6. REVISION OF THE INDIAN SPECIES OF GONATOCERUS NEES

6.1. Genus Gonatocerus Nees

Gonatocerus Nees, 1834: 192. Type species Gonatocerus longicornis Nees, by monotypy.


Rachistus Foerster, 1847: 203. Type species Ooctonus litoralis Haliday, by subsequent designation of Gahan & Fagan, 1923: 128. Synonymy by Foerster, 1856.

[Rhachistus Dalla Torre, 1898: 492. Unjustified emendation].

Cosmocomoidea Howard, 1908: 68. Type species Cosmocomoidea morrilli Howard, by monotypy. As subgenus of Lymaenon by Ogloblin, 1959.

Oophilus Enock, 1909: 458. Type species Oophilus longicauda Enock, by monotypy. Synonymy by Girault, 1911.

Agonatocerus Girault, 1913a: 276. Type species Agonatocerus humboldti Girault, by monotypy and original designation. Synonymy by Girault, 1915.

Gonatoceroides Girault, 1913b: 255. Type species Gonatocerus australicus Girault, by monotypy and original designation. Described as subgenus of Gonatocerus. Synonymy by Girault, 1915.

Historical Review.

A detailed historical review of the genus Gonatocerus was recently given by Huber (1988), and is, therefore, not attempted here. I concur with Boucek & Graham (1972) and Huber (1988) regarding the synonyms of Gonatocerus. I also accept Boucek & Graham's (1972) well documented evidence regarding the validity of the generic name Gonatocerus Nees (1834); and also agree with their synonymy of Lymaenon Walker with Gonatocerus. Further, in the light of the facts given by Boucek & Graham (1972) and Graham (1972), I do not agree with Viggiani (1970, 1991) in his listing of Gonatocerus Nees as a genus different from Gonatocerus as is known to all other authors, and his consistent use of the name Lymaenon. His views (1970, 1991) regarding the neotype of G. longicornis which was selected and designated by Boucek & Graham (1972) are not accepted here. It may be pointed out that all recent authors on the taxonomy of the Mymaridae (e.g. Subba Rao & Hayat, 1983, 1986; Sahad & Hirashima, 1984; Matthews, 1986; Huber, 1988; Schauff, 1984; Yoshimoto, 1990) accept Gonatocerus Nees as a valid taxon and consider Lymaenon and other generic names, noted above under citations, as being junior synonyms.

Two generic names, namely, Gahanopsis Ogloblin and Decarthrius Debauche (1949) have been excluded from the list of synonyms of Gonatocerus given under citation above. Huber (1988) and Yoshimoto (1990) also did not synonymize
them with Gonatocerus. However, it can be pointed out here that while the former of these two genera was described as a subgenus of Lymaenon by Ogloblin (1946), but elevated to generic rank by Annecke & Doutt (1961) the later generic name was placed by these authors in synonymy with Gahanopsis. Huber (1988) regarded these genera as species-groups of the Gonatocerus complex, namely, the deficiens-group and the straeleni-group, with these names based on the names of the type species of these two genera. It is evident from the original descriptions of these genera and also from the data matrix given by Huber (1988: Table 1) that the type species of these genera are very close to Gonatocerus species except for the reduction in the number of funicle segments to 7 from the presumably plesiomorphic number 8. However, inspite of this fact Huber (1988) refrained from formally synonymizing Gahanopsis and Decarthrius with Gonatocerus stating that future studies on the genus may lead to the eventual accord of generic or subgeneric status to these names and to some of the species-groups recognized by him. I am inclined to agree with Huber (1988) mainly because his study on the genus is the most detailed to date and is supported by a phylogenetic analysis. It is for these reasons, therefore, that I agree with Huber (1988) regarding the species-group, deficiens and straeleni, but in the absence of formal synonymy of these genera with Gonatocerus, I have excluded both these groups from the key to species-groups that follows (See 6.3)
Diagnosis.

Pentamerous mymarid with 11-segmented (females) or 13-segmented (males) antenna; female funicle 8-segmented, clava unsegmented; face usually with subantennal sulci distinct, convergent ventrally; pronotum without a transverse ridge; anterior scutellum transverse, shorter than posterior scutellum; fore wing hypoachaeta usually placed midway between proximal and distal macrochaetae; propodeum at most with a medial carina, or two submedial carinae or grooves; mesophragma not extending beyond propodeum.

Description. (Figs. 2-14, 162, 183, 184, 187, 196, for terminology).

Female. Length variable, 0.50-2.50 mm, rarely longer. Head as broad as or broader than thorax; dorsum flat to slightly convex, wider than long or subrectangular; vertex separated from occipital region usually by a distinct vertexal suture; anterior ocellus forming a right angle or obtuse angle with lateral ocelli; head in front view distinctly broader than high to as broad as high; eyes prominent, always longer than length of malar space; face separated into a medial and two lateral sclerites by subantennal sulci, rarely the subantennal sulci absent; antennal toruli usually separated from transverse trabecula by a distance less than the maximum diameter of a torulus; back of head (occipital region) with sutures variable, vertexal suture usually complete, but it may be medially obliterated; in some there is a distinct occipital suture
separating the gena from the occiput above; in some Indian species the occipital suture is indicated by faint cuticular thickening; in *membraciphagus*-group a complete transoccipital suture is also present, where as this suture is medially obliterated in one Indian species, *G. kodaianus*. Mandibles 3-dentate, the dorsal tooth may be blunt; maxillary and labial palpi small and unsegmented. Antenna, excluding radicle, 11-segmented with an 8-segmented funicle and unsegmented clava; some of the funicle segments and clava with longitudinal sensilla (rhinaria), those on clava usually slightly curved; the relative dimensions of antennal segments variable and generally useful in identifying species.

Thorax slightly to strongly convex; pronotum either entire or divided into two or three lobes, usually much shorter than mesoscutum in dorsal view of thorax and without a transverse ridge; mesoscutum with notaular lines present; side lobes relatively large; axillae small; scutellum divided into a transverse anterior scutellum and a large posterior scutellum either by complete or incomplete faint suture or depression; anterior scutellum with a pair of circular pits (placoid sensilla); metanotum variable, either strap or ribbon shaped in which case the dorsellum is more or less rectangular; or the dorsellum either rhomboidal or biconvex, or triangular; propodeum narrow in the middle and broad on sides with the spiracle placed nearer to its antero-lateral margin: propodeum either smooth medially or
with one medial or two submedial carinae (sulphuripes-, asulcifrons-, and ater-groups) or with two submedial grooves or sutures (litoralis-group). Fore wing with dimensions, density of microtrichia and length of marginal fringe variable; venation short, not more than one-third length of the wing; submarginal vein usually longer than marginal vein and distally narrowed, with one dorsal seta and one to three hypoachaetae; marginal vein with a proximal and a distal large setae, called the proximal and distal macrochaetae; also present are 1-5 microchaetae; origin of hypoachaeta more usually mid way between the proximal and the distal macrochaetae; stigmal vein with pointed (like the beak of a bird) or truncate apex, the later with 3-4 sensilla, also a sensillum is always present at the junction of the marginal and stigmal veins at level of the distal macrochaeta or on the stigmal vein (litoralis-group); cubital row of setae complete or incomplete. Hind wing variable, relatively broad to very narrow, 14-55X as long as wide, with long marginal fringe and with a row of setae each along anterior and posterior margins; disc very sparsely setose to nearly bare. Legs usually long and slender; fore tibiae with variable number of conical pegs (?sensilla); all tarsi 5-segmented.

Petiole usually broader than long, rarely otherwise. Gaster with terga nearly equal in length, the last tergum (T7) either broader than long or longer than broad, usually with 4-6 setae; cercal plates elongate oval; hypopygium not
reaching to apex of gaster; ovipositor variable, short or long, either not exserted to distinctly exserted beyond apex of gaster.

**Setation.** The body, except for the antennae, wings and the legs, rather very sparsely setose and their number on various sclerites of the head, thorax and gaster appear to be more or less constant for a given species-group.

Ocellar setae: 2, (sulphuripes-, ater-, and asulcifrons-groups); 3-4 (litoralis-group).

Supraorbital setae: 1 (sulphuripes-, and ater-groups); 1-2 (litoralis-group); 2 (asulcifrons-group).

Intertorular setae: 2 (asulcifrons-, and sulphuripes-groups); absent or 2 (ater-group); 2-6, abnormally 3 or 5 (litoralis-group).

Setae on medial face: absent or 2 (ater-group); absent (sulphuripes-group); 2-6, abnormally only 3 (litoralis-group).

Setae on each lateral face: 4-7, (ater-group); 6-8 (sulphuripes-group); 6-11 (litoralis-group).

Setae on each lateral lobe of pronotum: 1 (asulcifrons-group); 1-3 (ater-, and litoralis-groups); 2-3 (sulphuripes-group).

Setae on mid lobe of mesoscutum: 2-4 (asulcifrons-, and
ater-groups); 2 setae, rarely 4 (litoralis-, and sulphuripes-groups).

Setae on each side lobe of mesoscutum: absent or 1 (ater-group); 1 (asulcifrons-, and sulphuripes-groups); 1-2 (litoralis-group).

Setae on each axilla: absent (ater-group); absent or 1 (sulphuripes-group); 1 (asulcifrons-group); 1-2 (litoralis-group).

Setae on anterior scutellum: usually absent, rarely 2 (as in three Indian species of ater-group).

Propodeal setae: one on each side behind spiracle (rarely 2 in a few species of litoralis-group).

Gaster: T1 usually without setae; T2-T6 with complete or medially interrupted rows of setae, T7 with 4-6 setae.

**Colour.** Gonatocerus species are generally yellow to pale-brown with distinct dark brown patches or spots on thorax and gaster. But specimens may be completely dark brown to nearly black. Though colour in at least some Indian species (G. tarae, narayani, delhiensis) shows variations, generally it is useful in identifying species. Antennae usually have the flagellum brown to dark brown or even black with F1 somewhat paler; colour of scape and pedicel variable, may be yellow to dark brown. Wings generally subhyaline with some very faint yellow tinge, rarely with distinct infuscations.
Male (Figs. 178-182, for terminology). Similar to female except for the antennae and genitalia. Males are usually darker than females. Antennae (Fig. 178) 13-segmented with a long, usually filamentous, flagellum. Genitalia, as noted by Viggiani (1989), lack a tubular phallobase (Figs. 179-182) and consist of a downcurved aedeagus, with a 'V' or 'U' shaped structure, referred to as the aedeagal apodemes, attached to its base. There are two lobe like structures called the parameres one on each side of the aedeagus. These may be large with rounded apices or may be narrow with pointed apices. A structure not described by Viggiani (1989, 1991) has been found in the male genitalia. This structure is basally relatively less sclerotized and is articulated with the proximal end of each paramere with its distal end consisting of a highly sclerotized stylet-like rod, hence called here the parameral stylet. The apical end of the rod appears to be attached to the last tergite dorsally. It is therefore quite possible that these structures help in the movement of parameres during copulation. Viggiani (1991: Fig. I.4, 5) shows a M-shaped 'interparameral apodeme' connecting the two parameres. These appear to represent what I call here the parameral stylets, as is evident from figure I.2 given by him (Viggiani, 1991) where the interparameral apodemes are shown to be medially unconnected. This whole complex rests on the last sternite (called genital sternite by Viggiani) whose distal half or so has a deep groove through which the downcurved aedeagus protrudes and can be seen even at low
magnifications. This last sternite has its anterior margin prolonged into an apodeme, whereas the two apical lobes may have blunt or pointed apices. The study of male genitalia in a few Indian species indicates that the shape of the last sternite, its apodeme, shape and length of the parameres, shape and length of the parmeral stylets, length of the aedeagal apodemes and that of the aedeagus, varies and that further studies on the male external genitalia in the genus may prove to be important at least at the species-group level.

**Relationships.**

The genus is well known containing a large number of species and can not possibly be confused with any other mymarid genus except perhaps for *Octonus* Haliday. *Gonatocerus* has traditionally been separated from *Octonus* on three characters: (i) absence of a transverse ridge on the pronotum, (ii) hypoachaeta of fore wing placed midway between the proximal and the distal macrochaetae or nearer the latter and, (iii) absence of a complex diamond-shaped pattern of carinae on the propodeum. Conversely, *Octonus* is characterized by the presence of characters (i) and (iii) given above (Fig. 200), and the origin of the hypoachaeta being near the proximal macrochaeta (Fig. 199). In addition to these, the cerci in *Octonus* are well-developed and apparently movable in one species studied by me (Fig. 201) as against the usual plate-like cerci in *Gonatocerus* (Figs. 59,60). Further, the male genitalia in *Gonatocerus* are
unencapsulated and not enclosed in a phallobase (Fig. 179) as against the condition in Ooctonus where the aedeagus is enclosed in a phallobase (Viggiani, 1989: Fig. 1.6).

A phylogenetic (sensu Hennig) analysis of the two genera is beyond the scope of this study. Such an analysis if based only on the Indian species may give inconclusive results as the species of these genera form only a small percentage (Ooctonus, 6%; Gonatocerus, 15%) of the world fauna. Added to this is the difficulty that the identities of nearly 50% of the world species of Gonatocerus are still not known. However, I have summarised here the results of the phylogenetic analyses by Schauff (1984) and Huber (1988) in order to show the complexity of the problem.

Schauff's (1984) analysis of the Holarctic genera shows that Gonatocerus and Ooctonus are distinguishable from other mymarid genera only on one character; antennal radicle elongated and clearly separated from scape. But even this character is homoplasious, being also found in Arescon Walker. He has also indicated that almost all the characters previously used to distinguish these genera from other genera in the family are hypothesized pleisiomorphic. His analysis further shows that only one apomorphic character each separates these two genera; presence of a transverse ridge on pronotum in Ooctonus, and the "submarginal slanting away from margin of wing towards the base, not joining the subcosta" in Gonatocerus. Huber
(1988) could not find any "reliable synapomorphy to unite Ooctonus and the Gonatocerus complex as sister groups". He presented two alternative hypotheses on the relationship of the Gonatocerus complex including deficiens-, and straeleni-groups. In the first hypothesis the Gonatocerus complex was defined on 5 characters: (i) presence of subantennal sulci; (ii) divided pronotum; (iii) hypochaeta midway between proximal and distal macrochaetae or nearer the latter; (iv) weak sculpture on head and thorax, and (v) unencapsulated male genitalia. However, he has noted that this analysis required that the first two characters become reversed in the deficiens-group. [It may be pointed out here that inclusion of asulcifrons-, and masneri-groups in that analysis would probably also show reversal of character (i) of the five characters listed above in asulcifrons-group and of character (ii) in masneri-group]. In the second hypothesis the genus was defined only on characters (iii), (iv) and (v). He preferred the first hypothesis as it was more parsimonious, being one step shorter, and has fewer reversals.

On the basis of my study of the 14 genera of mymarids present in the collection of M. Hayat and the study of the available literature on this family it can be said that the characters pertaining to the location of the hypochaeta, unencapsulated male genitalia and the presence of parameral stylets are most probably not found elsewhere in the family, and therefore may be regarded as uniquely derived characters
for Gonatocerus. In Ooctonus, on the other hand, the character of the presence of transverse ridge on the pronotum can be said to be autapomorphic.

6.2. Species-Groups

Huber (1988) and Yoshimoto (1990) recognize 5 species-groups (ater, sulphuripes, litoralis, membraciphagus, masneri) in the genus Gonatocerus. These do not include the two species-groups (deficiens, straeleni) recognized by Huber (see above under 'Historical Review'). These groups were proposed on the basis of studies of mainly the Palaearctic and the Nearctic fauna. But, very little is known about the groups to which the species described from the Afrotropical, Oriental, Australian and a majority of the Neotropical species belong. Though several species were described from India (see 'Literature Survey'), but in none of these publications the authors assigned the species to their respective species-groups. Therefore, in the present study all the Indian species, except G. longicrus Kieffer, have been assigned to the correct species-groups. While most of them could be accommodated in the ater-, litoralis-, and sulphuripes-groups, two of the species, G. asulcifrons sp. nov. and G. devikulamus Mani & Saraswat, could not be accommodated in any of the known groups and therefore a new species-group, asulcifrons, has been proposed. The remaining two species-groups, masneri and membraciphagus, have been included here in the key to the species-groups,
but are not considered further. While the masneri-group is based on a species known only from the Dominican Republic, the latter group is known from the Nearctic and the Neotropical regions.

### 6.3. Key to species-groups of Gonatocerus

1. Pronotum entire, large, subrectangular in dorsal view of thorax; propodeum submedially with two subparallel rows of punctures, and irregular rows of similar sized punctures on each side; petiole long, cylindrical, nearly as long as medial length of posterior scutellum and propodeum combined (Yoshimoto, 1990: Figs. 125, 126). **Masperi-Group**

   -- Pronotum divided into 2 or 3 lobes; propodeum different, never with such punctures; petiole variable, usually broader than long, but occasionally nearly as long as medial length of propodeum. **Litoralis-Group** (p. 110)

2. Pronotum three-lobed, the median lobe weakly sclerotized (Figs. 14, 190); dorsellum of metanotum strap-shaped (Figs. 14, 191); propodeum with two anteriorly converging sutures (Fig. 14), with area between sutures with small, sometimes visible at higher magnification, sensory pegs; ocellar triangle with 3 or 4 setae (Fig. 8). **Litoralis-Group** (p. 110)

   -- Pronotum two-lobed (Fig. 36); dorsellum of metanotum rhomboidal or biconvex (Figs. 36, 197); propodeum
different, not with two submedial sutures; ocellar triangle with 2 setae (Fig. 3).

3. Face without subantennal sulci (Figs. 16, 20); back of head separated into gena ventrally and occiput dorsally by a curved occipital suture (Fig. 9); antennal clava with nearly straight sensilla arranged in three whorls (Fig. 18). ASULCIPRONS-GROUP, NOV. (p. 36)

-- Face with subantennal sulci (Fig. 3); back of head same or different; antennal clava with sensilla at least slightly curved and not arranged in three whorls (Fig. 5).

4. Ovipositor produced anteriorly beneath thorax, enclosed in a membranous pouch; back of head with complete occipital and transoccipital sutures; occiput subdivided into three sclerites; propodeal spiracles usually much larger than pronotal spiracles; propodeum with several incomplete, less distinct longitudinal carinae between submedial carinae (Huber, 1988: Fig. 117).

-- Ovipositor not produced anteriorly beneath thorax, at most originating from base of gaster; back of head usually without occipital and transoccipital sutures, occasionally with medially obliterated occipital and transoccipital sutures (Figs. 9, 10); propodeal spiracles smaller than or equal in diameter to pronotal spiracles;
propodeum smooth between submedial carinae, or with a medial carina (Fig. 186).

5. Fore wing behind marginal vein either bare (asetose) (Fig. 28) or very sparsely setose; propodeum always with submedial carinae distinct (Fig. 36).

ATER-GROUP (p. 43)

-- Fore wing behind marginal vein setose, sometimes a few setae may extend proximally behind distal half of submarginal vein (Fig. 85); propodeum either smooth medially (Fig. 195) or with one medial carina (Fig. 186), occasionally with very weakly developed submedial carinae.

SULPHURIPES-GROUP (p. 73)
6.4. ASULCIFRONS-GROUP (NOV.)

Diagnosis.

Face without subantennal sulci, so that the facial region is large, rectangular, delimited laterally by preorbital suture (Figs. 16, 20); back of head divided by curved occipital suture into gena ventrally and occiput dorsally; vertexal suture incomplete (Fig. 9) antennal clava with sensilla nearly straight and arranged in three whorls (Figs. 18, 21); pronotum bilobed; dorsellum rhomboidal (Fig. 24); propodeum with submedian carinae weak; cubital row complete or incomplete (Figs. 19, 23); ovipositor originating from base of gaster and exserted at apex (Fig. 24).

List of Indian Species.

1. Gonatocerus asulcifrons sp. nov.
2. G. devikulamus Mani & Saraswat

Comments. The relationships of the species of this group are not very clear. It differs from all the other groups by the absence of subantennal sulci, otherwise it falls between ater-, and membraciphagus-groups in the structure of the back of head (curved suture separating the genae completely from occiput), and in the presence of only an incomplete vertexal suture.
Description of species.

1. Gonatocerus asulcifrons sp. nov.

(Figs. 9, 16-19)

Description.

Female. Length, thorax + gaster 1.4 mm. Head yellow with ocellar region, middle of transverse trabecula, supra orbital trabecula and preorbital trabecula dark brown; thorax yellow; gaster yellow with two dark brown bands on distal portion of gaster; antenna dark brown to black; wing subhyaline; legs yellow.

Head (Figs. 16, 17) width 1.35 - 1.5X as wide as vertex width; ocellar triangle with 2 setae; facial region with numerous setae; torulus 0.38 - 0.4X its own length from transverse trabecula; intertorular region with 2 setae; eye length 1.64 - 1.7X as long as malar space length.

Antenna (Fig. 18). Scape slightly more than 2X to about 2.5X as long as wide, 1.6X as long as radicle and more than 2X as long as pedicel; F1 longer than pedicel but shorter than F2; all funicular segments larger and longer than broad with longitudinal sensilla (F1 = 2, F2 = 2 or 3, F3 = 2, F4 = 3, F5 = 4, F6 = 4 or 5, F7 = 4, F8 = 5); clava nearly 4X as long as wide, subequal to F6-8 combined, with more than 11 sensilla.

Thorax distinctly shorter than gaster; each lateral lobe of pronotum with one seta; mid lobe of mesoscutum
slightly longer than scutellum with 2 pairs of setae; each side lobe of mesoscutum and each axilla with one seta; propodeum 1.5X as long as metanotum and 0.5X of scutellum. 

Fore wing (Fig. 19) 3X as long as wide, submarginal vein 1.25-1.36X as long as marginal vein; disc setose behind marginal vein; marginal fringe 0.12-0.15X of wing width. Hind wing with marginal fringe 1.73X as long as wing width. Mid tibia 2.28-2.30X as long as mid basitarsus.

**Gaster.** Ovipositor strongly exserted and 2.8X as long as mid tibia.

**Male.** Unknown.

**Relative measurements:** Holotype: HW 28.5, FVW 20, MFW 10.5, LFW 3, TL 4, TTD 1.5, EL 15, MSL 9, RL 6.75, SCL 13.5, PL 5, F1 7, F2 7.75, F3 7, F4 7, F5 7, F6 7, F7 6.75, F8 6.75, CL 21, THL 40, MSTL 14, SCTL 13.5, MTL 7, PDL 7, FWL 99, FWW 33, SMVL 15, MVL 12, STL 4, FFL 4, HWL 75, HWW 4, HFL 4, FFm 21, FTb 23, FTrs 30, FBstr 10.75, MFm 21, MTb 32, MTrs 34, MBstr 14, HFm 22, HTb 34, HTrs 40, HBstr 17, OVPL 90

**Paratype:** HW 27, FVW 20, MFW 10, LFW 3, TL 3.75, TTD 1.5, EL 14, MSL 8.5, RL 7.75, SCL 12.5, PL 4.5, F1 6, F2 7, F3 7, F4 6.75, F5 6.5, F6 6.5, F7 6.5, F8 6.25, CL 19, THL 36.5, MSTL 13, SCTL 12, MTL 4, PDL 6, FWL 95, FWW 31.5, SMVL 15, MVL 11, STL 4, FFL 5, HWL 69.75, HWW 3.75, HFL 6.5, FFm 19, FTb 21, FTrs 27, FBstr 9.75, MFm 19, MTb
Host. Unknown.

Distribution. India: Assam. (Known only from the type locality.)

Material examined.

Type material. Holotype female (on slide, under 5 coverslips) INDIA: Assam, Halflong. ix.1987 (S. Singh). Paratype, 1 female with data as holotype.

Comments. Gonatocerus asulcifrons differs from the only other species of this group, devikulamus, in the following characters: body pale yellow with slight brown infuscations and gaster with two dark brown bands; legs yellow; fore wing with microtrichia behind marginal vein and a complete cubital row; F1 shorter than F2 and with sensilla, and F6-8 each with 4 or 5 sensilla. (G. devikulamus: body dark brown; legs yellow brown with dark brown fore coxae; fore wing with a few microtrichia behind marginal vein and cubital row incomplete; F1 and F2 subequal in length, the former without sensilla; F6-8 each with 2 sensilla).
2. *Gonatocerus devikulamus* Mani & Saraswat
(Figs. 20-24)


Redescription.

**Female.** Length, 1.4 mm. (as given by Mani & Saraswat). Body including ovipositor sheath dark brown; scape brown, flagellum dark brown; wings subhyaline; fore coxae dark brown, mid and hind coxae yellowish brown, trochanters pale yellow, rest of legs yellowish to pale yellow.

**Head** (Fig. 20) width 1.38X as wide as vertex width; ocellar triangle with 2 setae; facial region with numerous setae; torulus 0.3X its own length from transverse trabecula; intertorular region with 2 setae; eye length 1.5X as long as malar space length. **Antenna** (Fig. 21) with scape slightly more than 2X as long as wide; pedicel shortest; F1 as long as F2 and without sensilla, otherwise rest of funicular segments subequal, F2-8 with longitudinal sensilla; (F2-3 = 1, F4-8 = 2); clava 4X as long as wide, slightly longer than F6-8 combined.
Thorax distinctly shorter than gaster; mid lobe of mesoscutum probably with 2 setae (not clearly visible in the holotype) and each axilla with 1 seta. Fore wing (Fig. 22) 3X as long as wide; submarginal vein 1.6X as long as marginal vein; disc with a few (about 4) microtrichia behind marginal vein; cubital row incomplete (Fig. 23); marginal fringe 0.22X of wing width. Mid tibia slightly more than 3X as long as mid basitarsus.

Gaster (Fig. 24). Ovipositor strongly exserted and 2.26X as long as mid tibia.

Male. Unknown.

Relative measurements: Holotype: HW 26, FVW 18.75, TL 3.25, TTD 1, EL 12.5, MSL 8, THL 33.5, MTL 3.75, PDL 6, FWL 90, FWW 29.5, SMVL 16, MVL 10, STL 3, FFL 6.5, FFm 17, FTb 17, FTrs 22.5, FBstr 7, MFm 17, MTb 26.5, MTrs 24, MBstr 8.5, HFm 17, HTb 27, HTrs 27.25, HBstr 11, GSTL 40, OVPL 60

Host. Unknown.

Distribution. India: Tamil Nadu. (Known only from the type locality.)

Material examined.

Type material. Holotype female (on two slides), both labelled 5-17. Devikulam. 2.iv. 1972, (Mani & party) (USNM).
Comments. The holotype is a partly dissected specimen, with the antennae on one slide and rest of the body on a second slide. The head, both antennae and left part of wing are detached and the thorax and gaster laterally mounted. The body and head partly crushed.

The characters differentiating this species from asulcifrons are given under the description of the latter species.
6.5. ATER-GROUP

Diagnosis.

Vertexal suture complete or medially obliterated; back of head sometimes with medially obliterated transoccipital and occipital sutures; pronotum bilobed; metanotal dorsellum rhomboidal or biconvex; propodeum with submedial carinae; fore wing behind marginal vein either bare (asetose) or with setae not uniformly distributed.

List of Indian Species.

1. Gonatocerus unicolouratus Subba Rao
2. G. longiterebratus Subba Rao
3. G. fulvipodus Subba Rao
4. G. bialbifuniculatus Subba Rao
5. G. kodaianus (Mani & Saraswat), comb.nov.
6. G. monticolus sp. nov.
7. G. trialbifuniculatus Subba Rao
8. G. ater Foerster
9. G. udakamandus Mani & Saraswat
10. G. sahadevani (Subba Rao & Kaur)

Key to Indian species of ater-group

1. Ovipositor exserted, exserted part at least 0.33X of gaster. ———————————————————————————————————— 2
-- Ovipositor not exserted, or very slightly exserted.  

2. Funicle uniformly coloured brown to dark brown.  

-- Funicle with F6 and F7 pale yellow contrasting with remaining brown to dark brown segments.  

