep postspiracular oblique sulcus; hind coxa distinctly larger than half of the ovoid femur; outer region with wide meshed reticulation, meshes often appearing as if umbilicate; hind femur on outer margin with shallow groove to receive tibia; outer ventral margin of femur with a row of small regular teeth; hind tibia with ventral side flat and delimited by an outer and inner carina, apex sinuate-truncate, ventrally produced into a narrow spine, between spine and tarsus two distinct spurs; forewing with MV longer than half of costal cell; gaster sessile, tergites with straight margins; T2 small and usually hidden under the T1; T3 and T4 large, apical one retracted; only apex of ovipositor sheath visible; male very similar to female except for more pubescent antennae and for different arrangement of apical sternites.

**Biology:** The members of this genus are parasitic in the eggs of certain pentatomorph heteroptera of relatively large size.

**Distribution:** This genus is found in Africa and in Indo-Australian region.

*Chrysochalcissa indica* Narendran

**(Plate: 32: C&D; Figures: 22-24)**


**Diagnosis:** (Based on original descriptions of Narendran, 1994).
**Female:** Length 1.9 mm; dark metallic blue, bright blue on head; antennae with scape testaceous, rest of antennae brown; eye pale cupreous; ocelli brown; legs with coxae and hind femur concolorous with mesosoma; fore and mid femora, mid and hind tibiae blackish brown; fore tibia and all tarsi testaceous (except the brown tip of tarsi); tegulae concolorous with mesosoma; wings hyaline, veins brown; uniformly reticulate, pubescence sparse but denser on vertex and behind; occiput broadened by a weak carina; ocelli large; POL 1.8x OOL; malar space 0.17x as long as eye; antennae inserted below middle of face; scrobe deep, not reaching front ocellus; antennal formula 11263; scape short, not reaching front ocellus; all funicular segments transverse, equal in length, with long white sensilla in single row; clava as long as preceding 3.5 segments combined; mesoscutum 1.45x as broad as long with notaular lines distinct anteriorly and fading posteriorly; scutellum about as long as broad, distinctly raised above propodeum; dorsellum smooth, propodeum with a shallow basal groove, subdivided by short carinulae; mesopleura reticulate with mesepisternum narrowed and depressed; metapleura reticulopunctate; prepectus very small with a faint ventral carina; fore and mid legs normal; hind femur 2.26x as long as wide; hind femur with a raw of small regular comb like teeth; gaster 1.12x as long as wide; T₁ and T₂ smooth, T₃ and T₄ with sparse hairs, those on fourth tergite in about four rows; only apex of ovipositor visible.

**Male:** Similar to female.

**Host:** Heteropteran eggs.

**Distribution:** Kerala & Tamil Nadu.


**Remarks:** Only one species is reported from Kerala.

It differs from *Chrysochalcissa physomeri* Bouček in having: 1) basal groove of propodeum differently sculptured from the rest (in *C. physomeri* basal groove of propodeum not differently sculptured from the rest of the region); 2) all funicular segments with conspicuously long sensilla in one row (in *C. physomeri* funicular...
segments 2 to 6 with conspicuously long sensilla in one row, first funicular segment without conspicuous sensilla); and 3) basal half of T4 with four rows of hairs (in C. physomeri basal half of T₄ with two rows of hairs).
Genus *Ecdamua* Walker


**Diagnostic features:** Metallic green, fore and mid legs (except coxae) yellow; long petiole and in the female with ovipositor more than 3x as long as the body; the pronotum is comparatively narrow and the propodeum strongly convex between the postspiracular deep sulci; scutellum with distinct longitudinal furrow on prefrenal part; frenum separated by a transverse sulcus, smooth and shiny; PMV almost as long as MV: STV forms a very acute angle and is not knobbed; pubescence on body moderately dense, yellowish white; small tooth on ventral side of hind femur near apex.

**Biology:** Members of this genus are parasitic on Sphecids and probably on other aculeate hymenoptera nesting in holes and in dead wood (Bouček).

**Distribution:** They are found distributed in Africa, Asia and in Australia.

*Ecdamua indica* Walker

*(Plate: 8)*


*Amonodontomerus indicus* Ahmad, 1946:5-6; Holotype ,F., INDIA (IARI); synonymised by Farooqi, 1985:262.

Redescription:

**Female: Plesiotype:** Length 3.45 mm; ovipositor 10.3 mm.

**Colour:** Generally metallic green; antennae blackish brown except scape and pedicel which are pale brownish; eyes dull grey without pubescence; all coxae concolorous with mesosoma fore and mid legs (except coxae) pale yellow; hind femora blackish brown with greenish reflection, tibia pale yellow at base and rest of portion pale brownish yellow, tarsi pale yellow; gaster black with metallic luster; petiole pale yellow; exerted part of ovipositor brownish black; wings sub hyaline, veins pale brown; pubescence on body moderately dense, yellowish white.

**Head:** 1.17x as broad as long; frons with shallow sparse punctures, interstices smooth and shiny; scrobe smooth and shiny; pubescence sparse on upper half of frons, moderately dense on lower half; relative measurements of AOL:POL:OOL = 6:17:11; POL 1.54x OOL; interocular space (minimum space between the compound eyes behind the front ocellus) a trifle over 3 times POL; eye length 1.4x scape; a flat smooth area in front of front ocellus present; antenna stout; scape not reaching front ocellus; relative measurements of L:W of antennal segments = scape 12:5, pedicel 4:3, F₁ 9:5, F₂ 9:5, F₃ 9:5, F₄ 8:5, F₅ 8:5.5, F₆ 7:5.5, F₇ 7:5.5, clava 14:6; clava 2x preceding funicular segment.

**Mesosoma:** Mesosoma transversely rugulose; a little wider than long; mesoscutum a little less than 1.5x as long as wide; scutellum 1.25x as long as wide (25:20), with distinct longitudinal furrow on prefrenal part; frenum separated by a transverse sulcus, smooth and shiny, apex rounded; propodeum almost smooth and convex; hind femur with a single small subapical tooth; hind tibia with two spurs distally; hind coxa and femur with long pubescence; relative measurements of L:W of hind leg = coxa 24:10, femur 33:6, tibia 33:4, tarsi 33:2; femur, tibia and tarsi of hind leg are of equal length; hind femur 5.5x as long as broad; hind coxa 2.4x as long as broad; forewing 2.5x as long as broad (100:40); relative measurements of SMV: MV: PMV: STV = 37:25:24:4; PMV 6x STV; PMV about as long as MV; basal vein thin, distinct.
Metasoma: Petiole smooth and distinct; gaster compressed from sides, not high anteriorly; exserted part of ovipositor approximately 3 x length of the body; gaster 3x petiole (33:11); ovipositor 14x gaster (6:84).

Male: Unknown.

Biology: Unknown.

Host: Probably aculeate Hymenoptera nesting in dead wood (Narendran, 1994).

Variation: Length varies from 3.4-3.65mm; ovipositor length varies from 10.2-10.6 mm.

Distribution: India: Kerala, Kozhikode, Malappuram.


Remarks: This is the only one species reported from Kerala. It differs from the other Indian species Ecdamua lehensis Sureshan in having 1) POL 1.54x OOL (in E. lehensis POL 2.13x OOL); 2) ovipositor approximately 3 x the length of the body (in E. lehensis ovipositor 4.1x length of the body); 3) forewing 2.5x as long as broad (in E.lehensis forewing 2.72x as long as broad); and 4) PMV 6x STV (in E. lehensis PMV 6.4x STV). This species is redescribed to include more characters for the easy determination of the species.
Genus *Palachia* Bouček

*Palachia* Bouček, 1970: 27 Type-species: *Palachia putchra* Bouček (original designation and monotypic, BMNH).

**Diagnostic features:** Clypeal margin with short, obtuse-angular, median tooth; malar groove not distinct; pubescence on mesosoma usually reduced and indistinct; notauli posteriorly meeting the scuto-scutellar sutures at the transscutal articulation, metasternum with propodeal foramen adjacent to the hind coxal foramina, frenal area of scutellum sometimes indicated; propodeum without distinct neck, without carina; spiracular sulcus and callus absent; its apex not reaching far from base of hind coxa in lateral view; hind femur with two or more irregular teeth; forewing with MV half of costal cell; MV 10x STV and 1.5-4x PMV; length of STV equal to its width; gastral petiole conspicuous; gaster compressed from sides; posterior margins of anterior tergites (atleast the first) incised in middle; ovipositor much longer than gaster; forewing with brown infuscation below parastigma.

**Biology:** Members of this genus are parasitic on mantid ootheca (Narendran, 1984).

**Distribution:** This genus is found in Africa and in India (Bouček, 1978).

**Key to Species of Palachia Bouček**

1. Forewing without brownish patch below parastigma; POL 3.66x OOL; exerted part of ovipositor 2.58x as long as hind tibia; ovipositor 2.25x as long as gaster (fig.28); prepectus and axilla with reticulations..................
   
   .............................. *P. hayati* Narendran & Sureshan

   = Forewing with brownish patch below parastigma; other characters partly or completely different................................................................. 2

2. POL 5.33x OOL; antenna black with pale yellow scape and with pale yellow distal three segments of funicle (Plate: 9:D); ovipositor 2.86x as long as gaster; exerted part of ovipositor 3.9x as long as hind tibia; prepectus and axilla almost shiny and smooth ....................... *P. mangalae* Narendran
= Characters partly or completely different .......................................................... 3

3. Area between lateral ocelli and inner margins of compound eyes clearly microsculptured (fig.38); exserted part of ovipositor 2.7x as long as hind tibia; gaster with fine reticulations; length of clava about combined length of 5.5 preceding funicular segments (fig.37). .................................................................

.................................................................................................................  \textit{P. punctigastra} Narendran & Sureshan

= Area between lateral ocelli and inner margins of compound eyes shiny and smooth; exserted part of ovipositor 4x as long as hind tibia; gaster smooth; length of clava equal to combined length of four preceding segments (fig.31)

.................................................................................................................  \textit{P. punctifronta} Narendran & Sureshan

\textit{Palachia hayati} Narendran & Sureshan

(Figures: 25-29)


\textbf{Diagnosis:} (Based on original descriptions of Narendran & Sureshan, 1989).

\textbf{Female:} Length : 1.64 mm, ovipositor sheaths: 1.16 mm; head metallic green, eyes reddish, antenna pale yellow with clava and preceding funicular segment black, first and second funicular segments slightly brownish; ocelli reddish-brown; POL 3.66x OOL; pronotum, sides of mesoscutum, scutellum, mesopleura, metapleura, middle portion of propodeum and first gastric tergite metallic-green; middle portion of mesoscutum, metanotum and basal portion of propodeum metallic greenish-blue; all legs pale yellow; gaster except first tergite brown; first tergite metallic-green; ovipositor pale brownish yellow; vertex and frons distinctly microsculptured; temples clearly visible from dorsal side; moderately large, without pubescence; malar groove indicated faintly; scape not reaching front ocellus; length of clava equal to combined length of preceding four funicular segments; clava with micropilosity underneath; prepectus and axilla with reticulations; mesoscutum length 24, maximum width 45 ; notaulices somewhat distinct, not at all deep;
relative measurements of L:W of scutellum 24: 33; slightly convex centrally, apical margin rounded with rim not upturned; frenal area not marked off; relative L of SMV: PMV: STV of forewing = 35:22:12:4; MV 1.83x PMV; PMV 3x STV; hind leg with two conspicuous widely separated teeth, distal tooth followed by minor irregular teeth; petiole hardly longer than broad, smooth; body of gaster almost smooth, sparsely rugulose in a few places, first tergite relatively very small, metallic-green with microsculptures, incised medially; second tergite slightly incised medially; ovipositor 2.25x as long as gaster; ovipositor 2.58x as long as hind tibia (168:65).

**Male:** Unknown.

**Biology:** Unknown.

**Distribution:** INDIA: Kerala.

**Remarks:** This species comes near to *P. mangalae* Narendran in the key to Indian species by Narendran (1994) in general appearance but differs from it in having: 1) Prepectus and axilla with reticulations (in *P. mangalae* prepectus and axilla almost shiny and smooth); 2) forewing without brownish patch at parastigma (in *P. mangalae* forewing with brownish patch at parastigma); 3) exerted part of ovipositor 2.58x as long as hind tibia (in *P. mangalae* exerted part of ovipositor 3.9x as long as hind tibia); 4) POL 3.66x OOL (in *P. mangalae* POL 5.33x OOL); 5) ovipositor 2.25x as long as gaster (in *P. mangalae* ovipositor 2.86x as long as gaster); 6) head metallic green, pronotum, sides of mesoscutum, scutellum, mesopleura, metapleura, middle portions of propodeum and T1 metallic green (in *P. mangalae* generally dark metallic, dark cupreous on pronotum, mesoscutum, scutellum and propodeum, with violet gloss on vertex, metallic green on frons, axillae and metanotum); 7) antenna pale yellow with clava and preceding funicular segments slightly brownish (in *P. mangalae* antenna black with pale yellow scape and with pale yellow distal three segments of funicle); 8) all legs pale yellow (in *P. mangalae* legs pale yellow with ventral side of the basal part of hind coxa dark metallic); and 9) gaster except T1 brown, T1 metallic green (in *P. mangalae* gaster blackish brown with slight metallic tinge).
**Palachia mangalae** Narendran

(Plate: 9)

*Palachia mangalae* Narendran, 1984:110, F., INDIA, Kerala, Calicut University Campus (QMB).

**Redescription:**

**Female:** *Plesiotype:* Length 1.87-2.04 mm, plus ovipositor sheaths 2.1-2.18 mm.

**Colour:** Generally dark metallic; dark cupreous on pronotum, mesoscutum, scutellum, and propodeum with violet gloss on vertex, metallic greenish on frons, axillae and metanotum; antenna black with pale yellow scape and with pale yellow distal three segments of funicle; legs pale yellow with ventral side of basal part of hind coxa dark metallic; gaster blackish brown with slight metallic tinge; wings sub hyaline with a small brownish patch at parastigma; pubescence inconspicuous.

**Head:** A little more than 1.5 x as broad as pronotum in dorsal view, a trifle broader than long; vertex slightly elevated between posterior ocelli but without distinct crest; temples dorsally almost invisible; eyes large, without pubescence; POL: OOL: AOL= 16: 3: 10; POL 5.33x OOL; interocular space (minimum width between the compound eyes behind front ocellus) a little over 1.5 times POL; scrobe not smooth, microsculptured; frons with rugose striations on lower half; malar groove indistinct; antenna with scape almost reaching front ocellus; relative measurements of L:W of antennal segments = scape 30:6, pedicel 10:4, F1 7:3, F2 7:3, F3 7:4, F4 7:5, F5 7:5, F6 6:6, F7 6:7, clava 28:10; length of clava equal to combined length of first 4 funicular segments; clava a little longer than the combined length of four preceding segments, underneath with micropilosity areas.

**Mesosoma:** Mesosoma with dense reticulate punctures except on axillae; mesoscutum 1.53x as broad as long; notaulices distinct, not deep; prepectus and axilla almost shiny and smooth; scutellum longer than wide, centrally convex, apical margin rounded with rim not upturned; frenal area not marked off; dorsellum with distinct reticulate punctures; relative measurements of L:W of hind leg = coxa 22:7,
femur 38:8, tibia 28:3, tarsi 21:1.5; hind femur 1.72x as long as hind coxa; hind femur with two conspicuous and widely separated teeth, distal tooth followed by serration; forewing 3.1x as long as its maximum width (62:20); relative measurements of SMV: MV: PMV: STV = 20:16:5:3; MV 3.2x PMV.

**Gaster:** Gastral petiole dorsally hardly longer than broad, smooth; body of gaster almost smooth, sparsely rugulose in a few places; first tergite incised medially; exerted part of ovipositor distinctly 3.9x as long as hind tibia (86:22); ovipositor 2.86x as long as gaster (86:30); ovipositor 1.22x as long as body (86:70).

**Male:** Length 1.98 -1.99 mm; similar to female but colour generally duller and sculpture slightly more deep; antenna completely brown; gaster brown with slight metallic gloss; scape reaching front ocellus.

**Biology:** Parasitic on ootheca of mantids.

**Distribution:** INDIA: Kerala, Karnataka.


**Remarks:** This species comes near *P. hayati* Narendran & Sureshan in the key to species by Narendran (1994) in general appearance but differs from it in having: 1) Prepectus and axilla almost shiny and smooth (in *P. hayati* prepectus and axilla with reticulations) ; 2) forewing with a small brownish patch at parastigma (in *P. hayati* forewing without brownish patch at parastigma) ; 3) exerted part of ovipositor 3.9x as long as hind tibia (in *P. hayati* exerted part of ovipositor 2.58x as long as hind tibia); 4) ovipositor 2.86x as long as gaster (in *P. hayati* ovipositor 2.25x as long as gaster ); 5) POL 5.33x OOL (in *P. hayati* POL 3.66x OOL); 6) generally dark metallic, dark cupreous on pronotum, mesoscutum, scutellum and propodeum, with violet gloss on vertex, metallic green on frons, axillae and metanotum (in *P. hayati* head metallic green, pronotum, sides of mesoscutum, scutellum, mesopleura, metapleura, middle portions of propodeum and T1 metallic
green); 7) antenna black with pale yellow scape and with pale yellow distal three segments of funicle (in *P. hayati* antenna pale yellow with clava and preceding funicular segments slightly brownish); 8) legs pale yellow with ventral side of the basal part of hind coxa dark metallic (in *P. hayati* all legs pale yellow); and 9) gaster blackish brown with slight metallic tinge (in *P. hayati* gaster except T₁ brown, T₁ metallic green). This species is redescribed to include more characters for the easy determination of the species.

*Palachia punctifronta* Narendran & Sureshan

*(Figures: 30-35)*


**Diagnosis:** (Based on original descriptions of Narendran & Sureshan, 1989).

**Female**: Length 1.99-2.42 mm, plus ovipositor 2.71 to 3.27 mm; generally metallic-green, cupreous on pronotum, mesoscutum, scutellum and middle part of propodeum, brightly bluish on inner sides of lateral lobes of mesoscutum, on lower and upper part of propodeum; antenna pale yellow, with first three and distal most funicular segments and basal part of clava black, pedicel testaceous; fore and hind legs testaceous with fore and mid coxae white, hind coxa pale yellow with black patches on the sides, hind femora testaceous, hind tibia dark brown; gaster dark brown with slight metallic tinge on first tergite; wings subhayaline, forewing with a brownish patch below parastigma; area between lateral ocelli and inner margins of compound eyes shiny and smooth; vertex together with frons and lower face complete reticulate; eyes without pubescence; scrobe sculptured; malar groove indistinct; scape hardly reaching front ocellus, length of clava equal to combined length of four preceding segments, with micropilosity beneath; scutellum about as long as mesoscutum dorsally, more or less flat; frenal area not marked; dorsellum with distinct reticulate punctures; propodeum with rather large reticulation, fairly convex, medi ally a little shorter than mesoscutum, side margin not deep; prepectus
reticulated; hind femur with two conspicuous teeth, widely separated, distal tooth followed by serration; forewing 2.93x as long as wide (94:32); relative L of SMV: MV: PMV: STV = 40:25:9:5; MV 2.77x PMV; PMV 1.8x STV; forewing with pubescence inconspicuous; petiole longer than broad, first and second tergites incised medially; body of gaster almost smooth; exserted part of ovipositor about 4x as long as hind tibia.

Male: Unknown.

Biology: Unknown.

Distribution: INDIA: Kerala.

Remarks:

This species comes near to Palachia punctigastra Narendran & Sureshan in the key to Indian species of Palachia Bouček by Narendran (1994) but differ from P. punctigastra in having: 1) exserted part of ovipositor about 4x as long as hind tibia (in P. punctigastra exserted part of ovipositor about 2.7x as long as hind tibia); 2) length of clava equal to combined length of four preceding segments (in P. punctigastra length of clava about combined length of 5.5 preceding funicular segments); 3) MV 2.77x PMV (in P. punctigastra MV 3x PMV); 4) gaster completely smooth and not reticulated (in P. punctigastra gaster with complete reticulation); and 5) first gastral tergite without any metallic colour (in P. punctigastra metallic blue on dorsal part of first tergite).

*Palachia punctigastra* Narendran & Sureshan

(Figures: 36-40)


Diagnosis: (Based on original descriptions of Narendran & Sureshan, 1989).
**Female:** Length: 1.99 mm, ovipositor 1.85 mm; generally metallic-green, brassy-yellow on pronotum, scutellum and middle part of propodeum; brownish on upper part of frons and vertex; violet gloss on middle lobe, inner sides of lateral lobes of mesoscutum, and upper and lower parts of propodeum; antenna black with scape and distal three funicular segments yellow; legs and lateral propleural flange just above fore coxa testaceous; side of hind coxa black; gaster dark brown with an area of metallic blue on dorsal part of first tergite; ovipositor sheaths pale yellow; wings subhayanline, forewing with a brownish patch below parastigma; area between lateral ocelli and inner margins of compound eyes clearly microsculptured; vertex and frons with dense reticulations, reticulation on lower face shallow; scape reaching front ocellus, length of clava about combined length of 5.5 preceding funicular segments with a broad area of micropilosity beneath; mesosoma with dense reticulate punctures, reticulation on axilla elongated; scutellum about as long as middle lobe of mesoscutum dorsally, more or less flat, frenal area not marked; dorsellum with reticulation lengthened; propodeum about 1.2x as long as scutellum dorsally, with conspicuous reticulation; forewing with pubescence short; gaster with fine reticulations; relative L of MV: PMV: STV = 21:7:2; MV 3x PMV; PMV 3.5x STV; hindcoxa with an area of dark metallic refringence and microsculptures dorsolaterally; petiole about as long as wide in dorsal view; first tergite with a metallic bluish-green spot on the basal part dorsally and faint sculptures, incised medially; hypopygium reaching apex of gaster; exserted part of ovipositor about 2.7 x as long as hind tibia.

**Biology:** Unknown.

**Distribution:** INDIA: Kerala, Karnataka & Tamil Nadu.

**Remarks:**

This species comes near to *Palachia punctifronta* Narendran & Sureshan in the key to Indian species of Palachia Bouček by Narendran (1994) but differ from *P. punctifronta* in having: 1) POL 4.5x OOL (in *P. punctifronta* POL 4.5x OOL); 2) exserted part of ovipositor about 4x as long as hind tibia (in *P. punctifronta* exserted part of ovipositor about 2.7 x as long as hind tibia); 3) length of clava equal to
combined length of four preceding segments (in *P. punctifronta* length of clava about combined length of 5.5 preceding funicular segments); 4) MV 2.77x PMV (in *P. punctifronta* MV 3x PMV); 5) gaster completely smooth and not reticulated (in *P. punctifronta* gaster with complete reticulation); and 6) first gastral tergite without any metallic colour (in *P. punctifronta* metallic blue on dorsal part of first tergite).
Genus *Palmon* Dalman


**Diagnostic characters:** The genus *Palmon* Dalman resembles the genus *Podagrion* Spinola; body metallic green; anellus longer than wide; clava prominent; metasternum with two submedian carinae which may be broken or irregular and hind coxal cavities separated at their narrowest point by a sclerotised area much less than diameter of the cavity; wings hyaline with or without infumation or brownish patch or stain near STV; gaster with distinct petiole; hind femur with irregularly arranged ventral teeth; ovipositor longer than body.

**Host:** Mantid ootheca.

**Distribution:** Worldwide.

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**Key to Species of *Palmon* Dalman**

1. Ovipositor 2x or more than 2x as long as rest of body (Plate: 10:A); hind coxa yellow with a blackish patch on dorsal side of basal half; forewing without an infuscation attached to STV (Plate:10:I) ..... *P. orchesticus* (Masi)

   = Ovipositor much shorter than 2x (less than 1.6x) length of rest of body; other characters partly or completely different .................................................. 2

2 Propodeum without a strong cross carina (fig.43); ovipositor 2.92x as long as gaster and 1.4x as long as rest of body; ovipositor 3.9x as long as hind tibia; clava with broad apex (fig.42); length of antennal clava 1.3x flagellum; MV 3.44x PMV; PMV 1.8x STV .............................. *P. alfredi* Sureshan

   = Propodeum with a strong cross carina; ovipositor 2.2x as long as gaster and 1.11x as long as of rest of body; ovipositor 4.25x as long as hind tibia; clava
with apex pointed, length of antennal clava 1.15x flagellum (fig.45); MV 2.7x PMV; PMV 2.33x STV) .........................  

*P. kottiyooricus* Narendran

**Palmon alfredi** Sureshan

(Figures: 41–43)

*Palmon alfredi* Sureshan, 2003: 101:241-245; Holotype F., NZSI.