3. Body including coxae completely black; fore femur dark brown; radicle about 0.33X of scape; F1 as long as pedicel and not shorter than F2.  

1. unicolouratus Subba Rao  

-- Body largely yellow, with brown (T2) to dark brown (T3, T5) patches on gaster; legs yellow; radicle nearly 0.5X of scape; F1 slightly shorter than pedicel, and about 0.5X of F2.  

2. longiterebratus Subba Rao  


-- Body yellow testaceous, with two brownish cross bands on gaster.  

3. fulvipodus Subba Rao  

5. All funicle segments clearly longer than broad, only F1 distinctly shorter than other segments.  

6. Flagellar segments except F1, long, gradually decreasing
in length distad, F8 about 0.75X of F2 (Fig. 26).

5. *kodaianus* (Mani & Saraswat) comb.nov.

--- Flagellar segments except F1 long, and subequal in length, F8 longer than F2 (Fig. 29).

6. *monticolus* sp.nov.

7. Head and thorax dark brown to black; flagellum uniformly coloured.

8. Head dark brown, thorax and gaster yellow with brown to dark brown patches or bands (Fig. 36); F1-5 dark brown, F6-8 white (Fig. 33).  7. *trialbifuniculatus* Subba Rao

8. Gaster completely brown to dark brown and fore wing discal setae begin distad of stigmal vein.

9. Gaster colour variable, either completely dark brown or basally yellow or yellowish brown, and brown to dark brown distally, occasionally more or less completely yellow brown; legs yellow with fore coxae and hind tibiae brown to dark brown, rarely hind tibiae completely yellow; discal setae begin at level of distal end of marginal vein.

9. Flagellar segments relatively shorter, F1, 2, 5 & 6 usually quadrate, F6 distinctly shorter than F5 (Fig. 49); discal setae of fore wing begin much distad of stigmal vein (Fig. 54).

10. Flagellar segments relatively longer, F1, 2, 5 & 6
clearly longer than broad, F6 only slightly shorter than F5 (Fig. 41); discal setae of fore wing begin at level of distal end of stigmal vein (Fig. 43). [Legs, including coxae, largely dark brown to black]. ________

9. udakamandus Mani & Saraswat

10. F8 either quadrate or longer than broad and slightly shorter than F7 (Figs. 49-51); legs largely pale yellow to pale yellow brown, with fore coxae and hind tibiae dark brown. ________ 10. sahadevani (Subba Rao & Kaur)

-- F8 quadrate and distinctly shorter than F7 (Fig. 52); legs, including coxae, largely dark brown. ________

_______ 10. Variant of sahadevani (Subba Rao & Kaur)
Description of species.

1. Gonatocerus unicolouratus Subba Rao

Gonatocerus unicolouratus Subba Rao 1989; 144. Female.

Holotype female, India, New Delhi (BMNH), not examined.

The holotype has not been examined. The following brief description is based upon the original description and figure (Subba Rao, 1989: Fig. 8) and the notes made from the holotype by M. Hayat.

Redescription.

Female. Length 2.2 mm (as given by Subba Rao, 1989). Body black; scape and pedicel brown, funicle and clava dark brown; wings hyaline; coxae black; fore femur and ovipositor sheath dark brown, rest of the legs light brown.

Antenna shorter than body (6.9:8.2); scape 3X as long as radicle; F1 longest and equal to pedicel; F2-8 subequal, longer than broad; clava large, longer than F4-8 combined, with 6-7 sensilla.

Thorax. Anterior scutellum smooth, posterior scutellum with reticulate coriaceous sculpture; propodeum with submedian carinae. Fore wing 2.5X as long as broad (7.6:3); discal setae fine, long, sparse; setae absent behind marginal vein; marginal fringe very short. Hind wing with marginal fringe 0.75X of wing width.

Gaster slightly longer than thorax (4:3.5); exserted part
of ovipositor slightly shorter than gaster (3.2:4.2).

**Male.** Unknown.

**Host.** Unknown.

**Distribution.** India: New Delhi. (Known only from the type locality.)

**Comments.** *G. unicolouratus* is probably very close to the Palaearctic *G. tremulae* (Bakkendorf) (Matthews, 1986) and the Nearctic *G. ovicenatus* Leonard & Crosby (Huber, 1988). It differs from the former in the greater length of the exserted part of ovipositor and relative lengths of pedicel and basal funicular segments. (Exserted part of ovipositor about 0.3X of gaster, and pedicel longer than F1 in *tremulae.*) From *ovicenatus*, it differs again in the relatively more exserted part of ovipositor, F1 longer than pedicel, and in black body colour.

2. *Gonatocerus longiterebratus* Subba Rao


Holotype female, India, Periyar Animal Sanctuary (BMNH), examined.

**Redescription.**

**Female.** Length, 1.8 mm. Body including legs honey yellow, with brown to dark brown as follows: transverse trabecula dark brown; a patch on most of mid lobe of mesoscutum except sides and posterior margin, most of
scutellum except sides, and narrowly the apex, a spot on each axilla and dorsellum dark brown; gaster with T2 brown, T3 and T5 dark brown; exserted part of ovipositor dark brown; antenna dark brown.

Head is collapsed in holotype. Therefore it is not possible to measure the different parts of head. Antennal scape 3.5X as long as wide and slightly more than 2X of radicle; F1 short, about half of F2; F2-8 all long, at least 2X as long as F1; F2-8 with longitudinal sensilla; clava more than 4X as long as wide, and slightly longer than F5-8 combined.

Thorax. Mesoscutum slightly longer than scutellum; medial length of propodeum more than the medial length of metanotum; mid lobe of mesoscutum with two pairs of setae. Fore wing 3.34X as long as wide; submarginal vein 1.54X as long as marginal vein; marginal fringe about 0.1X of wing width. Hind wing with marginal fringe slightly less than 2X of wing width. Mid tibia 2.75X as long as mid basitarsus.

Gaster distinctly longer than thorax; ovipositor strongly exserted, the exserted part about 0.8X of gaster and 1.2X as long as mid tibia.

Male. Unknown.

Relative measurements: Holotype: HW 18, RL (13), SCL (27), PL (5), F1 (4), F2 (8.5), F3 (9), F4 (9), F5 (8.5), F6
(8), F7 (8), F8 (8.5), CL (36), THL 27, MSTL 10, SCTL 8, MTL 3, PDL 6.5, FWL 72, FWW 21.5, SMVL (24), MVL (15.5), STL (5.5), PFL 2.5, HWL 53, HWW 3, HFL 5, FFm 14, FTb 16.5, FTrs 22, MFm 16, MTb 22, MTrs 23, MBstr 8, HFm 15.5, HTb 24, HTrs 23, HBstr 10, GSTL 34, OVPL (only exserted part) 27

**Host.** Unknown.

**Distribution.** India: Kerala. (Known only from the type locality.)

**Material examined.**

Type material. **Holotype** female: (on card), INDIA, Kerala, Periyar A. Sanctuary, 5-15.x.1979 (J.S. Noyes), BM 1979-518 (BMNH).

**Comments.** *G. longiterebratus* is a distinctive species, and can be separated from all the other Indian species of ater-group by the strongly exserted ovipositor, generally yellow body colour with distinct brown to dark brown bands on gastric terga 1, 3 and 5 and in having F1 about 0.5 of F2 and only slightly shorter than the abconical pedicel. These characters also separate it from *G. ovicenatus* Leonard & Crosby (Huber, 1988).

3. **Gonatocerus fulvipodus** Subba Rao


Holotype female, India, Nelliampatty (BMNH), not
examined.

The holotype has not been examined. The species was adequately described and illustrated by Subba Rao (1989: Fig. 12). The following brief description, based upon the original description and the notes made from the holotype by M. Hayat, is sufficient to recognize the species.

**Redescription.**

**Female.** Relatively large in size (1.95 mm as given by Subba Rao, 1989). Body dark; antennal scape and pedicel dark yellow, F6 and F7 pale yellow, rest of the flagellum dark brown; legs including coxae pale yellow.

**Antenna.** Radicle 0.5X of scape; F1 shorter than both pedicel and F2 (2:4:5), F4 longer than F5 (6:4), F5-8 of same length; clava slightly shorter than F5-8 combined. **Thorax** slightly shorter than gaster (5:6); metanotal dorsellum rhomboidal; propodeum with submedial carinae distinct. **Fore wing** about 3.2X as long as broad; cubital row absent; a row of setae adjacent to marginal vein present. **Gaster.** Ovipositor strongly exserted, the exserted part slightly (about one-sixth) shorter than length of gaster.

**Male.** Unknown.

**Host.** Unknown.

**Distribution.** India: Kerala. (Known only from the type
locality.)

Comments. *G. fulvipodus* is apparently a distinct species. It differs from all the Indian species (see key to species) by the combination of characters pertaining to the colour of flagellar segments, the body colour, and the exserted ovipositor.

4. *Gonatocerus bialbifuniculatus* Subba Rao

*Gonatocerus bialbifuniculatus* Subba Rao: 146. Female. Holotype female, India, 3 km east of Manjeler Dam. (BMNH), not examined.

The holotype has not been examined. The following brief description is, therefore, based upon the original description and figure (Subba Rao, 1989: Fig. 11), and the notes made from holotype by M. Hayat.

Redescription.

**Female.** Relatively large in size (1.95 mm as given by Subba Rao, 1989). Body yellowish with two brown bands on apical half of gaster; head dark brown to testaceous yellow; antenna black except the yellow F6 and F7.

**Antenna.** All funicular segments longer than broad; F1 smallest; F2 longest; F3 and F4 subequal; F5-8 of same length but shorter than F4; clava 4X as long as wide, subequal to F5-8 combined, with 5 sensilla. **Thorax** distinctly shorter than gaster (2.8:4.4); pronotum narrow;
metanotal dorsellum subtriangular; propodeum with faint submedial carinae. **Fore wing** 3X as long as wide (7.2:2.4); eight setae behind marginal vein in a curved row; cubital row absent. **Gaster.** Ovipositer exserted, exserted part as long as gaster.

**Male.** Unknown.

**Host.** Unknown.

**Distribution.** India: Tamil Nadu. (Known only from the type locality.)

**Comments.** *G. bialbifuniculatus* is apparently a very distinct species, and can be distinguished from all the other Indian species of the ater-group by the yellow F6 and F7 and yellowish body with only two brown bands on gaster.

5. *Gonatocerus kodaianus* (Mani & Saraswat), **comb.nov.**

(Figs. 10, 25-28)

Holotype female, India, kodaikanal (USNM), examined.


**Redescription.**

**Female.** Length, 0.85-1.50 mm. Body including ovipositor sheaths dark brown; radicle and scape yellow; dorsal margin
of scape brown; pedicel yellowish brown to brown; flagellum
dark brown, occasionally antenna completely dark brown;
wings subhyaline with slight yellowish tinge; legs yellowish
brown, fore coxa dark brown, hind tibia brown.

**Head** (Figs. 10, 25) width 1.76X as wide as vertex width;
ocellar triangle with 2 setae; lateral face width 5.3X as
wide as medial face width, with 6 setae; a pair of setae at
the junction of intertorular region and medial face; torulus
0.52X its own length from transverse trabecula; eye length
2X of malar space length; occipital suture slightly
indicated; transoccipital suture represented by incomplete
line. **Antenna** (Fig. 26) with scape about 3X as long as
wide; F1 slightly shorter than pedicel and distinctly
shorter than rest of the funicular segments; F2-F8 with
longitudinal sensilla (F2 = 1, F3-8 = 2); clava 3.7X as long
as wide, as long as F5-8 combined, with 8 longitudinal
sensilla.

**Thorax** equal or longer than gaster; each lateral lobe of
pronotum with 2 setae; mid lobe of mesoscutum 0.55X of
scutellum; each side lobe of mesoscutum with 1 seta; axilla
without seta; propodeum 0.42X of scutellum. **Fore wing** (Fig.
27) about 3X to slightly more than 3X as long as wide;
submarginal vein 1.7X as long as marginal vein; marginal
fringe 0.14-0.18X of wing width; setation as in Fig. 28. **Hind wing** with marginal fringe 0.5-0.6X of wing width and
1.2-1.5X as long as marginal fringe of fore wing. **Mid tibia**
2.9-3.5X as long as mid basitarsus.
**Gaster.** Ovipositor not exserted and its total length 0.78-0.92X of mid tibia.

**Male.** Unknown.

Relative measurements: Holotype: HW 30, FVW 17, MFW 1.5, LFW 8, TL 4.25, TTD 2.25, EL 16, MSL 8, F2 6.75, F3 7.25, F4 7, F5 6.75, F6 6.25, F7 6, F8 5, CL 18.5, THL 45, MSTL 14, SCTL 17, FWW 115, SMVL 20.5, MVL 11.75, STL 4.75, FFL 7, HWL 84, HWW 5, HFL 9, Ffm 20, FTb 25, FTrs 27.75, FBstr 10, MFm 23, MTb 34.5, MTrs 26, MBstr 9.75, HFm 26, HTb 39, HTrs 30.5, HBstr 12, GSTL 30.5, OVPL 32

Additional material: 1 female: HW 32, FVW 20.5, MFW 2, LFW 8, TL 4.75, TTD 2.5, EL 17.5, MSL 8, RL 4, SCL 18, PL 5.5, F1 4, F2 8, F3 9, F4 9, F5 8, F6 7, F7 6.75, F8 6, CL 22, THL 47, MSTL 10.75, SCTL 19.5, MTL 6, PDL 8.25, FWW 128, SMVL 25, MVL 14, STL 4.75, FFL 6, HWL 96, HWW 6.25, HFL 9, Ffm 23, FTb 28, FTrs 34, FBstr 11, MFm 25, MTb 42, MTrs 35, MBstr 14.25, HFm 28, HTb 46, HTrs 40, HBstr 18, GSTL 47, OVPL 33

Host. Unknown.

Distribution. India: Tamil Nadu.

Material examined.

Type material. **Holotype** female, (on slide) INDIA: Berijam lake, Kodaikanal hill, Tamil Nadu, 5.iv.1972 (Mani & Party) (USNM).
The holotype is a dismembered specimen: Head, both antennae and right fore leg, right hind leg and right mid leg beyond coxae, both fore wings and left hind wing detached. The body laterally mounted with the thorax partly crushed.

Additional material. (3 Females): INDIA: Tamil Nadu, Ooty, 2 Females, 5.iii.1993, (S.B. Zeya & S.I. Kazmi); 1 Female, 6.iii.1993 (S.B. Zeya).

Comments. G. kodaianus runs to G. incomptus Huber in the key to species given by Huber (1988), but can be distinguished from that species mainly by having F2-5 each at least 2.5X as long as broad and each about 2X as long as F1, and ovipositor shorter than mid tibia. In incomptus F1 and F2 shorter than F3, F1 longer than F2, F3-5 each about 2X as long as broad; and ovipositor longer than mid tibia.

6. Gonatocerus monticolus sp. nov.
(Figs. 29-31)

Description.

Female. Length, 0.96 mm. Body black; antenna brown; wing subhyaline; fore coxae and hind tibiae brown, mid and hind coxae and hind femora dark brown, fore and mid femora pale yellow brown.

Head width 1.59X as wide as vertex width, with a pair of setae in ocellar triangle; lateral face width 2X of medial
face width, with 4 setae; medial face with 2 setae; a pair of setae between toruli; torulus 0.83X its own length from transverse trabecula; eye length 1.83X as long as malar space length; head with hexagonal sculpture; back of the head with weak, medially obliterated occipital suture. **Antenna** (Fig. 29). Scape 3.0-3.5X as long as wide; pedicel 2X as long as F1 which is distinctly shorter than rest of the funicular segments; all funicular segments longer than broad; F3, F5-8 subequal with longitudinal sensilla (F3 = 1, F5-8 = 2); clava slightly shorter than F5-8 combined, with 4 sensilla.

**Thorax** subequal to gaster; each lateral lobe of pronotum with 1 seta; mid lobe of mesoscutum distinctly shorter than scutellum; each side lobe of mesoscutum with 1 seta; anterior scutellum with a pair of setae; axilla without seta. **Fore wing** (Fig. 30) about 3X to slightly more than 3X as long as wide; submarginal vein 1.62X as long as marginal vein; marginal fringe 0.28X of wing width; setation as in Fig. 31. **Hind wing** with marginal fringe 2.4-2.8X of wing width, and subequal in length to marginal fringe of fore wing. **Mid tibia** 3.5-3.8X as long as mid basitarsus.

**Gaster.** Ovipositor not exserted, only slightly shorter than mid tibia.

**Male.** Unknown.


Host. Unknown.

Distribution. India: Uttar Pradesh. (Known only from the type locality.)

Material examined.


Comments. G. monticolus sp.nov. runs to couplet 11 in the key to the North American species of ater-group given by Huber (1988), but it differs from both the included species
(impar Huber, inflatiscapus Huber) especially in having very small radicle (0.2X of scape), longer flagellar segments (F2-6 each at least 2X as long as broad), and in having sensilla on F3 and F5-8. In impar and inflatiscapus, radicle longer than 0.5X of scape; flagellar segments less than 2X as long as broad; and sensilla on F3, F5 and F7-8.

7. Gonatocerus trialbifuniculatus Subba Rao

(Figs. 32-36)


Female. Holotype female, India, 25 Kms West of Mudigere, (BMNH), examined.

Redescription.

Female. Length, 1.3 mm (as given by Subba Rao, 1989). Head dark brown; thorax yellow with dark brown as follows: two large patches in anterior two-fifth of mid lobe and anterior margin of side lobe; scutellum and axillae brownish yellow, the later with brownish anteriorly; mesosternum, dorsellum and middle of propodeum brown; pleura pale yellowish brown; gaster pale yellow to white with pale brown to dark brown broad cross bands on T2-T7; antennal radicle, scape, pedicel and F1 pale yellow, F2-5 brown, F6-8 white, and clava dark brown; wings subhyaline with very faint yellow tinge; legs including coxae pale yellow.

Head broader than high (Fig. 32) with 2 ocellar setae; torulus 0.8X its own length from transverse trabecula;
interriorul setae 2; lateral face width 3.5X as wide as medial face width; medial face devoid of setae; 6 setae on each lateral face; vertex with hexagonal sculpture. Antenna (Fig. 33). Radicle quadrate; scape about 3X as long as wide; F1 shortest and F3 longest; F4, F6 and F7 subequal, F8 nearly quadrate; sensilla F5-6 = 2, F7 = 1, F8 = 2; clava long, about 3.5X as long as wide and nearly as long as F4-8 combined.

Thorax (Fig. 36). Each lateral lobe of pronotum with 3 setae of which one seta below the spiracle; each side lobe of mesoscutum and axilla without seta; dorsellum rhomboidal but with anterior margin rounded. Fore wing (Fig. 34, 35) 3X as long as wide; submarginal vein 1.4X as long as marginal vein; marginal fringe about 0.17X of wing width. Hind wing with marginal fringe slightly more than 2.5X of wing width. Mid tibia about 3X as long as mid basitarsus.

Gaster (Fig. 36) slightly longer than thorax; setae as in figure; ovipositor not exserted, nearly equal to mid tibia, nearly 3X as long as mid basitarsus.

Male. Unknown.

3.75, FFL 5, HWL 64, HWW 2.25, HFL 6, PPm 8.5, PTrb 17.5, 
FTrs 22, FBrstr 8, MFm 15.75, MTb 25.75, MTrs 22, MBstr 
8.75, HFm 13.75, HTb 28, HTrs 25, HBstr 9, GSTL 40, OVPL 
25

**Host.** Unknown.

**Distribution.** India: Karnataka

**Material examined.**

Type material. **Holotype** female (on slide under 4 
coverslips), INDIA: Karnataka, 25 km. west of Mudigere, 

**Comments.** From the available descriptions of species of 
ater-group from other regions (excluding the Australian 
species described by Girault), *G. trialbifuniculatus* 
appears to be distinct by the contrastingly white F6-8. It 
differs from the Indian species on characters given in the 
key.

8. **Gonatocerus ater** Foerster

(Figs. 3, 37-40, 44-48)

**Gonatocerus ater** Foerster, 1841: 45. Female. Holotype 
female, Germany, Aachen (NMV), not examined.

**Lymaenon indicus** Subba Rao & Kaur, 1959: 229. Female, male. 
Holotype female, India, New Delhi (IARI), examined. 
**Syn.** Nov.

**Lymaenon nigroides** Narayanan & Subba Rao, 1961: 656. 
Female. Holotype female, India, Delhi (Not found in


[See Matthews, 1986, for extralimital synonymy].

Redescription.

Female. Length, 0.6-0.8 mm. Head and thorax dark brown; gaster yellowish with brown to dark brown bands, occasionally completely dark brown; antenna brown to dark brown; mostly scape, pedicel and F1 pale yellow to yellowish brown; wings subhyaline; legs pale yellow to yellowish brown with fore coxae dark brown, occasionally with all coxae dark brown and hind tibiae brown.

Head (Fig. 3) width 1.3-1.58X as wide as vertex width; ocellar triangle with two setae; medial face width 0.47-0.6X
of lateral face width; medial face without setae but each lateral face with 7 setae (4 setae in one specimen); torulus 0.4-0.87X of its own length from transverse trabecula; intertorular setae 2; eye length 1.6-1.9X as long as malar space length. Antenna (Figs. 37-40) with scape 2.75X to slightly more than 3X as long as wide and more than 3X as long as radicle; pedicel 0.34-0.45X of scape; F1 shortest, quadrate to slightly longer than broad; F3 and F5 subequal and distinctly longer than F6, sometimes F5 subequal to slightly longer than F6; F8 quadrate to longer than broad; F3-8 with longitudinal sensilla (F3 = 1-2, F4 = 0 or 1, F5 = 2, F6 = 1-2, F7 = 2, F8 = 2); clava 3.5X to slightly more than 4X as long as wide, subequal to slightly shorter than F5-8 combined, with 7-8 longitudinal sensilla (4 sensilla in one specimen).

Thorax subequal to gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum 0.4-0.8X of scutellum; each side lobe of mesoscutum with 1 seta, axilla without seta; medial length of metanotum 0.4-0.8X of medial length of propodeum; propodeum 0.36-0.55X of scutellum. Fore wing (Figs. 44-48) 2.76-3.39X as long as wide; submarginal vein 2.0-2.5X as long as marginal vein; marginal fringe 0.19-0.24X of wing width. Hind wing with marginal fringe 2.2-4.2X as long as wing width. Mid tibia 3.2-3.6X as long as mid basitarsus.

Gaster. Ovipositor unexserted to slightly exserted; total length of ovipositor 1.2-1.4X as long as mid tibia.
Male. Described by Subba Rao & Kaur (1959), but I could not find any male in IARI collections.

Relative measurements: Holotype of *G. indicus*: TL 15, EL 52, RL 12, SCL 50, PL 20, F1 10, F2 12, F3 17, F4 14.75, F5 16.75, F6 15.75, F7 15.5, F8 13.75, CL 60, FWL ?275, FWW 100, MVL 33, STL 13, FFL 20, HWL 232, HWW 10, HFL 27, MFm 65, MTb 105, MTrs 85, MBstr 31, HFm 74, HTb 110, HBstr 30, OVPL 131

Holotype of *G. empoascae*: TL 16, TTD 13, EL 56, RL 15, SCL 47, PL 20, F1 11, F2 13, F3 18.5, F4 16, F5 17.75, F6 16.75, F7 16, F8 14.5, CL 64, FWL 304, SMVL 64, MVL 30, STL 14, FFL 21, HWL 232, HWW 7, HFL 30, FFm 64, FTb 71, FTrs 83, FBstr 30, MTb 100, MTrs 80, MBstr 27, HFm 77, HTb 105, HTrs 90, HBstr ?34, OVPL 120

Additional material: (Females): HW (n=5) 16.5-22.75 (19.2), FVW (n=5) 11-15 (12.85), MFW (n=5) 1-2 (1.7), LFW (n=5) 3-5.5 (3.85), TL (n=5) 2-3 (2.45), TTD (n=5) 1-2 (1.6), EL (n=4) 8-11.5 (9.56), MSL (n=4) 4.75-6 (5.2), RL (n=7) 2.00-3.00 (2.25), SCL (n=7) 8.5-11.75 (9.64), PL (n=7) 3-4 (3.7), F1 (n=7) 1.5-2.25 (1.96), F2 (n=7) 1.75-2.5 (2.03), F3 (n=7) 2.5-3.75 (3.14), F4 (n=7) 2-3 (2.6), F5 (n=7) 2.75-3.5 (3.25), F6 (n=7) 2.5-3.25 (2.85), F7 (n=7) 2.5-3.0 (3.85), F8 (n=7) 2.25-2.75 (2.57), CL (n=7) 11-13.5 (12.4), THL (n=7) 21.75-28 (23.75), MSTL (n=7) 4.75-7.75 (5.96), SCTL (n=7) 8-11 (9.92), MTL (n=7) 2-3 (2.46), PDL
(n=7) 3-5 (4.53), FWL (n=7) 50-68 (59.5), FWW (n=7) 16.5-24 (19.96), SMVL (n=7) 11-15 (12.7), MVL (n=7) 5-6 (5.57), STL (n=7) 2.25-3.0 (2.82), FFL (n=7) 4-5 (4.57), HWL (n=6) 37-50 (44), HWW (n=7) 1.5-2.5 (2.14), HFL (n=7) 5-6 (5.28), FFm (n=7) 9.5-13 (11.42), FTb (n=7) 11-14 (12.80), FTrs (n=7) 14-17.5 (15.78), FBstr (n=7) 4.5-7 (5.85), MFm (n=7) 10-13.75 (11.82), MTb (n=7) 15.5-21.5 (18.67), MTrs (n=6) 14-17 (15.62), MBstr (n=6) 4.75-6 (5.37), HFm (n=7) 10-14 (11.92), HTb (n=7) 16-22.5 (18.89), HTrs (n=7) 14-19 (16.46), HBstr (n=7) 4-7 (5.53), GSTL (n=5) 20.5-26.5 (23.8), OVPL (n=7) 21.5-30.0 (24.75)

Host. Empoasca devastans Distant

Distribution. India: Andhra Pradesh, Assam, Bihar, Delhi, Kerala, Punjab, Uttar Pradesh. (Palaearctic).

Material examined.

Type material. Lymaenon indicus: Holotype female, INDIA: New Delhi, 17.v.1957 (R.B. Kaur), IARI.

The holotype on a single slide; thorax crushed under the coverslip and most of the leg parts are missing.

Lymaenon empoascae: Holotype female, INDIA: Delhi, 9.v.1964 (Atma Ram), IARI.

The holotype mounted on a slide with the thorax crushed under the coverslip and left side of the fore wing detached from the body.

Additional material: (13 Females): INDIA: Andhra Pradesh,
Visakhapatnam, 2 Females, 20.iv.1991 (M.C. Basha); Assam, Halflong, 1 Female, ix.1987 (S. Singh); Silchar, 1 Female, 9.ii.1989 (M.C. Basha); Bihar, Chakradharpur, 1 Female, 23.ii.1994 (S.B. Zeya & S.I. Kazmi); Kerala, Munnar, 1 Female, 24.ii.1993 (S.B. Zeya); Trichur (KFRI), 2 Females, 28.ii.1993 (S.B. Zeya); Calicut, U.C., 1 Female, 28.ii.1993 (S.B. Zeya & S.I. Kazmi); Kerala, Munnar, 1 Female, 28.ii.1993 (S.B. Zeya); Trichur (KFRI), 2 Females, 28.ii.1993 (S.B. Zeya & S.I. Kazmi); Calicut, U.C., 1 Female, 28.ii.1993 (S.B. Zeya); Walayar forest, 2 Females, 4.iii.1993 (S.B. Zeya); Uttar Pradesh, Bareilly, 1 Female, 7.x.1978 M. (Verma).

Comments. Initially, indicus was considered as valid species with empoascae and nigroides as its synonyms. However after study of a British specimen of ater determined by Matthews and also compared by him with paratypes of populi Viggiani, I find no character of specific value to separate the Indian species, indicus, nigroides, empoascae from ater. There are only a few characters pertaining to colour of gaster, the apparently longer ovipositor and relatively more robust thorax in some of the Indian material. The base of gaster in some Indian specimens including types of indicus and empoascae is paler but this appears variable. In three Indian specimens it is completely dark brown as in the British specimen. In nigroides it is said to be bright yellow. Though the ovipositor appears to arise from near base of gaster and very shortly exserted at apex, the relative measurements of ovipositor and the mid tibia show hardly any difference in this character. I have, therefore, placed indicus,
empoascae and nigroides as synonyms of ater.

9. *Gonatocerus udakamandus* Mani & Saraswat
(Figs. 41-43)

Holotype female, India, Ootacamund, Doddabetta (USNM), examined.


**Redescription.**

**Female.** Length, 1.20 mm (as given by Mani & Saraswat, 1973). Body black; antennae dark brown to completely black; wings subhyaline with very faint yellow tinge; coxae, trochanters, mid and hind femora and tibiae black; fore femur blackish brown; fore tibia, mid and hind tarsi yellowish brown except fore tarsi which are brown.

Head width 1.74X as wide as vertex width; a pair of setae in ocellar triangle; torulus about 0.5X its own length from transverse trabecula; lateral face width about 1.8X as wide as medial face; each lateral face with 7 setae and medial face with 2 setae; intertorular region without setae. Antenna (Fig. 41) with scape 2.5X as long as wide and 2.5X as long as pedicel; F1 and F2 subequal; F3 longest and equal to F5; F6 and F7 more or less equal in length and longer than rest of the funicular segments; F3, F5-8 with
longitudinal sensilla (F3 = 2, F5-8 = 2); clava slightly longer than F6-8 combined.

Fore wing (Fig. 42) nearly 3X as long as broad; setae in basal third of wing as in Fig. 43; marginal fringe 0.24X of wing width. Hind wing with marginal fringe 2X as long as wing width and slightly longer than marginal fringe of fore wing. Mid tibia 3.8X as long as mid basitarsus.

Gaster. Ovipositor not exserted beyond tip of gaster, its total length 1.38X as long as mid tibia.

Male. Unknown.

Relative measurements: Holotype: HW 26, FVW 15, MFW 3.5, LFW 6.5, TL 4, TTD 2, EL 11.5, MSL 8, RL 4.75, SCL 10, PL 4, F1 3, F2 3, F3 5, F4 3.75, F5 5, F6 4.5, F7 4.25, F8 3.75, CL 14, THL 35.5, SCTL 13.5, MTL 3, FWL 85, FWW 28.75, SMVL 18, MVL 7.25, STL 4, FFL 7, HWW 4, HFL 8, FFm 16, FTb 18, FTrs 20.5, FBstr 7, MFm 15, MTb 24.75, MTrs 21, MBstr 6.5, HFm 18, HTb 27, HTrs 23, HBstr 7.5, GSTL 40, OVPL 34

Material examined.

Type material. Holotype female, (on slide) with the following data; 5-8 Dodabetta. Coll. (Mani & Party) 23.iii.1972 (USNM).

The holotype has the head detached, otherwise a complete specimen. The body is laterally mounted and the thorax is crushed, therefore it is not possible to measure the thoracic parts. Also the detailed sculputre and setations
of the body can not be studied.

**Host.** Unknown.

**Distribution.** India: Tamil Nadu. (Known only from the type locality.)

**Comments.** *G. udakamandus* is very close to *sahadevani*, but differs from that species mainly in having longer F3 and F5, F6 not shorter than F7, and discal setae of fore wing beginning at level of apex of stigmal vein.

10. *Gonatocerus sahadevani* (Subba Rao & Kaur)

(Figs. 6, 49-54)


**Redescription.**

**Female.** Length, 0.62-0.70 mm. Body dark brown; gaster, if distended, may appear alternately banded with pale yellow and dark brown; antenna, with scape, pedicel, F1 and sometimes F2 yellowish brown; occasionally scape, pedicel and F1 may be brown to dark brown; wings subhyaline with very faint brownish tinge; fore coxae pale brown to dark brown, hind tibia dark brown, rest of legs yellowish to pale
brownish yellow.

**Head** width 1.46X as wide as vertex width; ocellar triangle with 2 setae; torulus 0.72-1.0X its own length from transverse trabecula; lateral face width 1.6X as wide as medial face width; eye length 1.42X as long as malar space. **Antenna** (Figs. 49-52), with scape 2.0-2.6X as long as wide and slightly longer than F1-2 combined; F3 longer and subequal to F5; F7 and F8 subequal; in some specimens F8 quadrate and subequal to F6 (Fig. 52): sensilla on F3, F5-8 (F3 = 1 or 2; F5 = 2; F6 = 0 or 1; F7 = 2; F8 = 0 or 2); clava 2.5-3.0X as long as wide, as long as or slightly shorter than F5-8 combined and with 7-8 longitudinal sensilla.

**Thorax** slightly shorter than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum 0.57-0.82X of scutellum; mid lobe of mesoscutum with 2 pair of setae; each side lobe of mesoscutum with 1 seta; anterior scutellum with 2 setae; axilla without seta; propodeum 0.25-0.56X of scutellum. **Fore wing** (Figs. 53, 54) 2.5-2.8X as long as wide; submarginal vein 1.72-2.1X as long as marginal vein; marginal fringe 0.17-0.21X of wing width. **Hind wing** with marginal fringe 1.7-1.8X as long as wing width. **Mid tibia** 2.9-3.7X as long as mid basitarsus.

**Gaster**. Ovipositor not exserted, its total length 1.29-1.4X as long as mid tibia.

**Male**. Unknown.
Relative measurements: Holotype: TL 15, TTD 15, PL 16, F1 9, F2 6.5, F3 15, F4 8, F5 15.5, F6 9.75, F7 13, F8 12.75, CL 50.75, SCTL 46, MTL 8, PDL 26, FWL 243, FWW 89, SMVL 50, MVL 29, STL 6, FFL 17, FFm 50, FTb 57, FTrs 57, FBstr 24, MFm 54, MTb 82, MTrs 70, MBstr 25, HFm 59, HTb 82, HTrs 80, HBstr 30, GSTL 131, OVPL 115

Additional material: (Females): HW (n=1) 19, FVW (n=1) 12.75, MFW (n=2) 2.5-3 (2.75), LFW (n=2) 3-5 (4), TL (n=2) 1.50-2.75 (2.12), TTD (n=2) 1.5-2.0 (1.75), EL (n=1) 10, MSL (n=1) 7, RL (n=4) 2-3 (2.68), SCL (n=4) 6-8 (7.9), PL (n=4) 3.5-4 (3.75), F1 (n=4) 1.75-1.75 (1.75), F2 (n=4) 1-1.25 (1.06), F3 (n=4) 2.75-3.5 (3.06), F4 (n=4) 1.5-2 (1.68), F5 (n=4) 2.75-3.5 (3.06), F6 (n=4) 1.75-2.25 (2), F7 (n=4) 2.5-3.00 (2.75), F8 (n=4) 2.00-2.75 (2.5), CL (n=4) 8-11 (10), THL (n=3) 21.75-25 (23.5), MSTL (n=4) 5-8 (6.5), SCTL (n=4) 8.75-10 (9.5), MTL (n=4) 1.75-2 (1.93), PDL (n=4) 2.5-5 (3.9), FWL (n=4) 45.5-51 (49.3), FWW (n=4) 16-19.75 (18.18), SMVL (n=4) 9-10.5 (9.56), MVL (n=4) 4.5-6 (5.25), STL (n=4) 2-2.5 (2.37), FFL (n=4) 3-4 (3.62), HWL (n=3) 40-44 (42.33), HWW (n=3) 2.25-3.00 (2.66), HFL (n=3) 4-5 (4.66), FFm (n=4) 8.5-12 (10.43), FTb (n=4) 10.00-11.75 (11.25), FTrs (n=4) 12.5-15 (14.25), FBstr (n=4) 4-5.5 (5), MFm (n=4) 10-11 (10.5), MTb (n=4) 13.75-17.75 (16.18), MTrs (n=4) 12-16 (14.5), MBstr (n=4) 3.75-5.75 (5), HFm (n=4) 9-12 (10.5), HTb (n=4) 14-18 (16.5), HTrs (n=4) 13.5-17.5 (15.93), HBstr (n=4) 4.5-6 (5.5), GSTL (n=4) 23.5-26 (25.18), OVPL (n=4) 18-24 (21.75)
Host. Unknown.

Distribution. India: Bihar, Delhi, Kerala, Uttar Pradesh.

Material examined.


The holotype is mounted on a single slide with radicle and scape of both the antennae hidden under the head; thorax is crushed and left wing folded.

Additional material. (10 Females) INDIA: Bihar, Jamshedpur, 1 Female, 26.ii.1994, (S.B. Zeya); Ramgarh, 1 Female, 1.iii.1994, (S.B. Zeya & S.I. Kazmi); Kerala, Trichur (KFRI), 2 Females, 28.ii.1993 (S.I. Kazmi); Uttar Pradesh, Aligarh, 1 Female, 10.xii.1980; 1 Female, 24.xi.1983, 1 Female, 15.xi.1984, 1 Female, 24,xi.1985 (M. Hayat); 2 Females, xi.1979 (M. Verma).

Comments. This is a very distinctive species, and can be distinguished from the other species of ater-group by the peculiar configuration of the funicle segments, completely dark body colour and arrangement of discal setae of fore wing. It differs from udakamandus by the last mentioned character, and in having F1 and F2 generally quadrate, F4 quadrate to slightly longer than broad, and F6 always distinctly shorter than both F5 and F7 and usually quadrate.
6.6. **SULPHURIPES-GROUP**

**Diagnosis.**

Vertexal suture present; back of the head entire; sometimes occiput above foramen very narrow and with a longitudinal suture, the coronal suture; pronotum two-lobed; dorsellum of metanotum rhomboidal or biconvex; propodeum smooth medially or with one median carina or sometimes with very weak submedial carinae; fore wing behind marginal vein setose, sometimes a few setae may extend up to distal half of submarginal vein.

**List of Indian Species.**

1. *Gonatocerus shamimi* Subba Rao & Hayat
2. *G. edentulus* sp.nov.
3. *G. utkalensis* Subba Rao
4. *G. longicornis* Nees
5. *G. huberi* sp.nov.
6. *G. tarae* (Narayanan & Subba Rao)
7. *G. sulphuripes* (Foerster)
8. *G. orientalis* sp.nov.

**Key to Indian species of sulphuripes-group**

1. Either ovipositor distinctly exserted, the exserted part at least 0.25X of gaster or the total length of ovipositor at least 2X of mid tibia. ______________ 2
-- Either ovipositor not exserted or if slightly exserted, then its total length clearly less than 1.8X of mid tibia.

2. Base of inner plate of ovipositor (second valvifer) large, curved within gaster (Fig. 60); F4-6 individually distinctly shorter than both F3 and F7 (Fig. 55); stigmal vein relatively thin and long (Fig. 65).

-- Base of inner plate of ovipositor normal, not large (Fig. 15); F2-8 gradually decreasing in length distad or F4 at most slightly shorter than F3 but F6 not shorter than F7 (Fig. 70); stigmal vein relatively thick and short (Fig. 73).

3. Clypeus with distinct, lateral teeth (Fig. 194); distal macrochaeta slightly longer than proximal macrochaeta (Fig. 58). (Exserted part of ovipositor 0.25-0.33X of gaster). 

-- Clypeus without lateral teeth; distal macrochaeta distinctly longer than proximal macrochaeta (Fig. 65).

4. Ovipositor slightly exserted, the exserted part about 0.16X of gaster.

3. Shamimi Subba Rao & Hayat

4. Edentulus sp. nov.
-- Exserted part of ovipositor about 0.5X of gaster.  
_________________________ 3. utkalensis Subba Rao

5. Only F7 and F8 with sensilla (Fig. 67); propodeum narrow in middle, its medial length about equal to medial length of dorsellum; fore wing narrow, slightly more than 4.5X as long as broad (Fig. 68); body light yellowish brown. ______________ 3. utkalensis Subba Rao

-- F4-8 with sensilla (Fig. 70); propodeum distinctly longer than medial length of dorsellum; fore wing relatively broad, at most 4X as long as broad (Fig. 11); body generally dark brown with only some yellowish areas; basal third or so of gaster always paler, yellow to yellow brown compared to dark brown distal part. ______________________ 4. longicornis Nees

6. F5-8 with sensilla; F2-7 gradually decreasing in length distad (Fig. 74); fore wing disc apically relatively broad (Fig. 75). ______________________ 5. huberi sp.nov.

-- Only F7 and F8 with sensilla; F4-6 individually shorter than both F3 and F7 (Fig. 79); fore wing disc relatively narrow apically (Fig. 81). ______________________ 7

7. Fore wing with a row of setae behind submarginal vein (Fig. 86); clava clearly shorter than F5-8 combined. __ 8
-- Fore wing asetose behind submarginal vein (Fig. 82); clava at least as long as F5-8 combined, usually longer (Figs. 77-80). 6. tarae (Narayanan & Subba Rao)

8. F2 and F3 each about 3X as long as broad (Fig. 88); marginal fringe of fore wing relatively more in number (Fig. 89). 7. sulphuripes (Foerster)

-- F2 and F3 each 2.0-2.5X as long as broad (Fig. 84); marginal fringe of fore wing relatively fewer in number (Fig. 85). 8. orientalis sp.nov.

Description of species.

1. Gonatocerus shamimi Subba Rao & Hayat

(Figs. 1, 7, 55-61, 193-195)


Redescription.

Female. Length, 0.67-0.97 mm. Head dark brown; thorax yellow to dark brown as follows: a patch in anterior two-fifth to half of mid lobe, anterior margin of side lobes,
anterior scutellum medially, posterior scutellum medially, and propodeum dark brown; metanotum yellow to brown; gaster dark brown, with basal third, and last tergum sometimes brownish yellow to dark brown; radicle pale, scape and pedicel brownish yellow to brown, flagellar segments dark brown; wings subhyaline with faint yellow tinge; coxae brown to brownish yellow, sometimes hind coxae dark brown; otherwise legs pale yellow brown.

**Head** (Figs. 7, 193) width 1.5X as wide as vertex width; lateral face width 2.3X as wide as medial face width and with 7 setae; medial face without setae; torulus 0.2-0.3X its own length from transverse trabecula; intertorular setae 2; eye length 2.3X as long as malar space; clypeus laterally with a tooth on each side (Figs. 193, 194).

**Antenna** (Figs. 55, 56). Radicle slightly longer than pedicel; scape 2.6-3.2X as long as wide, slightly more than 2X of radicle; funicle segments all longer than broad; F4-6 individually shorter than both F3 and F7; F7-8 with longitudinal sensilla (F7-8 = 2); clava 3.3-4.5X as long as wide, subequal to or slightly longer than F6-8 combined and with 6-7 longitudinal sensilla.

**Thorax.** Each lateral lobe of pronotum with 3 setae; mid lobe of mesoscutum subequal to scutellum; each side lobe of mesoscutum with 1 seta; axilla without seta; propodeum narrow medially and distinctly shorter than metanotum (Fig. 195). **Fore wing** (Figs. 57, 58) 3.7-4.1X as long as wide, 1.2X as long as hind wing; marginal
fringe 0.34-0.4X of wing width; submarginal vein 2X as long as marginal vein. Hind wing with marginal fringe 4.9X as long as wing width. Mid tibia subequal in length to hind tibia, and 3.3X as long as mid basitarsus.

Gaster distinctly longer than thorax; proximal portion of ovipositor large and curved (Figs. 59-61), exserted part of ovipositor about 0.25-0.36X (measured from dry mounts) of gaster; ovipositor 1.8X to slightly more than 2X as long as mid tibia.

Male. Unknown.

Relative measurements: Additional material: (Females):

| Measurement  | n=2 | 19.5-19.5 (19.5) | 13-13.5 (13.25) | 1.5-2 (1.75) | 3.25-3.5 (3.37) | 2.25-2.5 (2.37) | 0.5-0.75 (0.6) | 10-10.5 (10.25) | 4.5-4.5 (4.5) | 4.5-5 (4.8) | 8.0-8.5 (8.12) | 3-4.0 (3.6) | 3-3.25 (3.06) | 4-4.25 (4.06) | 4.5-4.75 (4.6) | 3.25-3.75 (3.5) | 3.25-3.75 (3.5) | 3.0-3.5 (3.18) | 4-4.5 (4.1) | 3.75-3.75 (3.75) | 10-12.5 (11.6) | 21-28 (23.6) | 7-9 (8) | 8-8.5 (8.1) | 2-3.25 (2.5) | 1-1.75 (1.5) | 71-71 (71.00) | 17.25-19 (17.9) | 14-15.75 (14.9) | 7.25-8 (7.6) | 4.25-4.75 (4.5) | 6-7.0 (6.5) | 55-55.5 (55.25) | 1.75-1.75 (1.75) | 5-5.5 (5.5) |
8-8.5 (8.25), FFm (n=3) 11.75-13 (12.5), FTb (n=3) 13.5-14.75 (14.08), FTrs (n=3) 16-18 (16.6), FBstr (n=3) 5-6 (5.6), MFm (n=3) 12.0-12.5 (12.1), MTb (n=3) 21.00-21.75 (21.5), MTrs (n=3) 17-17.25 (17.08), MBstr (n=3) 6-6.25 (6.08), HFm (n=3) 13-13.75 (13.25) HTb (n=3) 22-23.75 (22.5), HTrs (n=3) 19.75-20 (19.9), HBstr (n=3) 6.75-7.75 (7.1), GSTL (n=4) 36-40 (37.75), OVPL (n=4) 41-46 (44)

Host. Unknown.

Distribution. India: Bihar, Uttar Pradesh.

Material examined.

Type material. See comments.

Comments. The original description of *shamimi* (as *Gonatocerus terebrator*) is based on two females, a holotype and a paratype, both collected in Aligarh on 5.iii.1980.

I found 5 females mounted on 6 slides in the collection of Dr. S.A. Shafee. These carry numbers '1' (2 slides), '2' (2 slides), '3' and '6' all written in pencil. Only two slides (no. 2 and 3) additionally mention 'sp.n. (1)'. All the five specimens agree fairly well with the original description. But as none of the slides carry any type designation, it is not possible to be sure which two of the five specimens actually represent the holotype and paratype. Also it appears that the figures given by Shamim & Shafee (1984: Figs. 8, 9) were drawn from the two slides carrying no. 1. The slides now bear my identification label.

*Gonatocerus shamimi* appears close to *pictus* (Haliday) but differs in having long and thin flagellar segments, only F7 and F8 with sensilla, relatively long and exserted ovipositor, and the basally enlarged second valvifer. It differs from *edentulus* sp.nov. in the characters given in the key to species. It also differs from all the Indian species of *sulphuripes* - group in the presence of lateral clypeal teeth.
2. Gonatocerus edentulus sp.nov.  
(Figs. 62-65)

Description.

Female. Length, thorax + gaster, 0.92 mm. Head dark brown, thorax yellow brown with dark brown as follows: a patch in anterior third of mid lobe of mesoscutum except sides; a patch in anterior third of side lobe, anterior scutellum medially except sides, anterior margin of posterior scutellum, and propodeum; axilla, metanotum and rest of mesoscutum brown; gaster dark brown with brown ovipositor sheaths; radicle, scape and pedicel brown, dorsal edge of scape and rest of antennal segments dark brown; wings subhyaline with slight yellow tinge; legs pale yellow brown with hind coxae dark brown and fore and mid tibiae brown.

Head width 1.39X as wide as vertex width; ocellar triangle with 2 setae; medial face width 0.69X of lateral face width; medial face without setae; each lateral face with 7 setae; torulus 0.25X its own length from transverse trabecula; a pair of setae between toruli; eye length 1.95X as long as malar space length; clypeus without lateral teeth (Fig. 62). Antenna (Fig. 63) with scape slightly more than 2.5X as long as wide, less than 2X as long as radicle and slightly more than 2X as long as pedicel; F1 subequal to F6; F4-6 each distinctly shorter than F3 and F7; F7 and F8 each with a pair of longitudinal sensilla; clava clearly more than 4X as long as wide, shorter than F6-8 combined, with 7
longitudinal sensilla.

**Thorax** distinctly shorter than gaster; each lateral lobe of pronotum with (!) 2 setae; mid lobe of mesoscutum subequal to scutellum; each side lobe of mesoscutum with 1 seta; axilla without seta; medial length of propodeum less than medial length of metanotal dorsellum. **Fore wing** (Fig. 65) 4.33X as long as wide; submarginal vein 2.6X as long as marginal vein; stigmal vein long and 0.45X of marginal vein; distal macrochaeta distinctly longer than proximal macrochaeta; marginal fringe 0.42X of wing width. **Hind wing** with marginal fringe 5.14X as long as wing width. **Mid tibia** 3.57X as long as mid basitarsus.

**Gaster.** Ovipositor exserted, exserted part 0.16X of gaster and its total length 2.24X as long as mid tibia; base of second valvifer large, curved within gaster.

**Male.** Unknown.

**Relative measurements:** Holotype: HW 22, FVW 15.75, MFW 2.25, LFW 3.5, TL 3, TTD 0.75, EL 10.75, MSL 5.5, RL 5.25, SCL 9.25, PL 4.75, F1 4, F2 5, F3 5.25, F4 5, F5 4.75, F6 4.25, F7 5, F8 4.75, CL 13.5, THL 28, MSTL 8.5, SCTL 8.75, MTL 2, PDL 1.5, FWL 87.75, FWW 20.25, SMVL 26, MVL 10, STL 4.5, FFL 8.5, HWL 67.5, HWW 1.75, HFL 9, FFM 14, FTb 15, FTrs 18.75, FBstr 6, MFm 9, MTb 25, MTrs 20, MBstr 7, HFm 13, HTb 27, HTrs 23, HBstr 8.5, GSTL ?53, OVPF 56.5

**Host.** Unknown.
**Distribution.** India: Bihar. (Known only from the type locality.)

**Material examined.**

Type material. **Holotype,** female (on a slide under 4 coverslips), INDIA: Bihar, Ranchi, 27.ii.1994 (S.B. Zeya).

**Comments.** *Gonatocerus edentulus* sp. nov. is very close to *shamimi* but differs mainly in the absence of lateral clypeal teeth, relatively longer and narrower fore wings, presence of two microchaetae and longer ovipositor.

3. *Gonatocerus utkalensis* Subba Rao

(Figs. 66-69)


Holotype female, India, Cuttack. (BMNH), not examined.

**Redescription.**

**Female.** Length, 1.2mm. Head dark brown; thorax brown to dark brown as follows: a patch in middle of anterior half of mid lobe of mesoscutum except sides, subtriangular patch on side lobe, axillae, anterior scutellum medially, posterior scutellum, metanotum and propodeum, dark brown; gaster brown to dark brown; antenna brown to dark brown; wing subhyaline with light yellow tinge; legs yellowish brown except coxae which are brownish yellow.

**Head** (Fig. 66) width 1.4X as wide as vertex width;
ocellar triangle with a pair of setae; medial face width 0.7X of lateral face width; medial face without seta but 8 setae on each lateral face; upper margin of torulus almost touching lower margin of transverse trabecula; intertorular region with 2 setae; eye length 2.2X as long as malar space length. Antenna (Fig. 67) nearly as long as thorax and gaster combined; radicle 0.5X of scape; pedicel slightly less than 0.5X as long as scape; all funicular segments longer than broad; F4-6 individually shorter than F7; F7 and F8 each with 2 longitudinal sensilla; clava narrow, about 4X as long as wide, slightly shorter than F6-8 combined, with 7 sensilla.

Thorax. Each lateral lobe of pronotum with 3 setae, 1 seta near lower margin of each lobe of pronotum; mesoscutum slightly longer than scutellum; each side lobe of mesoscutum with 1 seta; axilla without seta; metanotal dorsellum rhomboidal; propodeum medially narrow, not longer than metanotum; propodeum medially smooth. Fore wing (Fig. 68, 69) 4.5X as long as broad; distal macrochaeta about 1.5X as long as proximal macrochaeta; stigmal vein very long, nearly 0.5X of marginal vein; marginal fringe 0.45X of wing width (longest cilia of fore wing located along anterior margin). Hind wing with marginal fringe 4.5X as long as wing width. Mid tibia 3.75X as long as mid basitarsus.

Gaster slightly less than 2X as long as thorax; ovipositor very long, 2.9X as long as mid tibia; exserted part of ovipositor about 0.5X of gaster.

Relative measurements: 1 Female (Assamese specimen): HW 19, FVW 13.25, MFW 2.5, LFW 3.5, TL 3.25, TTD 0.5, EL 10, MSL 4.5, RL 5.75, PL 4.75, SCL 10, F1 4.5, F2 6, F3 6, F4 5, F5 5, F6 4.5, F7 5.5, F8 4.75, CL 14, THL 24, MSL 9.25, SCTL 8, MTL 2, PDL 1, FWL 89, FWW 20, SMVL 15.5, MVL 10, STL 5, FFL 9, HWW 2, HFL 9, FFm 15, FTb 16.75, FTrs 19, FBstr 7.25, MFm 14, MTb 26.75, MTrs 21, MBstr 7, HFm 14.75, HTb 29.75, HTrs 25, HBstr 10, GSTL 54, OVL 75

Host. ex eggs of Nophotettix virescens (Distant).

Distribution. India: Assam, Orissa.

Material examined.

Additional material. INDIA: Assam, Dehmciji, 1 Female (on slide), 31.x.1987, (Sudhir Singh).

Comments. The above redescription is based on a single female collected in Assam. It agrees fairly well with the original description of utkalensis supplemented with notes provided by Dr. M. Hayat who studied the holotype in BMNH in 1992. As the holotype is on card, it is not possible to be sure about the shape of the second valvifers (see Key to species). It is, therefore, very likely that the Assamese specimen may actually represent an undescribed species.
4. *Gonatocerus longicornis* Nees
(Figs. 11-13, 70-73, 196, 197)


**Syn. Nov.**


**Syn. Nov.**


[For extralimital synonymy, Matthews (1986) should be consulted].

**Redescription.**

**Female.** Length, 0.9-1.2 mm. Body dark brown; head dark brown, sometimes mouth region yellowish brown; thorax dark brown to nearly black, with pale on sides of mid lobe of
mesoscutum, side lobes posteriorly and scutellum on sides; gaster basal one-third to half pale yellow or pale brown, rest dark brown; ovipositor sheaths brown; antenna with radicle, scape and pedicel pale yellow brown, sometimes only pedicel and F1 brown, otherwise rest of flagellar segments dark brown; wings subhyaline with faint yellow tinge; legs including coxae pale yellow brown, occasionally mid and hind coxae basally dark brown.

Head width 1.3-1.6X as wide as vertex width; ocellar triangle with one pair of setae; medial face width 0.66-0.83X of lateral face width; each lateral face with 7-8 setae; medial face without setae; torulus 0.33-0.37X of its own length from transverse trabecula; intertorular setae 2; eye length 1.2-1.6X as long as malar space length. Antenna (Fig. 70, 71) with scape slightly less than to slightly more than 3X as long as wide, about 2X as long as radicle and pedicel individually; F1 distinctly shorter than F2; F2-F8 decreasing in length distad; F4-8 with longitudinal sensilla (F4 = 1, F5-8 = 2); clava about 4X as long as wide, nearly as long as F6-8 combined, in some specimens slightly longer than F6-8 combined, with 6-8 longitudinal sensilla.

Thorax distinctly shorter than gaster; each lateral lobe of pronotum with 2 setae; mesoscutum slightly shorter than scutellum; each side lobe of mesoscutum with 1 seta; axilla without seta; propodeum (Fig. 197) usually longer than medial length of dorsellum. Fore wing (Figs. 11, 72, 73) 3.5X to slightly more than 4X as long as wide; marginal
fringe 0.32-0.37X of wing width. **Hind wing** with marginal fringe 4.2-4.5X as long as wing width. **Mid tibia** 3.2X to slightly more than 4X as long as mid basitarsus.