**Diagnosis:** (Based on original descriptions of Sureshan, 2003).

**Female:** Body length 2.8 mm, ovipositor, 3.9 mm; metallic blue, bright green on face and gena; antennae testaceous except on clava brown; gaster brown, paler on ventral part and a narrow sub median band dorsally; ovipositor sheaths dark brown; fore and mid legs uniformly yellow; hind legs brown except basal half of coxae blackish on dorsal part; wings sub hyaline, veins and pubescence brown; occiput with a fine carina; eyes separated by a distance equal to their length; malar space length in profile 5, malar grooves distinct; gena with fine posterior carina; clava 1.3x as long as flagellum; prepectus almost polished; hind coxae with moderate reticulation on basal part; hind femur with 8 teeth; forewing 3.2x as long as its maximum width; pubescence on forewing almost complete except on a narrow posterobasal strip; relative lengths of SMV: MV: PMV: STV = 42: 31: 9:5; MV 3.44x PMV; PMV 1.8x STV; gaster shiny, 0.9x as long as rest of the body (without ovipositor), ovipositor 1.4x as long as rest of the body; ovipositor 2.92x gaster and 3.9x as long as hind tibia.

**Host:** Unknown.

**Distribution:** Kerala : Wayanad.

**Remarks:** It comes near to *Palmon kottiyooricus* Narendran in the key to species by Narendran & Abhilash (2009), but differs from it in having: 1) Ovipositor 1.4x as long as body (in *P. kottiyooricus* ovipositor 1.11x as long as body); 2) propodeum without a strong carina (in *P. kottiyooricus* propodeum with a strong carina); 3)
ovipositor 2.92x as long as gaster (in \textit{P. kottiyooricus} ovipositor 2.2x as long as gaster); 4) clava 1.3x as long as flagellum (in \textit{P. kottiyooricus} clava 1.15x as long as flagellum); 5) ovipositor 3.9x as long as hind tibia (in \textit{P. kottiyooricus} ovipositor 4.25x as long as hind tibia); 6) MV 3.44x PMV; PMV 1.8x STV (in \textit{P. kottiyooricus} MV 2.7x PMV; PMV 2.33x STV); 7) hind femur with 8 teeth (in \textit{P. kottiyooricus} hind femur with 9 teeth; and 8) clava with apex broad (in \textit{P. kottiyooricus} clava with apex pointed).

\textit{Palmon kottiyooricus} Narendran

\textit{(Figures: 44-46)}

\textit{Palmon kottiyooricus} Narendran \& Abhilash, 2009:109 (2) :1-12; Holotype F., NZSI.

\textbf{Diagnosis:} (Based on Narendran \& Abhilash, 2009)

\textbf{Female:} Length 2.18 mm; ovipositor length 2.42 mm; head and mesosoma dark metallic green; eyes reddish brown; ocelli dark brown; scape and pedicel pale yellow; anellus and funicle pale brownish yellow, mandible brown; fore and mid legs pale yellow; hind coxa pale yellow with a small dark patch dorsobasally; hind femur pale yellow with apical one-fourth brown, teeth black; hind tibia pale brownish yellow; hind tarsus pale yellow; wings hyaline with veins pale brown; metasoma pale brown with dark circular parts basally and subapically; basal dark part with slight metallic green refringence; ovipositor sheath dark brown; vertex and frons moderately reticulate; POL 3.33x OOL; POL 2x AOL; occiput with a fine carina; scrobe reticulate reaching front ocellus; margin ecarinate; antennal flagellum plus pedicel 1.57x as long as width of head in front view; scape almost reaching front ocellus; length of scape equal to combined length of first 3 funicular segments; clava 1.15x as long as flagellum; mesosoma 1.8x as long as broad; uniformly provided with setigerous pits; pronotum 0.33x as long as its width; mesoscutum 0.59x as long as its width, 2x as long as pronotum; scutellum length subequal to its width, subequal in length to mesoscutum; front margin of metapleuron straight; hind
coxa with a moderately spaced somewhat long setae on dorsal margin in side view; hind femur length 2.27x its width (including teeth) ventral margin with 9 teeth; forewing 3.5x as long as broad (70:20); MV 2.7x PMV; PMV 2.33x STV; metasoma (excluding ovipositor) longer than mesosoma (41 : 35), subequal in length to combined length of head plus mesosoma; hypopygium reaching apex of gaster; ovipositor sheath 1.09x as long as body (85: 78); ovipositor 2.2x as long as gaster (85:38), 4.25x as long as hind tibia (85:20).

**Male:** Unknown.

**Distribution:** Kerala: Kannur.

**Remarks:** It comes near to *Palmon alfredi* Sureshan in the key to species by Narendran & Abhilash (2009), but differs from it in having: 1) Ovipositor 1.11x as long as body ( in *P.alfredi* ovipositor 1.4x as long as body) ; 2) propodeum with a strong carina ( in *P. alfredi* propodeum without a strong carina); 3) ovipositor 2.2x as long as gaster ( in *P. alfredi* ovipositor 2.92x as long as gaster); 4) clava 1.15x as long as flagellum (in *P. alfredi* clava 1.3x as long as flagellum); 5) ovipositor 4.25x as long as hind tibia ( in *P. alfredi* ovipositor 3.9x as long as hind tibia); 6) MV 2.7x PMV; PMV 2.33x STV ( in *P. alfredi* MV 3.44x PMV; PMV 1.8x STV) ; 7) hind femur with 9 teeth ( in *P. alfredi* hind femur with 8 teeth; and 8) clava with apex pointed ( in *P. alfredi* clava with broad apex).

**Palmon orchesticus** Masi

(Plate: 10)


**Palmon orchesticus** (Masi): Grissell, 1995:228, new combination of *Pachytomoides orchesticus*.

**Redescription:**

**Female: Plesiotype:** Length 4.16-4.5mm (excluding ovipositor), ovipositor length 10mm.

**Colour:** Head and thorax metallic green with thorax slightly darker; eyes brownish red; ocelli brownish yellow; antenna yellowish brown with club darker and scape paler; mandibles and distal margin of clypeus brown; fore and mid legs including coxae yellow; hind coxa yellow with blackish patch on dorsal side of basal half; hind femur brownish yellow; hind tibia yellowish brown; hind tarsi brownish yellow; gaster yellowish brown with blackish brown colour on dorsal and lateral sides of T1 and on posterior half of gaster; wings hyaline without infumation or brownish patch or stain near STV; veins brown; pubescence yellowish white.

**Head:** In dorsal view 2.7x as wide as long (60:22); in anterior view 1.13x as wide as long (60:53); relative length of AOL:POL:OOL= 8:15:5; POL 3x OOL; antenna located above middle of frons, nearer to anterior ocellus than to clypeal margin; malar groove 0.28x as long as eye length (10:35); relative measurements of L:W of antennal segments = scape 18:3, pedicel 4:3, annulus 3:2.5, F1 5:3, F2 5:4, F3 5:4, F4 5:4, F5 4:4, F6 4:4.5, F7 4:5, clava 29:6; length of scape equals to combined length of anellus plus first three funicular segments; length of clava equal to preceding 6.5 segments combined.

**Mesosoma:** Mesosoma with minute pubescence, longer on scutellum; pronotum, mesoscutum and scutellum closely and distinctly sculptured except frenal area of scutellum where it is weakly sculptured or rugulose; scutellum and propodeum essentially in same plane; propodeum without median carina, irregularly pitted in median region, closely pitted in sides, metasternum with two submedian carinae which diverge slightly toward posterior side, hind coxa shorter than hind femur; hind femur with seven teeth ventrally, 2nd and 3rd smaller, 6th largest; relative measurements of L:W of hind leg = coxa 38:6, femur 42:21, tibia 42:4, tarsi 25:2;
hind femur 1.1x hind coxa; hind femur 2x as long as broad; forewing 2.89x as long as broad (110:38); relative length of SMV: MV: PMV: STV = 40:28:9:4; MV 3.1x PMV; PMV 2.25x TV; setae of forewing evenly distributed all over but slightly weaker in basal part.

**Metasoma:** Gaster with T₁ joining petiole at condyle near its insertion at foramen., gaster shorter than combined length of head and mesosoma in lateral view; gaster 1.55x hind femur (28:18); ovipositor 4.3x gaster (120:28); ovipositor 2.4x as long as body (120:50).

**Variation:** The metallic green colour may be slightly variable to metallic green with golden green tinge; hind coxa black colour may extend to a longer area in some specimens; hind femur may become a little more brownish in some specimens; the ovipositor length may vary from 3 to 5x length of body; ventral teeth of hind femur vary from 8 to 9 in female.

**Male:** Length 2.17mm; it differs from female by lesser number of teeth and in smaller clava.

**Host:** Ootheca of *Humbertiella similis* (Mantidae).

**Biology:** 5F emerged from the Ootheca of *Humbertiella similis*.

**Distribution:** India: Kerala, Orissa & Tamil Nadu.


**Remarks:** It differs from all other species of Palmon in the key to Oriental species of *Palmon* Dalman by Narendran and Abhilash (2010) in having: 1) Ovipositor 2.4x
as long as body; 2) POL 3x OOL; 3) MV 3.1x PMV; 4) gaster 1.55 x hind femur; 5) ovipositor 4.3x gaster; and 6) hind femur 2x as long as broad. This species is redescribed to include more characters for the easy recognition of the species.
**Podagriomicron gen. nov.**

**Diagnosis:**

**Female:** Head convex anteriorly; lower half of frons and face with dense silvery white setal scales; antennae inserted at middle of frons; apex of clypeus straight; occipital carina present; malar sulcus present; antennal formula 11173; anellus elongate, trumpet-mouth shaped; clava formed of 3 segments indicated by distinct annulations that completely encircle the clava; notauli present, but not well defined; frenal line absent; metasternum with two submedian carinae; mesepimeron not bulged over metapleuron; forewing without wing tracts; speculum present; midtibial spur not thread like, shorter than basitarsus; hind coxa with no seta dorsally or on other parts; petiole shorter than width of hind tibia; T₁ to T₃ notched posteriorly; ovipositor sheaths shorter than gaster.

**Etymology:** The genus name *Podagriomicron* is an anagram of *Micropodagrion* Ferriere. Neuter gender.

The new genus belongs to the tribe Podagrionini. It comes close to the genus *Micropodagrion* Ferriere in the key to genera of world Toryminae by Grissell (1995), but differs from it in four distinct characters: 1) Frons with distinct silvery setal scales (in *Micropodagrion* frons with no such setalscales); 2) Malar sulcus present (absent in *Micropodagrion*); 3) Midtibial spur not thread like, bare and not longer than basitarsus (in *Micropodargion* midtibial spur thread like, longer than basitarsus) and 4) hind coxa without dorsal setae (in *Micropodagrion* hind coxa with dorsal setae present).
KEY TO WORLD GENERA OF PODAGRIONINI
(Modified from Grissell, 1995)
(Figures: 51-62)

1  Hind tibia with apex eongately produced, the truncation atleast 2x width of tibia and with spur at base of truncation near basitarsus (fig.53), (oldWorld) .......................................................................................................................  Podagrionella Girault

=  Hind tibia with apex not elongately produced (fig.54); the truncation subequal in length to width of tibia and with spur at apex of truncation .......................................................................................................................................................... 2

2(1)  Mesepimeron bulged outwardly, raised into lamelliform Plate: above surface of metapleuron and overhanging (and partially obscuring) metasternal shelf (fig.55); forewing with well delimited spot (Australian) ............... .......................................................................................................................  Propachytoimoides Girault

=  Mesepimeron not bulged, abutting metapleuron and not overhanging metasternal shelf (fig.56); forewing without delimited spot, rarely with diffuse stain .................................................................................................................................................. 3

3(2)  Antennal clava ventrally divided into three clavomeres, of which only apical clavomere has micropilar area (fig.57), (Afrotropical) .................. .................................................................................................................................  Mantiphaga Ferriere

=  Antennal clava with ventral divisions, obscured by micropilosity) (fig.58), but if three clavomeres visible, then micropilar area covers at least apical 2 clavomeres (fig.59), (latter state most common in males) ......................... 4

4(3)  Midtibia with spur thread like, bare, longer than basitarsus(fig.60); anellus about as long as wide and trumpet mouth- piece shaped in profile (fig.61), (Afrotropical) .............................................  Micropodagrion Ferriere

=  Midtibia with spur, thickened, shorter than basitarsus, mostly setose (fig.49); anellus cylindrical, either elongate or transverse; if as long as wide and trumpet mouth- piece shaped in profile, then lower frons and face with scale like silvery setal scales ........................................................................................................... 5
5(4) Lower half of frons and face with silvery setal scales (Plate: 11:C); metasternum with two submedian carinae (fig.52) ........................................
............................................................................................................  Podagriomicron gen. nov.
= Lower half of frons without any such setal scales, metasternum variable .. 6
6(5) Anellus transverse; forewing with distinct vein tracts, cells and Speculum; metasternum variable, but often with single median carina between metacoxal foramina (World wide) .............................. Podagrion Spinola
= Anellus as long as broad; forewing entirely covered with setae, without vein tracts, cells or speculum; metasternum with two submedian carinae between metacoxal foramina, the carinae sometimes irregular or broken ...................
............................................................................................................ Palmon Dalman

Data Matrix

The new genus Podagriomicron can be separated from the seven closely related genera by the character state matrix:

1 Anelli width: length:
   State 1: Elongate, trumpet mouth-piece shaped in profile.
   State 2: Transverse.
   State 3: As long as broad.

2 Clava segments:
   1. Formed of 3 segments indicated by distinct annulations that completely encircle, no ventral micropiosity.
      2. Clava formed by 3 segments indicated by indistinct or poorly delimited annulations confined to dorsum of clava and with an area of micropilosity present ventrally.

3 Malar sulcus:
   1. Present.
   2. Absent.
4 Frontal setal scales:
   1. Present.
   2. Absent.

5 Wing tracts:
   1. Present.
   2. Absent.

6 Speculum:
   1. Present.
   2. Absent

7 Mid tibial spur:
   1. Thread like, longer than basitarsus.
   2. Not thread like, shorter than basitarsus.

8 Hind tibial apex:
   1. Elongately produced, the truncation at least 2x width of tibia and with spur
      at base of truncation near basitarsus.

      2. Hind tibia with apex not elongately produced, the truncation subequal in
      length to width of tibia and with spur at apex of truncation.

9 Hind coxal setae:
   1. Hind coxa with no setae dorsally.
   2. Hind coxa with a few, widely spaced long setae.
   3. Hind coxa more or less dorsally covered with stout setae.

10 Notauli:
   1. Well defined.

   2. Weakly or faintly represented, often indistinct or present on anterior part,
      which fades away posteriorly.
11  Metasternum:

1. With 2 submedian carinae between metacoxal foramina.
2. With single median carina.

12  Mesepimeron:

1. Bulged outwardly; raised into lamelliform Plate: above surface of metapleuron and overhanging metasternal shelf.
2. Not bulged, abutting metapleuron, and not overhanging metasternal shelf.

13  Forewing:

1. With a darkened spot below MV.
2. Without a spot below MV.

Character State Matrix for 7 Genera resembling *Podagriomicron* gen. nov.

<table>
<thead>
<tr>
<th>No.</th>
<th>Genus</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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**Podagriomicron wayanadense** gen. nov., sp. nov.

(Plate: 11 & Figures: 47 – 51)

**Description:**

**Female: Holotype:** Length 2.43mm.

**Colour:** Head metallic green with silvery white dense sensillae on lower frons and face; eyes chocolate brown; ocelli black brown; antenna brownish yellow with clava slightly darker and scape and pedicel yellowish; mesosoma metallic green; wings hyaline, veins pale brownish yellow; legs including coxae pale yellow with hind femoral teeth and pretarsi black; metasoma brownish yellow with T₁ and a large dark patch on either side extending from posterior part of T₂ to T₃; ovipositor sheath brown.

**Head:** Width in anterior view 1.1x its height; width in dorsal view 1.8x its length; occipital carina present; POL 5.5x OOL; AOL 3x OOL; LOL 2x OOL; vertex and frons distinctly reticulate; lower frons and face slightly convex and with characteristic unique, silvery dense setal scales; scrobe not reaching anterior ocellus; clypeal margin straight; malar space 0.3x eye height in sideview; malar sulcus distinct; mandibles minutely tridenate; antenna inserted well above level of ventral margin of eyes; distance between toruli and clypeal margin 0.64x distance between anterior ocellus and lower margin of antennal toruli; antennal formula 11173; each funicular segment with 1-3 sensillae; scape not reaching anterior ocellus; relative L: W of antennal segments = scape 28: 7; pedicel 12: 7; anellus 4: 3; F₁ 8: 7; F₂ 7: 7; F₃ 9: 7; F₄ 8: 7; F₅ 11: 7; F₆ 10: 7; F₇ 11: 7; length of scape equal to combined length first 3.5 funicular segments; clava 26: 10; length of clava about combined length of 2.5 preceding segments.

**Mesosoma:** Mesosoma 1.5x as long as broad; uniformly reticulate with raised margins and sparsely pubescent; pronotum a little over 2x as wide as its length; mesoscutum a little wider than pronotum, a little more than 2x its median length; notauli complete, but weakly represented, complete, scutellum wider than long; frenum not delimited; propodeum distinctly reticulate with an inverted ‘Y’ shaped
carinae; spiracle unusually large, its diameter 3x distance between it and metanotal margin, 0.6x distance between spiracle and posterior margin of propodeum; prepectus with a deep pit on dorsal part; smooth on other part; mesepisternum reticulate with a deep pit on dorsal side; upper mesepimeron mostly smooth and shiny; lower epimeron weakly reticulate; upper epimeron partly separated from lower epimeron by a deep pit; anterior margin of metapleuron straight; relative L:W of hind leg = coxa 26:11, trochanter 7:5, femur 35:13, tibia 38:5, tarsi 30:3; hind coxa without setae on dorsal side; hind femur 2.7x its width (excluding teeth); ventral margin with 6 teeth of varying size, 4th smallest; forewing 2.28x as long as wide (80:35); speculum present; relative length of veins SMV: MV: PMV: STV = 43: 32: 8: 5.

**Metasoma:** Metasoma (excluding exserted part of ovipositor sheath) as long as mesosoma; hypopygium reaching a little beyond middle length of gaster; ovipositor sheath shorter than gaster, gaster 1.5x as long as gaster (53:35); ovipositor 1.25x as long as hind tibia (35:28).

**Male:** Unknown.

**Biology:** Unknown.

**Variation:** Female length varies from 2.43-2.6mm; ovipositor 1.08 to 1.25x as long as hind tibia; eyes and ocelli chocolate brown to pale reflecting yellow.

**Etymology:** Named after the district from which it was collected (Neuter Gender).

**Distribution:** India: Kerala: Wayanad & Kozhikode.

Genus *Podagrion* Spinola

*Podagrion* Spinola, 1811:147. Type species: *Podagrion splendens* Spinola (monotypic).


*Cyanostola* Saussure 1890: Pl 15, fig.30 .Type species: *Cyanostola coerulae* Saussure (monotypic, no type, illustration only).Synonymized by Ferriere, 1955:207.

*Coquerelia* Sassure 1890: Pl 20, fig.7. Type species: *Coquerelia insidiosa* Sassure (monotypic,no type, illustration only).Synonymized by Masi, 1940:251.


**Diagnostic features:** Head convex anteriorly, almost round, frons slightly depressed; antennae inserted at middle of frons, long; formula 11173, anellus wider than long; club dilated; scutellum without delimited frenal area; propodeum with a pair of developed submedian carinae which are united at anterior part and in inverted 'V' shape or forming median carina at anterior part an inverted 'Y' shape; (this character of propodeum is of specific value. In some species these submedian carinae are weaker and sometimes they do not reach the base of propodeum and then may take the form of an incomplete transverse crest which may join partial longitudinal carinae on sides; several intermediate forms also exist); the apical spine of hind tibia less than 2x the tibial width; hind coxa and femur swollen; hind femur with a row of irregular teeth on ventral side; gaster slightly compressed from sides; first and a few tergites of gaster notched medially; ovipositor always much longer than gaster.

**Biology:** Members of this genus are parasitic in oothecae of mantids. (Bouček,1988; Narendran, 1994)

**Distribution:** They are found in Asia, Africa, Europe, Australia and America.

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**Key to species of Podagrion Spinola**

1. Ovipositor longer than body .................................................................4

   = Ovipositor shorter than body ..........................................................2

2. Hind femur with more than six teeth .................................................3

   = Hind femur with six teeth, second and fourth smaller than the rest( fig.72); MV 4.86x PMV ; POL 4.66x OOL; ovipositor 0.86x as long as body; ovipositor 1.8x gaster; length of clava equal to combined length of four preceding segments ................................. **P. malabarensis** Narendran

3. Hind femur with eight teeth, third and sixth are smaller than the rest( fig.69); MV 2x PMV; POL 2.2x OOL; ovipositor 2x length of gaster; ovipositor 0.78x as long as body; length of clava equal to combined length of preceding
3.5 funicular segments ...............................................  

= Hind femur with nine teeth, second and fourth smaller than the rest (Plate: 12:E); MV 5x PMV; POL 4.6x OOL; ovipositor 2.14x gaster; ovipositor 0.96x as long as body; length of clava equal to combined length of preceding six funicular segments ...........................................  

= P. indiensis Narendran

4 Hind femur with five teeth, second tooth smallest (Plate: 16:D); POL 2.57x OOL; MV 4x PMV; Ovipositor 1.53x as long as body; ovipositor 3.28x gaster; length of clava equal to combined length of preceding six funicular segments; length of scape equal to combined length of first three funicular segments; fore wing 2.77x as long as its maximum width.................................  

= P. aligarhensis Narendran

5 Hind femur with six; other characters partly or completely different from above .................................................. 5

5 POL 5x OOL; MV 4.5x PMV; ovipositor 2.78x gaster; length of clava equal to combined length of preceding 5.5 funicular segments; hind femur with six teeth; third, fourth and fifth longer than the rest( fig.78); forewing 2.66x as long as broad ........................................... P. opisthacanthum Masi

= Characters partly or completely different from above .........................6

6 POL 3x OOL; MV 5x PMV; ovipositor 2.7x gaster; ovipositor 1.3x length of body; length of scape as long as first four funicular segments combined; length of clava equal to combined length of preceding five funicular segments; hind femur with 6 teeth, second tooth smallest( Plate:17:G) ; forewing 2.96x as long as its maximum width ...................... P. scylla Fernando

= Characters partly or completely different from above ........................7

7 POL 2x OOL; MV 4.75x PMV; ovipositor 3.1x gaster; length of clava equal to combined length of preceding 5 funicular segments; hind femur with six teeth (fig.76) ................................................................. P. noyesi Narendran

= Characters partly or completely different from above ...................... 8

8 POL 3.4x OOL; MV 4x PMV; ovipositor 2.38x gaster ; ovipositor 1.28x as long as body; length of scape equal to combined length of first three funicular segments; length of clava equal to combined length of preceding
five funicular segments; Hind femur with six teeth, second tooth smaller than the rest (Plate: 14:G); fore wing 2.8x as long as its maximum width ..........................................................................................  P. dineni Narendran

= Hind femur with eight or nine teeth; other characters partly or completely different from above ........................................................................................................ 9

9  POL 3x OOL; MV 4x PMV; hind femur with eight teeth, third and sixth smaller than the rest (fig.81); length of scape equal to combined length of first 4.5 funicular segments; length of clava equal to combined length of preceding 6 funicular segments; forewing 2.5x as long as wide; ovipositor 1.28x as long as body ..................................................  P. prinomerum Masi

= Characters partly or completely different from above ............................. 10

10  POL 4.5x OOL; MV 4x PMV; hind femur with eight teeth, second and third smaller than the rest(Plate: 15:J); ovipositor 2.2x gaster; ovipositor 1.12x as long as body; length of scape equal to combined length of first four funicular segments; length of clava equal to combined length of preceding 5.5 funicular segments; fore wing 2.5x as long as its maximum width ......

.......................................................................................... P. keralensis Narendran

= Characters partly or completely different from above ......................... 11

11  POL 4x OOL; MV 5x PMV; length of clava equal to combined length of preceding 5.5 funicular segments; hind femur with eight ventral teeth, second and third smaller than the rest (Plate: 13:G); ovipositor 2.75x gaster; ovipositor 1.13x as long as body ..............................  P. christyi sp. nov.