**Gaster.** Ovipositor strongly exserted, exserted part 0.22-0.38X of gaster (measured from dry mounts); total length of ovipositor about 2X of mid tibia.

**Male.** Length, 1.2-1.3 mm. Body colour same as female except gaster apically slightly yellow brown; radicle and scape pale yellow; scape slightly infuscate along dorsal edge; pedicel brownish yellow; rest of flagellar segments dark brown; wings and legs as in female.

**Antenna** (Fig. 178) with scape 2.5X as long as wide and 2X of pedicel and radicle individually, slightly longer than half of F1; F1 distinctly shorter than rest of flagellar segments; F1 to F11 with more than 4 longitudinal sensilla; clava (F11) oblong, subequal to preceding segment.

**Thorax.** Mesoscutum subequal to scutellum; propodeum distinctly shorter than metanotum with no carina. **Fore wing** nearly 4X as long as wide; marginal fringe 0.3-0.36X of wing width. **Mid tibia** 3.2-3.7X as long as mid basitarsus.

**Gaster** distinctly longer than thorax.

**Relative measurements:** Holotype of *Lymaenon shasthryi:*

SCL 46, PL 23, F1 23, F2 28, F3 25, F4 22, F5 22, F6 20, F7 20, F8 18, CL 73, FWL 400, FWW 113, SMVL 75, MVL 50, STL 20,
FFL 27, HWL 300, HWW 6, HFL 38, FFm 67, PTb 75, FTrs 80,
FBstr 30, MFm 65, MTb 107, MTrs 85, MBstr 30, HFm 60, HTb
130, HTrs 100, HBstr 35, OVPL 215

Holotype of Gonatocerus uttarordeccanus: HW 23.65, FVW
15.5, MFW 3.0, LFW 3, TL 4, TTD 1.75, EL 11, MSL 8.75, SCL
11, PL 4.75, F1 3.0, F2 6, F3 5.5, F4 5.5, F5 5.25, F6 5, F7
5.75, F8 4, CL 13, THL 35, MST 16, SCT 10.25, MTL 3, PDL
6.75, FWL 80, FWW 21, SMVL 15, MVL 10, STL 4, FFL 7, HWW
2.5, HFL 7, FFm 16, FTb 16.75, FTrs 17, FBstr 6.75, MFm
13.75, MTb 23.75, MTrs 18, MBstr 5.75, HTb 25.75, HTrs 21,
HBstr 8, GSTL 43, OVPL 48

Additional material (n=4, Females): HW 18-22 (20.25), FVW
12-14 (13), MFW 2.25-2.5 (2.25), LFW 3-3.5 (3.12), TL 2-3
(2.5), TTD 0.75-1.5 (1), EL 8-11 (9.5), MSL 4.5-5 (4.75), RL
4-4.75 (4.1), SCL 9-9.75 (9.3), PL 4-4.5 (4.1), F1 3-3.75
(3.5), F2 5.5-6.00 (5.6), F3 5-5.75 (5.3), F4 4.75-5.50 (5),
F5 4.75-5.25 (5), F6 4.5-5 (4.6), F7 4.5-4.75 (4.6), F8
3.75-4.25 (3.9), CL 12.75-13.5 (13), THL 22-28 (25), MSTL 7-
9.75 (8.4), SCTL 8-10 (9.2), MTL 2.5-3 (2.8), PDL 2.5-3
(2.8), FWL 76-86 (81.5), FWW 18.5-23 (20.9), SMVL 14-17
(15.3), MVL 9-10.25 (9.6), STL 3.5-4.5 (3.9), FFL 7-7.50
(7.1), HWL 56-65 (60.7), HWW 1.75-2 (1.87), HFL 7.5-9 (8.1),
FFm 12-14 (13.5), FTb 15-16 (15.5), FTrs 15.25-17.75
(16.43), FBstr 6-6.25 (6.06), MFm 11-13.75 (12.9), MTb 22-
24 (22.75), MTrs 17-18 (17.5), MBstr 6-7.5 (6.37) HFm 11-14
(12.6) HTb 24-27 (25.1), HTrs 18.5-20 (19.6), HBstr 6-8
(7.1), GSTL 36-44 (40), OVPL 43.5-49 (46.3)
1 male: SCL 7.75, PL 4, F1 6.25, F2 8.5, F3 8.75, F4 8.25, F5 8.75, F6 8, F7 8.75, F8 8, F9 8, F10 8, F11 8, THL 33, MSTL 10.75, SCTL 11, MTL 3.5, PDL 4.5, FWL 85.75, FWW 22, SMVL 18, MVL 10, STL 4, FFL 8, HWL 67, HWW 2.25, HFL 9, FFm 16, FTb 17.5, FTrs 18.5, FBstr 7, MFM 14.5, MTb 26, MTrs 20, MBstr 7, HFm 13, HTb 26, HTrs 21, HBstr 8, GSTL 35

**Hosts:** Cofana spectra (Distant) (=Tettigella spectra); Nephotettix spp.

**Distribution:** India: Assam, Delhi, Jammu & Kashmir, Kerala, Madhya Pradesh, Orissa, Tamil Nadu, Uttar Pradesh. (Palaearctic).

**Material examined.**

Type material. Lymaenon shasthryi: **Holotype** female, INDIA: Delhi. 15.viii.1957. (R.B. Kaur) (IARI). The specimen mounted dorsally on one slide with radicle of one antenna and basal part of scape of another antenna hidden under the head and legs of right side hidden under the gaster.

Gonatocerus uttarodeccanus: **Holotype** female, INDIA: 5-16 Munnar, 2.iv.1972 (Mani & party) (USNM). Holotype mounted laterally on a single slide with the head detached, and both the head and body flattened.

Additional material. (56 Females, 5 Males): INDIA: Madhya Pradesh, Raipur, 45 Females, 5 Males, 10.xi.1988, ex eggs of C. spectra and Nephotettix spp. (K.P. Yadav); Jammu &
Kashmir, Mansar, 1 Female, 11.x.1989, (M.C. Basha); Uttar Pradesh, Aligarh, 1 Female, 21.xii.1977, (M. Verma); 3 Females, 10.xi.1983, (M. Hayat); Assam, Dhemaji, 1 Female 31.x.1981 (S. Singh); Tamil Nadu, Villupuram, 2 Females, 19.ii.1993 (S.I. Kazmi); Kodaikanal, 1 Female, 21.ii.1993 (S.B. Zeya); Kerala, Kottayam, 1 Female, 25.ii.1993, (S.B. Zeya); Orissa, Bhubaneshwar (OAUT), 1 Female, 22.ii.1994, (S.B. Zeya).

Comments. This species is well-known now through the paper by Boucek & Graham (1972). I have examined a female (BMNH, on slide No. M 1033/1) from Wales, Glam, determined as longicornis by Matthews.

The types of L. shasthryi, G. uttarodeccanus, and a large series of specimens examined by me, agree quite well with the description of the neotype of G. longicornis Nees given by Boucek & Graham (1972) and of the British specimens given by Matthews (1986). Therefore, both shasthryi and uttarodeccanus are placed in synonymy with longicornis.

From the descriptions and illustrations given by Sahad & Hirashima (1984), the specimens from Bangladesh and Thailand determined as uttarodeccanus appear to be misidentified and probably belong to shamimi. On the contrary, the specimens determined as G. cicadellae Nikol'skaya recorded by these authors from Japan and Korea (ex. Cicadella viridis) appear conspecific with longicornis. It is, therefore, very likely that cicadellae may eventually prove to be a synonym of
*longicornis* as suggested by Matthews (1986).

5. *Gonatocerus huberi* sp. nov.

(Figs. 74-76)

**Description.**

**Female.** Length, thorax + gaster, 0.9 mm. Head brown to dark brown; thorax yellow with brown to dark brown as follows: pronotum yellow brown to dark brown; anterior part of mid lobe of mesoscutum except sides, side lobe anteriorly, a spot on each axilla, anterior and posterior scutellum except sides, dorsellum and propodeum medially; gaster pale yellow with brown to dark brown bands; ovipositor sheaths brown; radicle pale, scape pale yellowish brown; funicle brown, clava dark brown; wing subhyaline with slight yellowish tinge; legs pale yellow brown.

**Head.** Width 1.46X as wide as vertex width; lateral face width 1.3X as wide as medial face width; 6-7 setae on each lateral face; medial face without setae; intertorular setae 2; torulus 0.75X of its own length from transverse trabecula; eye length 2.8X as long as malar space. **Antenna** (Fig. 74). Scape about 3X as long as wide and about 2X of pedicel; all funicular segments longer than wide; F4-F6 subequal; F4-F8 each with one longitudinal sensilla; clava 4.5X as long as wide, slightly longer than F6-8 combined, with five longitudinal sensilla.

**Thorax.** Each lateral lobe of pronotum with 3 setae;
mesoscutum slightly shorter than scutellum; each side lobe of mesoscutum with 1 seta; axilla without seta; dorsellum 0.6X of medial length of propodeum. **Fore wing** (Fig. 75, 76) slightly more than 3.5X as long as wide and 1.41X as long as hind wing; marginal fringe 0.31X of wing width (Fig. 75) and subequal to marginal fringe of hind wing. **Hind wing** with marginal fringe 3.5X as long as wing width. **Mid tibia** 3.6X as long as mid basitarsus.

**Gaster.** Ovipositor slightly exserted, and 1.4X as long as mid tibia.

**Male.** Unknown.

**Relative measurements:** Holotype: HW 19, FVW 13, MFW 2.5, LFW 3.25, TL 2, TTD 1.5, EL 11.5, MSL 4, RL 4.75, PL 4, SCL 9, F1 4, F2 5.25, F3 5, F4 4.75, F5 4.75, F6 4.75, F7 4.25, F8 3.5, CL 13.5, THL 27, MSTL 7, SCTL 9.75, MTL 3, PDL 5, FWL 75.5, FWW 21.25, SMVL 16, MVL 7.5, STL 3.75, FFL 6.75, HWL 53.5, HWW 2, HPL 7, FFm 13.5, FTb 15.0, FTrs 16, FBstr 6, MFm 13.25, MTb 22, MTrs 17, MBstr 6, HFm 12.75, HTb 22.25, HTrs 17, HBstr 7, OVPL 31

**Host.** Unknown.

**Distribution.** India: Kerala. (Known only from type locality.)

**Material examined.**

Type material. **Holotype** female (on slide under 4 coverslips). INDIA: Kerala, Mukkal (on way to Silent valley),
30.xii.1987, (M. Hayat).

**Comments.** Though this species runs near tarae and orientalis, in the key, it appears very close to longicornis especially in dimensions of antennal segments. It differs from longicornis in body colour, and shorter ovipositor which is 1.4X of mid tibial length.

6. **Gonatocerus tarae** (Narayanan & Subba Rao)
   (Figs. 77-83)

   Holotype female, India, Delhi (IARI), examined.

   **Syn. Nov.**

   Holotype female, India, Aligarh (ZDAMU). ?Type examined.
   **Syn. Nov.**


**Redescription.**

**Female.** Length, 0.58-0.80 mm. Head yellowish brown to dark brown; pronotum brownish yellow; a patch in middle of anterior third of mid lobe of mesoscutum, a spot on each
side lobe, axillae either completely or with a spot, anterior scutellum medially, posterior scutellum slightly or sometimes medially, brown to dark brown; metanotum yellow, dark brown in holotype of tarae; propodeum either suffused with slight brown tinge or dark brown completely; gastral terga with narrow broken brown bands or with basal third to half yellow, rest either with dark brown bands or broken bands, occasionally completely dark brown; antennal radicle and scape pale yellow brown, flagellum brown to dark brown; wings subhyaline with slight yellowish tinge; legs including coxae pale yellow, sometimes fore coxae light brown with bases dark brown; hind femora with brown suffusions; occasionally either all coxae dark brown or only fore coxae pale brown.

Head width 1.36-1.47X as wide vertex width; medial face width 0.5-0.7X of lateral face width; torulus 0.37-0.6X its own length from transverse trabecula; each lateral face with 7 setae or sometimes 6 on one side; medial face without setae; intertorular setae 2, in some specimens 3 setae; eye length 2.13-3.7X as long as malar space length. Antenna (Figs. 77-80) with scape 2.5-3.5X as long as wide; pedicel 1.5X to nearly 2X as long as radicle; F2 subequal to F3 but distinctly longer than F1; F5 and F6 subequal and shorter than F4, F4-6 subequal in some specimens; F7 slightly longer than F8, occasionally F7 distinctly shorter than F8 and subequal to F4-F6 individually; F7 and F8 with a pair of longitudinal sensilla, F7 without sensilla if it is shorter
clava 3.5X to slightly more than 4X as long as wide, with 6-8 longitudinal sensilla.

Thorax distinctly shorter than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum equal to or slightly longer than scutellum; occasionally mid lobe of mesoscutum with two pair of setae; each side lobe and axilla with 1 seta; medial length of propodeum 1.1-1.7X as long as medial length of metanotal dorsellum; propodeum 0.32-0.65X of scutellum; propodeum with medial carina. Fore wing (Figs. 81,82) 4.14-4.83X as long as wide; submarginal vein 1.4-1.8X as long as marginal vein; marginal fringe 0.4-0.5X of wing width. Hind wing fringe 4-5X as long as wing width. Mid tibia 3.36-3.9X as long as mid basitarsus.

Gaster. Ovipositor not or very slightly exserted, its total length 1.3-1.69X of mid tibia.

Male. Length, 0.8-0.85 mm. Colour as in female, except gaster, mid and hind coxae brownish yellow, fore coxae pale yellow brown and rest of legs pale yellow.

Antenna (Fig. 83) with scape 3X as long as wide, and 2X of pedicel; pedicel slightly shorter than radicle and F1 individually, rest of flagellar segments longer than F1; F11 (=clava) oblong, longer than all flagellar segments, subequal to scape; F1 to F11 with longitudinal sensilla. Fore wing 4.8X as long as wide; marginal fringe 0.62X of wing width. Hind wing with marginal fringe 4X as long as wing width. Mid tibia 4.75X as long as mid basitarsus.
Gaster slightly shorter than Thorax.

**Relative measurements:** Holotype of *Lymaenon tarae*: HW 97, TL 12, EL 52, MSL 18, PL 20, F1 18, F2 15, F3 15, F4 13, F5 12, F6 12, F7 15, F8 15, CL 50, MSTL 40, SCTL 38, MTL 15, PDL 25, FWL 290, FWW 70, SMVL 54, MVL 31, STL 15, FFL 34, HWL 219, HWW 7, HFL 35, FFm 50, FTb 62, FTrs 70, FBstr 26, MFM 52, MTb ?84, MTrs 72, MBstr 25, HFm 55, HTb ?39, HTrs 82, HBstr 30, OVPL 125

Holotype of *Gonatocerus miurai*: SCL 31, PL 16, F1 8, F2 12, F3 12, F4 10, F5 10, F6 9.75, F7 12.5, F8 11.75, CL 48, FWL 58, FWW 12, FFL 6, HWL 43, PTb 10, PTrs 11, FBstr 13, MFM 4.5, MTb 8.5, MTrs 14.75, MBstr 13.5, HFm 9, HTb ?10, HTrs 15, HBstr 5, OVPL 23.5

Additional material (Females): HW (n=5) 14-17.75 (16.5), FVW (n=5) 10-13 (11.65), MFW (n=5) 1.5-2 (1.7), LFW (n=5) 2-4 (3), TL (n=5) 2-2.5 (2.1), TTD (n=5) 0.75-1.5 (1.21), EL (n=5) 8-10.5 (9.3), MSL (n=5) 2.5-4 (3.5), RL (n=6) 3.25-4.75 (4.16), SCL (n=7) 6.75-8.5 (7.6), PL (n=7) 3.5-4.25 (3.9), F1 (n=7) 2-2.75 (2.14), F2 (n=7) 2.5-3.5 (3.17), F3 (n=7) 2.5-3.75 (3.14), F4 (n=7) 1.75-2.75 (2.17), F5 (n=7) 1.75-2.75 (2.21), F6 (n=7) 1.75-2.75 (2.14), F7 (n=7) 2.75-3.5 (3.03), F8 (n=7) 2.5-3.25 (2.91), CL (n=7) 10-12.75 (11.28), THL (n=7) 22-25 (23.6), MSTL (n=7) 7.5-9 (8), SCTL (n=7) 7-8 (2.1), MTL (n=7) 2-2.5 (2.1), PDL (n=7) 2.25-3.5 (3.07), FWL (n=7) 53-64 (57.32), FWW (n=7) 11.5-14 (12.8), SMVL (n=7) 10-12 (11.2), MVL (n=7) 6-7.5 (6.75), STI (n=7)
2.5-3 (2.82), FFL (n=7) 5-7 (6.10), HWL (n=7) 43-52 (47.96), HWW (n=7) 1.25-1.75 (1.39), HFL (n=7) 5-7 (5.92), FFm (n=7) 9-11 (10.17), FTb (n=7) 10-12.75 (11.78), FTrs (n=7) 12.5-15.75 (14.39), FBstr (n=7) 4.5-5.75 (5.10), MFm (n=7) 9-11 (10.07), MTb (n=7) 15.75-19.5 (17.6), MTrs (n=7) 13.75-16 (14.6), MBstr (n=7) 4.5-5 (4.77), HFm (n=7) 9-11.5 (10.25), HTb (n=7) 17-20 (18.3), HTrs (n=7) 15-17 (16), HBstr (n=7) 5-6 (5.46), GSTL (n=4) 28-32 (30.25), OVPL (n=7) 24-26.75 (25.46)

Males: RL (n=1) 3, SCL (n=1) 5.5, PL (n=2) 2.75-3.25 (3), F1 (n=2) 3.25-3.5 (3.37), F2 (n=2) 4-4 (4), F3 (n=2) 4.5-4.75 (4.6), F4 (n=2) 4.25-4.5 (4.37), F5 (n=2) 4.5-4.75 (4.6), F6 (n=2) 4-4.75 (4.37), F7 (n=2) 4.5-4.75 (4.6), F8 (n=2) 4.5-4.75 (4.6), F9 (n=2) 4.75-4.75 (4.75), F10 (n=2) 4.75-4.75 (4.75), F11 (n=2) 5-5.5 (5.25), THL (n=2) 21-23.5 (22.25), MSTL (n=1) 7.5, SCTL (n=1) 7.5, MTL (n=1) 2.5, PDL (n=1) 5, FWL (n=1) 54, FWW (n=1) 11.25, SMVL (n=1) 11, MVL (n=1) 5.75, STL (n=1) 2.75, FFL (n=1) 7, HWL (n=1) 45, HWW (n=1) 1.5, FL (n=1) 6, FFm (n=2) 10-11.5 (10.75), FTb (n=2) 10-13 (11.5), FTrs (n=3) 11.75-14 (12.8), FBstr (n=2) 3.75-4.75 (4.25), MFm (n=2) 8.5-9.0 (8.75), MTb (n=2) 17-19 (18), MTrs (n=2) 13-15 (14), MBstr (n=2) 4-4 (4), HFm (n=2) 10-10 (10), HTb (n=2) 18-20 (19), HTrs (n=2) 15-16 (15.5), HBstr (n=2) 10-10 (10), GSTL (n=2) 20-22 (21)

Hosts. ex eggs of Nilaparvata lugens (Stål); Sogatella furcifera (Horvath).
**Distribution.** INDIA: Assam, Andhra Pradesh, Bihar, Jammu & Kashmir, Kerala, Karnataka, Maharashtra, Meghalaya, Tamil Nadu, Uttar Pradesh. (Japan).

**Material examined.**

Type material. *Lymaenon tarae:* **Holotype** female, INDIA: Delhi, v.1960 (IARI), on slide under one coverslip.

*Gonatocerus miurai:* **Holotype** female, Reared from egg of *Nephotettix cincticeps* Uhler Japan, Matsue, Shimane Pref. 20.viii.1978. Holotype mounted laterally under one coverslip.

Female, 24.ii.1993 (S.I. Kazmi); Kottayam, 1 Female, 26.ii.1993, (S.B. Zeya); Karnataka; Mysore (Brindavan Garden), 1 Female, 7.iii.1993 (S.B. Zeya); Maharashtra, Elephanta Caves, 3 Females, 28.x.1979 (M. Hayat); Andhra Pradesh; Vishakhapatnam, 2 Females, 20.iv.1991 (M.C. Basha); Gudur, 1 Female, 14.ii.1993 (S.B. Zeya & S.I. Kazmi); Jammu & Kashmir, Mansar, 3 Females, 11.x.1989 (M.C. Basha); Assam, Dhemaji, 2 Females, 31.xi.1987 (S. Singh); Halflong (Chachar Valley), 1 Female, 7.xi.1989, Silchar, 1 Female, 9.xi.1989 (M.C. Basha); Meghalaya, 2 Females, 13.xi.1989 (M.C. Basha); Bihar, Gaya, 2 Females, 31.x.1991, 2 Females, 7.iii.1992, 5 Females, 22.x.1992, 1 Female, 4.i.1992 (S.B. Zeya); Tamil Nadu, Mahabalipuram, 2 Females, 16.iii.1993 (S.B. Zeya); 1 Female, 16.ii. 1993, (S.B. Zeya & S.I. Kazmi); Villupuram, 2 Females, 19.ii.1993 (S.B. Zeya & S.I. Kazmi); Kodaikanal, 3 Females, 21.ii.1993, 2 Females, 22.ii.1993 (S.B. Zeya & S.I. Kazmi).

**Comments.** G. *alam*: I have found in Dr. Shafee's collections a single slide containing antennae and a fore wing which agree with the figures of these parts given for G. *alam*. However, the slide bears no data or name of the species. Therefore, these may or may not be parts from the holotype. As the original figures and description given by Shamim & Shafee agree with those of *tarae*, I have placed *alam* in synonymy with *tarae*.

G. *miurai*: Study of the holotype shows no appreciable
difference between this species and the series of specimens of *tarae* studied by me (see above). I have, therefore, placed *miurai* in synonymy with *tarae*.

Among the Indian species, *G.tarae* has a very wide distribution, and together with *narayani* of *litoralis*-group, it is the most abundant species. Inspite of this fact, or because of this, it has proved to be the most difficult to identify. At one time I thought that there might at least be two species involved. But detail study shows that the relative lengths of radicle and scape, flagellar segments, ovipositor and mid tibia, and colour of thorax and gaster show variations. The holotype (of *tarae*) has a body colour about as that described for *pictus* by Matthews (1986) but F6 without sensilla (also in all the specimens referred here to *tarae*). In the relative dimensions of antennal segments this species is not much different from *sulphuripes* and *minor*, but both differ from *tarae* in having the head and thorax brown to dark brown and discal setae of fore wing reaching at least distal third behind submarginal vein. However, there are specimens which I have referred to *tarae* in which the thorax is nearly completely brown to dark brown. In the ratio of ovipositor and mid tibial length, *tarae* encompasses both *sulphuripes* and *minor*. In relative length and width, and length of marginal fringe, the fore wing in *tarae* is much more close to *minor* than to *sulphuripes*. The colour of gaster appears to be the most variable. In most specimens the basal third or so is
usually yellow, but the distal two-thirds is either dark brown, or with dark brown bands or these bands may be complete or broken into spots. Although I have not seen specimens of *sulphuripes* reported upon by Sahad & Hirashima (1984), the description and illustrations given by these authors leave no room for doubt that their material was a misidentification for tarae.

7. **Gonatocerus sulphuripes** (Foerster)

(Figs. 88-90)

*Rachistus sulphuripes* Foerster, 1847: 204. Female.

Holotype female (NMV), not examined.


[Matthews (1986) should be consulted for synonymy].

**Redescription.**

**Female.** Length, 0.92 mm. Head yellowish brown to brown; thorax yellow with brown as follows: a patch in anterior third of mid lobe of mesoscutum, a patch in anterior third of side lobe of mesoscutum, anterior scutellum, axillae, posterior scutellum and propodeum; basal third to half of gaster pale white, rest with brown bands; radicle, scape and pedicel pale yellow except the dorsal edge of scape and rest of the antenna, brown; legs yellow with mid and hind coxae brownish yellow.

**Head.** Ocellar triangle with 2 setae, **Antenna** (Fig. 88) with scape almost 3X as long as wide, 1.7-1.8X as long as
pedicel, F1-3 nearly 3X as long as broad, F4 distinctly longer than F5 and F6 individually and distinctly shorter than F3; F7 and F8 each with a pair of longitudinal sensilla; clava slightly more than 4X as long as wide and shorter than F5-8 combined, with 6 longitudinal sensilla.

**Thorax** slightly longer than gaster; each lateral lobe of pronotum narrow with 2 setae; mid lobe of mesoscutum subequal to scutellum; each side lobe of mesoscutum and axilla with 1 seta; medial length of propodeum 0.44-0.51X of scutellum. **Fore wing** (Figs. 89,90) 4-4.37X as long as wide; submarginal vein 1.6-1.8X as long as marginal vein; disc setose behind submarginal vein; marginal fringe 0.37X of wing width. **Hind wing** with marginal fringe 8X as long as wing width. **Mid tibia** 3.5-4X as long as mid basitarsus.

**Gaster.** Ovipositor not exserted, its total length 1.27-1.28X as long as mid tibia.

**Male.** Unknown.

**Relative measurements:** Indian specimens: (Females): SCL (n=2) 7-8 (7.5), PL (n=2) 3.5-4.5 (4), F1 (n=2) 2.75-3.5 (3.12), F2 (n=2) 3.75-4 (3.87), F3 (n=2) 4.25-4.25 (4.25), F4 (n=2) 3.50-3.75 (3.62), F5 (n=2) 2.5-3 (2.75), F6 (n=2) 2.5-2.75 (2.62), F7 (n=2) 3-3.75 (3.37), F8 (n=2) 3-3 (3), CL (n=2) 11-11.25 (11.12), THL (n=2) 24-27 (25.5), MSTL (n=2) 8-10 (9), SCTL (n=2) 9-9.75 (9.37), MTL (n=2) 3-3 (3), PDL (n=2) 4-5 (4.5), FWL (n=2) 70-75 (72.5), FWW (n=2) 16-18
(17), SMVL (n=2) 12.75-13 (12.87), MVL (n=2) 7-7.75 (7.37),
STL (n=2) 3-3.5 (3.25), FFL (n=2) 7-7 (7), HWL (n=1) 54.75,
HWW (n=1) 1, HFL (n=1) 6, FFm (n=1) 11.75, FTb (n=2) 13-13.5
(13.25), FTrs (n=2) 14-16 (15), FBstr (n=2) 5-6 (5.5), MPm
(n=1) 12.5, MTb (n=2) 20-21 (20.5), MTrs (n=2) 14-17 (15.5),
MBstr (n=2) 5-6 (5.5), HFm (n=2) 12-12 (12), HTb (n=2) 21-22
(21.5), HTrs (n=2) 17-18 (17.5), HBstr (n=2) 7-7 (7), GSTL
(n=2) 26-29 (27.5), OVPL (n=2) 25.5-27 (26.25)

Host. Unknown.


Material examined.

Additional material. INDIA: Himachal Pradesh, Manali, 3
Females, 9.x.1979 (M. Hayat).

Comments. I have examined a female specimen (BMNH slide
No. M 1019/1) from England, Bucks, and determined as
sulphuripes by Matthews (See Matthews 1986). The three
specimens from India agree fairly well with the British
specimen except for the slightly paler colour of thorax
with the yellowish areas relatively larger, F1 only slightly
shorter than F2 and legs more yellowish brown to yellow.

8. Gonatocerus orientalis sp.nov.

(Figs. 84-87, 183-187)

Description.