= POL 3.2x OOL; MV 4x PMV; length of clava equal to combined length of preceding 4 funicular segments; hind femur with nine teeth, eighth and ninth smaller than the rest( fig.65); ovipositor 2.88x as long as gaster; ovipositor 1.6x as long as body ..................................................  P. fulvipes Holmgren
Podagrion aligarhensis Narendran
(Plate: 12)


Redescription:

Female: Plesiotype: Length 2.9 mm, ovipositor 2.8 mm

Colour: Head and mesosoma dark green, gaster green with metallic bluish green reflection; pubescence on body white; scape yellowish brown; eyes brown, ocelli yellowish brown, coxae green; fore and mid femora pale brown; hind femur pale brown with metallic green reflection; tibiae pale yellowish brown, tarsi pale yellow; ovipositor sheath brown; ovipositor yellowish brown; wings hyaline with yellowish brown veins and pubescence.

Head: Head 1.27x wider than maximum width of mesosoma; head 1.25x as wide as high in front view; surface strongly sculptured; densely reticulate, reticulation small, more distinct on lower face with sparse small pubescence; anterior margin of clypeus straight; frons moderately convex in lateral aspect; eyes large, not pubescent; genal carina distinct, not very high; vertex margined posteriorly; temples 0.15x as long as eye in dorsal view; relative measurements of AOL:POL:OOL= 8:14:3; POL 4.6x OOL; antennal toruli placed above middle of face; scape hardly reaching anterior ocellus, stout, as long as combined length of first four funicular segments together; funicular segments become wider and shorter towards tip; relative measurements of L :W of antennal segments = scape 15:3, pedicel 5:2.5, F₁ 5:3, F₂ 5:4, F₃ 3:4, F₄ 3:4, F₅ 3:4, F₆ 3:4.5, F₇ 3:5, clava 19:7; length of clava equal to combined length of preceding 6 segments.

Mesosoma: Compactly sculptured with sparse pubescence; mesoscutum 1.6x as wide as long, mesopleuron highly sculptured; finely reticulate with moderate pubescence; pronotal collar with anterior margin more or less straight, not highly sloping; mesoscutum flat, notauli complete, 2x as broad as long; scutellum not convex, at level with mesoscutum and a little raised above propodeum, reticulated,
with reticulation obliterated on posterior tip with a line of deep punctures just above posterior end, as long as broad; posterior half of metanotum and dorsellum smooth; propodeum a 1.1x broader than long, short median carina present in front of an inverted 'V' shaped carina; mesopleuron with mesepisternum reticulated, mesepimeron smooth, metapleuron smooth, outer borders weakly reticulated; prepectus with a concavity, finely reticulated in front; fore wing 2.62x as long as its maximum width (84:32); relative measurements of SMV: MV: PMV: STV=32:20:4:2.5; forewing with MV5x PMV; relative L:W of hind leg = coxa 24:10, femur 32:16, tibia 30:3; hind coxa 0.75x as long as hind femur; hind femur 2x as long as its width; hind coxa weakly reticulated with moderate pubescence on sides; hind femur with nine ventral teeth, second and fourth smaller than the rest.

**Metasoma:** Gaster subsessile; 2.64x as long as broad; ovipositor 2.14x as long as gaster (60:28); gaster 1.53x as long as hind femur (40:26); ovipositor 0.96x as long as body (85:88).

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** India: Kerala (Kozhikode), U.P (Aligarh).

**Material Examined:** Plesiotype: 1 Female, INDIA: Kerala, Kozhikode, Kattullamala (near Koorachundu), 11° 29′N 75°50′E , 22.v.2011, Coll.Mercy Ignatius.

**Remarks:** This species comes near to *Podagrion indiensis* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) but differs from it in having: 1) MV 5x PMV (in *P. indiensis* MV 2x PMV); 2) POL 4.6x OOL (in *P. indiensis* POL 2.2x OOL); 3) ovipositor 2.14x as long as gaster (in *P.indiensis* ovipositor 2x as long as gaster); 4) hind femur with nine ventral teeth, second and four very smaller than the rest (in *P. indiensis* hind femur with eight teeth, third and sixth are smaller); and 5) length of clava equal to combined length of preceding 6 segments (in *P. indiensis* length of clava equal to combined length of preceding 3.5
segments). This species is reported for the first time from Kerala. It is redescribed to include more characters for the easy determination of the species.

*Podagrion christyi* sp. nov.

*(Plate: 13)*

**Description:**

**Female: Holotype:** Length 2.12 mm; ovipositor length: 2.4 mm.

**Colour:** Head and mesosoma dark green; gaster brown with metallic bluish green reflections dorsally and brown ventrally; eyes reddish brown; antennae yellowish brown except brownish club; fore and mid legs including coxae yellowish brown with tarsi lighter; hind coxa concolorous with mesosoma except distal testaceous tip; hind femur dark brown with slight metallic green reflection, outer teeth black; tegula brown. Wings hyaline, veins light brown; ovipositor yellow, ovipositor sheath brown.

**Head:** Very slightly wider than mesosoma (20:18) in dorsal view, 2.25x as long as wide, densely reticulate, reticulation small, more distinct on lower face with dense pubescence; anterior margin of clypeus straight; malar space 0.27x as long as eye; eyes large, not pubescent; genal carina distinct, not very high; vertex margined posteriorly; relative measurements of AOL:POL:OOL = 6:12:3; POL 4x OOL; antennal toruli above the middle of face; scape hardly reaching front ocellus, stout, as long as combined length of first 4 funicular segments, funicular segments become wider and shorter towards tip; relative L:W of antennal segments = scape 21:6, pedicel 10:4, F1 5:4, F2 6:5, F3 5:5, F4 5:5, F5 5:5, F6 4:5, F7 4:8, clava 26:12; length of clava equals to 5.5 preceding segments.

**Mesosoma:** Mesosoma 1.8x as long as broad, finely reticulate with moderate white pubescence; pronotal collar with anterior margin more or less straight; relative measurements of L:W of mesosomal segments = pronotum 5:19, mesoscutum 14:25, scutellum 11:11, propodeum 7:16; mesoscutum flat, notauli complete; scutellum not
convex, at level with mesoscutum and a little raised above propodeum, reticulated, with reticulation obliterated on posterior tip with a line of deep punctures just above posterior end; posterior half of metanotum and dorsellum smooth; propodeum with short median carina present in front of an inverted 'V' shaped carina; mesopleuron with mesepisternum reticulated, mesepimeron smooth, metapleuron smooth, outer borders weakly reticulated; prepectus with a concavity, finely reticulated in front; fore wing 2.2x as long as its maximum width (90:36); pubescence dense, speculum and basal cell closed below; basal vein with setae; relative measurements of PMV: MV: PMV: STV=35:25:5:2; forewing with MV 5x PMV; relative measurements of L:W of hind leg = coxa 30:9, femur 35:17.5, tibia 34:4; tarsi 25:2; coxa 0.8x as long as hind femur; hind coxa weakly reticulated with moderate pubescence on sides; hind femur microstriated moderate pubescence (on outer sides); hind femur 2x as long as its width; hind femur with eight ventral teeth, second and third smaller than the rest.

**Metasoma:** Gaster 2.31x as long as broad (37:16); ovipositor 1.13x as long as body (75:66), ovipositor 2.75x as long as gaster (55:20).

**Variation:** Length varies from 2.1-2.3mm; ovipositor length varies from 2.35-2.5mm.

**Male:** similar to female in colour and size, but differ from female in having antenna with smaller clava, and hind femur with lesser number of teeth (6 teeth).

**Biology:** Collected from the ootheca of *Mantis* sp.14 females and 2 males were emerged along with 48 *Mantis* nymphs.

**Etymology:** It is named after the collector Christy (masculine gender).

**Distribution:** India: Kerala, Wayanad (Vythiri)

**Material Examined:** 22F & 14 M. INDIA, Kerala, Wayanad, Vythiri (11°33’N 76°01’E), 13.i.2011, Coll.Christy K. Jose (DZCU).

**Remarks:** This species comes near to *Podagrion keralensis* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) in general appearance.
but differs from it in having: 1) Malar groove 0.27x eye length (in *P. keralensis* malar groove 0.33x eye length); 2) POL 4x OOL (In *P. keralensis* POL 4.5x OOL); 3) MV 5x PMV (in *P. keralensis* MV 4x PMV); 4) gaster 2.31x as long as broad ( *P. keralensis* gaster 2.64x as long as broad); 5) ovipositor 2.75x as long as gaster (in *P. keralensis* ovipositor 2.2x as long as gaster); and 6) forewing 2.2x as long as its maximum width (in *P. keralensis* fore wing 2.5x as long as its maximum width).

This species differs from *Podagrion malabarensis* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) in having: 1) ovipositor 2.75x as long as gaster (in *P. malabarensis* ovipositor 1.8x as long as gaster); 2) POL 4x OOL (in *P. malabarensis* POL 4.66x OOL); 3) hind femur with 8 teeth (in *P. malabarensis* hind femur with 6 teeth); 4) hind coxa concolorous with mesosoma (in *P. malabarensis* all coxa concolorous with mesosoma); 5) malar groove 0.27x eye length (in *P. malabarensis* malar groove 0.34x eye length); 6) MV 5x PMV (in *P. malabarensis* MV 4.85x PMV); and 7) ovipositor little longer than body (in *P. malabarensis* ovipositor shorter than body).

*Podagrion dineni* Narendran

(Plate: 14)

*Podagrion dineni* Narendran, 1994:71; Holotype F.,(QMB)

**Redescription:**

**Female: Plesiotype:** length 4.13 mm; ovipositor length 4.87 mm.

**Colour:** Head and mesosoma bright metallic green; gaster metallic green dorsally and laterally, ventrally brown; ovipositor dark brown; eyes pale yellow; ocelli dark brown; antenna, scape testaceous, other segments brown with club blackish brown; all coxae and hind femur concolorous with mesosoma except distal tips of coxae and basal part of hind femur brown; fore and mid femora and hind tibiae dark brown; all tarsi testaceous; tegulae and wing veins brown; wings hyaline.
**Head:** very closely reticulopunctate with small white pubescence, dense on lower face, about as wide as mesosoma, in dorsal view 1.76x wider than long; ocelli placed in a wide triangle whose base 2x its side; lateral ocellus close to eye margin than to the median ocellus; relative measurements of AOL:POL:OOL = 6:17:5; POL 3.4x OOL; occiput margined posteriorly, temple 0.25x as long as eye; head in front view 1.2x broader than long; malar space 0.35x as long as eye (16:46); antennal toruli situated below middle of face; scrobe deep, reticulate, not reaching anterior ocellus, with inter antennal ridge distinct; relative L:W of antennal segments = scape19:4, pedicel 7:3, F₁ 7:4, F₂ 6:5, F₃ 6:5, F₄ 5:5, F₅ 4:5, F₆ 4:6, F₇ 4:7, clava 23:8; length of scape equal to combined length of first three funicular segments; length of clava equal to combined length of preceding five segments.

**Mesosoma:** Mesosoma 1.77x longer than wide, uniformly reticulate and pubescent except on propodeum; pronotal collar broad, anteriorly not margined, 4.4x wider than long; mesoscutum with notauli complete, 1.55x as wide as long; scutellum reticulate but reticulation faint on posterior part, not shiny, median length almost as long as mesoscutum; dorsellum rectangular, smooth; median areola connected to anterior margin by a weak and short median carina; propodeum anteriorly reticulate, 1.29x as wide as long; mesopleuron reticulate, reticulation weak on mesepimeron, hind margin of mesepimeron smooth; metapleuron almost smooth; fore wing 2.8x as long as its maximum width(90:32); pubescence dense, speculum and basal cell closed below; basal vein with setae; fore wing with relative length of SMV: MV: PMV: STV = 35: 20 : 5 : 2.5; MV 4x PMV; PMV 2x STV; relative L:W of hind leg = coxa 35:11, femur 40:20, tibia 40:5, tarsi 26:2; hind coxa reticulate, hind femur 2x as long as its width; hind femur with six ventral teeth; second tooth very small; femur striated on outer disc, hind tibia rugulose.

**Metasoma:** Gaster as long as head plus mesosoma; ovipositor 2.38x as long as gaster (100:42); gaster 1.8x hind femur (40:22); ovipositor 1.28x length of body (100:78).
Male: Similar to male in size and colour; but it differs from female in having smaller clava, reduced number of teeth on hind femur, strong hind tibia and stout basitarsus.

Host: Ootheca of Hierodula sp.

Biology: 15 females and 4 males emerged from the ootheca of Hierodula along with 25 mantid nymphs.

Variation: length varies from 4.1-4.3 mm; ovipositor length varies from 4.6 - 4.9mm.

Distribution: India: Kerala.


Remarks: This species comes near Podagrion keralensis Narendran in the key to Indian species of Podagrion Spinola by Narendran (1994) in general appearance but differs from it in having: 1) hind femur with six large teeth, second tooth smaller than the rest (in P. keralensis hind femur with 8 ventral teeth, second and third smaller than the rest); 2) length of clava equal to combined length of 5 preceding segments (in P. keralensis length of clava equal to combined length of 5.5 preceding segments); 3) forewing 2.8x as long as its maximum width (in P. keralensis fore wing 2.5x as long as its maximum width); 4) ovipositor 1.28x as long as body (in P. keralensis ovipositor 1.11x as long as body); 5) ovipositor 2.38x as long as gaster (in P. keralensis ovipositor 2.2x as long as gaster); 6) length of scape equal to combined length of first three funicular segments (in P. keralensis length of scape equal to combined length of first four funicular segments); and 7) head and mesosoma bright metallic green (in P. keralensis head and mesosoma black with metallic green reflections). This species is redescribed to include more characters for the easy determination of the species.
**Podagrion fulvipes** (Holmgren)

*(Figures: 62-67)*

*Blephonira fulvipes* Holmgren, 1868: I: 438, Holotype, F., CHINA (NHRM)


**Diagnosis:** (Based on redescriptions of Narendran, 1994)

**Female:** length 2.9 mm (excluding ovipositor); head, mesosoma, hind coxa (except apex) metallic blackish green; scape, pedicel, forelegs, mid legs, apex of hind coxa, hind tibia and gaster pale yellowish brown; funicle testaceous; clava blackish-brown; uniformly reticulate on frons; relative measurements of POL:OOL = 16:5; POL 3.2x OOL; eyes large and not pubescent; malar groove 0.25x as long as eye length; antenna with scape reaches anterior ocellus; pedicel and F₁ subequal in length; F₂ longer than F₁; F₃ shorter than F₂; F₄ and F₅ subequal and each longer than F₃; F₆ and F₇ subequal; clava 4x F₇; length of antennal clava equals to combined length of preceding four funicular segments; forewing 2.6x as long as broad (65:25); relative measurements of SMV: MV: PMV: STV=25:16:4:2; forewing with MV 4x PMV; popodeal areola with distinct anterior median carina meeting anterior margin of propodeum; hind femur with 9 ventral teeth, eighth and ninth smallest, first and third longer than the rest; hind femur 2.08x as long as broad (52:25); gaster including petiole and excluding ovipositor 1.1x as long as mesosoma; petiole very short; ovipositor 2.88x as long as gaster; ovipositor 1.6x length of body.

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** India: Kerala & Tamil Nadu.

**Remarks:** This species comes near to *Podagrion prinomerum* Masi in the key to Indian species of *Podagrion* Spinola by Narendran (1994) in general appearance but differs from it in having: 1) POL 3.2x OOL (in *P. prinomerum* POL 3x OOL) 2)
length of clava equal to combined length of preceding 4 funicular segments (in *P. prinomerum* length of clava equal to combined length of preceding 6 funicular segments); 3) ovipositor 1.6x length of body (in *P. prinomerum* ovipositor 1.28x as long as body); 4) hind femur with eight teeth; third and sixth smaller than the rest (in *P. prinomerum* hind femur with 9 ventral teeth, eighth and ninth smaller than the rest); and 5) forewing 2.6x as long as wide (in *P. prinomerum* forewing 2.5x as long as wide).

**Podagrion indiensis** Narendran

**(Figures: 68-70)**


**Diagnosis:** (Based on original descriptions of Narendran, 1994).

**Female:** Length 1.67 mm; length of ovipositor 1.3 mm; head and mesosoma dark green; gaster brown with yellowish tinge; pubescence on body white; legs (including all coxae) yellow; hind femoral teeth brown; scape and pedicel yellowish brown; funicular segments pale brown; club brown; eyes grey; ocelli yellow; ovipositor yellowish brown; ovipositor sheath brown; tegula brown; wings hyaline with brown veins; head densely reticulate, reticulation small, more distinct on lower face with sparse small pubescence; eyes large, not pubescent; eye length 3.3x of genal length; POL 2.2x OOL; funicular segments become wider and shorter towards tip; length of scape equal to combined length of first two funicular segments; length of clava equal to combined length of preceding 3.5 segments; scape 3x longer than its greatest breadth; mesoscutum flat, notauli complete; scutellum subequal to its length and width, propodeum declined posteriorly; areola with carinate sculptures; forewing with length of MV 2x PMV; hind coxa 3x longer than its own greatest width; hind femur with eight ventral teeth; gaster 0.74x length of head and mesosoma combined; ovipositor 2x longer than gaster, ovipositor 0.78x as long as body.

**Male:** Unknown.
**Host:** Unknown.

**Distribution:** India: Kerala, Palakkad, Silent Valley.

**Remarks:** This species comes near to *Podagrion malabarensis* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) but differs from it in having: 1) MV 2x PMV (in *P. malabarensis* MV 4.86x PMV); 2) POL 2.2x OOL (in *P. malabarensis* POL 4.66x OOL); 3) ovipositor 2x as long as gaster (in *P. malabarensis* ovipositor 1.8x as long as gaster); 4) ovipositor 0.78x as long as body (in *P. malabarensis* ovipositor 0.86x as long as body); 5) hind femur with eight teeth (in *P. malabarensis* hind femur with six teeth); and 6) length of clava equal to combined length of preceding 3.5 segments (in *P. malabarensis* length of clava equal to combined length of preceding 4 segments).

*Podagrion keralensis* Narendran  
(Plate: 15)

*Podagrion keralensis* Narendran, 1994:69-70; Holotype, F., (QMB)

**Redescription:**

**Female:** Plesiotype: Length 2.73-3.31 mm; ovipositor length: 2.02-3.7 mm.

**Colour:** Head and mesosoma black with metallic green reflections; gaster brown with metallic bluish green reflections; antennae with scape testaceous; flagellum except clava brown; clava brownish black; fore and mid legs including coxae yellowish brown with tarsi lighter; hind coxa concolorous with mesosoma except distal testaceous tip; hind femur dark brown with slight metallic green reflection, outer teeth black, tibia and tarsi yellow with brown patch at base and sub-apex; tegula brown; wings hyaline, veins light brown.

**Head:** Head 1.1x as wide as mesosoma (20 : 18) in dorsal view, 1.8x as long as wide, in front view 1.17x as wide as high, densely reticulate, reticulation small, more distinct on lower face with sparse small pubescence; anterior margin of clypeus
straight; malar space 0.33 as long as eye; eyes large, not pubescent; genal carina
distinct, not very high; vertex margined posteriorly; temples 0.15 as long as eye in
dorsal view; relative measurements of AOL:POL:OOL=6:16:3.5; POL 4.5x OOL;
radius of lateral ocellus twice OOL; antennal toruli placed below middle of face,
distinctly above level of lower margin of eye; scape hardly reaching anterior ocellus,
stout, as long as combined length of first four funicle segments together; funicular
segments become wider and shorter towards tip; relative measurements of L :W of
4:5, F₇ 4:8, clava 26:12; length of scape equal to combined length of first four
funicular segments; length of clava equal to combined length of preceding 5.5
segments.

Mesosoma: Mesosoma 1.65x as long as broad, finely reticulate with moderate
pubescence: pronotal collar with anterior margin more or less straight, not highly
sloping, 5.14x as long as broad; mesoscutum flat, notauli complete, 2x as broad as
long; scutellum not convex, at level with mesoscutum and a little raised above
propodeum, reticulated, with reticulation obliterated on posterior tip with a line of
deep punctures just above posterior end, as long as broad; posterior half of
metanotum and dorsellum smooth; propodeum a little broader than long, short
median carina present in front of an inverted 'V' shaped carina; mesopleuron with
mesepisternum reticulated, mesepimeron smooth, metapleuron smooth, outer
borders weakly reticulated; prepectus with a concavity, finely reticulated in front;
pubescence dense, speculum and basal cell closed below; basal vein with setae; fore
wing 2.5x as long as its maximum width (88:35); relative measurements of SMV:
MV: PMV: STV=30:20:5:2; forewing with MV=4x PMV; relative L:W of hind leg =
coxa 28:8, femur 36:18, tibia 35:4, tarsi 23:2; hind coxa 0.8x as long as hind femur;
hind femur 2x as long as its width; hind coxa weakly reticulated with moderate
pubescence on sides; hind femur microstriated moderate pubescence (on outer
sides); hind femur with eight ventral teeth, second and third smaller than the rest.
Metasoma: Gaster 2.64x as long as broad; petiole dorsally 0.31x as long its median length of propodeum; ovipositor 2.2x as long as gaster (66:30); gaster 1.35x as long as hind femur (35:26); ovipositor 1.12x as long as body (90:80).

Male: Unknown.

Host: Ootheca of Humbertiella similis.

Biology: Two females emerged from the ootheca of Mantid (Humbertiella similis) along with 14 females and two males of podagrionella nupera sp. nov.

Variation: length varies from 2.73-3.31 mm; ovipositor length: 2.02-3.7 mm; colour varies from blackish green to brownish black.

Distribution: India: Kerala, Karnataka & Tamil Nadu.


Remarks: This species comes near to Podagrion dineni Narendran in the key to Indian species of Podagrion Spinola by Narendran (1994) in general appearance but differs from it in having: 1) length of antennal clava equal to combined length of preceding 5.5 segments (in P. dineni length of clava equal to 5 segments combined); 2) hind femur with 8 ventral teeth, second and third smaller than the rest (in P. dineni hind femur with six large teeth, second tooth smaller than the rest); 3) forewing 2.5x as long as its maximum width (in P. dineni fore wing 2.8x as long
as its maximum width; 4) ovipositor 1.12x as long as body (in *P. dineni* ovipositor 1.28x as long as body); 5) ovipositor 2.2x as long as gaster (in *P. dineni* ovipositor 2.38x as long as gaster); 6) length of scape equal to combined length of first four funicular segments (in *P. dineni* length of scape equal to combined length of first three funicular segments); and 7) head and mesosoma black with metallic green reflections (in *P. dineni* head and mesosoma bright metallic green). This species is redescribed to include more characters for the easy determination of the species.

**Podagrion malabarensis** Narendran

*(Figures: 71-73)*


**Diagnosis:** (Based on original descriptions of Narendran 1994).

**Female:** Length 3.52 mm (excluding ovipositor); ovipositor length 3.06 mm; generally metallic green; head and mesosoma metallic green with blackish and bluish tinge; gaster brownish green dorsally and brown ventrally; ovipositor dark brown; antenna brown with clava brownish black; all coxae and hind femur concolorous with mesosoma, rest of legs brown; tegula brown; wings hyaline, veins brown; temple 0.3x as long as eye; POL 4.66x OOL; occiput bordered by a faint carina; head in front view 1.3x as wide as high; malar space 0.34x as long as eye; eyes separated by length of their height; antennae situated almost middle of face, scape 0.63x as long as eye, scape reaching anterior ocellus; scape as long as combined length of first two funicular segments; length of clava equal to combined length of four preceding segments; combined length of pedicel and flagellum 1.5x as long as head width; pronotum, mesoscutum and scutellum moderately reticulate with moderate dense pubescence; relative L:W of collar = 5 : 22; mesoscutum 13: 23.5; scutellum 13 : 12.5; without smooth area behind, dorsellum finely reticulate; propodeum with areola continuing in front by a short median carina meeting anterior margin; hind femur with six teeth, first, third, fifth and sixth large; second and fourth smaller than the rest; fore wing with relative lengths of veins = MV:17;
PMV: 3.5; STV: 1.5; MV 4.86x as long as PMV; gaster almost as long as head plus mesosoma (25.5 : 27.5); ovipositor 0.86x as long as body, ovipositor 1.8x as long as gaster.

**Male:** Unknown.

**Host:** Ootheca of Mantid

**Distribution:** India: Kerala, Calicut University Campus.

**Remarks:** This species comes near to *Podagrion dineni* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) in general but differs from it in having: 1) MV 4.86x PMV (in *P. dineni* MV 4x PMV); 2) ovipositor 1.8x as long as gaster (in *P. dineni* ovipositor 2.38x as long as gaster); 3) length of clava equal to combined length of 4 preceding segments (in *P. dineni* length of clava equal to combined length of 5 preceding segments); 4) scape as long as combined length of first two funicular segments (in *P. dineni* scape as long as combined length of first three funicular segments); 5) hind femur with six large teeth, second and fourth smaller than the rest (in *P. dineni* hind femur with six large teeth, second tooth smaller than the rest); 6) antennae situated almost middle of face (in *P. dineni* antennal toruli situated below middle of face); and 7) scape reaches anterior ocellus (in *P. dineni* scape not reaches anterior ocellus).

**Podagrion manii** Narendran

*(Plate: 16)*

*Podagrion manii* Narendran, 1994:70-71; Holotype, F.,(QMB)

**Redescription:**

**Female:** Plesiotype: Length: 2.82- 3.9 mm, ovipositor length 4.15- 5mm.

**Colour:** Metallic green with bluish tinge; gastral sternites brown; eyes pale yellow; antennae with scape dark testaceous, remaining part brown with club darker; fore
and mid legs brown with coxae concolorous with mesosoma; hind coxa and femur concolorous with mesosoma; hind tibia brown, hind tarsi yellowish brown; tegula pale brown; wings hyaline, veins yellowish brown; ovipositor reddish brown, sheath blackish brown.

**Head:** Uniformly reticulopunctate with sparse white pubescence, slightly wider than mesosoma (23 : 25) in dorsal view;1.92x as long as broad; vertex margined behind; temple 0.25x as long as eye; relative measurements of AOL:POL:OOL= 9:18:7; POL 2.57x OOL; lateral ocellar diameter as equal to OOL; head in front view 1.2x as wide as long; malar space 0.4x as long as eye; antennae inserted slightly below middle of face; scrob deep reticulated, not reaching front ocellus, with a distinct interantennal ridge; relative measurements of L:W of antennal segments = scape 17:4, pedicel 6:3, F₁ 6:4, F₂ 6:4, F₃ 5:5, F₄ 5:5, F₅ 5:5.5, F₆ 4:6, F₇ 4:7, clava 29:10; length of scape equal to combined length of first three funicular segments; length of clava equal to combined length of 6 preceding segments.

**Mesosoma:** Mesosoma finely and closely reticulate, moderately pubescent; pronotum about as wide as mesoscutum; collar 4.2x as broad as long; mesoscutum with notauli complete; 1.62x as wide as long; scutellum as broad as long, subapically with a row of deep punctures, reticulation indistinct on posterior part; propodeum with areola continued in front with extremely short median carina meeting anterior margin; spiracles elongated slightly curved, located in front of a depression; mesopleuron reticulated with reticulation faint on mesepimeron; metapleuron smooth; forewing 2.77x as long as wide (75:27); pubescence dense, speculum and basal cell closed below; basal vein with setae; relative lengths of SMV:MV: PMV: STV =30:20:5:3; MV 4x PMV; relative L:W of hind leg = coxa 32:10, femur 43:19,tibia 43:4,tarsi 25:2; hind coxa laterally reticulated, hind femur rugulose and moderately pubescent; hind femur 2.26x as long as wide; outer margin with 5 teeth of which second from base smallest; hind tibia slender; hind tarsus with first segment 2.6x as long as second.

**Metasoma:** Gaster with a short petiole; ovipositor 1.53x as long as body (115:75); and 3.28x as long as gaster (115:35).
Male: Unknown.

Biology: Emerged from mantid ootheca.

Variation: Length: 2.82-3.9 mm, ovipositor length 4.15-5 mm.

Distribution: India: Kerala, Kannur, Palakkad; Karnataka: Belgam.


Remarks: This species comes near Podagrion dineni Narendran in the key to Indian species of Podagrion Spinola by Narendran (1994) in general appearance but differs from it in having: 1) hind femur with 5 ventral teeth (in P. dineni hind femur with six large teeth); 2) ovipositor 1.53x as long as body (in P. dineni ovipositor 1.28x as long as body); 3) ovipositor 3.28x as long as gaster (in P. dineni ovipositor 2.38x as long as gaster); 4) POL 2.57x OOL (in P. dineni POL 3.4x OOL); 5) hind femur 2.26x as long as wide (in P. dineni hind femur 2x as long as its wide); 6) forewing 2.77x as long as wide (in P. dineni fore wing 2.8x as long as its maximum width); 7) malar space 0.4x as long as eye (in P. dineni malar space 0.35x as long as eye); and 8) length of clava equal to combined length of 6 preceding segments (in P. dineni length of clava equal to combined length of preceding five segments). This species is redescribed to include more characters for the easy determination of the species.

Podagrion noyesi Narendran
(Figures: 74-76)


Diagnosis: (Based on original descriptions of Narendran,1994).
Female: Length 2.93 mm; 4.65mm; head and body blackish green with metallic green reflection on frons; gaster with base and ventral side yellowish brown; eyes pale greyish yellow; ocelli yellowish brown, antenna generally brown with scape yellowish brown, clava dark brown; all coxae and hind femur concolorous with mesosoma; tibiae yellowish brown with bases and apices paler; tarsi yellow; wings hyaline with veins brownish yellow and pubescence on wings brown; body with white pubescence; frons convex, eye length 2.3x of genal length; malar groove distinct; POL 2x OOL; length of scape equal to combined length of first 1.5 funicular segments; length of clava equal to combined length of preceding 5 segments; MV 4.75x PMV; scutellum not convex but in same plane of mesoscutum; propodeal areola without distinct median carina; hind femur with six ventral teeth; gaster subsessile, smooth and shiny; T1 0.4x total length of gaster; ovipositor 3.1x as long as gaster and 1.58x of total length body.

Variation: Eye colour varies from greyish yellow to red.

Male: Unknown.

Distribution: India: Kerala, Palakkad, (Malampuzha, Silent Valley) Calicut University Campus.

Remarks: This species comes near to Podagrion indiensis Narendran in the key to Indian species of Podagrion Spinola by Narendran (1994) but differs from it in having: 1)MV 4.75x PMV (in P.indiensis MV 2x PMV); 2) POL 2x OOL (in P.indiensis POL 4.66x OOL); 3) ovipositor 3.1x as long as gaster (in P.indiensis ovipositor 2x as long as gaster); 4) ovipositor longer than body (in P.indiensis ovipositor shorter than body); 5) hind femur with six teeth (in P.indiensis hind femur with eight teeth); and 6) length of clava equal to combined length of preceding 5 segments (in P.indiensis length of clava equal to combined length of preceding 3.5 segments).
**Podagrion opisthacanthum** Masi

*(Figures: 77-79)*


*Podagrion opisthacanthum* Masi, Narendran, 1994:75; redescribed.

**Diagnosis:** (Based on redescriptions of Narendran, 1994).

**Female:** Length 2.56 mm (excluding ovipositor); head and body dark metallic green; proximal half of gaster with brownish tinge; coxae concolorous with body; fore and mid tibiae yellowish brown; hind femur brownish green; tibiae brown; tarsi pale yellow, eyes reddish brown; antenna testaceous; clava dark brown; ocelli brownish yellow; ovipositor sheath brown; ovipositor brownish yellow; wings hyaline with brown veins and pubescence; head densely sculptured with minute sparse pubescence; eye 4.5x as long as malar space; POL 5x OOL; occiput carinate; funicular segments become wider and shorter towards tip; length of scape equal to combined length of first four funicular segments; length of clava equal to combined length of preceding 5.5 segments; pronotum, mesoscutum, scutellum and propodeum lying in same plane; propodeum with sculptures between submedian carinae; propodeal areola with a very short anterior median carina meeting front margin; forewing 2.66x as long as broad; MV 4.5x PMV; hind femur with six teeth; third, fourth and fifth longer than the rest; hind femur 2.22x longer than its breadth (60:27); gaster sessile, 2.26x longer than broad; ovipositor 2.78x longer than gaster.

**Male:** Unknown.

**Biology:** Unknown.

**Distribution:** India: Kerala & Tamil Nadu.

**Remarks:** This species comes near to *Podagrion dineni* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) but differs from it in having: 1) MV 4.5x PMV (in *P. dineni* MV 4x PMV); 2) POL 5x OOL (in *P.
Podagrion prinomerum Masi
(Figures: 80-82)

Podagrion Prionomerum Masi, 1926:12-13, F., Taiwan, India, Kankau (DEI)

Podagrion prinomerum Masi: Narendran, 1994:77; redescribed.

Diagnosis: (Based on redescriptions of Narendran, 1994).

Female: Length : 2.72mm (excluding ovipositor); ovipositor 3.26mm; head and mesosoma dark green with metallic bluish green reflection on frons; gaster brown with metallic bluish green reflection on dorsolateral sides; fore and hind coxae metallic dark green with apices brown; mid coxa, all femora and median part of all tibiae dark brown with metallic green reflection on hind femur; eyes dark red; scape and pedicel yellowish brown; funicular segments brown; club dark brown; ovipositor yellowish brown; pubescence on body white; wings hyaline with brown veins; head finely and closely sculptured with small sparse hairs; POL 3x OOL; gena not carinated; scrobe finely shagreened; face below antennal toruli highly sculptured with piliferous hairs; antenna inserted slightly below middle of orbital length, stout, clavate, about 3x height of head; funicular segments become wider and shorter towards tip; length of scape equal to combined length of first 4.5 funicular segments; length of clava equal to combined length of preceding 6 funicular segments; propodeum with areola continued in front by a short median carina to meet the anterior margin; forewing 2.5x as long as wide ; MV 4x PMV; hind coxa
0.7x of hind femur; hind femur with eight teeth; third and sixth small; gaster longer than half length of body; ovipositor 1.28x length of body.

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** India: Kerala & Karnataka.

**Remarks:** This species comes near to *Podagrion keralensis* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) in general appearance but differs from it in having: 1) POL 3x OOL (in *P. keralensis* POL 4.5x OOL); 2) length of clava equal to combined length of preceding 6 funicular segments (in *P. keralensis* length of clava equal to combined length of preceding 5.5 segments); 3) length of scape equal to combined length of first 4.5 funicular segments (in *P. keralensis* length of scape equal to combined length of first four funicular segments); 4) ovipositor 1.28x length of body (*P. keralensis* ovipositor 1.12x as long as body); 5) hind femur with eight teeth; third and sixth smaller than the rest (*P. keralensis* hind femur with 8 ventral teeth, second and third smaller than the rest); and 6) hind coxa 0.7x of hind femur (in *P. keralensis* hind coxa 0.8x as long as hind femur).

**Podagrion scylla** Fernando

*(Plate: 17)*

*Podagrion Scylla* Fernando, 1957: 215-216, Syntypes, F., Srilanka, Rampura (lost?)

*Podagrion Scylla* Fernando: Sureshan, 2000:127-130, reported from India and described.

**Redescription:**

**Female:** Plesiotype: length 3.12mm; ovipositor 4.5mm.
**Colour:** Head and mesosoma bright metallic green with brassy reflection; gaster blackish brown dorsally, pale ventrally, dorsally with metallic blue reflection; ovipositor sheath, ovipositor reddish brown; eyes pale yellow; ocelli dark brown; antenna, scape testaceous, other segments brown with club blackish brown; fore and mid coxae and femora and hind tibiae dark brown; hind coxae and femora blackish brown, metallic blue reflection on fore and hind coxae and hind femora; fore and mid tibiae and all tarsi dark testaceous; tegulae and wing veins brown; wings hyaline; pubescence on wing dark brown and of body silvery white.

**Head:** 1.1x as broad as mesosoma, in dorsal view 1.7x as broad as long and 1.2x as broad as heigh in front view; very closely reticulopunctate with small pubescence, denser on lower face; occiput margined posteriorly, carina weak, but distinct; temple 0.3x as long as eye; eyes separated by little less than their individual height, which is 1.3x the maximum diameter; relative measurements of AOL:POL:OOL=3:4:12; POL 3x OOL; inter ocellar area slightly raised; anterior margin of clypeus straight; scrobe deep; malar space 0.36x as long as eye; antennal toruli situated below middle of face; scrobe deep, reticulate, scape not reaching anterior ocellus; length 0.6x eye height; pedicel plus flagellum 1.4x head width; F1 shorter than pedicel; anellus trasverse; relative L:W of antennal segments = scape19:4, pedicel 5.5:3, F1 5:4, F2 5:4, F3 5:5, F4 4:5, F5 4:5, F6 4:5.5, F7 3:6, clava 20:8; scape as long as first four funicular segments combined; length of clava equal to combined length of preceding five segments.

**Mesosoma:** Mesosoma 1.9x longer than wide( 80:42); uniformly reticulate and pubescent except on propodeum; pronotal collar broad, anteriorly not margined, mesoscutum with notauli complete,1.55x as wide as long; scutellum less convex, scutellum reticulate but reticulation faint on posterior part, not shiny, median length almost as long as mesoscutum; dorsellum rectangular, smooth; median areola connected to anterior margin by an inverted ‘V’ shaped short median carina; propodeum anteriorly reticulate; spiracles oval; metapleuron almost shiny reticulate, with long hairs on the margins; reticulation weak on mesepimeron, hind margin of mesepimeron smooth; upper mesepimeron shiny, separated by a small deep fovea.
from the lower mesepimeron; mesepisternum moderately reticulate with long hairs anteriorly; metapleuron almost smooth; prepectus finely reticulate; fore wing 2.96x as long as its maximum width (77:26); pubescence dense, speculum and basal cell closed below; basal vein with setae; costal cell with three complete row of hairs on upper part; fore wing with relative length of SMV: MV: STV = 30: 18 : 3.5 : 1.5; MV 5x PMV ; PMV 2x STV ; relative L:W of hind leg = coxa 22:9,femur 22:13, tibia 25:3, tarsi 16:1; hind coxa uniformly and finely reticulate ; hind femora almost shiny, very finely reticulate with 6 teeth, second tooth smallest.

**Metasoma:** Petiole very short; gaster including petiole longer than1.1x mesosoma; ovipositor 2.7x as long as gaster (95:35); gaster 1.5x hind femur (35:23); ovipositor 1.3x length of body ( 95:70).

**Male:** Similar to female in size and colour; but it differs from female in having smaller clava, reduced number of teeth on hind femur (four femoral teeth, first smallest), strong hind tibia and stout basitarsus.

**Host:** Ootheca of *Hierodula* sp.

**Biology:** 5 females and 4 males emerged from the ootheca of *Hierodula* along with *Podagrion dineni* and mantid nymphs.

**Variation:** Length 3.1 - 3.2 mm; ovipositor 4.3- 4.5mm.

**Distribution:** India: Kerala: Kozhikode (Koorachundu), Maharashtra & Sri Lanka.


**Remarks:** This species comes near *Podagrion keralensis* Narendran in the key to Indian species of *Podagrion* Spinola by Narendran (1994) in general appearance but differs from it in having : 1) hind femur with six large teeth, second tooth smaller than the rest ( in *P.keralensis* hind femur with 8 ventral teeth , second and third smaller than the rest ) ; 2) POL 3x OOL ( in *P. keralensis* POL 4.5x OOL) ; 3) MV 5x PMV( in *P.keralensis* MV 4x PMV); 4) length of clava equal to combined length of 5 preceding segments (in *P. keralensis* length of clava equal to combined length
of 5.5 preceding segments); 5) forewing 2.96x as long as its maximum width (in *P. keralensis* forewing 2.5x as long as its maximum width); 6) ovipositor 1.3x as long as body (in *P. keralensis* ovipositor 1.11x as long as body); 7) ovipositor 2.7x as long as gaster (in *P. keralensis* ovipositor 2.2x as long as gaster); and 8) forewing 2.96x as long as its maximum width (in *P. keralensis* forewing 2.5x as long as its maximum width). This species is reported for the first time from Kerala; this species is redescribed to include more characters for the easy determination of the species.
Genus *Podagrionella* Girault

*Podagrionella* Girault, 1913: 159: 96-97. Type species: *Podagrionella bella* Girault (monotypic, QMB).


**Diagnostic features:** It comes very near to *Podagrion* Spinola. Generally dark metallic blue; scape usually not reaching front ocellus; first flagellar segments transverse; hind femur with irregularly arranged strong ventral teeth; relatively long curved spine at its apex on ventral side; the length of spine about quarter or more than quarter length of hind tibia; hind coxa and femur densely pubescent; only one median carina between hind coxae.

**Biology:** Members of this genus are mostly parasitic on ootheca of mantids except *Podagrionella indarbelae* Narendran & Sureshan which is found in emergence cages where egg mass of *Indarbela tetraonis* Moore (a pest of cashew in Malabar) are kept for emergence of parasitoids (Narendran & Sureshan, 1988).

**Distribution:** The genus is distributed in Mediterranean sub region, Africa, India, New Guinea and in Australia.

**Key to species of *Podagrionella* Girault**

1. Exserted part of ovipositor sheath shorter than gaster (fig. 83); gaster 3.13x as long as ovipositor; gaster about 1.7x as long as hind femur laterally

…………………………………………………………*P. indarbelae* Narendran & Sureshan
Podagrionella caudata Narendran

(Plate: 18)


Redescription:

Female: Paratype: Length 1.54mm; ovipositor 0.8mm

Colour: Blackish green: eye brownish red, ocelli bright reflecting yellow; antenna, scape, fore and mid tibiae, all tarsi whitish yellow; all trochanters, fore and mid femora pale brownish yellow with apices of femora paler; hind tibia brown with apex and base yellow; ovipositor sheath brown.

Head: Width in anterior view 1.3x its length, dorsal width 3x its median dorsal length; relative measurements of AOL:POL:OOL=10:18:6; POL 3x OOL; eye in profile 3x as long as malar groove; vertex and upper frons granulated; face sparsely granulated and sparsely pubescent; scrobe moderately deep; antennae placed above
the level of lower eye margin, scape not reaching anterior ocellus; relative measurements of L : W of antennal segments = scape 17:5, pedicel 5:6, F₁ 5:7, F₂ 5:8, F₃ 5:8, F₄ 5:8, F₅ 5:8, F₆ 5:9, F₇ 4:9 clava 16:10; scape small, equal to combined length of first 3.5 funicular segments, clava comparatively small and equal to combined length of 3.5 preceding segments.

**Mesosoma:** Distinctly and closely punctured on dorsum; mesoscutum a little over 2x as wide as its length, narrower than dorsal width of head; width of scutellum 1.2x its median length; frenal area somewhat smooth; dorsellum smooth; axilla deep, projecting slightly forward, rugulose; propodeum without distinct submedian carinae, with distinct close pits, interstices of pits narrow and carinate; mesopleuron with mesepisternum closely punctate; relative measurements of L:W of hind leg = coxa 22:8, femur 32:16, tibia 22:4, tarsi 32:3, tibial spine 15 ; hind femur 2x as long as broad; hind femur with 6 teeth of different size on outer ventral margin; hind tibia with very long ventral spine; tibial spine 1.25x as long as its basitarsus (15:12); hind coxa and femur densely pubescent with reticulation distinct; forewing 2.25x as long as its maximum width (97:43); relative length of SMV: MV: PMV: STV= 40:13:10:4; MV 1.3x PMV; PMV 2.5x STV.

**Metasoma:** Gaster sessile, smooth and shiny; posterior margin of T₁ narrowly incised; posterior margins of other tergites indistinct; ovipositor shorter than body; body 2x as long as ovipositor (112:56); ovipositor 1.16x as long as gaster (42:36); gaster 1.4x as long as hind femur (46:33); ovipositor 1.7 x as long as hind femur (56:33).

**Male:** Unknown.

**Host:** Unknown.

**Variation:** Length including ovipositor varies from 1.54 to 3 mm; colour varies from blackish green to more bright green in large specimens.

**Distribution:** India: Tamil Nadu (Coimbatore).

Remarks: This species differs from the only known species of Podagrionella indarbelae Narendran in the following characters: 1) POL 3x OOL (in P. indarbelae POL 6.5 x OOL); 2) hind femur with 6 teeth (in P. indarbelae hind femur with 7 teeth); 3) ovipositor longer than gaster (in P. indarbelae ovipositor shorter than gaster); 4) ovipositor 1.7 x as long as hind femur (in P. indarbelae ovipositor 0.38x as long as hind femur); 5) body 1.1 x as long as ovipositor (in P. indarbelae body 7.5x as long as ovipositor); 6) gaster 1.4 as long as hind femur laterally (in P. indarbelae gaster 1.17x as long as hind femur); and 7) MV 1.3x PMV; PMV 2.5x STV (in P. indarbelae MV 2.5x PMV; PMV 2x STV). This species is redescribed to include more characters for the easy determination of the species.

Podagrionella harithae sp. nov.

(Plate: 19)

Description:

Female: Holotype: Length: 2.35mm; ovipositor 1.07 mm.

Colour: Head and mesosoma metallic bluish green; gaster brown with metallic green reflections; fore and mid legs yellow; hind leg yellow except the proximal part of hind coxa concolourous with mesosoma; hind femur brownish yellow with black teeth; antennae yellowish brown, slightly brownish clava; eyes reddish brown; ocelli yellowish brown; tegula brown, wings hyaline, veins brown; ovipositor yellow, ovipositor sheath brown.

Head: Head with reticulation weak on lower face and genae, distinct on frons and vertex and covered with sparse small white pubescence, about 2.36x as broad as long in dorsal view (11:26); 1.1x as broad as long in front view (22:20); eyes large, without pubescence; malar groove distinct,0.5x as long as eye length (18:36); scrobe moderately deep; relative measurements of AOL:POL:OOL=10:21:7; POL
3x OOL; antennae placed above the level of lower eye margin, scape not reaching anterior ocellus; relative measurements of L : W of antennal segments = scape 14:5, pedicel 5:4, F₁ 7:5, F₂ 7:5, F₃ 7:5, F₄ 8:5, F₅ 6:4, F₆ 5:4, F₇ 7:5, clava 15:6; scape small, equal to combined length of first two funicular segments, clava comparatively small and equal to combined length of 2.5 preceding segments.

**Mesosoma:** With shallow reticulations, sparse small pubescence; pronotum with anterior margin round, posterior margin slightly emarginated; relative measurements of L : W of mesosomal segments = pronotum 7:25, mesoscutum 12:28, scutellum 12:12; frenal area smooth, axilla deep, projecting slightly forward, regulose with an anteriolateral area with microsculptures beneath; axilla deep and clearly marked off; propodeum without distinct submedian carinae, rest of the area coarsely reticulate, reticulation broad and well raised above the general surface; spiracles close to hind margin of metanotum; all legs with minute pubescence; hind coxa and femur smooth with moderate pubescence; relative measurements of L : W of hind leg = coxa 36:10, femur 40:20, tibia 35: 4 and tarsi 27:3; relative length of tibial spine = 9; length of hind tibial spine equal to length of basitarsus; tarsi 3x as long as tibial spine; hind femur 2x as long as broad; ventral margin of hind femur with 8 teeth, 1, 4, 5, 6 and 8 large, 2, 3small and 7th largest; forewing 2.37x as long as its maximum width (90:38); forewing with relative measurements of SMV : MV : PMV : STV = 36:26:12:3; MV 2.16x PMV; PMV 4x STV; forewing with speculum opened behind.

**Metasoma:** Gaster with a short petiole, petiole longer than broad (3: 2); gaster smooth and shiny, 3.07x as long as broad in dorsal view; 2x as long as broad in profile; gaster shorter than head and mesosoma (32:45); ovipositor 2.18x as long as gaster (32:70); ovipositor shorter than body (70:77); body 1.1x as long as ovipositor; ovipositor 2.33x as long as hind femur (70:30); gaster 1.06x as long as hind femur (32:30).

**Variation:** length varies from 2.2-2.4 mm; ovipositor 1.05-1.08 mm; colour varies from metallic green to bluish green.

**Male:** length 2mm; similar to female but smaller in size, antenna yellow with smaller clava; hind femur with 8 teeth, 2nd and 4th very small.
Host: Ootheca of *Humbertiella similis*.

**Biology:** Emerged from the ootheca of *Humbertiella similis*; 11 F & 3 M emerged from the ootheca along with 2 F *Podagrion keralensis* Narendran, 8 nymphs of *Humbertiella similis* also emerged from the ootheca.

**Etymology:** Species name is the latinized version of the Sanskrit word ‘haritha’ meaning green indicating the metallic green body.

**Distribution:** India: Kerala: Calicut University Campus.


**Remarks:** This species comes near to *Podagrionella caudata* Narendran in the key to species by Narendran 1994 but differs from it in having: 1) gaster 1.06x as long as hind femur laterally (in *P. caudata* gaster 1.4x as long as hind femur laterally); 2) hind femur with 8 teeth (in *P. caudata* hind femur with 6 teeth); 3) head 2.36x as broad as long in dorsal view (in *P. caudata* head 3x as broad as long); 4) length of apical spine of hind tibia equal to its basitarsus (in *P. caudata* apical spine of hind tibia 1.25x as long as its basitarsus); 5) gaster petiolate (in *P. caudata* gaster sessile); 6) ovipositor 2.18x as long as gaster (in *P. caudata* ovipositor 1.16x as long as gaster); 7) ovipositor 2.33x as long as hind femur (in *P. caudata* ovipositor 1.7x as long as hind femur); and 8) body 1.1x as long as ovipositor (in *P. caudata* body 2x as long as ovipositor).