Female. Length, 0.65-0.82 mm. Head yellow with occiput
and temples behind eyes dark brown; thorax yellow with dark
brown as follows: pronotum except collar, a patch in anterior third to half of mid lobe except sides narrowly, subtriangular patch on expanded part of each side lobe, anterior scutellum, anterior margin of posterior scutellum, axillae, propodeum, meso and metapleura; metanotum yellow to yellow brown; gaster with basal third to half pale yellow, rest with broad, brown to dark brown bands; antennal scape brown, rest of the flagellar segments brown to dark brown; wings subhyaline with faint yellow tinge; legs mainly pale yellow to yellow brown, with tibiae especially hind tibiae brown to dark brown, mid and hind coxae in basal third and mid and hind tarsi brown.

**Head** (Figs. 183, 184) width 1.37X as wide as vertex width; lateral face width slightly more than medial face width; each lateral face with 7 setae; medial face without setae; torulus 0.5X its own length from transverse trabecula; intertorular setae 2; eye length 2.7X as long as malar space length. **Antenna** (Fig. 84) with scape more than 3X as long as wide and about 2X of radicle as well as pedicel individually; F1 about same length as F2; F4-6 individually shorter than both F3 and F7; F7 and F8 subequal, larger and longer than other segments, each with a pair of longitudinal sensilla; clava 3.5X as long as wide and shorter than F5-8 combined, and with 6 longitudinal sensilla.

**Thorax** (Figs. 185, 187). Each lateral lobe of pronotum
with 3 setae; mid lobe of mesoscutum subequal to scutellum; each side lobe of mesoscutum with 1 seta, axilla without seta; propodeum distinctly longer than metanotum and with a medial carina (Fig. 186). Fore wing (Fig. 85) more than 4.5X to slightly less than 5X as long as wide; marginal fringe 0.62X of wing width; setae of fore wing begin behind middle of submarginal vein (Fig. 86). Hind wing with marginal fringe 5.6X as long as wing width. Mid tibia 6X to less than 7X as long as mid basitarsus.

Gaster slightly shorter than thorax; ovipositor 1.27X as long as mid tibia.

Male. Length, 0.65 mm. Body colour nearly as in female except basal third of gaster yellow and mid and hind coxae in about basal third dark brown.

Head. Ocellar triangle with two setae; medial face width 0.67X of lateral face width and without setae, each lateral face with 6 setae. Antenna (Fig. 87) with scape slightly more than 2X as long as wide, and 1.7X as long as pedicel; F1 slightly shorter than F2, F3-5 subequal, F9 slightly longer than F6, F7, F8 and F10 individually but shorter than oblong F11, F1-F11 with longitudinal sensilla.

Thorax. Each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum subequal to scutellum; each side lobe of mesoscutum with 1 seta, axilla without seta; propodeum 0.53X of scutellum with median carina. Fore wing 4.8X as long as wide; submarginal vein 1.5X as long as marginal vein;
marginal fringe 0.57X of wing width, setation on disc as in female. Hind wing with marginal fringe 6.2X as long as wing width. Mid tibia 4.2X as long as mid basitarsus.

Gaster distinctly longer than thorax.

Relative measurements: Holotype: HW 16.5, FVW 12, MFW 2.25, LFW 2.5, TL 2.5, TTD 1.25, EL 8.75, MSL 3.25, RL 4, SCL 6.75, PL 4, F1 2, F2 2, F3 2.5, F4 2.25, F5 2, F6 2, F7 2.75, F8 2.5, CL 9, THL 22.25, MSTL 7.5, SCTL 7, MTL 2.5, PDL 3.5, FWT 59, FWW 12.75, SMVL 10.75, MVL 6.5, STL 3.5, FEL 8, HWL 46, HWW 1.25, HFL 7, FFm 10, FTb 12, FTrs 11, FBstr 3.75, MFm 10, MB 17.25, MBTrs 11, MBstr 3, HFM 10, HTb 18.5, HTTrs 13.25, HBstr 3.75, GSTL 21, OVPL 22

Additional material & paratype (females): HW (n=1) 16.5, FVW (n=1) 16.5, MFW (n=2) 2-2.25 (2.1), LFW (n=2) 2.5-3 (2.75), TL (n=1) 2.5, TTD (n=1) 1.25, EL (n=2) 7-8.75 (7.8), MSL (n=2) 2.25-3.25 (2.75), RL (n=3) 4-4.25 (4.08), SCL (n=3) 6.5-6.75 (6.66), PL (n=3) 3.75-3.75 (3.75), F1 (n=3) 2-2 (2), F2 (n=3) 2-2.5 (2.5), F3 (n=3) 2.25-2.25 (2.25), F4 (n=4) 2-2 (2), F5 (n=3) 1.74-2 (1.9), F6 (n=3) 1.5-2 (1.8), F7 (n=3) 2.5-2.75 (2.58), F8 (n=3) 2.5-2.65 (2.58), CL (n=3) 8.5-9.5 (9.08), THL (n=3) 18.75-21.00 (19.5), MSTL (n=3) 5.25-6 (5.75), SCTL (n=3) 6-6.5 (6.3), PDL (n=3) 3.5-4.25 (3.9), MTL (n=3) 1.75-2.25 (2), FWT (n=3) 59-61 (59.75), FWW (n=3) 12.5-13.5 (12.9), SMVL (n=3) 11-12 (11.13), MVL (n=3) 6-6.75 (6.25), STL (n=3) 3.5-3.5 (3.5), FFL (n=3) 7-8 (7.3), HWL (n=3) 44.5-46.75 (45.41), HWW (n=3) 1.25-1.5 (4.00), HFL
(n=3) 7.5-8 (7.75), FVm (n=2) 10-10 (10), FTb (n=2) 11-12.5 (11.75), FTrs (n=2) 10-11 (10.5), FBstr (n=2) 2.75-3 (2.8), MFm (n=3) 10-10.75 (10.33), MTb (n=3) 16.75-17 (16.83), MTrs (n=3) 10-11 (10.66), MBstr (n=3) 2.5-3 (2.83), HFM (n=3) 10.75-11 (10.91), HTb (n=3) 19-20 (19.5), HTrs (n=3) 10.75-11 (10.9), HBstr (n=3) 4-4.75 (4.25), GSTL (n=2) 19-20 (19.5), OVPL (n=3) 20.75-21 (20.91)


Host. Unknown.

Distribution. India: Andhra Pradesh, Meghalaya, Pondichery, Tamil Nadu.

Material examined.

Type material. Holotype female (on slide under 4 coverslips): INDIA: Meghalaya, Botanical garden, 13.ii.1989 (M.C. Basha). Paratypes, 2 Females: 1 Female (on slide under 3 coverslips) with same data as holotype; 1 Female (on slide under 4 coverslips), Andhra Pradesh, Gudur, 13.ii.1993 (S.B. Zeya).

Additional material: (28 Females, 3 Males) INDIA: Andhra Pradesh, Guntur, Chebrol, 1 Female, 12.ii.1993 (S.B. Zeya &

Comments. Gonatocerus orientalis sp.nov. is very close to G. tarae (Narayanan & Subba Rao), but differs from this species mainly in having a longer stigmal vein, presence of a row of setae behind distal half of the submarginal vein and in having a shorter clava, which is not as long as preceding four funicular segments combined.

The new species also appears extremely close to G. sarawakensis Sveum (1982) but the original description does not mention the relative lengths of ovipositor and mid tibia and the figure of the thorax (Sveum 1982; Fig. 3) appears to be incorrect.
6.7. LITORALIS - GROUP

Diagnosis.

Back of head with vertexal suture complete; ocellar triangle with 3-4 setae; pronotum three-lobed; dorsellum of metanotum strap-shaped; propodeum with two converging sutures, area between them with small setae; wing behind marginal vein densely setose or sparsely setose or sometimes bare except a few setae; cubital row of setae occasionally extending up to distal half of submarginal vein.

List of Indian species.
1. Gonatocerus brevifuniculatus Subba Rao
2. G. bicoloriventris sp.nov.
3. G. tampilanus Mani & Saraswat
4. G. ramakrishnai (Subba Rao & Kaur)
5. G. longior Soyka
6. G. berijamus Mani & Saraswat
7. G. bakrotus Mani & Saraswat
8. G. devitatakus Mani & Saraswat
9. G. bouceki sp.nov.
10. G. narayani (Subba Rao & Kaur)
11. G. breviterebratus Subba Rao
12. G. spectabilis sp.nov.
13. G. munnarus Mani & Saraswat
14. G. malanadensis Subba Rao
15. G. pahlgamensis (Narayanan)
16. G. maculatus sp.nov.
17. *G. delhiensis* (Narayanan & Subba Rao)

18. *G. bashai* sp.nov.

19. *G. venustus* sp.nov.

**Key to Indian species of *litoralis*-group**

1. F1-4 individually shorter than F5 and usually at least one of these quadrate or broader than long (Fig. 91); if F1-4 each clearly longer than broad then fore wing not more than 3X as long as broad (Figs. 110, 111). ____ 2

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2. Head and thorax completely dark brown to black. ____ 3

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2. Head and thorax yellow, with distinct brown to dark brown patches on mid lobe, side lobes, scutellum, and propodeum; if thorax nearly as dark as in the first alternate, then at least lateral lobes of pronotum, sides of mid lobe and of scutellum yellow to nearly white. ________________________________ 11

3. Discal setae of fore wing short and fine, the disc densely setose from behind marginal vein (Fig. 95); F2-4 each transverse and the three segments combined shorter than pedicel (ventral length); F5-8 each distinctly less
than 2X as long as broad; F6 usually shorter than F5 and F8 subquadrate and shorter than F7 (Fig. 91); ovipositor shorter than mid tibia. __ 1. brevifuniculatus Subba Rao

Discal setae of fore wing relatively long and fine, and disc less densely setose (Fig. 103); F2-4 each quadrate or longer than broad and the three segments combined longer than pedicel, or at least one of the distal four segments (F5-8) 2X or more as long as broad (Figs. 98, 101); ovipositor at least slightly longer than mid tibia. ________________________________ 4

4. F6 usually without sensilla (Figs. 98, 101), if F6 with sensilla then either fore wing behind marginal vein bare except for the cubital row and the row adjacent to marginal or F5 distinctly longer than F6-8 individually. ________________________________ 5

-- F6 with sensilla (Fig. 113); fore wing with at least a few setae behind marginal vein and cubital row (Fig. 112). ________________________________ 8

5. Fore wing behind marginal vein bare except for the cubital row and the row of setae adjacent to marginal vein (Fig. 100). ________________________________ 6

-- Fore wing with setae between the cubital row and the row of setae adjacent to marginal vein (Fig. 112). ______ 7

6. F5 and F6 subequal in length, each distinctly longer
than F4 and distinctly shorter than F7; F5 without sensilla (Fig. 98). 2. bicoloriventris sp.nov.

- F6 distinctly shorter than F5 and F7; F5 with sensilla (Fig. 104). 3. tamilanus Mani & Saraswat

7. Ovipositor 1.3X as long as mid tibia. 4. ramakrishnai (Subba Rao & Kaur)

- Ovipositor slightly exserted (originating from base of gaster) and 2X as long as mid tibia. 5. longior Soyka

8. Fl-4 each clearly longer than broad (Fig. 113); gaster not completely dark brown; ovipositor shorter, 1.2-1.3X of mid tibia. 9

- Fl-4 with at least one segment quadrate or broader than long (Fig. 121) or gaster completely dark brown; ovipositor longer, 1.5-1.6X of mid tibia. 10

9. Flagellar segments long, F4 more than 2X as long as broad; clava about as long as F6-8 combined (Fig. 113); gaster yellowish brown with dark brown bands. 6. berijamus Mani & Saraswat

- Flagellar segments relatively short, F4 about 1.5X as long as broad; clava longer than F6-8 combined (Fig. 115); gaster with pale yellow base and with brown bands distally. 7. Variant of bakrotus

10. Fore wing 2.6X as long as broad, with marginal fringe relatively short, about 0.25 of wing width (Fig. 119);
F4 about 2X as long as broad (Fig. 118). ____________

__________7. bakrotus Mani & Saraswat

-- Fore wing relatively narrower, more than 3X as long as broad, with marginal fringe longer, slightly more than 0.3X of wing width (Fig. 122); F4 about 1.5X as long as broad (Fig. 121). ______ 8. devitatakus Mani & Saraswat

11. Fore wing with 2 microchaetae between proximal and distal macrochaetae (Fig. 133); F3 and F4 clearly longer than broad. ____________ (aberrant specimen of narayani)

-- Fore wing with 1 microchaeta between proximal and distal macrochaetae (Fig. 132). ____________ 12

12. Ovipositor about 2.0X of mid tibia; F1-4 each usually distinctly longer than broad (Fig. 124). ____________

__________9. bouceki sp. nov.

-- Ovipositor 1.2-1.6X as long as mid tibia; at least F2 and F3 quadrate to broader than long (Fig. 129, 135, 136). ____________ 10. narayani (Subba Rao & Kaur)

13. Fore wing with two infuscate patches, one in middle and other in distal fifth; setae absent behind marginal vein. ____________ 11. breviterebratus Subba Rao

-- Fore wing hyaline or with faint yellow tinge; at least a few setae present behind marginal vein. ____________ 14

14. Ovipositor exserted. ____________ 15
-- Ovipositor not exserted. ___________ 16

15. Gaster pale yellow in basal third, dark brown in distal two thirds; fore wing nearly bare behind marginal vein except for the cubital row and 4 setae adjacent to marginal vein (Fig. 140). ______ 12. *spectabilis* sp.nov.

-- Gaster pale yellow to white in basal third and last two terga, remaining terga dark brown to black; fore wing setose behind marginal vein and with a complete cubital row (Fig. 143). __________ 13. *munnarus* Mani & Saraswat

16. Gaster yellow with a brown patch covering T4 and T5; pedicel shorter than F1; clava long, slightly shorter than F4-8 combined. ________ 14. *malanadensis* Subba Rao

-- Gaster with basal 0.25-0.33 pale yellow, distal 0.75-0.66 brown to dark brown or with brown bands. ______ 17

17. Hypochaeta near proximal macrochaeta (Figs. 151, 152); F1-4 each longer than broad and shorter than F5 (Fig. 148). ___________ 15. *pahlgamensis* (Narayanan)

-- Hypochaeta mid way between proximal and distal macrochaetae or near distal macrochaetae; antennae same or different. ____________________________ 18

18. F2 and F3 subequal in length; F4 and F5 subequal in length, and each longer than F3; F6-8 longer and larger, each longer than F5 (Fig. 145). ___ 16. *maculatus* sp.nov.
-- Funicle segments of different dimensions. _______ 19

19. F1-4 individually shorter than F5. _______________ 20

-- F1 and F2 shorter than F3, the latter subequal to or shorter than F4 (Figs. 155, 160). _______ 17. delhiensis (Narayanan & Subba Rao)

20. Fore wing with only a few setae behind marginal vein and the cubital row (Fig. 173). ______ 18. bashai sp.nov.

-- Fore wing setose behind marginal; cubital row of setae extending to level of distal half of submarginal vein (Fig. 176). _______ 19. venustus sp.nov.

Description of species.

1. Gonatocerus brevifuniculatus Subba Rao
(Figs. 91-97)


Redescription.

Female. Length, 0.74-0.75 mm. Body dark brown; radicle pale, scape brown; pedicel and funicular segments pale yellow; clava brown; wings subhyaline with faint yellow
tinge; coxae dark brown, fore and middle femora brown except apical third, hind femora and tibiae except knees dark brown, rest of legs pale.

**Head** width 1.4X as wide as vertex width; ocellar triangle with 4 setae; medial face width 1.2X as wide as lateral face width and with 3 setae; each lateral face with 8 setae; torulus 0.50X its own length from transverse trabecula; intertorular region with 3 pair of setae; eye length about 0.5 of malar space length. **Antenna** (Figs. 91-93) with scape about 2X as long as wide; pedicel 0.57X of scape, subequal to length of radicle, and longer than F1-4 combined; F1-4 distinctly shorter than F5; F2-3 transverse, rarely F3 quadrate; F5-8 longer than broad, decreasing in length distad, with longitudinal sensilla (F5 = 3 or 4, F6 = 4, F7 = 4, F8 = 4); clava 3X to slightly more than 3X as long as wide, slightly shorter than F6-8 combined, with 10-12 sensilla.

**Thorax** slightly longer than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum distinctly shorter than scutellum; each side lobe of mesoscutum and axilla with 1 seta; propodeum 0.57X of scutellum. [Propodeum with sutures as mentioned in the group diagnosis, not as noted and illustrated by Subba Rao 1970]. **Fore wing** (Figs. 94, 95) 2.53X as long as broad; submarginal vein 1.5X as long as marginal vein; disc densely setose; marginal fringe 0.15X of wing width. **Hind**
wing with marginal fringe 1.67X as long as wing width. 
Mid tibia 3.3X as long as mid basitarsus.

Gaster. Ovipositor not exserted and 1.2-1.3X as long as mid tibia.

Male. Body colour as in female, legs pale yellow brown.

Antenna (Fig. 96) with scape 1.5X as long as wide, slightly longer than pedicel; F1 longer than pedicel; all funicular segments subequal in length except F11; F11 oblong, relatively thin and slightly longer than F1-F10 individually; F1-F11 with longitudinal sensilla.

Thorax. Mid lobe of mesoscutum slightly longer than scutellum; propodeum 0.65X of scutellum. Fore wing (Fig. 97) 2.5X as long as wide; submarginal vein 1.62X as long as marginal vein; disc densely setose (Fig. 97); marginal fringe 0.18X of wing width. Mid tibia 3X as long as mid basitarsus.

Gaster distinctly shorter than thorax.

Relative measurements: 1 Female: HW 19.5, FVW 13.5, MFW 3, LFW 2.5, TL 2, TTD 1, EL 11, MSL 5.5, SCL 30, PL 17, F1 5, F2 3, F3 5, F4 4, F5 14.5, F6 14, F7 13.5, F8 13, CL 40, THL 28, MSTL 7.5, SCTL 11, MTL 1, PDL 6.25, FWL 50.5, FWW 20, SMVL 9, MVL 6, STL 2.5, FFL 3, HWL 42, HWW 3, HFL 5, FFm 12, FTb 12, FTrs 15, FBstr 5, MFm 11, MTb 16.5, MTrs 14.25, MBstr 5, HFm 12, HTb 17, HTrs 17, HBstr 5, GSTL 29, OVPL 20.25
(Note: Antennal segments measured at 450X)

1 Male: RL 2, SCL 4, PL 3.5, F1 4.75, F2 4.75, F3 4.75, F4 4.5, F5 4.75, F6 4.75, F7 4.75, F8 4.75, F9 4.75, F10 4.5, F11 5, THL 31, MST 11.75, SCT 11, MTL 1.25, PDL 7.5, FWL 55, FWW 22, SMVL 10.5, MVL 6.5, STL 2.5, FFL 4, FFm 12, FTb 13, FTrs 17, FBstr 5.75, MFm 12, MTb 18, MTrs 16, MBstr 6, HFm 8, HTb 19, HTrs 18, HBstr 6, GSTL 21

Hosts. ex eggs of membracids; ex eggs of Oxyrachis sp.; ex eggs of Oxyrachis tarandus (Fab.)


Material examined.

Additional material: (4 Females, 4 Males): INDIA: Maharashtra, Manmad, 1 Female, 13.x.1967, ex eggs of Oxyrachis sp. on Acacia sp.; Punjab, Jullendar, 1 Female, 3.x.1968, ex eggs of Oxyrachis tarandus on Acacia sp. (M. Hayat); Tamil Nadu, 1 Female, 1 Male, ex eggs of membracids; received from K.A. Ananthasubramanian in August, 1987; Rajasthan, Jodhpur, 1 Female, 3 Males, xi.1974, ex eggs of membracids.

Comments. This is a very distinctive species and can be distinguished by the dark body colour, robust body, shorter and transverse F2-4, broad fore wings with discal setae fine and dense and originating from behind proximal end of marginal vein. Only G. tamilyanus Mani & Saraswat appears to
be close to brevifuniculatus, but that species has quadrate or slightly longer F2-4, relatively less broader fore wings, and setae behind marginal vein very sparse.

2. *Gonatocerus bicoloriventris* sp. nov.

*(Figs. 98-100)*

**Description.**

**Female.** Length, 0.7 mm. Body dark brown; gaster dark brown or with basal third yellow; radicle, pedicel and scape pale brown, funicular segments dark brown; occasionally the antenna brown except the pale radicle and dark brown dorsal edge of scape; wings subhyaline with slight yellow tinge; coxae, mid and hind tibiae except bases and apices, dark brown; trochanters pale; femora pale brown to dark brown except apices, rest of femora and tibiae pale yellow to white; tarsal segments 1-4 white to brown, last segment dark brown.

**Head** width 1.4X as wide as vertex width; ocellar triangle with 4 setae; medial face width 1.25X as wide as lateral face width, with one pair of setae; each lateral face with 9 setae; torulus 0.36X its own length from transverse trabecula; intertorular region with 2 pairs of setae of which one seta slightly above left torulus. **Antenna** (Fig. 98) with scape 3X to slightly more than 3X as long as wide and about 2X of pedicel; F1-4 short; F4 always quadrate; F5 and F6 subequal, distinctly
longer than F4 and distinctly shorter than F7; F7 and F8 with a pair of longitudinal sensilla; clava nearly 4X as long as wide and slightly longer than F6-8 combined, with six longitudinal sensilla.

Thorax slightly longer than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum slightly longer than scutellum, 1 seta on external margin of each side lobe of mesoscutum; each axilla with 1 seta; propodeum 0.48-0.60X of scutellum. Fore wing (Figs. 99, 100) about 2.5X to less than 3X as long as wide; submarginal vein 1.75-2X as long as marginal vein; marginal fringe 0.24-0.28X of wing width. Hind wing with marginal fringe 2.5-2.9X as long as wing width. Mid tibia subequal or sometimes distinctly shorter than hind tibia; mid tibia 2.90-3.25X as long as mid basitarsus.

Gaster. Ovipositor not exserted to slightly exserted beyond tip of gaster, 1.43-1.65X as long as mid tibia.

Male. Unknown.

Relative measurements: Paratypes: HW (n=1) 17, FJVW (n=1) 12, MPW (n=1) 2.5, LFVW (n=1) 2, TL (n=1) 2.75, TTD (n=1) 1, EL (n=1) 9.25, MSL (n=1) 4.25, RL (n=2) 4-4 (4), SCL (n=2) 8-8.75 (8.37), PL (n=2) 5-4 (3.87), P1 (n=2) 1-1.25 (1.12), F2 (n=2) 1-1 (1), F3 (n=2) 1.25-1.75 (1.5), F4 (n=2) 1.5-1.5 (1.5), F5 (n=2) 2-2.5 (2.25), F6 (n=2) 2.25-2.5 (2.37), F7 (n=2) 3.75-3.75 (3.75), F8 (n=2) 3.5-3.75 (3.62), CL (n=2) 10.75-11 (10.87), THL (n=2) 24.5-26
Host. Unknown.

Distribution. India: Bihar, Karnataka, Uttar Pradesh.

Material examined.

Type material. Holotype, female (on card) INDIA: Karnataka, Srirangapatnum, Mysore, 7. iii. 1993 (S.I. Kazmi). Paratypes, 2 Females: 1 Female with same data as holotype; 1 Female, Bihar, Gaya, 31. xii. 1991 (S.B. Zeya).


Comments. G. bicoloriventris sp. nov. is apparently close to G. thyrides (Debauche) (Matthews, 1986), but differs from that species in having F1-4 quadrate to only slightly longer than broad, F5 and F6 each distinctly

(25.25), MSTL (n=2) 8.75-9 (8.87), SCTL (n=2) 9.75-10.00 (9.87), MTL (n=2) 1-1 (1), PDL (n=2) 4.75-6 (5.37), FWL (n=2) 49-55.75 (52.37), FWW (n=2) 17.5-22.5 (20), SMVL (n=2) 10-10.5 (10.25), MVL: (n=2) 5-6 (5.5), STL (n=2) 2-2.5 (2.12), PFL (n=2) 5-5.5 (5.25), HWL (n=1) 46, HWW (n=2) 1.75-2.00 (1.87), HFL (n=2) 5-5 (5), FFm (n=2) 11-11.75 (11.37), FTb (n=2) 10.5-11.0 (10.75), FTfd (n=2) 14-16 (15), FBstr (n=2) 4.75-5.25 (5), MFm (n=2) 10-11 (10.5), MTb (n=2) 14.5-16.25 (15.37), MTrs (n=2) 16-18 (17), MBstr (n=2) 5-5 (5), HFm (n=2) 11-12 (11.5), HTb (n=2) 17-16.25 (16.62), HTrs (n=2) 16-18 (17), HBstr (n=2) 5-5.25 (5.12), GSTL (n=2) 25-27.75 (26.37), OVPL (n=2) 23.25-24 (23.62).
shorter than F7 and ovipositor 1.4-1.6X as long as mid tibia. In thyrides, F1-4 distinctly (at least 1.75X) as long as broad, F5 and F6 not much shorter than F7 and ovipositor only slightly longer than mid tibia.

3. Gonatocerus tamilanus Mani & Saraswat
(Figs. 104-109)

Gonatocerus tamilanus Mani & Saraswat, 1973: 93. Female, male. Holotype female, India, Valandur forest (USNM), examined.


Redescription.

Female. Length, 0.9 mm. Head brown; area around mouth and transverse trabecula yellow; thorax dark brown; gaster with base of T1 pale, otherwise dark brown or completely dark brown with intersegmental white bands if it is distended; ovipositor sheaths brown; radicle white; scape, pedicel and funicular segments brown; clava dark brown; sometimes only scape and pedicel brownish white; coxae pale brown to dark brown, hind femur, hind tibia, tarsi brown; rest of legs pale yellow brown.

Head width 1.36-1.58X as wide as vertex width; ocellar triangle with 3 or 4 setae; medial face width 1.0-1.1X as wide as lateral face width, with a pair of
setae; each lateral face with 8 setae (occasionally with 9 setae); torulus 0.4-0.9X its own length from transverse trabecula; intertorular region with 5 setae of which one seta just above left torulus; eye length 1.45-2.2X as long as malar space length. **Antenna** (Figs. 104, 106, 107) with scape 3-3.5X as long as wide and slightly more than 2X of radicle; pedicel slightly less than half of scape, slightly longer than F1-F2 combined; F1-F4 short; F2-F4 quadrate, sometimes F3 and F4 slightly longer than broad (Fig. 106); F7 and F8 longest, subequal to or slightly longer than F5; F6 distinctly shorter than F5 and F7, occasionally subequal to F5 (Fig. 107) with one sensilla (one antenna of one specimen); F5, F7 and F8 with longitudinal sensilla; (F5=1 or 2, F6 = 0 or 1, F7-8 = 2); clava about 3.5X to more than 4.5X as long as wide, slightly longer than F6-F8 combined, with 9-10 longitudinal sensilla.

**Thorax** distinctly shorter than gaster; mid lobe of mesoscutum subequal to or slightly shorter than scutellum; mid lobe of mesoscutum with one or two pair of setae; each side lobe of mesoscutum and axilla with one seta. **Fore wing** (Figs. 105, 108, 109) broad, 3X as long as wide; marginal vein 2.8X as long as stigmal vein; a few setae behind marginal vein, and cubital row of setae complete (Figs. 105, 109); marginal fringe 0.25-0.28X of wing width. **Hind wing** with marginal fringe 2.4-3.6X as long as wing width; equal or slightly longer than fringe of
fore wing. **Mid tibia** almost equal to or slightly shorter than hind tibia, 2.5-2.6X as long as mid basitarsus.

**Gaster.** Ovipositor slightly exserted beyond tip of gaster. 1.6-1.88X as long as mid tibia.

**Male.** Four males collected from Coimbatore and regarded as apparently conspecific with the female were described by Mani & Saraswat (1973). I have not seen these males and therefore it is not redescribed here.

**Relative measurements:** Holotype: HW 18, FVW 13, MFW 3, LFW 2.75, TL 2.75, TTD 2.5, EL 8, MSL 5.5, RL 3, SCL 7.5, PL 3, F1 1, F3 1.5, F4 1, F5 2.75, F6 2.5, F7 3.25, F8 3.25, CL 9.75, THL 26, MSTD 10, SCTL 10.5, MTL 1.5, PDL 11, FWW 17, STL 2, FFL 4, FFm 10, FTb 10, FTrs 13.75, FBstr 4.75, MFm 9.5, MTb 13.5, HFm 10, HTb 14.5, HTrs 15, HBstr 4.75, GSTL 30, OVLPL 24

**Additional material:** HW (n=3) 16.75-19.00 (18.25), FVW (n=2) 12-12.75 (12.33), MFW (n=2) 2.50-2.75 (2.62), LFW (n=2) 2.25-2.50 (2.37), TL (n=2) 2.5-3 (2.75), TTD (n=2) 1-1.75 (1.37), EL (n=2) 8.75-10 (9.37), MSL (n=2) 4-4.5 (4.25), RL (n=3) 4-5 (4.5), SCL (n=3) 8-10 (9.25), PL (n=3) 3.75-4.25 (3.91), F1 (n=3) 1.5-2 (1.75), F2 (n=3) 1-1.5 (1.25), F3 (n=3) 1.5-1.75 (1.58), F4 (n=3) 1.5-1.75 (1.66), F5 (n=3) 3-3.75 (3.41), F6 (n=3) 2.5-3.75 (3.08), F7 (n=3) 3.5-4.5 (4.16), F8 (n=3) 3.5-4.25 (3.91), CL (n=3) 10.5-13.5 (12.5), THL (n=3) 26.5-30
Host. Unknown.

Distribution. India: Kerala, Tamil Nadu, Uttar Pradesh.

Material examined.

Type material. Holotype, female, INDIA: 5-5 Valandur forest, Madras 15.iii. 1972 (Mani and Party) This data agrees with that given in the original description except that locality mentioned was "Madras-Mahabalipuram Road. The holotype is mounted on a single slide; both the antennae located near the margin of the coverslip and partly hidden by the sealing wax. Head pressed and thorax and gaster laterally mounted and pressed.

Additional material. (5 Females): INDIA: Uttar Pradesh, Aligarh, 2 Females, 10.x.1983; 1 Female, xi.1983; 1

(28.83), MSTL (n=3) 9-12 (10.33), SCTL (n=3) 8.0-9.5 (8.83), MTL (n=3) 1-1 (1), PDL (n=3) 6-7 (6.33), FWL (n=3) 49-57 (54.25), FWW (n=3) 17.5-19.5 (18.33), SMVL (n=3) 10-14 (12.16), MVL (n=3) 5.75-6.50 (6.16), STL (n=3) 1.25-2.25 (1.83), FFL (n=3) 5-5 (5), HWL (n=3) 40-49 (45.66), HWW (n=3) 1.5-2 (1.66), HFL (n=3) 5-5.5 (5.33), FFm (n=3) 11-12.5 (12), FTb (n=3) 10.25-12 (11.41), FTrs (n=3) 15-19 (17), FBstr (n=3) 5-7 (6), MFm (n=3) 10-11 (10.66), MTb (n=3) 15-18 (17), MTrs (n=3) 16.5-21 (19.33), MBstr (n=3) 5.75-7 (6.58), HFm (n=3) 8-13.5 (10.66), HTb (n=3) 15-19.5 (17.83), HTrs (n=3) 17-22.25 (20.08), HBstr (n=3) 5.5-7.5 (6.66), GSTL (n=3) 28-38 (33), OVPL (n=3) 24-34 (30)
Comments. *G. tamilanus* is close to *ramakrishnai, bakrotus* and *devitatakus*. It differs from the former by the characters given in the key. From *bakrotus* and *devitatakus*, it differs in the absence of sensilla on F6, and absence of setae behind marginal vein except for the cubital row and the row adjacent to the marginal vein.

4. *Gonatocerus ramakrishnai* (Subba Rao & Kaur)  
(Figs. 101-103)

Holotype female, India, Delhi (IARI), examined.


Redescription.  
**Female.** Length, 0.88 mm (as given by Subba Rao & Kaur, 1959). Head and thorax dark brown, gaster with dark brown bands interrupted by lemon yellowish colour; scape and pedicel brown except dark brown dorsal edge of scape, flagellum dark brown; wings subhyaline with slight yellow tinge; coxae, trochanters, femora largely except bases and apices, mid and hind tibiae, and tarsi dark
brown; femora basally and apically pale and fore tibia pale brown.

**Head.** Setae in ocellar triangle not visible in the holotype as it is not in good condition; medial face width 0.9X of lateral face width; medial face with 2 setae; each lateral face with 6 setae; torulus about 0.45X its own length from transverse trabecula; intertorular region with 5 setae. **Antenna** (Fig. 101) with scape 4X as long as wide and slightly more than 1.5X as long as radicle; pedicel slightly shorter than F1-2 combined; F1-4 short but longer than broad; F5 and F7 subequal and slightly longer than F8 and distinctly longer than F6; F5, F7 and F8 with longitudinal sensilla \( (F5 = 1, F7 = 2, F8 = 2) \); clava 3.5X as long as wide, subequal to F6-F8 combined, with 6 longitudinal sensilla.

**Thorax** distinctly shorter than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum nearly equal to scutellum; hexagonal sculpture distinct on mesoscutum and scutellum; each side lobe of mesoscutum with 1 seta; each axilla with 2 setae; propodeum 0.38X of scutellum. **Fore wing** (Figs. 102, 103) nearly 3X as long as wide; submarginal vein 2.23X as long as marginal vein; disc densely setose; marginal fringe 0.28X of wing width. **Hind wing** with marginal fringe 4.7X as long as wing width, slightly longer than marginal fringe of fore wing. **Mid tibia** 3.5X as long as mid basitarsus.
Gaster. Ovipositor not exserted beyond tip of gaster, 1.25X as long as mid tibia.

Male. Unknown.

Relative measurements: Holotype: HW 80, MFW 10, LFW 11, TL 11, TTD 5, EL 41, MSL 25, RL 20, SCL 32, PL 16, F1 10, F2 6, F3 7.75, F4 8.75, F5 15, F6 12.75, F7 15.5, F8 14, CL 43, THL 100, MSLT 35, SCTL 39, MTL 5, PDL 15, FWL 237, FWW 80, SMVL 47, MVL 21, STL 9, FFL 23, HWL 180, HWW 5.5, HFL 26, FFm 48, FTb 52, FTrs 72, FBstr 25, MFm 49, MTb 70, MTrs 75, MBstr 22, HFM 53, HTb 78, HTrs 75, HBstr 23, GSTL 125, OVPL 88

Distribution. India: Delhi. (Known only from the type locality.)

Host. Unknown.

Material examined.

Type material. Holotype, female, INDIA: 5.v.1957. R.B. Kaur (IARI). Whole specimen mounted on a single slide, with the thorax somewhat crushed.

Comments. G. ramakrishnai differs from G. brevifuniculatus in the relatively longer discal setae and marginal fringe of fore wings, in the quadrate to slightly longer than broad F2-4, longer F5-8, and in the absence of sensilla on F6.
5. *Gonatocerus longior* Soyka

(Figs. 110-112)

*Gonatocerus longior* Soyka, 1946: 38. Female. Holotype female, Holland, Valkenburg (NMV), not examined.


**Redescription.**

**Female.** Length, thorax + gaster 1.00 mm. Body dark brown; radicle pale yellow, scape and pedicel yellowish brown, flagellum dark brown; wings subhyaline with faint yellow tinge; legs pale yellow brown.

Head width 1.4X as wide as vertex width; ocellar triangle with 3 setae; medial face width subequal to lateral face width, with one pair of setae; each lateral face with 7 setae; torulus about 0.4X its own length from transverse trabecula; intertorular region without setae, however one pair of setae above toruli present; eye length 2X as long as malar space length. Antenna (Fig. 110) with scape about 4X as long as broad; pedicel 0.37X of scape; F1 and F2 subequal; F6 longer than F1-4 individually but distinctly shorter than F5 and F7; F5, F7 and F8 with longitudinal sensilla, (F5 = 2, F6 = 0-1, F7 = 2, F8 = 2); clava 3.5X as long as wide, longer than F6-8 combined with 10-12 longitudinal sensilla.

Thorax distinctly shorter than gaster; each lateral lobe
of pronotum with 2 setae; mid lobe of mesoscutum shorter than scutellum; each side lobe of mesoscutum and axilla with 1 seta; propodeum 0.73X of scutellum. Fore wing (Figs. 111, 112) about 3X as long as wide; submarginal vein 1.84X as long as marginal vein; disc of fore wing rather sparsely setose; marginal fringe 0.23X of wing width. Hind wing with marginal fringe 3.1X as long as wing width. Mid tibia distinctly shorter than hind tibia and 2.64X as long as mid basitarsus.

Gaster. Ovipositor exserted and 2.05X as long as mid tibia.

Male. Unknown.

Relative measurements: 1 Female: HW 18, FVW 12.5, MFW 2.5, LFW 2.5, TL 3, TTD 1.25, EL 9.5, MSL 4.75, RL 5, SCL 10.75, PL 4, F1 2, F2 2, F3 2.75, P4 3, F5 4.5, F6 3.5, F7 4, F8 3.75, CL 13, THL 27.5, MSTL 7.75, SCTL 9.5, MTL 1, PDL 7, FWL 56, FWW 19, SMVL 12, MVL 6.5, STL 2.5, FFL 4.5, HWL 48, HWW 1.75, HFL 5.5, FFm 12, FTb 12, FTrs 17.5, FBstr 6, MFm 11.75, MTb 18.5, MTrs 20, MBstr 7, HFm 12.75, HTb 21.75, HTrs 21.5, HBstr 7.75, GSTL 35.5, OVPL 38

Host. Unknown.


Material examined.

Additional material. INDIA: Uttar Pradesh, Aligarh, 1
Female (on slide under four coverslips) 12.viii.1993, (S.I. Kazmi).

Comments. This single specimen referred to longior is apparently conspecific with G. longior Soyka. It agrees fairly well with the redescription and illustrations of this species given by Matthews (1986) except for the presence of greater number of setae behind marginal vein and the cubital row.

6. Gonatocerus berijamus Mani & Saraswat
(Figs. 113, 114)

Gonatocerus berijamus Mani & Saraswat, 1973: 82. Female.
Holotype female, India, Anamalai Hills (USNM), examined.


Redescription.
Female. Length, 1.00 mm (as given by Mani & Saraswat, 1973). Head, thorax and antenna dark brown except yellowish brown face and pronotum; gaster yellowish brown with dark bands; ovipositor sheaths dark brown; wings subhyaline with slight yellow tinge; legs including coxae brown with hind tibia dark brown.

Head width 1.5X as wide as vertex width; ocellar triangle with 3 setae; medial face width as wide as lateral
face width; medial face with 2 setae; each lateral face with 8 setae; torulus about 0.26X its own length from transverse trabecula; intertorular region reticulate with 5 setae of which one seta just above right torulus; eye length 1.7X as long as malar space length. Antenna (Fig. 113) with scape 4X as long as wide and about 1.5X as long as radicle; pedicel 0.36X of scape and shorter than F1-2 combined; all funicular segments longer than broad, F1-3 subequal and each shorter than F4; F6 and F7 subequal and longer than F8, but distinctly shorter than F5; F5-8 with longitudinal sensilla (F5=1, F6=1, F7=4, F8=3); clava 3X as long as wide and as long as F6-8 combined, with 9 longitudinal sensilla.

Thorax subequal to gaster; mid lobe of mesoscutum almost equal to scutellum; each side lobe of mesoscutum with 2 setae; each axilla with 1 seta. Fore wing (Fig. 114) folded so that it is not possible to measure accurately, but it is about 3X as long as wide; marginal fringe 0.26X of wing width. Hind wing with marginal fringe 4X as long as wing width, slightly longer than marginal fringe of fore wing. Mid tibia 2.5X as long as mid basitarsus.

Gaster. Ovipositor not exserted beyond tip of gaster, and 1.21X as long as mid tibia.

Male. Unknown.

4.5, F7 4.5, F8 4, CL 13.75, THL 33.5, MSTL 13, SCTL 13, MTL 1.5, FWL 78, FWW 26.5, SMVL 13, MVL 12.5, STL 3.75, FFL 7, HWL 66, HWW 2, HFL 8, FFM 15.5, FTb 16, FTrs 22, FBstr 8.25, MFm 14, MTb 23, MTrs 23, MBstr 9, HFM 16.75, HTb 26.5, HTrs 23, HBstr 9, GSTL 34.75, OVPL 28

**Host.** Unknown.

**Distribution.** India: Tamil Nadu. (Known only from the type locality.)

**Material examined.**

Type material. **Holotype** female, INDIA: 5-20 Berijam lake, Kodaikanal Hills, 5. iv. 1972 (Mani & Party) (USNM). Holotype mounted on a single slide, head and right antenna detached from the body, the later laterally mounted and pressed under the coverslip.

**Comments.** *G. berijamus* is very close to *G. litoralis* but differs from it in only two characters the longer radicle which is 0.66X of scape and the broader fore wings which are about 3X as long as broad. In *litoralis* (based on the redescription and figures given by Matthews, 1986 and a single female from Scotland (BMNH) examined by me) even in the larger specimen the fore wings are not less than 3.5X as long as broad and the radicle is not more than 0.5X of scape. However, as *berijamus* is known only from the type specimen, the two characters mentioned above may eventually be found to be variable in longer series of
specimens.

7. *Gonatocerus bakrotus* Mani & Saraswat

(Figs. 115-120)


Holotype female, India, upper Bakrota, Dalhousie (USNM), examined.


Redescription.

**Female.** Length, 0.9 mm. (as given by Mani & Saraswat, 1973). Body including ovipositor sheaths dark brown; scape and pedicel brown, dorsal edge of scape and flagellum dark brown; fore wing subhyaline with some yellowish tinge; coxae, hind trochanter, tibiae and hind tarsi dark brown except the paler bases and apices of fore tibiae; hind tibiae basally and femora distally, rest of the trochanters and tarsi, brown.

Head width 1.3X as wide as vertex width; ocellar triangle with 3 setae; medial face width nearly subequal to lateral face width, with one pair of setae; each lateral face with 6 setae; torulus 0.66X its own length from transverse trabecula; one pair of setae just above toruli; eye length 2X as long as malar space length. Antenna (Figs.
115, 118) with scape 3X as long as wide and twice of radicle; pedicel 0.38X of scape and shorter than F1 and F2 combined; F1-4 short, longer than broad; F6 distinctly longer than F4 and distinctly shorter than F5 and F7; F8 shorter than F7; F5-8 with longitudinal sensilla (F5 = 2, F6 = 1, F7 = 2, F8 = 2); clava slightly more than 3X as long as wide and as long as F6-8 combined.

Thorax almost equal to gaster; mid lobe of mesoscutum slightly longer than scutellum; each axilla with 1 seta; rest of setation on the thoracic dorsum not distinct in the holotype (as it was laterally mounted); propodeum 0.5X of scutellum. Fore wing (Figs. 116, 119) 2.5X as long as wide; submarginal vein 2X of marginal vein; disc behind marginal and stigmal veins less densely setose (Figs. 117, 120); marginal fringe 0.20X of wing width. Mid tibia distinctly shorter than hind tibia, and 2.7X as long as mid basitarsus.

Gaster. Ovipositor hardly exserted and 1.56X as long as mid tibia.

Male. Unknown.

Relative measurements: Holotype: HW 19.25, FVW 14, MFW 3, LFW 2.75, TL 3, TTD 2, EL 10, MSL 5, RL 5, SCL 9.75, PL 3.75, F1 2.25, F2 2, F3 2.25, F4 3.5, F5 4.25, P6 3.75, F7 4, F8 3.5, CL 12, THL 30, MSTL 15, SCTL 13, MTL 2, PDL 6.5, FWL 70, FWW 27, SMVL 13, MVL 6.5, STL 2.5, FFL 5.5, FFm 13.75, FTb 13, FTrs 18, FBstr 6, MFm 13, MTb 19.5, MTrs 20, MBstr 7, HFM 15, HTb 22, HTrs 21.25, HBstr 8, GSTL 30,
Host. Unknown.

Distribution. India: Himachal Pradesh. (Known only from the type locality.)

Material examined.


Comments. G. bakrotus runs to couplet 12 in the key to British species given by Matthews (1986), but differs from both the included species (acuminatus and longior) by the shorter and hardly exserted ovipositor, and in the relative dimensions of funicle segments, especially the shorter F1-3. I have seen a female (on slide M 1007/1) from England, West Sussex determined as G. acuminatus by Matthews. G. bakrotus differs from berijamus and devitatakus in the characters given in the key.

8. Gonatocerus devitatakus Mani & Saraswat

(Figs. 121-123)

Gonatocerus devitatakus Mani & Saraswat 1973: 86. Female. Holotype female, India, Devikulum (USNM), examined.

Redescription.

Female. Length, 0.75 mm (as given by Mani & Saraswat, 1973). Body and legs dark brown; antenna dark brown except scape ventrally brown.

Head width 1.8X as wide as vertex width; ocellar triangle with 3 setae; medial face width 1.2X as wide as lateral face width and with two pair of setae, each lateral face with 7 setae; torulus about 0.7X its own length from transverse trabecula; intertorular region with two pairs of setae; eye length 1.7X as long as malar space length. Antenna (Fig. 121) with scape about 3X as long as wide and more than 1.5X as long as radicle; pedicel 0.35X of scape and subequal to F1-2 combined; F1-4 short, F1-3 hardly longer than broad; F5-8 subequal and with longitudinal sensilla (F5-7=2, F8=4); clava 3X as long as wide, slightly longer than F6-8 combined, with five sensilla.

Thorax distinctively shorter than gaster; mid lobe of mesoscutum slightly shorter than scutellum; each side lobe of mesoscutum with 2 setae and each axilla with 1 seta; propodeum 0.7X of scutellum. Fore wing (Fig. 122, 123) slightly more than 3X as long as wide; submarginal vein 2.25X as long as marginal vein; marginal fringe 0.4X of wing width. Hind wing with marginal fringe 5.6X as long as wing width, fringe slightly shorter than marginal fringe of fore
wing. \textit{Mid tibia} distinctly shorter than hind tibia and 3.35X as long as mid basitarsus.

\textbf{Gaster.} Ovipositor slightly exserted beyond tip of gaster, and 1.5X as long as mid tibia.

\textbf{Male.} Unknown.

\textbf{Relative measurements:} Holotype: HW 20, FVV 11, MFW 3, LFW 2.5, TL 3, TTD 2, EL 8, MSL 4.5, RL 5, SCL 8.5, PL 3, F1 2.5, F2 2, F3 2, F4 2.5, F5 3.5, F6 3.5, F7 3.25, F8 3.25, CL 10.75, THL 23, MSTL 7, SCTL 8, MTL 1.25, PDL 5, FWL 54, FWW 19, SMVL 11.25, MVL 5, STL 2.5, FFL 7.25, HWL 44, HWW 1.75, HFL 7, FFm 11.5, FTb 10.5, FTrs 16, FBstr 5, MFm 10.5, MTb 16.75, MTrs 15.5, MBstr 5, HFm 11.75, HTb 18.5, HTrs 16, HBstr 5.5, GSTL ?26, OVPL 25

\textbf{Host.} Unknown.

\textbf{Distribution.} India: Tamil Nadu. (Known only from the type locality.)

\textbf{Material examined.}

Type material. \textbf{Holotype} female, INDIA: 5-17 Devikulum 2.iv.1972 (Mani & party); (USNM). Holotype mounted on a single slide, head detached and flattened, left side of wings are missing and pronotum damaged.

\textbf{Comments.} \textit{G. devitatakus} comes close to \textit{bakrotus} but differs from that species in the characters given in the key and also in having F1 and F2 quadrate, relatively shorter
and robust F5-8, and in having only 5 sensilla on clava.

The specimens from Bangladesh determined as *devitatakus* and recorded by Sahad & Hirashima (1984) appear to be misidentified. These specimens probably belong to *pahlgamensis* except that F2-4 are short in the Bangladeshi specimens.

9. *Gonatocerus bouceki* sp.nov.

(Figs. 124-128)

**Description.**

**Female.** Length, 0.9 mm. Head brownish yellow to brown; thorax yellow with brown to dark brown as follows: a patch in anterior third to most of the mid lobe of mesoscutum except sides, transverse patch on side lobe, anterior scutellum medially, axillae, metanotum medially or except the brown sides or completely brown and propodeum; occasionally brown suffusions on posterior scutellum except sides; gaster brownish yellow, basal 0.25 to 0.50 pale brown to pale yellow; radicle white, scape pale white to pale brown, dorsal edge of scape dark brown, pedicel to clava brown, occasionally clava dark brown, wings subhyaline; legs pale yellow brown, sometimes margins narrowly of femora, mid and hind tibiae and tarsi dark brown.

Head width 1.3X as wide as vertex width; ocellar triangle with 3 setae, medial face width subequal to lateral face width; medial face with one pair of setae; each lateral face
with 9 setae; torulus about 0.5X its own length from transverse trabecula, intertorular region with 2 pair of setae; eye length 1.9X as long as malar space. Antenna (Fig. 124, 125) with scape about 4X as long as wide; pedicel 0.43X of scape and longer than F1-2 combined; F1-4 individually distinctly shorter than F5; F2 quadrate, occasionally F1-4 longer than broad; F6 longer than F1-4 individually, but shorter than F5 and F7; F5, F7, F8 with longitudinal sensilla (F5 = 0-2, F7 = 2, F8 = 2); clava 3.75X to more than 4X as long as wide, longer than F6-8 combined, with 7-9 longitudinal sensilla.

Thorax distinctly shorter than gaster; each lateral lobe of pronotum with 3 setae; mid lobe of mesoscutum shorter than scutellum; each side lobe of mesoscutum and axilla with one seta; propodeum 0.5X of scutellum. Fore wing (Fig. 126) 2.8X to slightly more than 3X as long as wide, submarginal vein 1.6-2.15X as long as marginal vein; area behind marginal vein bare except for a few setae and the complete cubital row of setae; marginal fringe 0.33-0.37X of wing width. Hind wing with marginal fringe 0.34X of wing width. Mid tibia about 3X as long as mid basitarsus.

Gaster. Ovipositor slightly exserted, and 1.9-2.07X as long as mid tibia.

Male. Unknown.

Relative measurements: Holotype: RL 3.25, SCL 6.5, PL
3.25, F1 1, F2 1, F3 1.5, F4 1.75, F5 2.5, F6 2, F7 2.75, F8 2.5, CL 9, THL 16, MSTL 7.5, SCTL 7.5, MTL 1, PDL 6, FWL 42, FWW 15, SMVL 7, MVL 4.75, STL 2, FFL 5, HWL 35, HWW 1.5, HFL 5, FFm 9.75, FTb 9.5, FTrs 13, FBstr 4.25, MFm 9, MTb 13.75, MTrs 15.5, MBstr 5, HFm 9, HTb 14.5, HTrs 14, HBstr 4.5, GSTL 25, OVPL 27

Relative measurements: Paratypes: HW (n=1) 13.5, FVW (n=1) 11, MFW (n=1) 2, LFW (n=1) 2, TL (n=1) 2, TTD (n=1) 1, EL (n=1) 7.5, MSL (n=1) 4, RL (n=3) 3-4.25 (3.75), SCL (n=3) 7-8.75 (7.75), PL (n=3) 3-3.75 (3.33), F1 (n=3) 1-1.75 (1.41), F2 (n=3) 1-1.75 (1.25), F3 (n=3) 1.25-2 (1.58), F4 (n=3) 1.75-2.25 (2), F5 (n=3) 3-3.75 (3.25), F6 (n=3) 2.25-3 (2.5), F7 (n=3) 3-3.5 (3.16), F8 (n=3) 2.75-3 (2.83), CL (n=3) 9-12 (10.33), THL (n=3) 19-23 (20.91), MSTL (n=3) 6-9 (7.10), SCTL (n=3) 8-9 (8.66), MTL (n=3) 1-1 (1), PDL (n=3) 4-4.5 (4.33), FWL (n=3) 45-54.75 (49.83), FWW (n=3) 14.5-18.5 (16.33), SMVL (n=3) 8-11 (9.91), MVL: (n=3) 4.75-6 (5.25), STL (n=3) 2-2.5 (2), FFL (n=3) 4-6 (5), HWL (n=2) 37-40.5 (38.75), HWW (n=2) 1.5-1.75 (1.62), HFL (n=2) 5-5 (5), FFm (n=3) 8.5-12 (10), FTb (n=3) 9-12 (10), FTrs (n=3) 14-15.75 (14.91), FBstr (n=3) 5-5 (5), MFm (n=3) 8-9 (8.5), MTb (n=3) 14.5-17.0 (15.5), MTrs (n=3) 15.25-23 (18.4), MBstr (n=3) 5-6 (5.41) HFm (n=3) 9.5-12 (10.5) HTb (n=3) 15-20 (17), HTrs (n=2) 16-17 (16.5), HBstr (n=2) 5.5-5.5 (5.5), GSTL (n=3) 26-30 (27.33), OVPL (n=3) 29-33 (30.5)

Host. Unknown.
Distribution. India: Bihar, Uttar Pradesh.

Material examined.


Comments. G. bouceki sp. nov. is very close to and may be confused with the widely distributed G. narayani. It differs from narayani mainly in having F1-4 longer than broad and ovipositor originating from near base of gaster and shortly exserted at apex, and about 1.9X as long as mid tibia. In the five specimens available for study, the fore wing setation varies from nearly bare behind marginal vein (except the usual cubital row and the row adjacent to marginal vein) to sparsely setose. In a majority of the specimens of narayani (including holotype) examined, generally at least one or all of F2-4 quadrate, and ovipositor shorter, 1.2-1.6X of mid tibial length. For further comments see under narayani.
10. *Gonatocerus narayani* (Subba Rao & Kaur)  
(Figs. 129-137)

Holotype female, India, Delhi (IARI), examined.

*Gonatocerus narayani* (Subba Rao & Kaur): Subba Rao & Hayat,  
1442 redescription.

**Redescription.**

**Female.** Length, 0.7 mm. Head pale yellow to brownish yellow; thorax pale yellow with brown to dark brown as follows: a patch on anterior third of mid lobe of mesoscutum, occasionally most of mid lobe except sides and posterior margin, a spot on each side lobe, axillae, middle of anterior scutellum, occasionally the posterior scutellum except sides, metanotum medially except sides, and propodeum; gaster pale yellow brown, basal 0.33-0.5 pale yellow, rest with brown to dark brown bands; radicle pale, scape and pedicel brownish yellow, flagellum brown to dark brown; wings subhyaline with light yellow tinge; coxae and femora pale yellow to brown, trochanters pale yellow, tibiae pale yellow to brown, hind tibiae sometimes dark brown; tarsi pale brown to brown.

Head width 1.4-1.5X as wide as vertex width; ocellar triangle with 3 setae; medial face width subequal to lateral face; medial face with a pair of setae, each lateral face
with 9 setae; distance between torulus and transverse trabecula variable; torulus 0.1-0.8X its own length from transverse trabecula, intertorular region with a pair of setae, sometimes these setae may be located above intertorular region. eye length 1.37-2X as long as malar space length. Antenna (Figs. 129, 135-137) with scape 3X to slightly more than 3X as long as wide; pedicel equal to or longer than F1-2 combined; F1-4 distinctly shorter than F5; F2 quadrate to broader than long; F6 and F7 subequal, sometimes F6 distinctly shorter than F4 and F7; F5-8 with longitudinal sensilla [F6 without sensilla if it is distinctly shorter than F5 and F7 (Fig. 135)] (F5 = 1-2; F6 = 0-2; F7 = 2 F8 = 2 or 3); clava 3-4X as long as wide, subequal to or longer than F5-8 combined, with 7-13 longitudinal sensilla.