**Podagrionella indarbelae** Narendran & Sureshan

*(Figures: 83-86)*

*Podagrionella indarbelae* Narendran & Sureshan, 1988:45:42-44; Holotype, F.INDIA, Kerala (USNM).

**Diagnosis:** (Based on original descriptions of Narendran & Sureshan, 1988).
**Female:** Length 1.9mm (including ovipositor); generally dark metallic blue with gaster dark brown; antenna testaceous with club brown; eyes reddish brown; ocelli pale brown; legs with fore and hind coxae concolorous with body; mid coxa brown; all femora and tibiae brown with dentition on hind femur black; tarsi testaceous, with tips brown; ovipositor brown; tegulae dark brown, wings hyaline with venation light brown; head with reticulation weak on lower face and genae, distinct on frons and vertex and covered with sparse small white pubescence; eyes large, without pubescence; malar groove distinct; POL 6.5 x OOL; length of scape equal to combined length of first 3.5 funicular segments; length of clava equal to combined length of 3 preceding segments; clava with micropilosity underneath; scutellum a little flattened, its length subequal to width; frenal area smooth; posterior margin of frenum with a single row of deep punctures; propodeum with distinct submedian carinae, rest of the areas coarsely reticulate; spiracles oval and close to hind margin of metanotum; hind tibial spine 1.25x as long as its basitarsus (10:8); hind coxa and femur densely pubescent and with reticulation weak and indistinct, often invisible; outer ventral margin of hind femur with irregularly arranged 7 strong teeth; forewing 4x as long as its maximum width; relative measurements SMV: MV: STV=40:20:8:4; MV 2.5x PMV; PMV 2x STV; gaster subsessile with a short petiole, smooth and shiny; hind margins of only a few basal segments clear, others greatly obliterated and indistinct; ovipositor very small; gaster 3.13x as long as ovipositor; gaster shorter than combined length of head and mesosoma (50:70); body 7.5x as long as ovipositor; ovipositor 0.38x as long as hind femur (16:42.5); gaster 1.17x as long as hind femur (50:42.5).

**Host:** Found emerged in the emergence cages where egg clusters of bark borer *Indarbela tetraonis* Moore (Arbeidae) on cashew are kept.

**Distribution:** India: Kerala.

**Remarks:** This species differs from *Podagrionella caudata* Narendran in the following characters: 1) POL 6.5 x OOL (in *P. caudata* POL 3x OOL); 2) hind femur with 7 teeth (in *P. caudata* hind femur with 6 teeth); 3) ovipositor shorter than gaster (in *P. caudata* ovipositor longer than gaster); 4) ovipositor 0.38x as long
as hind femur (in *P. caudata* ovipositor 1.7 x as long as hind femur); 5) body 7.5x as long as ovipositor (in *P. caudata* body 1.1 x as long as ovipositor); 6) gaster 1.17x as long as hind femur laterally (in *P. caudata* gaster 1.4x as long as hind femur laterally); and 7) MV 2.5x PMV; PMV 2x STV (in *P. caudata* MV 1.3x PMV; PMV 2.5x STV).

*Podagrionella nupera* sp. nov.

(Plate: 20)

**Description:**

**Female: Holotype:** Length: 2.45mm; ovipositor 1.7 mm.

**Colour:** Head and mesosoma metallic green, gaster golden yellow with brownish patch on the dorsal side; all legs concolorous with gaster; teeth on hind femur black, ventral side of hind tibia with a brown strip; antennae concolorous with legs except brownish clava; eyes reddish brown; ocelli yellowish brown; tegula brown, wings hyaline, veins brown; ovipositor reddish brown, ovipositor sheath brown.

**Head:** Head with reticulation weak on lower face and genae, distinct on frons and vertex and covered with sparse small white pubescence, about 4x as broad as long in dorsal view (7:28), 1.66x as broad as long in anterior view; eyes large, without pubescence; malar groove distinct, 0.47x as long as eye length (18:38); scrobe moderately deep; relative measurements of AOL:POL:OOL = 7:16:6; POL 2.66x OOL; antennae placed above middle of face, scape reaches front ocellus, relative measurements of L:W of antennal segments = scape 16:4, pedicel 6:4, F₁ 8:4, F₂ 8:4, F₃ 8:4, F₄ 8:4, F₅ 7.5:4.5, F₆ 7.5, F₇ 7:5, clava 21:6; scape small, equal to combined length of first two funicular segments, clava comparatively small and subequal to the length of three preceding segments.

**Mesosoma:** Mesosoma with shallow reticulations, sparse small pubescence; pronotum with anterior margin round, posterior margin slightly emarginated; relative measurements of length : breadth of thoracic segments = pronotum 4:18,
mesoscutum 8:30, scutellum 14:14. Frenal area smooth, axilla deep, projecting slightly forward, regulose with an anteriolateral area with microsculptures beneath; tegula deep and clearly marked off; axilla narrow and nearly smooth; propodeum without distinct submedian carinae, rest of the area coarsely reticulate, reticulation broad and well raised above the general surface; spiracles close to hind margin of metanotum; all legs with minute pubescence; hind coxa and femur smooth with moderate pubescence; relative measurements of L : W of hind leg = coxa 25:7, femur 35:17.5, tibia 28:3 and tarsi 20:2; hind tibial spine 1.5x as long as basitarsus (9:6); hind femur 2x as long as broad; ventral margin of hind femur with 8 teeth, 1, 4 and 7 large, 2, 3, 5, 6 small and 8th broad; forewing 2.6x as long as its maximum width (96:37); forewing with relative measurements of SMV: MV: PMV: STV = 37:26:17:3; (MV 1.53x PMV); forewing with an open speculum.

**Metasoma:** Gaster with a short petiole, petiole longer than broad (4:2.5); gaster smooth and shiny, 3.42x as long as broad (48:14); gaster shorter than head and mesosoma combined (42:45); body 1.37x as long as ovipositor (85:62); ovipositor 1.47x as long as gaster (62:42); gaster 1.4x as long as hind femur (42:30); ovipositor 2.06x as long as hind femur (62:30).

**Male:** Unknown.

**Host:** Unknown.

**Etymology:** species name is taken from the Latin word ‘nupera’ meaning new (neuter gender).

**Distribution:** India: Kerala: Palakkad (Parambikulam).

**Material examined:** Holotype F, INDIA: Kerala, Palakkad, Parambikulam, 10°46’N 76°38’E, 10.v.2010, Coll. Mercy Ignatius (DZCU). Paratype: 1F with same collection data.

**Remarks:** This species comes near to *Podagrionella caudata* Narendran in the key to species by Narendran 1994 but differs from it in having 1) POL 2.66x OOL (in *P. caudata* POL 3x OOL); 2) hind femur with 8 teeth (in *P. caudata* hind femur...
with 6 teeth); 3) apical spine of hind tibia 1.5x as long as basitarsus (in *P. caudata* apical spine of hind tibia 1.25x as long as basitarsus); 4) gaster petiolate (in *P. caudata* gaster sessile); 5) ovipositor 2.06x as long as hind femur (in *P. caudata* ovipositor 1.7x as long as hind femur); 6) ovipositor 1.47x as long as gaster (in *P. caudata* ovipositor 1.16x as long as gaster); 7) body 1.37x as long as ovipositor (in *P. caudata* body 2x as long as ovipositor); and 8) body metallic green with golden yellowish gaster (in *p. caudata* body blackish green).
Genus *Propalachia* Bouček

*Propalachia* Bouček, 1978: 101. Type species: *Propalachia infumata* Bouček (original designation (BMNH)).

**Diagnostic features:** Head and mesosoma dark green, gaster black; eyes dark red; POL 3.5x OOL; forewing with a broad central infumation; hind femur infuscate distally and on teeth, apically truncate hind tibia, apical half of ventral surface of hind femur with at least two large teeth, and often with several other irregular teeth; malar groove distinct; antennae inserted below middle of face, above level of lower margin of eye; scrobe deep; notauli absent or weakly defined, frenal line absent, spiracles elongated and narrow; prepectus broad; metapleuron distinctly reticulopunctate; propodeum with a neck distinctly projecting beyond base of hind coxa; marginal vein shorter than half of costal cell; MV 2.5x PMV; gaster convex; hind margins of anterior tergites entire; body 3x as long as ovipositor; ovipositor shorter than gaster.

**Host:** They may be parasitic in the ootheca of Mantids.

**Distribution:** Members of this genus are found in Africa, Malaysia, Thailand and India.

*Propalachia intermedia* Narendran

(Figures: 87-92)

*Propalachia intermedia* Narendran, 1994:63-64, Holotype F (BMNH).

**Diagnosis:** (Based on original descriptions of Narendran, 1994).

**Female:** Length 1.67 mm. plus ovipositor 0.55 mm; head and mesosoma dark green, gaster black, ovipositor brownish black; eyes dark red; antennae dark brown with scape whitish pale colour, tip of pedicel also pale white; legs yellowish white with following exceptions; hind femur infuscate distally and on teeth, tibiae and tarsi yellow; tegula brown; forewing with a broad central infumation; uniformly and
closely reticulate, punctate; eyes large; occiput with a very weak carina; temples 0.22x as long as eye; relative measurements of POL: OOL : AOL = 14: 4: 6; POL 3.5x OOL: head in front view 1.3x as wide as long; clypeus reticulate; anterior margin straight; malar space about 0.27x as long as eyes; malar grooves distinct; antennae inserted below middle of face, above level of lower margin of eye; scrobe deep; scape 0.58x as long as eye; flagellum becoming broader towards tip; clava as long as 6.5 preceding segments combined, micropilosity broad, reaching base; mesosoma distinctly reticulate punctuate; notaular grooves shallow; propodeum regularly reticulate; spiracles elongated and narrow; prepectus broad, slightly depressed in middle weakly reticulate area; hind femur with four teeth, second tooth largest; hind femur 3.19x as long as wide; forewing 2.88x as long as its maximum width (72:25); relative measurements of SMV: MV: PMV: STV = 66 : 28: 11: 10; MV 2.54x PMV; gaster a little less wider than mesosoma and 1.5x as long as wide; hind margin of dorsally visible tergites straight; T 0.55x as long as gaster in dorsal view; ovipositor 0.85x as long as gaster (30:35); body 3x as long as ovipositor (90:30).


Remarks: This is the only one species reported from India.
Genus *Pseudotorymus* Masi


*Eridontomeroidella* Girault in Ramakrishna Ayyar, 1919: 935. Type species: “*Eridontomeroidella gibbon* Girault” (monotypic). *Nomen nudum.*


**Diagnostic features:**

Head wider than long anteriorly; antenna inserted above level of ventral margin of eye; antennal formula 1173; notauli distinct; propodeum without median carina; smooth or finely rugose; head and mesosoma rugosely punctuate; hind femur occasionally with small distinct apical denticle; MV relatively very long; gaster sessile; posterior margin of T1 incised in middle at posterior margin.

**Biology:** Members of this genus are parasitic on gall midges and weevil larvae.

**Distribution:** They are distributed in Palaearctic, Ethiopian, Oriental and Nearctic regions (Grissell, 1995).
Key to Species of *Pseudotorymus* Masi

1. Ovipositor 0.61x gaster (fig.99); funicular segments wider than long; MV 4.5x PMV; POL 3.5x OOL .................. *P. grisselli* Narendran & Girishkumar

2. Ovipositor longer than gaster ................................................................. 2

3. Ovipositor less than 2x length of gaster .................................................. 3

4. Ovipositor 2x or more length of gaster ..................................................... 4

3. Ovipositor 1.1x gaster (Plate: 21:A); funicular segments wider than long; POL 2.5x OOL; MV 5x PMV; length of clava equal to preceding 4.5 funicular segments; scutellum wider than long …… *P. amuthae* Narendran

4. Ovipositor 2x gaster (fig.93); funicular segments wider than long; POL 3.3x OOL; MV 4.23x PMV; length of clava equal to preceding 2.5 funicular segments; scutellum longer than wide ............... *P. annamalaicus* Narendran

4. Ovipositor 2.32x gaster (fig.105); funicular segments longer than wide; POL 2.85xOOL; MV 5.2x PMV; length of clava equal to preceding 2 funicular segments; scutellum longer than wide ............... *P. salemensis* Narendran

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*Pseudotorymus amuthae* Narendran

(Plate: 21)

*Pseudotorymus amuthae* Narendran, 1994: 50-51 Holotype F. India: Tamil Nadu (AEI)

Redescription:

Plesiotype: Female: Length 2.16 mm.

Colour: Head and mesosoma dark metallic bluish green; eyes brick red; ocelli brown; antenna brown with scape light yellow; pedicel ring segment and flagellum
yellowish brown; tegula brown; trochanters yellowish brown; femora blackish brown except pale yellow apices, tibiae and tarsi pale yellow, more than half of anterior portion of each abdominal tergite shows metallic green reflection, remaining region brownish black; ovipositor sheath blackish brown; ovipositor bright yellow; wings hyaline, SMV yellow, becoming little brown towards apex; MV and PMV brownish yellow, STV with more brown colour than MV and PMV; pubescence silvery on head, mesosoma and abdomen, white on legs and on antennae; brown on wings and on ovipositor sheath.

**Head:** Head width in dorsal view more than 3.8x its median dorsal length; head moderately pubescent ; head rugose and granulate, antennal scrobe slightly reticulate, polished, deep, reaching front ocellus, margins ecarinate; relative measurements POL:OOL:AOL= 15:6:6; POL 2.5x OOL; relative measurements of L:W of antennal segments = scape 40:9, pedicel 10:8, F₁ 8:12, F₂ 8:13, F₃ 7:13, F₄ 7:13, F₅ 7:13, F₆ 7:14, F₇ 6:14, clava 30.5:15; scape not reaching front ocellus, scape 1.3x as long as clava; all funicular segments wider than long; length of scape equal to combined length of first 5.5 funicular segments; length of clava equal to combined length of preceding 4.5 funicular segments.

**Mesosoma:** Mesosoma subequal to gaster; rugose, granulate; prepectus smooth; mesepimeron with certain smooth, polished projections, remaining parts of mesepisternum finely reticulate; mesepimeron reticulate; median dorsal length of pronotum 2.1x shorter than mesoscutum; mesoscutum 1.18x longer than scutellum, scutellum wider than long; propodeum faintly rugulose with a row of shallow pits on anterior margin; mesosoma dorsally moderately pubescent; forewing 2.11x as long as wide( 95:45); relative measurements of SMV: MV: PMV: STV=40:25:5:3; MV 5x PMV; relative L:W of hind leg = 45:20, femur 55:20, tibia 60:13, tarsi 45: 5; hind femur without any tooth.

**Metasoma:** Gaster sessile, subequal to mesosoma; all tergites minutely rugulose; ovipositor sheath distinctly shorter than combined length of head and mesosoma, ovipositor 1.1 x longer than gaster; pubescence sparse on tergites.

**Male:** Unknown
Host: Jasminum sambac (Family: Olivaceae).

Distribution: India: Tamil Nadu: Padapai.


Remarks: This species comes near to Pseudotorymus harithavarnus Narendran in the key to oriental species of Pseudotorymus by Narendran 1994 in general but differs from it in having: 1) ovipositor 1.1x longer than gaster (in P. harithavarnus ovipositor 1.6x longer than gaster); 2) forewing 2.11x as long as its maximum width (in P. harithavarnus forewing 2.26x as long as wide); 3) MV 5x PMV (in P. harithavarnus MV 3.42x PMV); 4) POL 2.5x OOL (in P. harithavarnus POL 2.1x OOL); 5) length of clava equal to combined length of preceding 4.5 funicular segments (in P. harithavarnus length of clava equal to combined length of preceding 3 funicular segments); and 6) all funicular segments wider than long (in P. harithavarnus funicular segments two onwards slightly wider than long). This species is redescribed to include more characters for the easy determination of the species.

Pseudotorymus annamalaicus Narendran
(Figures: 93-98)


Diagnosis: (Based on original description of Narendran, 1994)

Female: Length 2.14mm; ovipositor 1.85 mm; liver brown with metallic violet blue and green reflections on head, dorsum of mesosoma and parts of gaster; eyes brick red; ocelli reflecting pale yellow; antenna with scape and pedicel pale yellow, remaining segments slightly darker; all tibiae and tarsi pale yellow; ovipositor sheath pale brown; ovipositor pale yellow; wings hyaline, veins pale yellow; pubescence silvery; frons and vertex rugoso-reticulate, with moderately dense
pubescence; strobe rugulose-shine, reaching front ocellus; occipital carina distinct, its lateral edges extending down to hypostoma; malar sulcus complete; POL 3.3x OOL; all funicular segments wider than long; scape not reaching front ocellus; length of clava equal to combined length of preceding 2.5 funicular segments; dorsum strongly punctate and reticulate; prepectus smooth; median length of pronotum a little more than half length of mesoscutum; notauli distinct and complete; scutellum a little longer than its maximum width, apex rounded; frenal line distinct; frenal area similarly sculptured as that of scutellum; propodeum with weak median carina, surface weakly reticulate; spiracle oval, spiracular sulcus indistinct; forewing 1.85x as long as its maximum width (50:27); relative lengths of SMV:MV:PMV:STV = 75:55:13:8; MV 4.23x PMV; hind coxa dorsally reticulate with a few widely spaced dorsal setae; length 3x its maximum width, ventral margin slightly and faintly serrate; hind tibia with two distinct straight spurs at apex; posterior margin of T1 sinuate medially; length of ovipositor 2x length of gaster; ovipositor 2.95x as long as hind femur (65:22).

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** INDIA: Tamil Nadu, Annamalai.

**Remarks:** This species comes near to *Pseudotorymus salemensis* Narendran in general but differs from it in having: 1) length of ovipositor 2x length of gaster (in *P. salemensis* ovipositor 2.32x gaster); 2) MV 4.23x PMV (in *P. salemensis* MV 5.2x PMV); 3) POL 3.3x OOL (in *P. salemensis* POL 2.85x OOL); 4) all funicular segments wider than long (*P. salemensis* all funicular segments longer than wide); and 5) length of clava equal to combined length of preceding 2.5 funicular segments (in *P. salemensis* length of clava equal to preceding 2 funicular segments).
**Pseudotorymus grisselli** Narendran and Girish Kumar

*(Figures: 99-104)*


**Diagnosis:** (Based on original description of Narendran & Girishkumar, 2006).

**Female:** Length 2.65 mm; head and mesosoma brownish black with metallic green reflections, gaster brown with blackish brown and green reflections on dorsum; eyes blackish brown, ocelli reflecting yellowish brown; antenna with scape yellowish brown, pedicel and anellus blackish brown, remaining segments darker; all coxae concolourous with mesosoma, all trochanters and femur blackish brown, fore and mid tibia pale brown, paler towards apex, hind tibia and all tarsi except apices pale brownish white, apical tarsi and claws pale brown; ovipositor sheath dark brown; ovipositor pale yellowish brown with apices brown; wings hyaline, forewing veins yellowish brown except marginal vein yellow; pubescence silvery; frons and vertex rugoso-reticulate, with scattered pubescence; scrobe rugulose, shiny, not reaching front ocellus, basal region deep, margins not carinate; interantennal projection with pubescence; area just below antennal toruli with a slight ridge; occipital carina not distinct clypeal margin with a faint notch in middle; POL 3.5 x OOL; malar sulcus complete; scape not reaching front ocellus; all funicular segments wider than long; length of scape equal to combined length of first three funicular segments; length of clava equal to combined length of preceding 3 funicular segments; dorsum strongly punctate and reticulate; scutellum 0.73x shorter than mesoscutum, 0.86x longer than its maximum width, apex rounded; frenal line distinct, frenal area similarly sculptured as that of scutellum; propodeal surface finely reticulate; spiracle oval, spiracular sulcus indistinct; forewing length 2.2x its maximum width;(66:30) relative lengths of forewing viens SMV:MV:PMV:STV = 41: 27:6.5:6; MV 4.5 x PMV; hind coxa strongly reticulate dorsally with a few widely spaced dorsal setae; length 3.4x its maximum width, ventral margin slightly and faintly serrate; hind tibia with two distinct straight spurs at apex; posterior margin of T1 sinuate medially; length of ovipositor 0.6x length of gaster (18:30).
Male: Unknown.

Host: Unknown.

Distribution: INDIA: Kerala, Wayanad, Thirunelli.

Remarks: This species differs from all other Indian species of *Pseudotorymus* Masi in having: 1) propodeum finely reticulate; 2) ovipositor distinctly shorter (0.61x) than gaster; 3) POL 3.5 x OOL; 4) MV 4.5 x PMV; 5) forewing length 2.2x its maximum width; 6) all funicular segments wider than long; 7) length of scape equal to combined length of first three funicular segments; and 8) length of clava equal to combined length of preceding 3 funicular segments.

*Pseudotorymus harithavarnus* Narendran

(Plate: 22)


Redescription:

Female: Plesiotype: Length 2.2 mm; ovipositor 1.83mm.

Colour: Metallic green; eye brownish red with posterior area blackish yellow; ocelli pale brownish yellow; antenna blackish brown with scale, pedicel, ring segment and F1 paler; fore and mid femora and coxae blackish brown with apices of femora paler; hind trochanter and femur blackish brown with metallic green refrigence; all tibiae and all tarsi yellow; tegula pale brown; ventral part of gaster and apical part of T6 blackish brown; ovipositor sheath blackish brown; wings hyaline with veins yellowish brown; pubescence pale brown.

Head: Head width in dorsal view a little more than 2.4x its median dorsal length; its width in front view a little more than 1.1x its median length; head rugose and granulate; scrobe shallow, not reaching front ocellus, its margins ecarinate;
maximum diameter of eye 3x length of malar groove in profile; POL: OOL: AOL = 19: 9: 10; POL 2.1x OOL; relative measurements of L:W of antennal segments = scape 16.5:4, pedicel 4:3, F₁ 3:3, F₂ 3:4, F₃ 3:4, F₄ 3:4, F₅ 3:4.5, F₆ 3:5, F₇ 3:5, clava 9:6; scape not reaching front ocellus; F₁ width equal to length; length of scape equal to combined length of first 5.5 segments; funicular segments two onwards slightly wider than long ; length of clava equal to combined length of preceding three funicular segments.

**Mesosoma:** Rugose and granulate; median dorsal length pronotum including collar shorter than half length of mesoscutum; scutellum shorter than mesoscutum, as long as wide; propodeum smooth, with a row of shallow pits on its anterior margin, posterior margin of each pit ecarinate; sides of propodeum faintly rugulose; prepectus large; reticulate; mesepimeron smooth, mesepisternum rugulose; mesosoma sparsely pubescent; forewing 2.26x as long as its maximum width (102:45); relative measurements of SMV: MV: PMV: STV = 40: 24: 7: 3 ; MV 3.42x PMV; PMV 2.33x STV; relative measurements of L:W of hind leg = 25:8, 32:9, 32:7, 26:2.

**Metasoma:** Gaster sessile; longer than mesosoma (65:72) but shorter than combined length of head and mesosoma in profile; T₁ to T₄ incised at middle of posterior margin; all tergites rugulose with T₁ smooth on anterior three-fourth; a transverse yellow membraneous depressed pit like area present at posterior margin of last tergite at base of ovipositor sheath; ovipositor sheath distinctly shorter than combined length of mesosoma and gaster, ovipositor 1.6x longer than gaster (75:47).

**Male:** Length: 2.1 mm; similar to female except for shorter gaster.

**Host:** Caterpillar boring into *Cajanus indicus* (Family: Papilionacea).

**Distribution:** India, Kerala & Karnataka.

Remarks: This species comes near to *Pseudotorymus amuthae* Narendran in the key to Indian species of *Pseudotorymus* by Narendran 1994 in general but differs from it in having: 1) ovipositor 1.6x longer than gaster (in *P. amuthae* ovipositor 1.1 x longer than gaster ); 2) forewing 2.26x as long as its maximum width (in *P. amuthae* forewing 2.11x as long as wide); 3) MV 3.42x PMV (in *P. amuthae* MV 5x PMV); 4) POL 2.1x OOL (in *P. amuthae* POL 2.5x OO)L; 5) length of clava equal to combined length of preceding three funicular segments. (in *P. amuthae* length of clava equal to combined length of preceding 4.5 funicular segments); and 6) funicular segments two onwards slightly wider than long (in *P. amuthae* all funicular segments wider than long). This species is redescribed to include more characters for the easy determination of the species.

*Pseudotorymus salemensis* Narendran

(Figures: 105-107)


Diagnosis: (Based on original description of Narendran, 1994).

Female: Length 2.94 mm; black with slight metallic green refrigence; eye yellowish grey; ocelli pale yellow; antennae pale brownish yellow, club and preceding two segments more darker,scape with more yellowish colour; apices of all femora paler; all tibiae and tarsi yellow; pubescence sparse and dirty white; surface of head rugose and granulate; scrobe shallow, not reaching front ocellus; margins ecarinate; maximum diameter of eye in profile 3x length of malar groove in profilescape not reaching front ocellus, funicular segment upto 6 distinctly longer than wide; length of scape equal to combined length of first 3 funicular segments; length of clava equal to combined length of preceding two funicular segments; dorsum of mesosoma rugose and granulate; median length of pronotum including collar shorter
than half length of mesoscutum; scutellum shorter than mesoscutum; distinctly longer than its maximum width; propodeum smooth, rugulose on sides, with shallow pits on anterior margin; prepectus large, reticulate; relative L:W of hind leg = 18:9, femur 12:10, tibia 15:5, tarsi 20:2; forewing 2.28x as long as its maximum width (80:35); relative measurements of SMV: MV: PMV: STV = 30: 26: 5: 3 ; MV 5.2x PMV; PMV 2.66x STV; gaster sessile, as long as mesosoma; T₁ to T₄ incised medially at posterior margins; all tergites (except T₁ and T₂) faintly rugulose; no pit at base of ovipositor sheath on dorsal side; ovipositor sheath distinctly much longer than combined length of mesosoma and gaster; ovipositor 2.32x gaster (100:43).

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** India: Tamil Nadu: North Salem.

**Remarks:** This species comes near to *Pseudotorymus annamalaicus* Narendran in general but differs from it in having: 1) ovipositor 2.32x gaster (in *P. annamalicus* length of ovipositor 2x length of gaster); 2) MV 5.2x PMV (in *P. annamalicus* MV 4.23x PMV); POL 2.85x OOL (in *P. annamalicus* POL 3.3x OOL); 3) forewing 2.28x as long as its maximum width (in *P. annamalicus* forewing 1.85x as long as its maximum width); 4) funicular segment upto 6 distinctly longer than wide (in *P. annamalicus* all funicular segments wider than long); and 5) length of clava equal to combined length of preceding two funicular segments (in *P. annamalicus* length of clava equal to combined length of preceding 2.5 funicular segments).

**Character state matrix of species of *Pseudotorymus* Masi**

The five species of *Pseudotorymus Masi* can be identified by the character state matrix:

1. Funicular segments L:W
   - State 1: longer than broad
   - State 2: broader than long
2 Scutellum L:W
   State 1: longer than broad
   State 2: broader than long
   State 3: as long as broad

3 Length of ovipositor
   State 1: shorter than gaster
   State 2: less than 2x length of gaster
   State 3: 2x or more longer than gaster

4 POL: OOL
   State 1: POL more than 3x OOL
   State 2: POL less than 3x OOL

5 MV: PMV
   State 1: MV 5x or more
   State 2: MV 4x or more
   State 3: MV less than 4x PMV

6 Length of clava
   State 1: equal to 2-3 preceding funicular segments
   State 2: equal to more than 3 preceding funicular segments

7 Forewing L:W
   State 1: less than 2x width
   State 2: more than 2x width

Character state matrix of five species of *Pseudotorymus* Masi

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Genus *Rhynchoticida* Bouček

*Rhynchoticida* Bouček, 1978 : 116. Type species: *Rhynchoticida ovivora* Bouček, by original designation (BMNH)

**Diagnostic features:** Body metallic blue; eyes reddish, ocelli pale reflecting brown; all coxae concolorous with mesosoma; dark and densely pubescent mesosoma; hind femur swollen with a row of broad ventral teeth; a rather short antenna with a short scape, antennal formula 11173; PMV half as long as MV; hind leg with dense pubescence; convex gaster; ovipositor shorter than gaster.

**Biology:** The type species was reported from heteropteran eggs on Cocoa (Bouček, 1978).

**Distribution:** Oriental Region, New Guinea and Malagasy.

**Key to Species of *Rhynchoticida* Bouček**

1. Hind femur with three teeth (fig. 105); ovipositor about 0.6x length of hind tibia; PMV half as long as MV.......................... *R. tridens* Bouček

= Hind femur with five teeth (Plate: 23:G); ovipositor sheath 0.87x as long as hind tibia; PMV 0.63x MV........................................ *R. keralensis* sp. nov.

*Rhynchoticida keralensis* sp. nov.

(Plate: 23)

**Description:**

**Female: Holotype:** Length 1.34 mm, plus ovipositor sheath 0.55 mm.

**Colour:** head metallic blue; eyes reddish, ocelli pale reflecting brown; antennae brown with scape and pedicel yellowish brownish; mesosoma dark metallic blue; gastral tegites dark bluish with green refringence; ovipositor sheath brown; ovipositor yellowish brown; all coxae concolorous with mesosoma; remaining
segments of fore and mid legs pale yellow; hind trochanter yellowish brown; hind femur and teeth black; hind tibia yellowish brown and tarsi pale yellow with brown pretarsus; wings hyaline with veins dark brown; wing pilosity brown; pubescence on body pale yellow.

**Head:** Width equal to its height in front view (excluding mandibles); width in dorsal view 2.56x its length (64:25), equal to width of mesosoma (excluding tegulae); convex upper clypeus cross striolate, lower part strongly reticulate; minimum distance between eyes at toruli 4.5x distance between toruli (27:6), 0.68x height of eye in profile; scrobe separated from anterior ocellus by 2x diameter of anterior ocellus (14:7); relative measurements of AOL:POL:OOL=5:12:7; POL 1.7x OOL; OOL equal to the diameter of posterior ocellus; antenna with scape not reaching anterior ocellus; antennal formula 11173; relative L :W of antennal segments: scape 15:5, pedicel 6:4, anellus 2:3, F1 to F7 (each segment) 1.4x as broad as long (7:5); clava 15:6; each funicular segment with 3 rows of longitudinal sensillae; clava with two apical segments combined as long as its first claval segment; face and eyes with dense pubescence.

**Mesosoma:** Length 1.25x its width (excluding tegulae); pronotum 2.27x as wide as long; mesoscutum 3.2x as broad as long; scutellum as long as broad; pronotum, mesoscutum and scutellum strongly reticulate and uniformly with dense pubescence; frenal area nearly smooth; propodeum with a strong median carina and a row of deep pits at basal margin, followed by two smaller pits (one each) on either side of median carina, lying close to it; propodeal spiracle elongate; each callus with more than 20 setae; broad smooth mesepimeron with central fovea, mesepisternum with ring like shallow grooves; prepectus with two pits, not hairy; relative measurements of L:W of hind leg = coxa 25:14; trochanter 7:9, femur 32:18; tibia 30:5; tarsi 23:3; hind femur 1.28x as long as hind coxa; hind femur 1.77x as long as broad; hind coxa distinctly and closely pitted, interstices shorter diameter of a pit, smooth and shiny, not pubescent, dorsal and ventral side closely reticulate and pubescent; hind femur with close setigerous pits on outer disc, interstices and inside of pits rugose, outer ventral margin with a row of more or less equal sized 5 teeth; upper and lower
sides of hind femur with dense pubescence; hind tibial spur 0.55x as long as hind metatarsus (5:9) ; hind tibia and tarsi with dense pubescence; distal end of hind tibia with a row of long bristles; forewing 2.47x as long as its maximum width (94:38); relative L of SMV: MV: PMV: STV= 32: 22:14: 3.5 (MV 1.57x PMV; PMV 4x STV ; PMV 0.63x MV).

**Metasoma:** Gaster1.2x as long as mesosoma (50:60); gastral tergites smooth and shiny; gaster 1.19x as long as ovipositor sheath (50:42); ovipositor sheath 0.87x as long as hind tibia (35:40); body 2.85x as long as ovipositor (100:35).

**Male:** Unknown.

**Host:** Unknown.

**Etymology:** species named after the name of the state from which it was collected (neuter gender).

**Distribution:** India: Kerala : Kozhikode (Koorachundu).

**Material Examined:** Holotype: Female, INDIA: Kerala, Calicut, Kattullamala (near Koorachundu), 11° 29’N 75°50’E, 22.v.2011, Coll.Mercy Ignatius (DZCU). Paratype 1 F, with same collection data.

**Remarks:** This new species comes near to *Rhynchoticida maai* Bouček in the key to Oriental species of *Rhynchoticida* by Bouček (1978) but differs from it having : 1) ovipositor sheath length 0.87x length of hind tibia (in *R. maai* ovipositor sheath length 0.6x length of hind tibia); 2) PMV 4x as long as STV,0.63x as long as MV (in *R. maai* PMV 4.3x as long as STV,0.8x as long as MV); 4) MV 1.57x PMV (in *R. maai* MV 1.23x PMV); and 5) mesosoma 1.25x as long as wide (in *R. maai* mesosoma 1.61x as long as wide). The genus *Rhynchoticida* is reported for the first time from Kerala.
**Rhynchoticida tridens** Bouček

(*Figure: 108*)


**Diagnosis:** (Based on redescriptions of Narendran, 1994).

**Female:** Length: 2.2-2.5 mm, plus ovipositor about 0.5 mm; dark green, sides darker, bluish or blackish; vertex and pronotum bright brassy; scape, tibiae and tarsi yellow; flagellum pale brown; head 2x as broad as its length in anterior view; antennal formula 11173; scape 1.6x F1; all funicular segments subequal in length to width; scutellum with pubescence clearly extending down to marginal crenulate furrow; propodeum with foveolate depressed parts, with some hairs; prepectus pilose; hind femur with three irregular ventral teeth; first tooth larger than other two; basitarsus 2x as long as hind tibial spine; forewing with costal cell on upper surface in proximal two thirds with one hair line; MV half as long as costal cell, PMV half as long as MV; relative L of gaster : ovipositor = 50: 29; ovipositor about 0.85x length of hind tibia; body 4.6x as long as ovipositor; gaster 1.72x as long as ovipositor;

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** India (Karnataka).

**Remarks:** This species differs from all other Oriental species in having 1) hind femur with three irregular teeth (in all other species hind femur with more than three teeth); and 2) scutellum without distinct frenum (in all other species scutellum with distinct frenum).
Genus *Torymoides* Walker


*Dimeromicrus* Crawford, 1910:127. Type species: *Dimeromicrus ashmeadi* Crawford (original designation and monotypic, USNM); Synonymized by Bouček, 1988:135.


*Macrodontomerus* Girault, 1913:175:100. Type species: *Macrodontomerus triangularis* Girault (original designation); Synonymized by Bouček, 1988:135.


*Pondorymus* Bouček, 1978:124. Type species *Pondorymus latus* Bouček (original designation and monotypic, BMNH); synonymized by Grissell, 1995:110.

**Diagnostic features:** This genus may be characterised by a combination of the following characters: colour normally metallic green or blue ranging to partly yellow or occasionally black; antennal formula 11263; mesosoma with variable sculputure, most often reticulate to coriaceous, occasionally with large punctures; frenal groove usually indistinct; posterior margin of mesepimeron sinuate; hind tibia with two spurs; unmodified propodeum; gaster with posterior margin of first tergite incised medially.
**Biology:** Members of this genus are parasites in various galls of herbaceous plants or on soft parts of woody plants, mainly in galls of Diptera (Bouček, 1988).

**Distribution:** This genus is cosmopolitan in distribution.

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**Key to Species of **Torymoides** Walker**

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<tr>
<th>Step</th>
<th>Description</th>
<th>Species</th>
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<tr>
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<td>Exserted part of ovipositor (1.2x or more) longer than gaster</td>
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<tr>
<td>=</td>
<td>Exserted part of ovipositor equal to or shorter than gaster</td>
<td>6</td>
</tr>
<tr>
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<td>Body metallic green (except apices of femora); POL 3x OOL; MV 6.75x PMV; exserted part of ovipositor 1.4x as long as gaster (Plate: 26:G); forewing 2.5x as long as its maximum width</td>
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<td>=</td>
<td>Colouration not as above; other characters partly or completely different</td>
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<td>3</td>
<td>Exserted part of ovipositor 2x as long as gaster (Plate: 25: G); POL 2.35x OOL; MV 5.5x PMV; hind femur normal, nearly smooth and without subapical tooth; forewing 2.35x as long as its maximum width</td>
<td>T. keralensis Narendran</td>
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<td>Ovipositor 1.2- 1.4x as long as gaster; other characters partly or completely different</td>
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<td>Ovipositor 1.4x gaster (Plate: 29: G); POL 3x OOL ; MV 5.1x PMV; scape, pedicel, apices of femora,tibiae,tarsi pale brownish yellow; head, mesosoma, gaster, coxae metallic green with blackish tinge on gaster</td>
<td>T. sureshani Narendran</td>
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<td>Characters partly or completely different</td>
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<tr>
<td>5</td>
<td>Head and mesosoma metallic green, gaster yellowish (Plate: 24:A), ovipositor 1.2x gaster; POL 2.33x OOL; MV 9x PMV(Plate: 24:E); forewing 2.64x as long as its maximum width; hind femur near apex slightly emarginate with a low subapical tooth (Plate: 24:H)</td>
<td>T. amabilis Walker</td>
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<td>Body metallic green, gaster longer than mesosoma (Plate: 27:A), ovipositor 1.57x as long as gaster, POL 2x OOL; MV4x PMV; forewing 2.5x as long as its maximum width; hind femur without subapical tooth</td>
<td>T. longigastralis sp.nov.</td>
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6 Ovipositor little shorter than gaster (Plate: 28:G); T₃ shorter than T₄, mesosoma longer, length 1.6x width and cheeks broad, width of gena 0.4x maximum diameter of eye in profile; POL 2x OOL; MV 7x PMV .................

.........................................................  T. periyarensis Sureshan & Narendran

= Ovipositor as long as gaster (fig.109), T₃ equal to T₄; mesosoma short, length 1.4x width and cheeks narrow; width of gena 0.2x maximum diameter of eye in profile; POL 2x OOL; MV 5x PMV ....  T.anamalaianus Mani & Kaul

_Torymoides amabilis_ Walker

(Plate: 24)


Redescription:

**Female: Plesiotype:** Length 2mm; ovipositor 1mm.

**Colour:** Head (except antennae, compound eyes and ocelli) and mesosoma (except forecoxa, all femora, all tibiae and all tarsi) metallic green; antenna brownish black except scape which is yellowish brown; compound eyes grey or darkish grey; tegulae pale yellow; legs (except mid and hind coxae metallic green) pale brownish yellow; gaster mostly yellowish brown; ovipositor sheath black; wings hyaline; veins pale brown.

**Head:** 1.3x as broad as long in anterior view; vertex not elevated behind anterior ocellus; frons rugose with sparse shallow pits behind antennae, each pit with a short white hair; relative measurements of POL:OOL:AOL=14:6:5; POL 2.33x OOL; interocular space (the minimum distance between the compound eyes behind the anterior ocellus) about twice POL; scrobe narrow, margins not well carinate; antenna with scape not reaching front ocellus ; relative measurements of L:W of antennal segments: scape 27:5; pedicel 8:5; F₁, 10:8; F₂ 9:8; F₃ 9:8; F₄ 9:8; F₅ 7:8; F₆
6:8; clava 18: 9; length of clava equal to combined length of 2.5 preceding segments.

**Mesosoma:** Rugose, intermixed with minute punctures; mesoscutum a trifle more than 1.5x as wide as long; notaulices distinct and deep; scutellum a little wider at base (excluding axillae) than its length, apical margin prominent, rounded, bordered by a row of coarse punctures and not upturned; propodeum rugulose with short vertical carinae at basal margin; anterior half of mesopleura rugulose; hind part of mesopleura with arched episternal scrobe indistinct; posterior half of propodeum smooth and shiny; hind femur near apex slightly emarginate with a low subapical tooth; forewing with relative L of SMV: MV: PMV: STV = 35:27:3:3; MV 9x PMV; forewing 2.64x as long as its maximum width (90:34); relative L: W of hind leg = coxa 25:13; femur 32:9; tibia 33:6; tarsi 30:2.

**Metasoma:** Gaster Sessile, sparsely rugulose on dorsal side; ovipositor 1.2x length of gaster.

**Male:** Length 1.79-1.9 mm; very similar to female; antennal segments stouter, pedicel shorter, flagellum with a little longer decumbent pubescence; gaster shorter than that of female.

**Variation:** length varies from 1.9-3.52mm; ovipositor 0.66-1.12 mm; ovipositor 0.8 -1.2x as long as gaster.

**Host:** Unknown.

**Distribution:** India: Kerala, Karnataka and Sri Lanka.

Remarks: This species comes near *T. sureshani* Narendran in the key to Indian species of Torymoides Walker by Narendran 1994 & Narendran *et al.*, 2010 in general appearance but differs from it in having: 1) Mid coxa metallic green (in *T. sureshani* mid coxa pale brown); 2) tegula pale yellow (in *T. sureshani* tegula brown); 3) gaster mostly yellowish brown (in *T. sureshani* gaster green with a little brown tint dorsally and completely brown ventrally); 4) POL $2.33 \times$ OOL (in *T. sureshani* POL $3 \times$ OOL); and 5) exserted part of ovipositor 1.2x length of gaster (in *T. sureshani* length of exerted part of ovipositor 1.4x length of gaster). This species is redescribed to include more characters for the easy identification of species.

*Torymoides anamalaianus* (Mani & Kaul)

(Figures: 109-110)

*Holaspis anamalaianus* Mani & Kaul, 1972:313-316 INDIA: Devikulam, Anamalai Hills, Holotype, Female, India:Tamil Nadu (SCA?).


Diagnosis: (Based on original descriptions of Mani & Kaul, 1972 & Narendran, 1994).

Female: Length 2.00 mm; body bright metallic-green; antennae brownish-black (except dark metallic green scape and pedicel); wings hyaline, veins pale brown; tibiae and tarsi white, tibial spurs white, otherwise legs concolorous with body; ovipositor black; face uniformly, finely rugulosely punctate; vertex finely rugulose; POL 2x OOL; antenna slender, flagellum less widening towards tip, anelli short and transverse, length of both together less than half of F₁, first ring segment smaller than second; F₁-F₄ width and length subequal in size; clava equal to the preceding 2.5 segments combined; width of gena 0.2x maximum diameter of eye in profile; mesosoma shorter, length 1.4x width and cheeks narrow; mesoscutum with notauli well developed and complete; relative measurements of SMV: MV: PMV: STV = 14: 10 :2: 1; MV 5x PMV; gaster with T₃ almost equal to T₄ in dorsal view; length of ovipositor equal to mesosoma; ovipositor equal to length of gaster.

Host: Unknown.


Remarks: This species comes near T.kiesenwetteri (Mayr) in the key to Indian species of Torymoides Walker by Narendran (1994) in general appearance but differs from it in having: 1) Length of ovipositor equal to length of gaster (in T. kiesenwetteri length of ovipositor distinctly more than 1.2x gaster); and 2) first four funicular segments subequal (in T.kiesenwetteri first four funicular segments not subequal).

This species comes near to T. periyarensis Sureshan & Narendran in the key to Indian species of Torymoides Walker by Narendran et al., 2010 in general but differs from it in having: 1) fore and mid femora brownish black with metallic green reflection (in T. periyarensis fore and mid femora yellow); 2) antenna with anelli short and transverse, length of both together less than half of F₁ (in T. periyarensis
antenna with two longer anelli, length of both together 0.8x $F_1$; 3) antenna slender, flagellum less widening towards tip (in *T. periyarensis* flagellum more widened towards tip); 4) exserted part of ovipositor as long as gaster (in *T. periyarensis* exserted part of ovipositor little shorter than gaster); 5) gaster with $T_3$ almost equal to $T_4$ in dorsal view (in *T. periyarensis* $T_3$ distinctly shorter than $T_4$ in dorsal view); 6) mesosoma shorter, length 1.4x width and cheeks narrow (in *T. periyarensis* mesosoma longer, length 1.6x width and cheeks broad); and 7) width of gena 0.2x maximum diameter of eye in profile (in *T. periyarensis* width of gena 0.4x maximum diameter of eye in profile).

*Torymoides keralensis* Narendran

(Plate: 25)


Redescription:

**Female: Plesiotype:** Length 2.4 mm; ovipositor 2 mm.

**Colour:** Head, dorsal surface of mesoscutum, scutellum and axillae metallic green; pronotum fuscous with a little greenish tint dorsally, propodeum brown with greenish tint, gaster and ovipositor fuscous; eyes cupreous; antennae uniformly brown; coxae and femora yellowish brown; other parts of legs pale yellow with tips of tarsi brown.

**Head:** Slightly wider than mesosoma (60:52), in dorsal view 2x as wide as long; weakly rugulose with small sparse pubescence; face below antennal toruli with sparse small punctures intermixed with rugosity; occiput nearly smooth with a very weak carina, almost indistinct; temples 0.45x as long as eyes; POL 2.35x OOL; antennae inserted just above level of lower margin of compound eyes; scape never reaching front ocellus; relative measurements of L:W of antennal segments: scape 24:6; pedicel 9:6; $F_1$ 6:8; $F_2$ 6:8; $F_3$ 7:8; $F_4$ 7:8; $F_5$ 8:8; $F_6$ 8:9; clava 21:11; length of
clava equal to combined length of about 2.5 preceding segments; anterior margin of clypeus straight; malar space 0.5x as long as the eyes in front view.

**Mesosoma:** Mesosoma weakly rugulose; pronotum 1.5x as broad as long; collar rounded anteriorly; mesoscutum with notaulices complete and distinct; scutellum slightly overlapping metanotum, 1.14x as long as wide; frenum not separated; propodeum smooth with a few small longitudinal carinae beneath the tip of scutellum; spiracle round, close to hind margin of metanotum; propodeum 2.13x as broad as long; mesopleuron with mesepisternum weakly rugulose, mesepimeron and metapleuron smooth; fore and hind coxae very weakly rugulose laterally; hind femur normal, nearly smooth and without subapical tooth; hind tibia with two spurs; forewing 2.35x as long as its maximum width; forewing with SMV 1.5x as long as MV, MV 5.5x PMV, STV very short; relative measurements of SMV: MV: PMV: STV = 33:22:4:2.

**Metasoma:** Gaster with T1 medially produced on dorsal side, hind margin slightly incised; ovipositor about 2x as long as gaster.

**Variation:** Length 2.2-2.4 mm; ovipositor 2-2.09 mm.

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** Kerala.


**Remarks:** This species comes close to *T. taruni* Narendran & Girishkumar in the key to Indian species of *Torymoides* Walker by Narendran et al., 2010 in general but differs from it in having: 1) Head, dorsal surface of mesoscutum, scutellum and axillae metallic green (in *T. taruni* head and mesosoma blackish brown with faint bluish green reflections); 2) POL 2.35x OOL (in *T. taruni* POL 4x OOL); 3) mesoscutum and notaulices complete and distinct (in *T. taruni* notaulices groove like and shallow); 4) T₁ medially produced, hind margin slightly incised (in *T. taruni* T₁ medially produced, hind margin not incised); and 5) ovipositor 2x as long as gaster (in *T. taruni* ovipositor 1.25x as long as gaster). This species is redescribed to include more characters for the easy identification of species.

*Torymoides kiesenwetteri* Mayr

(Plate: 26)

*Holaspis kiesenwetteri* Mayr, 1874: 83, Holotype: Female, (NHMV), Italy.

*Dimeromicrus longicauda* Masi 1916:67-68 syntype , (USNM) Italy.

Synonymized by Erdos, 1956:188.

*Dimeromicrus kiesenwetteri* (Mayr, 1874), Erods, 1955 transferred to *Dimeromicrus*.

*Dimeromicrus longicauda* Masi, 1916: 67-68, Italy (USNM); Erods (1956:188)

Synonymized with *Dimeromicrus kiesenwetteri* (Mayr).

*Torymoides kiesenwetteri* (Mayr,1874); Bouček, 1988:135, new combination for *Holaspis kiesenwetteri*, transferred to *Torymoides*.

Redescription:

Female: Plesiotype: Length 1.6mm; ovipositor 1.6mm.

Colour: Body metallic green; eyes cupreous; antenna with scape and pedicel dark metallic green; otherwise brownish black; legs with coxa and hind femur concolorous with mesosoma; fore and mid femora brownish black, rest of legs pale yellow with tips of tarsi pale brown; tegulae brown; ovipositor sheath black, ovipositor reddish brown; wings hyaline, veins pale brown.