Thorax longer than gaster; each lateral lobe of pronotum with 1 seta; mid lobe of mesoscutum shorter than scutellum; propodeum 0.3-0.53X of scutellum; each side lobe of mesoscutum and axilla with 1 seta. Fore wing (Fig. 131) 2.8-3.2X as long as wide; disc of fore wing less densely setose (Fig. 130) or area behind the marginal and stigmal vein and cubital row of setae with a few setae; (Figs. 132, 133) marginal fringe 0.2-0.35X of wing width. Hind wing with marginal fringe 2.7-3.7X as long as wing width. Mid tibia 2.5-3.4X as long as mid basitarsus.

Gaster. Ovipositor not exserted to stightly exserted,
and 1.2-1.6X as long as mid tibia.

**Male.** Length, 0.7 mm. Colour similar to that of female. Antenna (Fig. 134) with scape slightly less than 2X as long as wide, slightly longer than pedicel but distinctly shorter than F1; F1-F10 more or less equal in length and each distinctly shorter than the oblong F11 (= clava); all funicular segments with longitudinal sensilla.

Thorax subequal to gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum distinctly shorter than scutellum; each side lobe and axilla with 1 seta; propodeum 0.58X of scutellum. Fore wing 2.17X as long as wide; submarginal vein 2.25X as long as marginal vein; marginal fringe 0.3X of wing width; setation of disc as in female. Hind wing with marginal fringe 3X as long as wing width. Mid tibia 3.2X as long as mid basitarsus.

**Relative measurements:** Holotype: HW 98, TL 15, TTD 13, EL 48, MSL 35, RL ?15, SCL 42, PL 16, F1 9, F2 7, F3 8, F4 10, F5 15, F6 15, F7 17, F8 14, CL 52, MSTL 41, SCTL ?45, MTL 4, PDL 24, FWL 225, FWW 70, SMVL 50, MVL 30, STL 8, FFL 23, HWL 184, HWW 9, HFL 25, FFm 54, FTb 50, FTrs 72, FBstr 27, MFm 48, MTb 80, MTrs 75, MBstr 25, HFm 54, HTb 85, HTrs 72, HBstr 20, OVPL 120

**Additional material:** (Females): HW (n=4) 14.75-17.25(16.25), FVW (n=4) 10-12(11.25), MFW (n=4) 2-2.5 (2.18), LFW (n=4) 2.0-2.5 (2.37), TL (n=4) 2-2.75 (2.31), TTD (n=4) 0.25-1.00 (0.50), EL (n=4) 8.5-10 (9.12), MSL
(n=4) 4.25-5.25 (4.75), RL (n=10) 3.75-4.75 (4.2), SCL (n=10) 6.75-9.75 (7.97), PL (n=10) 2.75-4 (3.47), F1 (n=10) 1.5-2 (1.85), F2 (n=10) 1-2 (1.32), F3 (n=10) 1.00-2 (1.62), F4 (n=10) 1-2.5 (1.85), F5 (n=10) 1.75-3.75 (2.97), F6 (n=10) 1.75-3.50 (2.75), F7 (n=10) 2.5-3.5 (2.92), F8 (n=10) 2.5-3.75 (2.97), CL (n=10) 9.25-13.00 (10.87), THL (n=9) 19.0-25.5 (21.6), MSTL (n=9) 5.25-8.50 (7.25), SCTL (n=9) 7-10 (8.19), MTL (n=9) 0.75-1.25 (1), PDL (n=9) 3-5 (4.38), FWL (n=10) 41.25-54.75 (47.8), FWW (n=10) 13.75-19.50 (16.25), SMVL (n=10) 8-13 (10.08), MVL: (n=10) 4.75-11 (5.8), STL (n=10) 1.75-2.75 (2.2), FFL (n=10) 4-5.5 (4.52), HWL (n=6) 35.5-47 (39.75), HWW, (n=7) 1.5-1.75 (1.64), HFL (n=6) 4-6.5 (5.08), FFm (n=8) 9.75-12.5 (11), FTb (n=8) 10-15 (11.6), FTrs (n=7) 14-17.5 (15.7), FBstr (n=8) 5-6 (5.40), MFm (n=8) 8-12 (10.12), MTb (n=10) 12.75-18.00 (15.52), MTrs (n=10) 14-19 (15.97), MBstr (n=10) 4.5-7.0 (5.5), HFm (n=10) 9-13 (10.97) HTb (n=10) 12-18 (15.92), HTrs (n=9) 13.25-18 (15.7), HBstr (n=9) 3.75-6 (4.8), GSTL (n=6) 20-30 (23.5), OVPL (n=10) 19-26.75 (23.4)

1 Male: HW 14, FVW 10, SCL 2.5, PL 2, F1 3, F2 3.25, F3 3.25, F4 3, F5 3.5, F6 3.5, F7 3.25, F8 3.5, F9 3.5, F10 3.5, F11 4.25, THL 19, MSTL 7, STL 8.5, MTL 1, PDL 5, FWL 37, FFW 17, SMVL 8, MVL 3.5, STL 1.5, FFL 5, HWL 32, HWW 2, HFL 6, FFm 9, FTb 8, FTrs 12.75, FBstr 4, MFm 7, MTb 11, MTrs 12.5, MBstr 3.5, HFm 10, HTb 14.5, HTrs 13, HBstr 4.5, GSTL 19
Host. ex eggs of *membracids*, *Eucoccosterphus tuberculatus*.

**Distribution.** India: Andhra Pradesh, Bihar, Himachal Pradesh, Kerala, Tamil Nadu, Uttar Pradesh. (Bangladesh, Thailand).

**Material examined.**

Type material. **Holotype** female, INDIA: Delhi, 15.v.1957 (R.B. Kaur), (IARI). Holotype on a single slide, with the body slightly tilted.

Additional material. (37 Females, 3 Males) INDIA: Assam, Silchar, 1 Female, 9.xi 1989 (M.C. Basha); Bihar, Chakradharpur, 2 Females, 23.i.i.1994 (S.B. Zeya & S.I. Kazmi); Himachal Pradesh, Manali, 1 Female, 9.x.1979 (M. Hayat); Kerala, Calicut, (U.C.), 2 Females, 2.iii.1993; Trichur, 1 Female, 27.i.i.1993 (S.B. Zeya); Vallanikara, 1 Female, 27.i.i.1993 (S.B. Zeya); Walayar forest, 1 Female, 4.iii.1993 (S.B. Zeya); Tamil Nadu, Madras, 3 Females, 3 Males, vi.1990, ex eggs of *membracids*, *Eucoccosterphus tuberculatus*, (Ms. S. Chitra); Mahabalipuram, 1 Female, 16.i.i.1993 (S.B. Zeya); 2 Females, 16.i.i.1993 (S.I. Kazmi); 1 Female, 16.i.i.1993 (S.B. Zeya & S.I. Kazmi); Kodaikanal, 1 Female, 21.i.i.1993 (S.B. Zeya & S.I. Kazmi); Uttar Pradesh, Aligarh, 2 Females, 25.vii.1977; 1 Female, 6.vii.1978; 1 Female, 4.x.1978; 1 Female, viii.1979; 2 Females,
Comments. *G. narayani* is a widely distributed species. It has, however, proved to be the most difficult to identify even after the study of the type material. The antennal segments, setation behind marginal vein of fore wing and to some extent body colour show variation. The general colour of body is pale with brown to dark brown spots or patches on thoracic dorsum and the gaster pale yellow with distal half to two-thirds brown, but in some specimens the thoracic dorsum may be brownish with only the sides and posterior margin of mid lobes and sides of anterior scutellum and posterior scutellum pale yellow. The fore wing behind marginal vein may be sparsely setose (as in the type, Fig. 130) or may be nearly bare. In *narayani* usually F5-8 bear sensilla and they are subequal in length, but there are specimens in which F6 lack sensilla, and also in some specimens it is distinctly shorter than both F5 and F7. In still other specimens both F5 and F6 lack sensilla and also these are individually distinctly shorter than F7 (as in *bicoloriventris* sp. nov.). However, these are all considered here as belonging to *narayani*. 
G. narayani appears unrelated to any of the British species of litoralis-group (Matthews, 1986), but the darker specimens may be confused with longior Soyka and thyrides (Debauche). In the former species, F1-4 distinctly longer than broad, F6 without sensilla and ovipositor about 2X as long as mid tibia. In thyrides, F1-4 distinctly longer than broad, F5 and F6 lack sensilla, and the ovipositor is slightly longer than mid tibia.

11. Gonatocerus breviterebratus Subba Rao


Holotype female, India, 25 km west of Mudigere (BMNH), not examined.

The holotype has not been examined. The following brief description is based on the original description and figure (Subba Rao, 1989; Fig. 10) and the notes made from the holotype by M. Hayat.

Redescription.

Female. Length, 1.45 mm (as given by Subba Rao 1989). Head, thorax, basal third of gaster, pale testaceous; area between propodeal sutures contrastingly brown; rest of gaster and ovipositor sheaths black; antenna dark brown except the lighter pedicel and first funicular segment and testaceous scape; fore wing with two infuscate patches one in middle and other in distal fifth; legs pale testaceous.

Antenna. Pedicel triangular; F1 very small; F3-5 each 2-
2.5X as long as broad; F2 and F6 subequal in length; F7 and F8 larger, quadrate.

Thorax. Pronotum, mesoscutum, anterior and posterior scutellum, propodeum except the area between the sutures delicately reticulate. Fore wing narrow, long, 4.36X as long as wide; discal setae sparse, fine, brown; setae absent behind venation.

Gaster longer than thorax (3.5 : 2.5); smooth; ovipositor sheaths exserted.

Male. Unknown.

Host. Unknown.

Distribution. India: Karnataka. (Known only from the type locality.)

Comments. G. breviterebratus appears to be quite distinct, and differs from all the other Indian species of litoralis-group by the presence of two infuscated patches on the fore wing, short and triangular pedicel, very short F1, longer F3-5, and large F7-8.

12. Gonatocerus spectabilis sp.nov.
(Figs. 138-140)

Description.

Female. Length, 1.22 mm. Head pale yellow brown, with dark brown vertex, occiput above and gena anterior to
sulcus; thorax yellow with brown as follows: spots on sides of pronotum, a patch in anterior third of mid lobe of mesoscutum except sides, spots on anterior third of side lobe, anterior scutellum, axilla, metanotum and propodeum; basal half of gaster yellowish, distal half and ovipositor sheaths dark brown; radicle, scape and pedicel pale brownish yellow except dorsal edge of scape, and flagellum dark brown; wings subhyaline with faint yellow tinge; legs yellow to brown.

Head width 1.57X as wide as vertex width; ocellar triangle with 3 setae; medial face width 1.16X as wide as lateral face width, and with one pair of setae; each lateral face with 11 setae; torulus about 0.6X its own length from transverse trabecula; intertorular region with 2 pairs of setae; one pair of setae above toruli; eye length 2.6X as long as malar space length. Antenna (Fig. 138) with scape about 3.5X as long as wide, 2X of radicle; pedicel 0.43X of scape; F1-3 distinctly shorter than F4; F5 slightly longer than F4; F5-8 decreasing in length distad, with longitudinal sensilla (F5 = 2, F6 = 2, F7 = 2, F8 = 2); clava slightly more than 3X as long as wide and as long as F6-8 combined, with 8-9 longitudinal sensilla.

Thorax distinctly shorter than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum slightly longer than scutellum; each side lobe of mesoscutum and
axilla with 1 seta; propodeum 0.45X of scutellum. **Fore wing** (Fig. 139) slightly less than 4X as long as wide; marginal vein 0.5X of submarginal vein; disc nearly bare behind marginal vein except for the cubital row and 3 setae adjacent to marginal vein (Fig. 140), marginal fringe 0.29X as long as wing width. **Hind wing** with marginal fringe 2.25X as long as wing width. **Mid tibia** 2.25X as long as mid basitarsus.

**Gaster** Ovipositor exserted, exserted part about 0.15X of gaster; total length of ovipositor 2X of mid tibia.

**Male.** Unknown.

**Relative measurements:** Holotype: HW 22, FVW 14, MFW 3.5, LFW 3, TL 2.5, TTD 1.5, EL 13, MSL 5, RL 6, SCL 11, PL 4.75, F1 2.75, F2 3, F3 4, F4 5, F5 5.75, F6 5, F7 4.75, F8 3.75, CL 14.75, THL 30.75, MSTL 11.75, SCTL 11.75, MTL 1.25, PDL 5, FWL 76, FWW 20.5, SMVL 18, MVL 8.75, STL 3, PFL 6, HWL 62, HWW 3, HFL 6.75, FFM 15, FTTb 15.5, FTrs 19.75, FBstr 8, MFM 14, MTb 22, MTrs 22, MBstr 19.75, HFm 14, HTb 26, HTrs 24, HBstr 10, GSTL 45, OVPL 48

**Host.** Unknown.

**Distribution.** India: Uttar Pradesh. (Known only from the type locality.)

**Material examined.**

Type material. **Holotype** female (on a single slide under 4 coverslips), INDIA: Uttar Pradesh, Aligarh, 6.iv.1980 (M.
Comments. *G. spectabilis* sp. nov. differs from *G. munnarus* by the characters given in the key. It differs from longior (as described by Matthews, 1986, and the Indian specimen referred to this species) in the relative dimensions of funicle segments, presence of sensilla on F6, and narrow fore wing which is nearly 4X as long as broad.

13. *Gonatocerus munnarus* Mani & Saraswat

(Figs. 14, 141-144, 188-192)

*Gonatocerus munnarus* Mani & Saraswat, 1973: 89. Female. Holotype female, India, Munnar (USNM), examined.


Redescription.

**Female.** Length, 0.9-1.1 mm. Head and thorax honey yellow to dark brown; pronotum and mid lobe of mesoscutum honey yellow with transverse dark patch on anterior half, a dark patch on each side lobe; anterior scutellum except sides, axilla, metasternum, propodeum, mesopleuron and metapleuron dark brown; gaster with basal three segments pale honey yellow, following two terga dark brown, rest of
gaster pale brown to nearly pale yellow; ovipositor sheaths dark brown; radicle and scape pale yellow with dorsal edge of scape dark brown; pedicel brown and flagellum dark brown; wings subhyaline with slight yellow tinge; fore coxae pale yellow to yellowish brown, mid and hind coxae with brown to dark brown patches; all trochanters, all femora pale yellow or pale yellow with brown infuscations; tibiae especially hind tibiae and all tarsi more or less brown.

Head (Figs. 188, 189) width 1.5-1.7X as wide as vertex width; ocellar triangle with 3 setae; medial face width 1.1-1.3X as wide as lateral face width (in holotype medial face width 0.77X of lateral face width); medial face with 3-4 setae; each lateral face with 8 setae; torulus about 0.33-0.75X its own length from transverse trabecula; intertorular region with 3-4 setae; eye length 1.37-2.2X as long as malar space length. Antenna (Figs. 141, 144) with scape about 3X as long as wide and 2X of radicle and pedicel individually; all funicular segments longer than broad; F1 and F2 each shorter than F3; F5-6 subequal; F6-8 decreasing in length distad; F5-8 with longitudinal sensilla, occasionally F5 without sensilla (F5 = 0 or 2, F6 = 1-2, F7 = 2, F8 = 2-3); clava 3.5-4X as long as wide and subequal to F5-8 combined, with 9-11 longitudinal sensilla.

Thorax (Fig. 14) distinctly shorter than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of
mesoscutum slightly longer than scutellum; each side lobe of mesoscutum and axilla with 1 seta (in holotype side lobe of mesoscutum with 2 setae). Fore wing (Figs. 142, 143) about 4X as long as wide; submarginal vein 1.1-1.6X as long as marginal vein; marginal fringe 0.26-0.36X of wing width. Hind wing with marginal fringe 3.5-5.6X as long as wing width. Mid tibia distinctly shorter than hind tibia and 2.9-3.4X as long as mid basitarsus.

Gaster. (Fig. 192) Ovipositor strongly exserted, exserted part 0.22-0.36X of gaster (measured from dry mounts), total length of ovipositor 1.81-2.06X as long as mid tibia.


Relative measurements: Holotype: HW 23.75, FVW 15, MFW 3.5, LFW 4.5, TL 3.75, TTD 1.25, EL 11, MSL 8, RL 5, SCL 10.5, PL 4.5, F1 3.75, F2 4, F3 4.5, F4 5, F5 5, F6 5, F7 4.5, F8 4, CL 15, THL 30, MSTL 12.5, SCTL 10.75, MTL 1.75, PDL 6, FWL 79, FWW 20, SMVL 15.5, MVL 13, STL 3.25, FFL 6, HWW 1.5, HFL 8, FPM 15, FTb 17, FTrs 19.0, FBstr 7.5, MFM 13, MTb 23.5, MTrs 22, MBstr 8, HPm 15.5, HTb 28, HTrs 24, HBstr 8.5, GSTL 44, OVPL 47.5

Additional material: (Females): HW (n=3) 18.25-21 (19.75), FVW (n=3) 11-14 (12.5), MFW (n=3) 3-3.5 (3.33), LFW (n=3) 2.25-3 (2.66), TL (n=3) 2.5-3 (2.83), TTD (n=3) 1-2.25
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(1.58), EL (n=3) 9-11 (10), MSL (n=3) 5-5 (5), RL (n=4) 4-
5.5 (4.62), SCL (n=4) 9-11 (10), PL (n=4) 4-4.75 (4.25), F1
(n=4) 2.75-3.5 (3.06), F2 (n=4) 3-4 (3.43), F3 (n=4) 3.75-
4.5 (4.06), F4 (n=4) 4.5-5 (4.68), F5 (n=4) 4.25-4.75
(4.62), F6 (n=4) 4-5 (4.62), F7 (n=4) 4-4.75 (4.43), F8
(n=4) 3.5-4.25 (3.81), CL (n=4) 13-15 (14), THL (n=4) 25-28
(26.37), MST (n=4) 9-9.5 (9.25), SCT (n=4) 8-9.25 (8.75),
MTL (n=4) 1-1.25 (1.18), PDL (n=4) 4.25-7 (6.18), FWL (n=4)
72.5-81 (76.4), FWW (n=4) 19-20.25 (1.96), SMVL (n=4) 12-14
(13.3), MVL (n=4) 9-9.5 (9.18), STL (n=4) 2.75-3.75 (3.18),
FFL (n=4) 5-7 (6.37), HWL (n=3) 57-61 (52.3), HWW, (n=3)
1.25-1.75 (1.58), HFL (n=3) 6.25-7 (6.75), FFm (n=3) 14-15
(14.58), FTb (n=4) 13-17 (15.12), FTrs (n=4) 18.5-21 (19.2),
FBstr (n=4) 6-7.5 (6.93), MFm (n=4) 11-13 (12), MTb (n=4)
21.5-24 (22.87), MTrs (n=4) 20-23 (21.37), MBstr (n=4) 7-
7.75 (7.25) HFm (n=4) 12-15 (13.6) HTb (n=4) 24.5-28
(26.68), HTrs (n=4) 21.5-24.0 (23), HBstr (n=4) 8.5-9
(8.75), GSTL (n=4) 35-48 (39.75), OVPL (n=4) 43-46.5 (45.31)

Host. ex eggs of Cofana spectra (Distant), Nephotettix
nigropictus (Stål); N. virescens (Distant).

Distribution. India: Andhra Pradesh, Jammu & Kashmir,
Kerala, Maharashtra, Madhya Pradesh, Tamil Nadu, Uttar
Pradesh. (Bangladesh, Indonesia).

Material examined.

Type material. Holotype female, INDIA: Kerala, 5-16
Munnar, 2.iv.1972 (Mani & Party) (USNM). Holotype mounted
on a single slide; head, both fore wings and antennae detached from rest of the body; thorax and gaster laterally mounted and specimen pressed under coverslip.


Comments. This is a widely distributed species recorded here from several Indian states, and also known from Bangladesh and Indonesia. It shows very little variation in body colour and dimensions of different body parts, except, in the material from Bangladesh and Indonesia (Sahad & Hirashima, 1984) in which the ovipositor is 2.3X as long as mid tibia. G. munnarusr is a distinctive species, apparently not closely related to any of the species of litoralis-group from India. In the key to British species
given by Matthews (1986), it runs to couplet 10, but differs in several characters from both the included species \textit{(litoralis} (Haliday), \textit{novickyi} Soyka).

\textbf{14. Gonatocerus malanadensis} Subba Rao


Holotype female, India, Mudigere (BMNH), not examined.

The holotype has not been examined. The following brief description is based upon the original description and figures (Subba Rao, 1989: Fig. 21-23) and the notes made from the holotype by M. Hayat.

\textbf{Redescription.}

\textbf{Female.} Length, 1.1 mm. (as given by Subba Rao, 1989). Body lemon yellow with brown on mesoscutum, axillae, anterior scutellum medially, area between sutures on propodeum; gaster yellow except for infuscate large brown patches on T4 and T5; scape and pedicel yellow with dorsal edge of scape, and flagellum dark brown.

\textbf{Head} in front view 1.5X as wide as high; ocellar triangle with 3 setae. \textbf{Antenna} with radicle long, slightly less than half as long as scape, about 4X as long as wide; pedicel less than one-third of scape and subequal to F1; F1 to F3 distinctly shorter than F4, however F2 shorter than F1 and F3 individually; F4-8 with longitudinal sensilla; clava slightly more than 3X as long as wide, slightly shorter than
F4-8 combined, with 9 longitudinal sensilla.

**Thorax.** Each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum distinctly shorter than scutellum; each axilla with one seta; propodeum distinctly shorter than scutellum. **Fore wing** 3.5X as long as wide; submarginal vein subequal to stigmal and marginal vein combined; discal setae sparse, but evenly distributed; disc bare behind submarginal vein; marginal fringe one-fifth of wing width, **Hind wing** with marginal fringe 4X as long as wing width.

**Gaster.** Oval, longer than thorax; ovipositor sheaths slightly exserted.

**Male.** Unknown.

**Host.** Unknown.

**Distribution.** India: Karnataka. (Known only from the type locality.)

**Comments.** *G. malanadensis* appears to be close to *relictus*, but differ from it in the body colour, especially the presence of two brown patches on gastral terga 4 and 5; relatively broader fore wing and in having longer clava (clava nearly as long as preceding five segments and clearly longer than radicle and scape combined. In *relictus* clava slightly shorter than preceding four segments combined and shorter than radicle and scape combined.
15. *Gonatocerus pahlgamensis* (Narayanan)  
(Figs. 5, 148-154)


**Redescription.**

**Female.** Length, 0.6-0.8 mm. Head lemon yellow to yellowish brown; pronotum pale yellow with edge of each
lateral lobe dark brown, rest of thorax pale yellow with brown to dark brown as follows: a patch in anterior third to most of the mid lobe of mesoscutum except sides, subtriangular patch in anterior third of side lobe, anterior scutellum medially, axillae, metanotum and propodeum; posterior scutellum yellow to brown except sides; basal third of gaster pale yellow, otherwise rest of gaster with brown to dark brown bands, (occasionally gaster completely with dark brown bands); radicle yellow, otherwise antenna yellowish brown to dark brown completely; wings subhyaline with slight yellow tinge; leg colour extremely variable, it varies from yellowish brown to dark brown, except yellow trochanters; fore coxae pale yellow to dark brown; mid coxae brown to basal half dark brown and hind coxae with basal half to basal two-third dark brown.

**Head** width 1.6-1.8X as wide as vertex width; ocellar triangle with 3 setae; medial face width 0.45-0.67X of lateral face width (occasionally medial face width as wide as lateral face width); medial face with 2 pairs of setae, sometimes with only 3 setae; each lateral face with 7-9 setae; torulus 0.50-0.87X its own length from transverse trabecula; intertorular region with 3 setae; one or two setae above the toruli; eye length 1.7-2.5X as long as malar space. **Antenna** (Figs. 5, 147, 148) with scape 3-4.6X as long as wide and slightly more than twice of radicle; F1-4 individually shorter than F5 and each longer than broad; F5-8 decreasing in length distad, F6 usually distinctly shorter
than F5 and F7; F5-8 with longitudinal sensilla (F5 = 1-2, F6 = 0-2, F7 = 1-2, F8 = 1-2); clava 3.25 - 4X as long as wide, longer than F6-8 combined, with 4-8 longitudinal sensilla.

Thorax usually shorter than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum subequal to scutellum; each side lobe of mesoscutum and axilla with 1 seta; medial length of propodeum 0.5-0.78X of scutellum. Fore wing (Figs. 150, 153) 3.76-4.6X as long as wide; submarginal vein 1.4-2.35X as long as marginal vein; hypochaeta more or less nearer to the proximal macrocheata (Figs. 151, 152, 154); marginal fringe 0.35-0.57X of wing width. Hind wing with marginal fringe 3.7-4.8X as long as wing width. Mid tibia 2.96-3.8X as long as mid basitarsus.

Gaster. Ovipositor either not exserted or slightly exserted, its length 0.98-1.4X of mid tibia.

Male. Unknown.

Relative measurements: Holotype of G. pahlgamensis HW 72, MFW ?12, LFW ?8, TL 10, TTD 1, EL 45, MSL 18, RL 19, SCL 46, PL 19, F1 10, F2 10, F3 10, F4 13, F5 15, F6 15, F7 14, F8 13, CL 47, THL 95, MSTL ?43, SCTL ?38, MTL 5, PDL 30, FWL 259, FWW 63, SMVL 50, MVL 23, STL 13, FFL 27, HWL 195, HWW 7, HFL 26, FFm 46, FTb 53, FBstr 25, MFM 50, MTb 80, MTrs 73, MBstr 26, HFm 52, HTb 82, HTrs 70, HBstr 25, GSTL 105, OVPL 100
Holotype of *G. kanheriensis*: HW 18, MFW 2.25, LFW 5, TL 3, EL 9, MSL 5, RL 3, SCL 9.5, PL 3.5, F1 2, F2 2, F3 2.5, F4 3, F5 3.75, F6 3.25, F7 3.5, F8 3, CL 11.5, THL 23, MSTL 8, SCTL 8, MTL 1, PDL 6, FWL 53.75, FWW 13.75, SMVL 11, MVL 4.75, STL 2.5, FFL 7, FFm 11, FTb 11.25, FTrs, 15, FBstr 9, MTb 18, MTrs 17, MBstr 5, HFm 11, HTb 18.5, HTrs 18.75, HBstr 6, GSTL 15, OVPL 19.5

Holotype of *G. fukuokensis*: SCL 12, PL 4.25, F1 2, F2 3.25, F3 4, F4 5, F5 6, F6 5.75, F7 5, F8 4.75, CL 16.25, THL 33, MSTL 12, SCTL 11, MTL 1.75, PDL 8.00, FWL 76, FWW 17, SMVL 15, MVL 7, STL 3, FFL 6, HW 1.25, HFL 7, FFm 14, FTb 16.5, FTrs, 23, FBstr 8, MFm 12, MTb 25, MTrs 20, MBstr 6.5, HFm 15, HTb 26, HTrs 22, HBstr 8, GSTL 32, OVPL 35

Additional material (Females): HW (n=3) 15.5-19 (17.5), FVW (n=3) 10-12 (11.25), MFW (n=3) 2-3 (2.5), LFW (n=3) 2.5-3 (2.83), TL (n=3) 2-3 (2.33), TTD (n=3) 1-2 (1.58), EL (n=3) 9.00-9.75 (9.33), MSL (n=3) 3.5-5 (4.41), RL (n=4) 3-4.75 (3.7), SCL (n=6) 7-10.75 (9.2), PL (n=6) 3-4 (3.54), F1 (n=6) 1.5-2.75 (2.16), F2 (n=6) 1.5-3.5 (2.41), F3 (n=6) 2-3.5 (2.62), F4 (n=6) 2-3.75 (2.95), F5 (n=6) 2.75-4.5 (3.75), F6 (n=6) 2.25-4.25 (3.5), F7 (n=6) 2.75-4.5 (3.62), F8 (n=6) 2.75-3.5 (3.12), CL (n=6) 9.75-13 (11.62), THL (n=6) 17-26 (21.5), MSTL (n=6) 5-9 (7.16), SCTL (n=6) 7.25-10 (8.95), MTL (n=6) 0.75-1.25 (1), PDL (n=6) 4-7 (5), FWL (n=6) 46-64 (55.87), FWW (n=6) 10-17 (13.79), SMVL (n=6) 8-11.75 (10.37), MVL (n=6) 4.5-7.5 (5.79), STL (n=6) 2-3
(2.62), FFL (n=6) 5-7 (6.16), HWL (n=4) 35-50 (42.75), HWW (n=4) 1-1.75 (1.37), HFL (n=4) 5-7 (6.25), FFm (n=5) 9-12 (10.45), FTb (n=6) 10-13 (11.70), FTrs (n=5) 14-19.5 (16.85), FBstr (n=6) 4.5-7 (5.91), MFm (n=6) 8.5-12 (10.45), MTb (n=6) 13-19.25 (17.83), MTrs (n=4) 13.5-20 (17.12), MBstr (n=5) 3.5-7 (5.5), HFm (n=5) 8.25-12.25 (11.1), HTb (n=6) 14.75-21 (18.75), HTrs (n=5) 14-19 (16.6), HBstr (n=6) 4-6.5 (5.5), GSTL (n=6) 18-30 (23.5), OVPL 14.75-25.75 (21.20)

Host. [?] Quadraspisiotus perniciosus Comstock

Distribution. India: Andhra Pradesh, Assam, Bihar, Jammu & Kashmir, Kerala, Maharashtra, Orissa, Tamil Nadu. (Japan).