Head: 1.2x as broad as high in dorsal view; vertex narrow, regulose; occiput nearly smooth with a thin carina anteriorly; relative measurements of POL: OOL: AOL = 18:6:8; POL 3x OOL; face rugoso-reticulate with lower part with small punctures; genae striated; malar groove distinct; clypeus a little elevated, anterior margin straight; scrobe narrow, margins not well carinate; antenna with scape not reaching front ocellus; relative measurements of L:W of antennal segments = scape 18:4; pedicel 5:4; F1 5:6; F2 6:6; F3 7:6; F4 7:7; F5 7:8; F6 6:8.5; clava 17:9; clava 2.83x as long as preceding segment; length of clava equal to combined length of 2.5 preceding segments; combined length of flagellum as long as width of head in dorsal view.

Mesosoma: Mesosoma rugulose, intermixed with small sparse pubescence; pronotum 2.45x as broad as long; mesoscutum 2x as long as pronotum; notaulices fine and groove like; scutellum 1.26x as long as broad, posteriorly with a narrow line of punctures; scutellum overlaps metanotum; dorsellum smooth; propodeum narrow, smooth; spiracles large and oval, close to hind margin of metanotum; propodeum medially with a line of transverse punctures close to metanotum, callus with a few scattered hairs; mesopleuron with mesepisternum clearly demarked by a groove, nearly smooth except the basal part, weakly regulose; metapleuron weakly regulose; forewing with relative L of SMV: MV: PMV: STV = 36:27:4:3; MV 6.75x PMV; forewing 2.5x as long as its maximum width (95:38); hind femur near apex slightly emarginate with a low subapical tooth; hind tibia with two spines of unequal length; relative L:W of hind leg = coxa 36:23; femur 42:11; tibia 48:9; tarsi 44:4.
**Metasoma:** Gaster 2.4x as long as scutellum in dorsal view; T₁ slightly incised posteriorly; exserted part of ovipositor 1.48x as long as gaster (55:37); ovipositor 2.36x as long as hind tibia (52:22).

**Male:** Resembles female in general appearance.

**Variation:** Length varies from 1.57-2.4mm; ovipositor length varies from 1.63-1.8mm.

**Host:** *Procecidochares utilis* Stone and *Acanthophilus helianthi* Rossi.

**Distribution:** India (Kerala, Tamil Nadu, West Bengal) and Sri Lanka.


**Remarks:** This species comes close to *Torymoides keralensis Narendran* in the key to Indian species of *Torymoides* Walker by Narendran *et al.*, 2010 in general but differs from it in having: 1) POL 3x OOL (in *T. keralensis* POL 2.35x OOL); 2) ovipositor more than 1.2x as long as gaster (in *T. keralensis* ovipositor 2x as long as
gaster); 3) MV 6.75x PMV (in *T. keralensis* MV 5.5x PMV); 4) forewing 2.5x as long as its maximum width (in *T. keralensis* forewing 2.35x as long as its maximum width); and 5) hind femur near apex slightly emarginate with a low subapical tooth (in *T. keralensis* hind femur normal, nearly smooth and without subapical tooth). This species is redescribed to include more characters for the easy identification of species.

**Torymoides longigastralis** sp. nov.

(Plate: 27)

**Description:**

**Female: Holotype:** Female: Length 1.85mm; ovipositor sheath length: 1.62 mm.

**Colour:** Body bright metallic green; all coxa concolorous with mesosoma; all femora brown; all tibia and tarsi yellow with tips of tarsi brown; antenna with scape and pedicel brown with metallic green reflection; tegula brown; wings hyaline with venation light brown; ovipositor sheath brownish black; ovipositor dark reddish brown.

**Head:** Uniformly microreticulate and sparsely pubescent; head 1.57x as long as broad in front view (22:14), 1.5x as long as broad in dorsal view (6:4); eyes 2x as long as broad in front view; clypeus with anterior margin straight; relative measurements of POL:OOL:AOL = 14:7:5; POL 2x OOL; antenna inserted above lower level of eyes; antennal scape stout, not reaching front ocellus; relative measurements of L:W of antennal segments = scape 14:4, $F_1$ 4:4, $F_2$ 4:5, $F_3$ 5:6, $F_4$ 5:6, $F_5$ 5:6, $F_6$ 4:6, clava 14:10; length of scape equals to the combined length of first three funicular segments, length of clava equals to combined length of three preceding segments.

**Mesosoma:** Finely reticulate, moderately pubescent; pronotal collar round anteriorly; relative measurements of length : breadth of mesosomal segments = pronotum 3:20, mesoscutum 9:24, scutellum 12:12; scutellum almost smooth, median carina and plicae absent; spiracles close to the hind margin of metanotum
callus with a few scattered hairs, dorsellum smooth; propodeum narrow, 3.6x as broad as long; mesopleuron with mesepisternum reticulate; mesepimeron and metapleuron smooth; forewing 2.5x as long as its maximum width (106:42); forewing with SMV: MV: PMV: STV = 22: 20: 5: 2.5; MV 4x PMV; relative measurements of L:W of hind leg = coxa 12:5, femur 20:5, tibia 23:2.5; hind coxa rugulose, hind femur without subapical tooth; tibial spurs two, unequal.

**Metasoma:** gaster 3x as long as scutellum in dorsal view, T₁ slightly incised posteriorly; relative measurements of length: breadth of gaster = 36:12 in dorsal view and 36:10 in profile; ovipositor 1.57x as long as gaster (55:35); gaster 1.33x as long as mesosoma (60:45); ovipositor 4x as long as hind tibia (100:25), a little less than combined lengths of head and body (115:100).

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** INDIA: Kerala (Kozhikode).

**Material examined:** Holotype 1 F, INDIA: Kerala, Kozhikode, Kattullamala (near Koorachundu, 11°29’N 75°50’ E; 23.i.2011, Coll. Mercy Ignatius (DZCU). Paratype 1F with same collection data.

**Remarks:** This species comes near to *Torymoides sureshani* Narendran in the key to Indian species of *Torymoides* Walker by Narendran (1994) in general appearance but differs from it in having: 1) gaster longer than mesosoma (in *T. sureshani* gaster as long as mesosoma); 2) Length of ovipositor 1.6x gaster (in *T. sureshani* length of ovipositor 1.4x gaster); and 3) MV 4x PMV (in *T. sureshani* MV 5.1x PMV).

This species differs from *T. keralensis* Narendran in having: 1) ovipositor 1.6x as long as gaster (in *T. keralensis* ovipositor 2x as long as gaster); 3) MV 4x PMV (in *T. keralensis* MV 5.5x PMV); 3) POL 2x OOL (in *T. keralensis* Narendran POL 2.35x OOL); and 4) forewing 2.5x as long as its maximum width (in *T. keralensis* forewing 2.35x as long as its maximum width).
*Torymoides periyarensis* Sureshan & Narendran

(Plate: 28)


**Redescription:**

**Female:** Plesiotype: 1.5-1.8 mm; ovipositor 0.5-0.7 mm.

**Colour:** metallic bluish green with bronzy reflection; gaster bluish- green, brown partly on dorsal and ventral sides; ovipositor sheaths blackish brown; ovipositor reddish brown; antennae blackish brown; scape with slight bluish reflection; all coxae and hind femora (except distal tip) concolorous with mesosoma, distal tip of hind femora brown, remainder of legs yellow, except partly brown tips of tarsi and mid femora; wings hyaline; tegulae and veins brown.

**Head:** Slightly wider than mesosoma, finely rugulose reticulate and striate with small punctures on lower face; occipital carina weak; genae finely reticulate; in dorsal view head width 2x length and in anterior view head width 1.2x height; POL 0.4x eye length; malar space length 0.5x eye length; malar grooves distinct; anterior margin of clypeus slightly produced, straight; eyes separated 1.3x their length; eye length 1.3x width (in profile); relative measurements of AOL:POL:OOL=6:14:7; POL 2x OOL; antenna inserted below middle of face, just above lower margin of eyes; scape not reaching front ocellus, length 0.83x eye length; relative L:W of antennal segments scape 16:3, pedicel 4:3, F₁ 4:4, F₂ 4:4, F₃ 5:4, F₄ 5:4, F₅ 5:5, F₆ 5:6, clava12:6; flagellum gradually widening towards tip; clava almost as long as three preceding segments combined.

**Mesosoma:** Weakly rugulose and with scattered punctures; pubescence small. pronotum 1.8x as broad as long, collar rounded anteriorly; mesoscutum width 1.5x length; notauli groove like, shallow; scutellum length 1.12x width, slightly overlapping metanotum; frenum not separated; propodeum shiny, with a row of
small deep punctures on the anterior margin between spiracles; callus with a few hairs; prepectus and mesepisternum weakly rugulose; mesepimeron and metapleuron smooth; fore and hind coxae finely rugulose laterally; relative L:W of hind leg = coxa 25:10, femur 30:8, tibia 32:5, tarsi 19:1; hind femora with a small subapical tooth; forewing 2.3x as long as its maximum width (77:33); relative length of SMV:MV:PMV:STV = 30:21:3:2; MV 7x PMV.

**Metasoma:** As long as mesosoma; exerted part of ovipositor shorter than gaster (28:30); ovipositor 0.9x as long as gaster; T₁ medially produced, hind margin deeply incised; tergites very finely aciculate.

**Male:** Unknown.

**Biology:** Unknown.

**Distribution:** INDIA: Kerala.


**Remarks:** This species closely resembles *T. anamalaianus* Mani & kaul in the key to Indian species of *Torymoides* Walker by Narendran et al., 2010 but differs from it in having: 1) antenna with two longer anelli, length of both together 0.8x F₁ (in *T. anamalaianus* antennae slender, anelli short and transverse, length of both together less than half of F₁); 2) clava almost as long as three preceding segments combined and flagellum more widened towards tip (in *T. anamalaianus* clava as long as 2.5 preceding segments combined and flagellum less widened towards tip); 3) exerted part of ovipositor little shorter than length of gaster (in *T. anamalaianus* exerted part of ovipositor as long as gaster); 4) gaster with T₃ distinctly shorter than T₄ in dorsal view (in *T. anamalaianus* T₃ almost equal to T₄); 5) mesosoma longer, length 1.6x width and cheeks broad (in *T. anamalaianus* mesosoma shorter, length
1) width and cheeks narrow); and 6) width of gena 0.4x maximum diameter of eye in profile (in *T. anamalaianus* width of gena 0.2x maximum diameter of eye in profile).

It also resembles *T. sureshani* Narendran in the nature of antenna and general colour, but the exserted part of ovipositor a little shorter than gaster (in *T. sureshani* exserted part of ovipositor 1.4x gaster). This species is redescribed to include more characters for the easy identification of species.

**Torymoides sureshani** Narendran

(Plate: 29)

*Torymoides sureshani* Narendran, 1994:45, F. INDIA: Kerala, Malampuzha (QMB)

**Redescription:**

**Female: Plesiotype:** Length 1.36 mm; ovipositor sheath 1mm.

**Colour:** Head and mesosoma metallic green; gaster green with a little brown tint dorsally and completely brown ventrally; eyes dark cupreous; legs pale brown with hind coxa concolorous with mesosoma; tegula brown; wings hyaline with veins pale brown; ovipositor sheath dark brown.

**Head:** Uniformly microreticulate and sparsely pubescent; head a little wider than mesosoma in front view, 1.3x as wide as long; eyes large more pubescent, 2x as long as broad in anterior view; clypeus with anterior margin straight; antennae inserted above lower level of eyes; antennal scape stout, not reaching front ocellus; funicular segments transverse; relative measurements of L:W of antennal segments = scape 25:4, pedicel 9:6, *F₁* 7:8, *F₂* 6:8, *F₃* 7:8, *F₄* 7:8, *F₅* 7:9, *F₆* 7:9, clava 21:10; length of scape equals to the combined length of first 3.5 funicular segments, length of clava equals to combined length of three preceding segments; relative measurements of AOL:OOL:POL= 7:6:18; POL 3x OOL.
**Mesosoma:** mesosoma finely reticulate, moderately pubescent; pronotal collar round anteriorly, 8x as wide as long; mesoscutum with notauli complete but not fine, 2x as broad as long; scutellum highly convex, similarly reticulated as mesoscutum, as broad as long; propodeum almost smooth; spiracles close to hind margin of metanotum, callus with a few scattered hairs; 2.36x as broad as long; mesopleuron with mesepisternum reticulate; mesepimeron and metapleuron smooth; hind femur a little flattened; hind coxa reticulate on side; sides of hind femur microreticulate; forewing with STV highly sessile; relative L:W of hind leg = coxa 25:10, femur 30:9, tibia 34:5, tarsi 35:2; forewing 2.23x as long as its maximum width (67:30); relative length of SMV:MV:PMV:STV= 25: 18: 3.5: 2; MV 5.1x PMV.

**Metasoma:** Gaster as long as mesosoma; tegula regulose uniformly; exerted part of ovipositor 1.4x as long as gaster.

**Male:** Unknown.

**Host:** Unknown.

**Distribution:** INDIA (Kerala).

Remarks: This species comes near *T. amabilis* Walker in the key to Indian species of *Torymoides* Walker by Narendran (1994) in general appearance but differs from it in having: 1) Mid coxa pale brown (in *T. amabilis* mid coxa metallic green); 2) tegula brown (in *T. amabilis* tegula pale yellow); 3) gaster green with a little brown tint dorsally and completely brown ventrally (in *T. amabilis* gaster mostly yellowish brown); 4) POL 3x OOL (in *T. amabilis* POL 2.33x OOL); and 5) exserted part of ovipositor 1.4x as long as gaster (in *T. amabilis* exserted part of ovipositor 1.2x as long as gaster).

This species comes near *T. taruni* Narendran & Girishkumar in the key to Indian species of *Torymoides* Walker by Narendran *et al.* (2010) in general appearance but differs from it in having: 1) Head & mesosoma metallic green (in *T. taruni* head & mesosoma blackish brown with faint bluish green reflections); 2) hind coxa with metallic green reflections (in *T. taruni* hind coxa without metallic bluish green reflections); 3) all tibiae and tarsi pale brown (in *T. taruni* all tibiae and tarsi whitish yellow except last tarsal segment brown); 4) eyes pubescent (in *T. taruni* eyes bare); 5) F₁ & F₂ transverse (in *T. taruni* F₁ & F₂ quadrate); 5) POL 3x OOL (in *T. taruni* POL 4x OOL); and 6) exserted part of ovipositor 1.4x as long as gaster (in *T. taruni* exserted part of ovipositor 1.25x as long as gaster). This species is redescribed to include more characters for the easy identification of species.
Genus *Torymus* Dalman


*Syntomaspis* Foerster 1856:43-44. Type species *Torymus eurynotus* Forster (Designated by Gahan and Fagan, 1923:139); synonymised by Huber, 1927:2-4; treated as subgenus by Bouček and Graham, 1978a:226.


*Callimomus* Thomson, 1876:60, 77. Type species *Callimomus scaposus* Thomson (Designated by Ashmead, 1904a: 241); synonymised by Schmiedeknecht, 1914:209 who included the type species under *Torymus*.

*Nannocerus* Mayr, 1885:159,195. Type species *Nannocerus biarticulatus* Mayr (Monotypic); synonymised by, Bouček, 1933:209 and treated as subgenus.

*Hemitorymus* Ashmead, 1904a:243. Type species *Hemitorymus thoracicus* Ashmead(monotypic); synonymized by Gahan, 1948:244.

**Diagnostic features:** Length 1-6mm (excluding ovipositor); normally metallic green or blue (in extralimital species ranging to entirely yellow or occasionally black); head wider than long anteriorly; antennal formula 11173 (but in Lioterphus first funicular segment is anelliform); thorax convex, with variable sculpture usually reticulate or coriaceous, rarely with large pits; scutellum convex, frenal groove present or absent; apex of scutellum usually projecting over metanotum; posterior
part of mesepimeron sinuate; PMV always distinctly shorter than MV; STV shorter than MV; gaster sessile; T₁ and T₄ atleast partially incised; exerted part of ovipositor longer than gaster; ovipositor 1.5 to 2x as long as gaster; hind coxa large, hind femur relatively thick with distinct apical tooth or denticle; hind tibia with two spurs at apex.

**Biology:** Mostly ectoparasitic on Sphecidae, gall-forming Cecidomyiidae and Cynipidae; a few are parasitic on gall-forming Psyllidae, Eurytomidae and Tephritidae; single records are known of Torymus reared from eggs of Cicadidae (Nearctic) and larvae of Coleoptera, Lepidoptera and Coccidae (Palearctic, Nikolskaya, 1952); some are phytophagous on seeds of apple, pear etc.

**Distribution:** Holarctic region South to Northern India and Southern China Southern Africa and Australia (Grissell, 1995).

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Key to Species of *Torymus* Dalman

1  Hind femur without sub apical tooth(fig.109); ovipositor shorter than body (Plate: 31); ovipositor 1.9x hind femur; gaster 1.72x hind femur; POL 2.5x OOL.......................... *T.sharmai* Sureshan & Narendran

= Hind femur with sub apical tooth; other characters partly or completely different ........................................................................................................ 2

2  Ovipositor longer than body; hind femur with subapical tooth followed by serrations (fig.108); gaster 1.6x hind femur; ovipositor 2.86x as long as gaster; MV 3x PMV; POL 1.5x OOL ...................... *T.calcaratus* Nees

= Ovipositor shorter than body; hind femur with subapical tooth followed by no serrations (Plate: 30:E); gaster 1.33x hind femur; ovipositor 2 x as long as gaster (Plate: 30:I); MV 1.33x PMV; POL 1.7x OOL.................. .......................................................................................... *T.harithus* sp. nov.
*Torymus calcaratus* (Nees)  
(Figure: 111)

*Diomorus calcaratus* (Nees, 1834) Holotype: Australia (QMB).

*Torymus calcaratus*, Nees, 1834: 69 transferred to *Torymus*. Type: lost, Germany

*Diomorus orientalis* Narendran & Sureshan, 1994: 25; identified as *Torymus calcaratus* & described.

**Diagnosis:** (Based on descriptions of Narendran & Sureshan, 1989).

**Female:** Length 5.25 mm, plus ovipositor 7.19 mm; generally bright metallic green, partly bluish with violet tinge; antennae, eyes, mandibles all tibiae, mid femora and ovipositor black; tarsi brownish; pubescence white; wings slightly dusky, veins darkish brown; frons rugulose, moderately pubescent; malar groove distinct; malar groove 3.8x as long as eye in profile; POL 1.5x OOL; length of clava equal to combined length of preceding two funicular segments; scape not exceeding front ocellus; mesosoma coarsely punctate and reticulate; scutellum length subequal to its width; frenum distinctly separate (but without groove), smooth and shiny; apex of scutellum rounded; forewing 2.86x as long as its maximum width (80:28); relative measurements of MV: PMV: STV = 15:5:3; MV 3x PMV; PMV 3x STV; relative measurements of L:W of hind leg= coxa 25:12.5, femur 25:8, tibia 25:4, tarsi 23:1; hind femur with distinct sub-apical tooth followed by serrations; gaster sessile; slightly compressed from sides, moderately smooth and shiny dorsally, sides moderately rugulose; exserted part of ovipositor 1.35x as long as body (115:85); ovipositor 2.86x as long as gaster (115:40); ovipositor 4.6x as long as hind femur (115:25); gaster 1.6x as long as hind femur.

**Biology:** Parasitic in the nests of Sphecidae.

**Remarks:** This species comes near to *Torymus sharmai* Sureshan & Narendran key to species by Narendran et al., 2005 but differs from it in having: 1) Hind femur with subapical tooth( in *T. sharmai* hind femur without subapical tooth; 2)
ovipositor longer than body (in *T. sharmai* ovipositor shorter than body) 3) gaster sessile (in *T. sharmai* gaster with a very short petiole); 4) ovipositor 4.6x as long as hind femur (in *T. sharmai* ovipositor 1.9x as long as hind femur); 5) gaster 1.6x as long as hind femur (in *T. sharmai* gaster 1.72x as long as hind femur); 6) POL 1.5x OOL (in *T. sharmai* POL 2.5x OOL); 7) hind coxa 2x as long as wide (in *T. sharmai* hind coxa 2.5x as long as wide); and 8) length of clava equal to combined length of preceding two funicular segments (in *T. sharmai* clava as long as three preceding segments combined).

**Torymus harithus** sp. nov.  
(Plate: 30)

**Description:**

**Female: Holotype:** Length 4.4 mm. excluding ovipositor sheath; ovipositor sheath 3.52 mm.

**Colour:** Body metallic green with bluish reflections; antenna dark brown except yellowish brown scape; eyes blackish brown; ocelli yellowish brown; all coxae and hind femora concolorous with body except distal ends of hind femora yellowish brown; all tarsi yellow; all trochanters yellow except yellowish brown hind trochanter; fore and mid tibia yellow, hind tibia yellowish brown; wings hyaline, venation brown; ovipositor reddish brown, ovipositor sheath blackish brown; pubescence yellowish white.

**Head:** Width 1.25x its median length up to lower clypeal margin (excluding mandibles); width in dorsal view 4.28x its median length; eyes bare; relative measurements of AOL:POL:OOL = 4:12:7; POL 1.7x OOL; head rather granulated; clypeus smooth; length of eye 1.64x malar space; malar sulcus distinct; head with moderately dense pubescence; antennal formula 11173; antenna with toruli well above lower eye line; relative measurements of L: W of antennal segments: scape 35:10; pedicel 10:7; F₁ 12:13; F₂ 17:15; F₃ 17:15; F₄ 15:14; F₅ 15:14; F₆ 15:14; F₇
12:14; clava 30:16; scape not reaching median ocellus; clava 1.1x as long as two preceding segments combined; sensilla numerous.

**Mesosoma:** Strongly convex; pronotum and mesoscutum with dense pubescence except at lateral part of pronotum; median width of pronotum 3x its median length; pronotum, mesoscutum and scutellum granulated; pronotal collar rounded anteriorly; mesoscutum width 1.35x its median length, notauli deep; scutellum with sparsely long hairs; frenal groove distinct; frenum and metasternum almost smooth; propodeum smooth with a median carina, spiracles oval shaped, lateral margin with few long hairs; metapleuron and mesepimeron smooth without hairs; mesepisternum with transverse striations, medially with a row of hairs; all coxae with dense pubescence; hind coxa and hind femur stout; relative measurements of L : W of hind leg : coxa 29:11; femur 35:10; tibia 33:6; tarsi 30:2.5; hind coxa 2.64x as long as its width; hind femur with a strong subapical tooth; hind tibia with two apical spines of equal length; hind femur 3.5x as long as its width; hind tibia 5.5x as long as its width. hind femur with dense pubescence hind tibia and tarsi with strong bristles; forewing 2.1x as long as its maximum width (82:39); relative measurements of SMV: MV: PMV: STV = 40 : 20 : 15 : 3; MV 1.33x PMV; PMV 5x STV.

**Metasoma:** Gaster sessile; equal to mesosoma; posterior margin of first tergum with median incision; ovipositor sheath 2x as long as gaster (60:30); gaster 1.33x as long as hind femur (40:30); ovipositor 2.83x as long as hind femur (85:30); exserted part of ovipositor distinctly shorter than body; body 1.1 x as long as ovipositor (95:85); pilosity on ovipositor sheath moderately long.

**Male:** similar to female but smaller in size; length 2.5 mm.

**Etymology:** Species name is taken from the Latinized version of Sanskrit word ‘haritha’ meaning green indicating the metallic green body (neuter gender).

**Distribution:** Kerala: Kozhikode (Koorachundu).

**Material Examined:** Holotype :1F. INDIA: Kerala: Kozhikode: Kattullamala (near koorachundu) 11°32’16.48” N 75°50’19.47” E ; 23.i.2011; Coll. Mercy Ignatius (DZCU); Paratype :1M with same collection data.
Remarks: This species comes near to Torymus calcaratus Nees in the key to Indian species of Torymus Dalman by Narendran et al. (2005) in general appearance but differs from it in having: 1) Ovipositor shorter than body (in T. calcaratus ovipositor longer than body); 2) hind femur with subapical tooth followed by no serrations (in T. calcaratus hind femur with subapical tooth followed by serrations; 3) gaster 1.33x as long as hind femur (in T. calcaratus gaster 1.6x as long as hind femur) 4) ovipositor 2x as long as gaster (in T. calcaratus ovipositor 2.86x as long as gaster); 5) MV 1.33x PMV (in T. calcaratus MV 3x PMV); and 6) POL 1.7x OOL (in T. calcaratus POL 1.5x OOL).

*Torymus sharmai* Sureshan & Narendran

(Plate: 31 & Figures: 112-117)


Redescription:

**Female: Holotype:** Length 1.8 mm, ovipositor 1 mm.

**Colour:** Head & mesosoma metallic green with bronzy reflection, bluish on dorsal part of mesosoma; gaster dorsally dark metallic blue with brown medially and at tip, laterally yellowish brown on lower half and dark brown on upper half; ovipositor sheath dark brown; antenna with scape, pedicel and anelli testaceous, remainder brown; tegulae testaceous; wings hyaline, veins pale brown.

**Head:** In dorsal view head width 2.5 x length (35:14); temple length 0.22x eye length; relative measurements AOL:POL:OOL = 4:9:3.5; POL 2.5x OOL; in front view head width 1.2x height; inner orbits almost parallel; genae straight; malar space 0.3x eye length; malar groove distinct; eye 1.4x as long as wide in profile (20:14); lower face and genae feebly reticulate; upper face and vertex closely reticulate; pubescence moderately dense; antenna inserted below the middle of face;
scape just reaching median ocellus, 0.6x as long as eye; pedicel 2x as long as wide; all funicular segments longer than wide; clava as long as three preceding segments combined; relative L:W of antennal segments = scape 13:2, pedicel 4:2, F₁ 3.5:3, F₂ 4:3, F₃ 4:3, F₄ 4:3.5, F₅ 4:3.5, F₆ 4.5:4, F₇ 4.5:4, clava 13:5.

Mesosoma: strongly convex; dorsum moderately shiny, rather densely hairy, but pilosity short except on scutellum longer; piliferous punctures very small, surface finely but rather irregularly engraved reticulate; pronotal collar rounded anteriorly; mesoscutum width 1.6x length; scutellum 1.3x as long as wide; no frenal groove, frenal area almost shiny, apex of scutellum rather protruding; hind margin of scutellum carinate and separated by a narrow groove; dorsellum shiny; propodeum shiny with a raw of short fine rugae in anterior margin which is interrupted in the middle; no median carina and plicae; callus with a few scattered hairs; prepectus and mesepisternum feebly reticulate; mesepimeron large, shiny; relative L:W of hind leg = coxa 25:10, femur 32:7, tibia 30:6, tarsi 30:2; hind coxa stout, 2.5x as long as broad, almost shiny, dorsally in its distal two-thirds with a few scattered hairs; hind femora slender, hind tibia with two spurs; long spur 1.1x as long as width of tibial apex; forewing 2.6x as long as its maximum width (111:43); costal cell hairy only at distal ends, basal cell almost bare; speculum opened below; relative length of SMV: MV: PMV: STV = 26.5: 21: 7: 2.5; MV 3x PMV; PMV 2.8x STV.

Metasoma: Gaster with a very short petiole; body 1.75x as long as ovipositor (105:60); gaster 1.2x longer than mesosoma (55:45); exerted part of ovipositor 1.1x as long as gaster (60:55); gaster 1.72x as long as hind femur (55:32); ovipositor 1.9x as long as hind femur (60:32); pilosity on ovipositor moderately long.

Male: Differs from female in colour which is dark bluish green, almost black on head and mesosoma and dark brown on gaster, with only slight metallic reflection; antenna blackish brown; legs dark brown; scape not reaching median ocellus; anelli short; all funicular segments transverse with curved black hairs and gaster shorter and compressed.

Biology: Reared from galls of Strobilanthes sessilis (Nees) (Acanthacea) caused by an unnamed cecidomyiid (Diptera), probably parasitic on it.
**Distribution:** India: Kerala: Idukki (Eravikulam National Park).

**Material examined:** Holotype F (from Depository); INDIA: Kerala: Idukki: Munnar: Eravikulam National Park (10° 11’N 77° 00’E) Coll. P.M. Sureshan, 20.iii.1995. 1M with same collection data.

**Remarks:** This species comes near to *Torymus calcaratus* Nees in the key to Indian species of *Torymus* Dalman by Narendran et al. (2005) in general appearance but differs from it in having: 1) hind femur without subapical tooth (in *T. calcaratus* hind femur with subapical tooth); 2) ovipositor shorter than body (in *T. calcaratus* ovipositor longer than body); 3) gaster with a very short petiole (in *T. calcaratus* gaster sessile); 4) ovipositor 1.9x as long as hind femur (in *T. calcaratus* ovipositor 4.6x as long as hind femur); 5) gaster 1.72x as long as hind femur (in *T. calcaratus* gaster 1.6x as long as hind femur); 6) POL 2.5x OOL (in *T. calcaratus* POL 1.5x OOL); 7) hind coxa 2.5x as long as wide (in *T. calcaratus* hind coxa 2x as long as wide); and 8) length of clava equal to combined length of preceding 3 funicular segments (in *T. calcaratus* clava as long as 2 preceding segments combined). This species is redescribed to include more characters for the easy identification of the species.
## V.2 CHECK LIST OF TORYMID SPECIES OF INDIA

(Valid names are in roman letters. Invalid name/s in italics)

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Species</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Amoturoides breviscapus Girault 1932</td>
<td>India: Karnataka; Australia &amp; Africa.</td>
</tr>
<tr>
<td>2</td>
<td>Anneckeida angustifrons Bouček 1978</td>
<td>India: U.P.</td>
</tr>
<tr>
<td>4</td>
<td>Bootanelleus orientalis (Mathur &amp; Hussey) 1956 =Bootanomyia orientalis Mathur &amp; Hussey, 1956</td>
<td>India: Orissa &amp; Tamil Nadu; Australia, USA, Cuba, Fiji etc.</td>
</tr>
<tr>
<td>5</td>
<td>Bootanomyia dorsalis (Fabricius, 1978) =Callimome dorsalis (Fabricius, 1978) =Cynips dorsalis (Fabricius, 1798) =Diplolepis dorsalis (Fabricius, 1798) =Ichneumon dorsalis Fabricius, 1798 =Megastigmus dorsalis (Fabricius, 1798) =Megastigmus xanthopygus Förster, 1859 =Torymus (Megastigmus) dorsalis (Fabricius, 1798)</td>
<td>India: U.P; USSR, Iran, Italy, Europe, France, Turkey etc.</td>
</tr>
<tr>
<td>6</td>
<td>Chrysochalcissa indica Narendran 1994</td>
<td>India; Kerala &amp; Tamil Nadu.</td>
</tr>
<tr>
<td>7</td>
<td>Chrysochalcissa oviceps Bouček 1978</td>
<td>India: U.P; Burma, Malasia.</td>
</tr>
<tr>
<td>8</td>
<td>Chrysochalcissa physomeri Bouček 1978</td>
<td>India: West Bengal.</td>
</tr>
<tr>
<td>10</td>
<td>Ecdamua lehensis Sureshan 2010</td>
<td>India: Jammu &amp; Kashmir.</td>
</tr>
<tr>
<td>No.</td>
<td>Name of Species</td>
<td>Distribution</td>
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</tr>
<tr>
<td>12</td>
<td>Mangostigmus bengalicus Narendran &amp; Sudheer 2004</td>
<td>India: West Bengal.</td>
</tr>
<tr>
<td>13</td>
<td>Mangostigmus malabaricus Narendran &amp; Vijayalakshmi 2007</td>
<td>India: Kerala.</td>
</tr>
</tbody>
</table>
| 14  | Megastigmus albifrons Walker 1869  

= *Megastigmus grandiosus* Yoshimoto, 1979 | India: Arunachal Pradesh; Canada, Mexico, USA. |
| 15  | Megastigmus albizziae Mukerji 1950 | India: Delhi. |
| 16  | Megastigmus brevivalvus (Girault) 1926  

= *Epimegastigmus brevivalvus* Girault, 1926 | India: U.P; Australia. |
| 19  | Megastigmus indi Girault 1913 | India: U.P. |
| 21  | Megastigmus kashmiricus Sureshan 2009 | India: Kashmir. |
| 22  | Megastigmus sonneratiae Narendran & Girish Kumar 2010 | India: West Bengal. |
| 24  | Monodontomerus aereus Walker 1834  

= *Monodontomerus aereus viridanae* Mayr, 1874  

= *Monodontomerus cupreus* Fabre, 1886  

= *Monodontomerus kashmiricus* Narendran, 1994  

= *Torymus anephelus* Ratzeburg, 1844 | India: Himachal Pradesh, Kashmir; France, Europe, Germany, Japan, Russia etc. |
| 25  | Monodontomerus kashmericus Narendran 1994 | India: Jammu Kashmir |
| 28  | Monodontomerus obscurus Westwood 1833  

= *Callimome pubescens* Walker, 1833  

= *Monodontomerus anthroporae* Walker, 1852  

= *Monodontomerus intermedius* Förster, 1860 | India: Haryana, U.P., Jammu Kashmir; Europe, France, Germany, Japan, etc. |
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<tr>
<td>1</td>
<td>Monodontomerus masii Hoffmeyer, 1929</td>
<td>USA, USSR etc.</td>
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<td>2</td>
<td>Monodontomerus obscurus steffani Bouček, 1954</td>
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<td>3</td>
<td>Monodontomerus pubescens (Walker, 1833)</td>
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<td>4</td>
<td>Monodontomerus strichioptalmus (Cameron, 1913)</td>
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<td>5</td>
<td>Monodontomerus trichioptalmus (Cameron)</td>
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<td>6</td>
<td>Paroligosthenus trichiopthalmus Cameron, 1913</td>
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<tr>
<td>7</td>
<td>Torymus dresdensis Ratzburg, 1844</td>
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<tr>
<td>8</td>
<td>Torymus metallicus Ratzburg, 1844</td>
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<td>9</td>
<td>Monodontomerus trichiopthalmus Cameron 1912</td>
<td>India: U.P.</td>
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<tr>
<td>10</td>
<td>Neoeukobelea mayarami Lal, Farooqi &amp; Husain 1991</td>
<td>India: U.P.</td>
</tr>
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<td>11</td>
<td>Odopoia reticulata Sureshan 2007</td>
<td>India: Orissa.</td>
</tr>
<tr>
<td>12</td>
<td>Ophiopinotus pinotus Husain &amp; Kudeshia 1987</td>
<td>India: Delhi.</td>
</tr>
<tr>
<td>13</td>
<td>Palachia farooqii Bouček 1988</td>
<td>India: U.P; Nepal</td>
</tr>
<tr>
<td>14</td>
<td>Palachia frontopuncta Narendra 2009</td>
<td>India: Himachal Pradesh.</td>
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<td>15</td>
<td>Palachia grisselli Bouček 1998</td>
<td>India: U.P.</td>
</tr>
<tr>
<td>17</td>
<td>Palachia mangalae Narendra 1984</td>
<td>India: Kerala &amp; Karnataka.</td>
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<td>18</td>
<td>Palachia neorobusta Narendra 2009</td>
<td>India: U.P.</td>
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<td>19</td>
<td>Palachia punctifronta Narendra &amp; Sureshan 1989</td>
<td>India: Kerala</td>
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<td>20</td>
<td>Palachia punctigastra Narendra &amp; Sureshan 1989</td>
<td>Kerala, Karnataka &amp; Tamil Nadu</td>
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<td>22</td>
<td>Palachia turneri Bouček 1978</td>
<td>India: Delhi; South Africa, Botswana.</td>
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<td>23</td>
<td>Palmon alfredi Sureshan 2003</td>
<td>India: Kerala.</td>
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<td>24</td>
<td>Palmon greeni Crawford 1912</td>
<td>India: A.P; Sri Lanka,</td>
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<td>45</td>
<td>Palmon kottiyooricus Narendran 2009</td>
<td>Taiwan</td>
</tr>
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| 46  | Palmon orchesticus (Masi) 1926  
    \ = Pachytomoides orchesticus Masi,1926  
    \ = Podagrion iago Fernado,1957  
    \ = Podagrion orchesticum ( Masi,1926) | India: Kerala, Tamil Nadu, U.P., Andhra Pradesh, Orissa; Sri Lanka, Taiwan. |
| 47  | Podagriomicron wayanadense gen.nov.sp.nov | India: Kerala : Wayanad, Calicut. |
| 48  | Podagrion ahlonei Mani & Kaul 1972 | India, Myanmar. |
| 50  | Podagrion calopeplum Mani & Kaul 1972 | India: U.P. |
| 51  | Podagrion charybdis Olivier | India: Orissa |
| 52  | Podagrion chatterjeei Mani & Kaul 1972 | India: U.P |
| 54  | Podagrion christyi sp. nov. | India: Kerala: Wayanad. |
| 57  | Podagrion fulvipes (Holmgren)1868  
    \ =Blephonira fulvipes Holmgren, 1868 | India: Kerala , Assam, Tamil Nadu; China. |
<p>| 58  | Podagrion hayati Narendran 1994 | India: U.P. |
| 59  | Podagrion indicum Girault | India: U.P. |
| 60  | Podagrion indiensis Narendran 1994 | India: Kerala. |
| 61  | Podagrion keralensis Narendran 1994 | India: Kerala, Tamil Nadu &amp; Karnataka |
| 63  | Podagrion manii Narendran 1994 | India: Kerala &amp; Karnataka |
| 64  | Podagrion mantisiphagum (Mani) 1936 | India: Delhi, Orissa. |</p>
<table>
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<td><em>Pachytomus mantisiphagus</em> Mani, 1936</td>
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<td>66</td>
<td>Podagrion opisthacanthum Masi 1926</td>
<td>India: Kerala &amp; Tamil Nadu; Taiwan.</td>
</tr>
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<td>67</td>
<td>Podagrion pachymerum (Walker) 1833</td>
<td>India: U.P, Europe, France, Germany, Poland, Spain etc.</td>
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<tr>
<td></td>
<td>= <em>Cleptimorpha binotata</em> Walker, 1872</td>
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<td>= <em>Palmon pachymerus</em> (Walker, 1833)</td>
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<td>= <em>Palmon pachymerus rufiventris</em> Giraud, 1863</td>
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<td>= <em>Palmon religiosus</em> Westwood, 1847</td>
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<td>= Podagrion pachymerum rufiventre (Giraud, 1863)</td>
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<td>= Podagrion splendens rufiventre (Giraud, 1863)</td>
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<td>= Priomerus pachymerus Walker, 1833</td>
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<td>= Torymus (Priomerus) pachymerus (Walker, 1833)</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Podagrion prionomerum Masi 1926</td>
<td>India: Kerala &amp; Karnataka; Taiwan.</td>
</tr>
<tr>
<td>69</td>
<td>Podagrion scylla Fernando 1957</td>
<td>India: Kerala, Maharashtra; Sri Lanka.</td>
</tr>
<tr>
<td>70</td>
<td>Podagrionella caudata Narendran 1994</td>
<td>India: Tamil Nadu.</td>
</tr>
<tr>
<td>71</td>
<td>Podagrionella harithae sp. nov.</td>
<td>India: Kerala: Calicut university campus.</td>
</tr>
<tr>
<td>72</td>
<td>Podagrionella indarbelae Narendran &amp; Sureshan 1988</td>
<td>India: Kerala.</td>
</tr>
<tr>
<td>75</td>
<td>Propalachia intermedia Narendran 1994</td>
<td>India: Kerala.</td>
</tr>
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<td>76</td>
<td>Pseuderimerus corianderi Narendran &amp; Mercy 2012</td>
<td>India: Rajasthan.</td>
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<tr>
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<td>Name of Species</td>
<td>Distribution</td>
</tr>
<tr>
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<td>--------------</td>
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| 77  | Pseuderimerus indicus (Subba Rao & Bhatia) 1962  
| 79  | Pseudotorymus annamalaicus Narendran 2006 | India: Tamil Nadu. |
| 80  | Pseudotorymus ephedrae Narendran & Prabha Sharma 2006 | India: Rajasthan. |
| 81  | Pseudotorymus grisselli Narendran & Girish Kumar 2006 | India: Kerala: Wayanad. |
| 82  | Pseudotorymus harithavarmus Narendran 1994 | India: Kerala, Karnataka; China. |
| 83  | Pseudotorymus indicus (Mani) 1942  
     =Holaspis indicus Mani, 1942 | India: U.P; China. |
| 84  | Pseudotorymus leguminosae (Risbec) 1951  
     =Eridontomeroidella gibboni Girault 1915 | India: U.P; Mali, Nigeria. |
| 86  | Rhynchoticida keralensis sp. nov. | India: Kerala: Calicut: Koorachundu. |
| 87  | Rhynchoticida tridens Bouček 1978 | India; Karnataka. |
| 88  | Torymoides amabilis Walker 1871 | India: Kerala,Karnataka; Sri Lanka. |
| 89  | Torymoides anamalaianus (Mani & Kaul) 1972  
     =Holaspis anamalaianus Mani & Kaul, 1972  
     =Pseudotorymus anamalaianus (Mani & Kaul, 1972) | India: Kerala, Orissa, U.P & T.N. |
<p>| 90  | Torymoides binduae Narendran &amp; Girish Kumar 2010 | India: Maharashtra. |
| 91  | Torymoides keralensis Narendran 1994 | India: Kerala. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Species</th>
<th>Distribution</th>
</tr>
</thead>
</table>
| 92  | Torymoides kiesenwetteri (Mayr) 1874  
   = Dimeromicrus kiesenwetteri (Mayr, 1874)  
   = Dimeromicrus longicauda Masi, 1916  
   = Holaspis kiesenwetteri Mayr, 1874  
   = Pseudotorymus kiesenwetteri (Mayr, 1874) | India: Kerala, West Bengal, Tamil Nadu; Sri Lanka, England, Italy, Spain, Bulgaria Yugoslavia, France, Poland etc. |
| 93  | Torymoides longigastralis sp. nov. | India: Kerala: Calicut: Koorachundu. |
| 95  | Torymoides sureshani Narendran 1994 | India: Kerala. |
| 96  | Torymoides taruni Narendran & Girish Kumar 2010 | India: U.P. |
| 98  | Torymus calcaratus Nees 1834  
   = Diomorus calcaratus (Nees, 1834)  
   = Diomorus fertoni Kieffer, 1898  
   = Diomorus violaceus Kieffer, 1898  
   = Diomorus (Diomorus) calcaratus (Nees, 1834)  
   = Torymusigneiventris Costa, 1858  
   = Torymus (Aretorymus) calcaratus Nees, 1834 | India: Kerala; Europe, Italy, Bulgaria, Rumenia, Russia etc. |
| 100 | Torymus harithus sp. nov. | India: Kerala: Calicut: Koorachundu. |
| 102 | Torymus indicus (Ahmad) 1946  
   = Diomorus indicus Ahmad, 1946 | India: Bihar. |
| 103 | Torymus orientalis (Masi) 1926  
   = Diomorus orientalis Masi, 1926  
   = Diomorus silvifilia (Girault, 1927)  
   = Macrodontomerus silvifilia Girault, 1927 | India: U.P, Himachal Pradesh; Philippines, Taiwan, Australia etc. |
<p>| 104 | Torymus orissaensis (Mani) 1936 | India: Orissa. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Species</th>
<th>Distribution</th>
</tr>
</thead>
</table>
| 107 | Torymus varians (Walker) 1833  
= Callimome varians Walker, 1833  
= Syntomaspis annella Thomson, 1876  
= Syntomaspis annellus Thomson, 1876  
= Syntomaspis pubescens (Förster, 1841)  
= Syntomaspis varians (Walker, 1833)  
= Torymus pubescens Förster, 1841  
= Torymus (Syntomaspis) varians (Walker, 1833)  
= Torymus (Torymus) varians (Walker, 1833) | India: U.P; Australia, USSR, France, Germany, Europe, Canada etc. |
<table>
<thead>
<tr>
<th>No.</th>
<th>HOST ANIMALS</th>
<th>PARASITOID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Acanthophilis helianthi</em> Rossi (Diptera: Tephritidae)</td>
<td>Torymoides kiesenwetteri</td>
</tr>
<tr>
<td>2</td>
<td>Cecidomyiidae (Diptera)</td>
<td>Mangostigmus amraeus &amp; M. malabaricus</td>
</tr>
<tr>
<td>3</td>
<td><em>Chetostoma completum</em> (Tephritidae)</td>
<td>Torymoides kiesenwetteri</td>
</tr>
<tr>
<td>4</td>
<td>Coreidae (Heteroptera)</td>
<td>Chrysochalcissa indica</td>
</tr>
<tr>
<td>5</td>
<td><em>Cynips kollari</em> (Cynipidae)</td>
<td>Torymus calcaratus</td>
</tr>
<tr>
<td>6</td>
<td><em>Hierodula membranacea</em> (Mantidae)</td>
<td>Podagrion scylla &amp; P. dineni</td>
</tr>
<tr>
<td>7</td>
<td><em>Humbertiella similis</em> (Mantidae)</td>
<td>Podagrionella harithae, podagrion keralensis &amp; Palmon orchesticus</td>
</tr>
<tr>
<td>8</td>
<td><em>Indarbelae tetraonis</em> (Moore) (Lepidoptera: Arbelidae)</td>
<td>Podagrionella indarebelae</td>
</tr>
<tr>
<td>9</td>
<td><em>Koralliomyia portentosa</em> Mesnil (Tachinidae)</td>
<td>Amoturoides breviscapus</td>
</tr>
<tr>
<td>10</td>
<td><em>Mantis sp.</em> (Mantidae)</td>
<td>Podagrion christyi sp. nov.</td>
</tr>
<tr>
<td>11</td>
<td>Mantidae (Mantoidea)</td>
<td>Podagrion manii, P. malabarensis, palmon orchesticus &amp; palachia mangalae</td>
</tr>
<tr>
<td>12</td>
<td><em>Procecidochares utilis</em> Stone (Diptera: Tephritidae)</td>
<td>Torymoides kiesenwetteri</td>
</tr>
<tr>
<td>13</td>
<td><em>Procontarinia echinogalliperda</em> (Mani) (Diptera: Cecidomyiidae)</td>
<td>Mangostigmus amraeus</td>
</tr>
<tr>
<td>14</td>
<td><em>Procontarinia metteiana</em> Kurian &amp; Chandy (Diptera: Cecidomyiidae)</td>
<td>Mangostigmus amraeus</td>
</tr>
<tr>
<td>No.</td>
<td>HOST ANIMALS</td>
<td>PARASITOID</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>15</td>
<td><em>Psychid</em> larvae (Pteroma sp)</td>
<td><em>Megastigmus karnatakensis</em></td>
</tr>
<tr>
<td>16</td>
<td>Sphecidae (Hymenoptera)</td>
<td><em>Torymus calcaratus, Ecdamua indica</em></td>
</tr>
</tbody>
</table>

### V. 3 B HOST (PLANT) PARASITOID INDEX OF THE FAMILY TORYMIDAE

<table>
<thead>
<tr>
<th>No.</th>
<th>HOST PLANTS</th>
<th>PARASITOID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Cajanus indicus</em> (Papilionacea) (Pods)</td>
<td><em>Pseudotorymus harithavarnus</em></td>
</tr>
<tr>
<td>2</td>
<td><em>Calycotyler floribunda</em> (Combretaceae) (Galls of leaf buds)</td>
<td><em>Megastigmus viggianii</em></td>
</tr>
<tr>
<td>3</td>
<td><em>Casuarina equisetifolia</em> (Casuarinacea) (Seeds)</td>
<td><em>Bootanellus orientalis</em></td>
</tr>
<tr>
<td>4</td>
<td><em>Eucalyptus</em> (Myrtaceae) (Stem &amp; Leaf galls)</td>
<td><em>Megastigmus dharwadicus</em></td>
</tr>
<tr>
<td>5</td>
<td><em>Eupatorium adenophorum</em> (Asteracea) (Galls)</td>
<td><em>Torymoides kiesenwetteri</em></td>
</tr>
<tr>
<td>6</td>
<td><em>Eupatorium glandulosum</em> (Asteracea) (Galls)</td>
<td><em>Torymoides kiesenwetteri</em></td>
</tr>
<tr>
<td>8</td>
<td><em>Jasminum sambac</em> (Olivacea)</td>
<td><em>Pseudotorymus amuthae</em></td>
</tr>
<tr>
<td>6</td>
<td><em>Mangifera indica</em> (Anacardiaceae) (Leaf galls)</td>
<td><em>Mangostigmus amraeus &amp; M.malabaricus</em></td>
</tr>
<tr>
<td>7</td>
<td><em>Strobilanthes sessilis</em> (Acanthacea) (Galls)</td>
<td><em>Torymus sharmai</em></td>
</tr>
</tbody>
</table>
V.4

DISTRIBUTION

MAP OF TORYMIDAE OF KERALA
V.4 DISTRIBUTION MAP OF 8 GENERA OF TORYMIDAE

PLATE 3
V.4 DISTRIBUTION MAP OF 7 GENERA OF TORYMIDAE

- Megastigmus
- Propalachia
- Anneckeida
- Ecdamua
- Torymoides
- Chrysochalcissa
- Mangostigmus
Pie diagram showing the generic wise abundance of Torymidae in Kerala