Material examined.

body not yet located in Dr. Shafee's collections.

Additional material. (25 Females): INDIA: Andhra Pradesh, Guntur, 2 Females, 12.i.1993 (S.B. Zeya & S.I. Kazmi); Gudur, 1 Female, 13.ii.1993 (S.B. Zeya); Assam, Gwahati, 1 Female, 17.v.1986; Halflong, 1 Female, ix.1989 (S. Singh); Halflong, Chacchar valley, 1 Female, 7.xi.1989 (M.C. Basha); Bihar, Gaya, 1 Female, 31.xii.1991, 1 Female, 4.i.1992 (S.B. Zeya); Chakradharpur, 1 Female, 23.ii.1994 (S.B. Zeya & S.I. Kazmi). Jammu & Kashmir, Mansar, 1 Female 11.x.1989 (M.C. Basha); Kerala. Mukkal to Silent valley, 1 Female, 30.xii.1980 (M. Hayat); Orissa, Puri, 1 Female, 19.ii.1994 (S.B. Zeya); Tamil Nadu, Villupuram, 1 Female, 19.ii.1993 (S.I. Kazmi); Kodaikanal, 1 Female, 21.ii.1993 (S.B. Zeya & S.I. Kazmi); Uttar Pradesh, Aligarh, 1 Female, 4.x.1978; 1 Female, x.1979, 1 Female, xi.1979; 1 Female, 18.x.1985, 1 Female, i.1988, 1 Female, 28.viii.1988 (M. Hayat); 1 Female, 9.x.1978 (M. Hayat & M. Verma); 1 Female, ix. 1978 (M. Verma); Bareilly, 1 Female, 7.x.1978 (M. Verma).

Comments. This species is very distinctive and widely distributed. It however shows variations specially in forewing length and width and in the length of marginal fringe (Figs. 150, 153), but in all these the hypochaeta is always slightly to distinctly nearer proximal macrochaeta than to distal macrochaeta. There is, however, very little variation in dimensions of antennal segments and in body colour.
G. pahlgamensis is extremely close to chrysis (Debauche) and may be confused with it. It agrees with chrysis in relative dimensions of antennal segments and in the location of hypochaeta, but differs in having relatively broader wings and greater number of marginal fringe cilia which are closely spaced. In chrysis the fore wings are very narrow and the marginal fringe cilia are relatively fewer and widely spaced. I have seen a specimen (on slide No. M 1015/1) from England, West Sussex, determined by Matthews. (See also Matthews, 1986: Figs. 20, 33).

16. Gonatocerus maculatus sp. nov.

(Figs. 145-147)

Description.

Female. Length, 0.83 mm. Head brown; thorax brownish yellow; a dark brown to brown patch on most of the mid lobe of mesoscutum except sides; a patch on anterior third of side lobe and anterior scutellum medially, dark brown; axilla, most of posterior scutellum except sides, metanotum and propodeum brown; gaster with basal 0.25 pale, distal 0.75 brown; radicle pale, scape and pedicel pale yellow brown except the dark brown dorsal edge of scape, flagellum brown; fore wing subhyaline with slight yellow tinge; legs pale yellow brown with hind tibia dark brown.

Head mounted laterally, therefore, it is not possible to give dimensions. Antenna (Fig. 145) with scape slightly more than 3X as long as wide and 2.35X as long as pedicel;
pedicel shorter than F1-2 combined; F2-3 subequal in length, F4 and F5 subequal in length and each longer than F3-; F6-8 longer and larger, each longer than F5; F6-8 with longitudinal sensilla (F6=2, F7=2, F8=2); clava more than 3X as long as wide, longer than F5-8 combined, with 9 longitudinal sensilla.

Thorax subequal to gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum subequal to scutellum; each side lobe of mesoscutum and axilla with one seta, propodeum 0.56X of scutellum. Fore wing (Figs. 146, 147) slightly more than 3X as long as wide; submarginal vein 1.82X as long as marginal vein; marginal fringe 0.29X of wing width. Hind wing with marginal fringe 4.6X as long as wing width. Mid tibia 3X as long as mid basitarsus.

Gaster. Ovipositor not exserted, its total length 1.35X of mid tibia.

Male. Unknown.

Relative measurements: Holotype: SCL 40, PL 17, F1 9, F2 8, F3 9, F4 11, F5 11.75, F6 14, F7 14, F8 14, CL 48, THL 24, MSTL 9, SCTL 9, MTL 1, PDL 5, FWL 54, FWW 17.5, SMVL 10, MVL 5.5, STL 2.75, FFL 5, HWL 43, HWW 1.25, FFm 10.75, FTb 11, FBstr 5.5, MFm ?9, MTb 17, MTrs 16.5, MBstr 5.5, HFm 11, HTb 19, HTrs 16, HBstr 6, GSTL 24, OVPL 23
(Note: Antennal segments measured at 450X)

Host. Unknown.
Distribution. India: Uttar Pradesh. (Known only from type locality.)

Material examined.


Comments. Although only a single specimen was available, it is described here as it appears to be quite distinct from all the other species of literalis-group. It may appear to be related to narayani, but differs from that species in the dimensions of funicle segments, especially the subequal F4 and F5, each of which is longer than F3 and shorter than F6, and presence of sensilla on F6-8.

17. Gonatocerus delhiensis (Narayanan & Subba Rao)
(Figs. 8, 155-170)

Female. Holotype female, India, Delhi (IARI), examined.

Holotype female, India, Kodaikanal hills (USNM), examined. Syn.Nov.


Gonatocerus virgatus Subba Rao, 1989: 150. Female. Holotype female, India, Mudigere (BMNH), not examined. Paratype


**Redescription.**

**Female.** Length, 0.75-1.00 mm. Head pale yellow to yellowish brown, occasionally gena and vertex brown to dark brown; thorax pale yellow with brown to dark brown as follows: a patch in anterior third to most of mid lobe of mesoscutum except sides and posterior margin (occasionally dark brown patch extends from anterior margin to half of its length, sides and posterior half brown); a patch in anterior third of side lobe, anterior scutellum medially or most of it, anterior margin of posterior scutellum except sides or most of the posterior scutellum except sides, metanotum medially; propodeum yellowish brown to dark brown; basal 0.33-0.50 of gaster pale yellow or pale yellow brown with distal part of gaster either with dark brown bands or dark brown; radicle pale, otherwise antenna brown to dark brown; wings subhyaline with some yellow tinge; leg colour variable; fore coxae mostly pale yellow or with slight brown suffusion, mid coxae pale to basal third brown, hind coxae with basal third to completely infuscate brown to dark
brown, all trochanters pale yellow, occasionally hind trochanter brown; all femora pale yellow with brown infuscations, except mid femora, or fore and mid femora completely pale yellow; occasionally all femora with brown to dark brown infuscation except apices; all tibiae and tarsi yellow to more or less brown to dark brown.

Head (Fig. 8, 162) width 1.15X-1.7X as wide as vertex width; ocellar triangle with 3 setae; medial face width 0.83-1.3X of lateral face width; medial face with 2-3 pairs of setae; each lateral face with 9-11 setae; torulus about 0.5-0.7X its own length from transverse trabecula; intertorular region with 3-6 setae; one pair of setae above intertorular region (sometimes without setae); eye length 1.7X-2.45X as long as malar space length. Antenna (Figs. 155-160) with scape 3-4.5X as long as wide and nearly 2X of radicle; pedicel 0.2-0.38X of scape, and slightly shorter to about equal to F1 and F2 combined, F3-F5 of different dimensions (Figs. 155, 157); F8 quadrate to longer than broad, F4-8 with longitudinal sensilla (F4 = 0-2, F5 = 1-2, F6 = 2, F7 = 1-2, F8 = 1-2); clava about 3X to more than 3X as long as wide, with 7-12 longitudinal sensilla.

Thorax distinctly shorter than gaster; each lateral lobe of pronotum with 1 seta; mid lobe of mesoscutum more or less equal to scutellum; mid lobe of mesoscutum with 1-2 pairs of setae; each side lobe of mesoscutum with 1-2 setae; each axilla with 1 seta in some an additional setae is present at
the outer margin of axilla; propodeum 0.47-0.76X of scutellum, propodeum with 1+1 or 2+2 setae. **Fore wing** (Figs 164, 166, 168) 3.25-3.87X as long as broad; submarginal vein 1.06-1.8X as long as marginal vein; mostly one microchaeta present between the proximal and distal macrochaetae; in one specimen there are two microchaetae between the proximal and distal macrochaetae (Fig. 170); marginal fringe 0.19-0.3X as long as wing width. **Hind wing** with marginal fringe 3.5-5.6X as long as wing width. **Mid tibia** 2.7-3.14X as long as mid basitarsus.

**Gaster.** Ovipositor not exserted to slightly exserted, its total length 1.00-1.27X as long as mid tibia.

**Male.** Unknown.

**Relative measurements:** Holotype of *G. delhiensis*: RL 24, SCL 45, PL 16.75, F1 10, F2 10, F3 13, F4 14, F5 18, F6 14, F7 15, F8 13, CL 48, THL 110, MSTL 45, SCTL 40, MTL 5, PDL 22, FWL 260, FWW 80, SMVL 39, MVL 25, STL 9, FFL 24, HWL 200, HWW 6, HPL 24, FFm 53, FTb 59, FTrs 80, FBstr 27, MFm 54, MTb 85, MTrs 80, MBstr 27, HFm 58, HTb 93, HTrs 88, HBstr 29, GSTL 152, OVPL 104

Holotype of *G. relictus*: HW 25.5, FVW 23, MFW 4, LFW 3, TL 3.5, TTD 2.75, EL 14.75, MSL 6, RL 5.5, SCL 13, PL 4.75, F1 3, F2 3.25, F3 4, F4 5.5, F5 5.75, F6 5, F7 4.5, F8 4, CL 13, MSTL 12, SCTL 13, MTL 1.75, PDL 10, FWL 76, FWW 20.75, SMVL 9, MVL 8, STL 3, FPL 6, HWL 60, HWW 2, HFL 7, FFm 14, FTb 17, FTrs 22.5, FBstr 7.5, MFm 15, MTb 24.75, MTrs 23,
MBstr 8.5, HFm 16, HTb 26.5, HTrs 22.5, HBstr 8, GSTL 33, OVPL 25

Holotype of G. noyesi: HW 23, FVW 14, MFW 3.75, LFW 3.5, TL 3.5, TTD 2, EL 10.75, MSL 6, RL 6.5, SCL 13.75, PL 4.5, F1 2.75, F2 4, F3 5, F4 5.5, F5 4.75, F6 4, F7 3.5, F8 3, CL 14, THL 29.5, MSL 11, SCTL 11.25, MTL 1.75, PDL 5.5, FWL 72, FWW 19, SMVL 12.5, MVL 8, STL 3, FPL 5, HWL 58, HWW 1.5, HFL 6, FFm 16, FTb 17, FTrs 22.5, FBstr 8.75, MFm 14, MTb 25, MTrs 23.75, MBstr 8.5, HFm 11.5, HTb 28.5, HTrs 25, HBstr 10, GSTL 41, OVPL 29

Paratype of G. virgatus: HW 23, FVW 13.5, MFW 2.5, LFW 3, TL 3.75, TTD 2.5, EL 11, MSL 6, RL 6, SCL 14.5, PL 4.75, F1 3, F2 3.75, F3 5, F4 5.75, F5 5.5, F6 4.5, F7 4, F8 3, CL 16, THL 30, MSL 10.5, SCTL 11.5, MTL 2, PDL 5.5, FWL 76.25, FWW 21, SMVL 12.5, MVL 8.5, STL 3, FPL 4, HWL 60, HWW 1.5, HFL 6, FFm 13.5, FTb 16.5, FTrs 23, FBstr 8.5, MFm 15, MTb 25, MTrs 25, MBstr 9, HFm 16, HTb 28, HTrs 26, HBstr 9.75, GSTL 32, OVPL 28

Additional material: (Females): HW (n=2) 21-21.75 (21.37), FVW (n=2) 13.75-14 (27.75), MFW (n=3) 3-3 (3), LFW (n=3) 3-3 (3), TL (n=3) 3-3 (3), TTD (n=2) 1.5-1.75 (1.62), EL (n=3) 11.75-13 (12.25), MSL (n=3) 6-6.25 (6.08), RL (n=5) 4.00-6.75 (5.5), SCL (n=5) 11.75-13.75 (12.5), PL (n=5) 3.5-4 (3.75), F1 (n=5) 3-3 (3), F2 (n=5) 3.5-3.75 (3.7), F3 (n=5) 4.75-5.5 (5.9), F4 (n=5) 5.00-5.75 (5.3), F5 (n=5) 4.75-5 (4.9), F6 (n=5) 3.75-4.50 (4.2), F7 (n=5) 3.5-4 (19.25), F8
(n=5) 3-3.5 (3.2), CL (n=5) 12-15.75 (13.2), THL (n=5) 28-31 (29.6), MSTL (n=5) 10.5-11.25 (10.95), SCTL (n=5) 10-11 (10.65), MTL (n=5) 1-1.5 (1.25), PDL (n=5) 5-7 (6.3), FWL (n=5) 70.25-79.5 (73.45), FWW (n=5) 18.75-21 (19.9), SMVL (n=5) 8-15 (12.6), MVL (n=5) 7-8.5 (7.75), STL (n=5) 2.5-3.5 (2.95), FFL (n=5) 4-5 (4.55), FWL (n=3) 55-60.25 (56.75), HWW (n=3) 1.25-1.5 (1.41), HFL (n=3) 7-7 (7), FFm (n=5) 14.25-16 (15), FTb (n=5) 14.5-17 (15.85), FTrs (n=5) 22-23.5 (22.8), FBstr (n=5) 7.75-9 (8.3), MFm (n=5) 14-15.5 (14.7), MTrs (n=4) 23.5-25 (24.25), MBstr (n=5) 8-9 (8.35), HFm (n=5) 14.25-16 (15.2), HTb (n=5) 24-27.25 (25.65), HTrs (n=5) 24-26 (25.2), HBstr (n=5) 8-9.75 (8.95), GSTL (n=5) 33-39 (36.15), OVPL (n=5) 27-30.5 (28.9)

Host: Unknown.

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

Material examined.

Type material. Lymaenon delhiensis: Holotype female, (mounted on one slide) INDIA: Delhi, vi.1960 (B.R. Subba Rao) (IARI). The holotype is not in good condition; head partly damaged, left antenna broken at 4th and 5th funicular articulation, left fore wing, right and left hind wings mounted ventrally.

Party) (USNM). Holotype partly dissected; head, antenna, fore wing of right side, fore legs with propleura and prosternum detached from the rest of the body.


G. virgatus: Paratype female (mounted on single slide under 4 coverslips) INDIA: Karnataka, Mudigere 26.x-4.xi. 1979 (J.S. Noyes); BM 1979-518 (BMNH).


Comments. This is a widely distributed species showing variations in body colour, relative dimensions of antennal
segments (Figs. 155-161). Fore wing length and width, setae on mid lobe, axillae and popodeum. For this reason, and also because earlier authors did not examine relevant types or mistook intraspecific variation for specific characters, the author has to synonymise three species (relictus, noyesi, virgatus) under delhiensis. G. delhiensis is a distinct species and can be distinguished from other Indian species of litoralis- group by its robust and long antennae, shorter F1 and F2, F3 slightly shorter to as long as F4, and F8 with truncate apex.

From the original description and figure given by Viggiani & Jesu (1987), Gonatocerus vidanoi (Viggiani & Jesu), comb. nov. from Lymaenon, appears to be very close to, if not the same as, delhiensis. But as setation of the head sclerites is not given and the ovipositor is said to be 2.38X as long as the mid tibia, it is not considered desirable to synonymise it without study of the type material.

18. Gonatocerus bashai sp.nov.

(Figs. 171-173)

Description.

Female. Length, thorax + gaster = 0.725 mm. Head pale yellow to brown, with occipital region dark brown; thorax yellow to brown, pronotum pale yellow, a dark brown patch in anterior half to most of mid lobe of mesoscutum except sides
narrowly, subtriangular patch in anterior third of each side lobe, anterior scutellum medially, axillae, metanotum medially except sides and propodeum, brown; basal third of gaster pale yellow, rest dark brown; radicle white, scape and pedicel yellow, flagellum brown, occasionally clava dark brown; wings subhyaline with faint yellow tinge; legs pale yellowish brown.

**Head** width 1.5X as wide as vertex width; ocellar triangle with 3 setae; medial face width almost equal to lateral face width; medial face with one pair of setae; each lateral face with 8 setae, torulus 0.36-0.5X its own length from transverse trabecula; intertorular region with two pair of setae; eye length 2X to slightly more than 2X as long as malar space. **Antenna** (Fig. 171) with scape about 4X as long as wide; pedicel slightly shorter than radicle and 0.5X of scape; F1-4 individually shorter than F5; F5-8 decreasing in length distad, with longitudinal sensilla (F5 = 2, F6 = 2, F7 = 2, F8 = 2); clava 4.5X as long as wide and shorter than F5-8 combined, with 9 longitudinal sensilla.

**Thorax** distinctly shorter than gaster; each lateral lobe of pronotum with 1 seta; mid lobe of mesoscutum slightly shorter than scutellum, mid lobe of mesoscutum with 1 pair of setae, each side lobe and axilla with 1 seta; propodeum 0.5-0.7X of scutellum. **Fore wing** (Figs. 172, 173) 3.5-3.6X as long as wide; submarginal vein 1.6-2X as long as marginal vein; marginal fringe 0.3-0.4X of wing width. **Hind wing** with marginal fringe 5.25X as long as wing width. **Mid tibia**
slightly shorter than hind tibia and about 3X as long as mid basitarsus.

**Gaster.** Ovipositor not exserted, 1.4-1.5X as long as mid tibia.

**Male.** Unknown.

**Relative measurements:** Holotype of *G. bashai* sp.nov.: HW 16, FVW 10.5, MFW 2.5, LFW 2.5, TL 2, TTD 1, EL 8, MSL 4, SCL 9.5, PL 3.75, F1 2.5, F2 2, F3 2.5, F4 3, F5 4, F6 3.75, F7 3.75, F8 3, CL 13, THL 16.5, MSTL 7.25, SCTL 8.25, MTL 0.5, PDL 6, FWL 56.25, FWW 15.5, SMVL 10, MVL 6, STL 2.75, FFL 6.5, HWL 45.75, HWW 1.25, HFL 6, FFm 11.5, FTb 12, FTrs 17, FBstr 6, MFm 10.25, MTb 17.5, MTrs 18, MBstr 6, HFm 11, HTb 19, HTrs 19, HBstr 5.75, GSTL 34, OVPL 26.75

Paratype: HW 15, FVW 10, MFW 2.5, LFW 2.5, TL 2.75, TTD 1, EL 8.5, MSL 4, RL 4.25, SCL 8, PL 4, F1 2.5, F2 2, F3 2.25, F4 3, F5 3.75, F6 3.75, F7 3.5, F8 3.5, CL 13.25, THL 20, MSTL 7, SCTL 8, MTL 1, PDL 4, FWL 54, FWW 15.25, SMVL 12, MVL 6, STL 2.75, FFL 6, HWL 49, HWW 1, HFL 5.25, FFm 11, FTb 11.5, FTrs 17, FBstr 5, MFm 10.25, MTb 17, MTrs 18, MBstr 6, HFm 10, HTb 17.75, HTrs 17.5, HBstr 6, GSTL 26, OVPL 25.25

**Host.** Unknown.

**Distribution.** India: Assam.
Material examined.

Type material: Holotype female (on one slide under 5 coverslips), INDIA: Assam, Silchar near Rly. station, 9.xi.1989 (M.C. Basha); Paratype, 1 female (on one slide, under 4 coverslips), INDIA: Assam, Halflong, New Rly station Chachar valley 7.xi.1989 (M.C. Basha).

Comments. G. bashai sp.nov. is a distinct species. It agrees with G. chrysis (Debauche) only in having more or less similar dimensions of funicle segments, but differs from that species in the nearly bare fore wing disc behind marginal vein and the cubital row, hypochaeta near distal macrochaeta, broad fore wing with shorter marginal fringe and longer ovipositor. In chrysis, fore wing 4.5-5.1X as long as broad, disc behind marginal vein and cubital row, setose, hypochaeta nearer proximal macrochaeta, and ovipositor about equal in length to mid tibia or very slightly longer. Among the Indian species of litoralis-group, it appears superficially similar to narayani, but differs from that species in the longer fore wings (3.5X as long as broad) and longer flagellar segments. In the long series of specimens of narayani I have not come across any specimen resembling G. bashai sp.nov. in these characters, and therefore, for the present and until further collection proves otherwise, the two specimens from Assam are here regarded as representing a distinct species.
19. *Gonatocerus venustus* sp.nov.

(Figs. 174-177)

**Description.**

**Female.** Length, 0.57-0.62 mm. Head brown to dark brown; thorax largely dark brown except pronotum white or with anterior edge slightly brown; posterior end and sides of mid lobe white to yellow; each side lobe of mesoscutum with a subtriangular dark spot anteriorly; antenna brown except the white radicle, occasionally radicle, scape and pedicel pale brown; fore wing subhyaline with slight yellow tinge; fore coxae, all trochanters, all femora and largely fore and hind tibiae white to pale yellow, mid and hind coxae at least in proximal two-thirds, hind tibiae and tarsi dark brown, ventral margin of fore and mid tibiae and fore and mid tarsi brown to dark brown.

Head width 1.19-1.34X as wide as vertex width; ocellar triangle with 3 setae; medial face width 1-1.25X as wide as lateral face width, with one pair of setae; each lateral face with 7-8 setae; torulus 0.25-0.5X its own length from transverse trabecula; intertorular region with 3 pairs of setae; eye length 1.5-2X as long as malar space. **Antenna** (Fig. 174) with scape about 3X as long as wide, twice of radicle and pedicel individually; F1-4 short and each longer than broad; F6 distinctly longer than F3 but distinctly shorter than F5 and F7; F5, F7 and F8 with longitudinal sensilla (F5=0 or 1, F7=1, F8=2); clava slightly more than 3X as long as wide and slightly shorter to about as long as
F5-8 combined, with 7-10 longitudinal sensilla.

Thorax slightly shorter than gaster; each lateral lobe of pronotum with 2 setae; mid lobe of mesoscutum slightly shorter than scutellum; each side lobe of mesoscutum and axilla with 1 seta; propodeum 0.5-0.6X of scutellum. Fore wing (Figs. 175-177) 4.2-4.3X as long as wide; submarginal vein about 2X of marginal vein; marginal fringe 0.42-0.52X as long as wing width. Hind wing with marginal fringe 4.4-6X as long as wing width. Mid tibia about 3-3.88X as long as mid basitarsus.

Gaster. Ovipositor not exserted beyond tip of gaster, 1.07-1.16X as long as mid tibia.

Male. Unknown.

Relative measurements: Paratype of G. venustus sp.nov.: HW (n=3) 12-14 (13), FVW (n=4) 9-11.25 (9.81), MFW (n=4) 2.25-2.5 (2.37), LFW (n=4) 1.75-2.25 (2), TL (n=4) 1.25-2.25 (1.88), TTD (n=4) 0.50-0.75 (0.68), EL (n=3) 5.5-7.0 (6.33), MSL (n=3) 3.5-4.5 (4.16), RL (n=4) 3-3.5 (3.18), SCL (n=4) 6.25-7 (6.68), PL (n=4) 3.25-3.75 (4.12), F1 (n=4) 1.25-2.00 (1.68), F2 (n=4) 1.5-1.75 (1.56), F3 (n=4) 1.5-1.75 (1.62), F4 (n=4) 1.5-1.75 (1.68), F5 (n=4) 2.5-3.75 (2.87), F6 (n=4) 2-2.25 (2.06), F7 (n=4) 2.25-2.5 (2.37), F8 (n=4) 2.5-2.75 (2.62), CL (n=4) 9-9.75 (9.5), THL (n=4) 17.0-22.75 (19.31), MSTL (n=4) 5-7 (6.31), SCTL (n=4) 7-7.25 (7.06), MTL (n=4) 0.75-1.0 (0.93), PDL (n=4) 4-4.25 (4.12), FWL (n=4) 49-52
(50.2), FWW (n=4) 11.75-13 (12.18), SMVL (n=4) 9-10.5 (9.75), MVL (n=4) 4.75-5.00 (4.9), STL (n=4) 2-2.25 (2.06), FFL (n=4) 5-6.25 (5.56), HWL (n=4) 36-37.5 (36.87), HWW (n=4) 1-1.5 (1.22), HFL (n=4) 5.5-6 (5.75), FFm (n=4) 9-10 (9.5), FTb (n=4) 8.75-10 (9.18), FTrs (n=4) 13-14.25 (13.68), FBstr (n=4) 4-5 (4.5), MFm (n=4) 8-10 (9), MTb (n=4) 13.25-14.75 (14.06), MTrs (n=4) 13-14 (13.3), MBstr (n=4) 3.5-4 (3.75), HFm (n=4) 9-10 (9.75), HTb (n=4) 15-16.75 (15.62), HTrs (n=4) 13-14 (13.75), HBstr (n=4) 3.75-4.5 (4.06), GSTL (n=4) 19-22 (20.5), OVPL (n=4) 14.5-16.75 (15.67)

**Host**: Unknown.

**Distribution.** India: Bihar, Kerala, Meghalaya, Tamil Nadu.

**Material examined.**

Type material. **Holotype** female (on card) INDIA: Bihar, Davision, Gaya, 22.x.1992 (S.B. Zeya); **Paratypes**, 22 Females: 7 Females with same data as holotype; 3 Females, same data except 24.x.1992; Ranchi (BAU), 1 Female, 27.ii.1994 (S.B. Zeya); 1 Female, 27.ii. 1994 (S.I. Kazmi); Kerala, Chengalam, Kottayam, 2 Females, 26.ii.1993 (S.B. Zeya & S.I. Kazmi); Meghalaya, M.G. Raod, 1 Female, 13.xi.1989 (M.C. Basha); Tamil Nadu, Kodaikanal, 1 Female, 21.ii.1993 (S.B. Zeya & S.I. Kazmi); Villupuram, 3 Females, 19.ii.1993 (S.I. Kazmi); 3 Females, 19.ii.1993 (S.B. Zeya).

**Comments.** G. venustus sp. nov. is apparently similar to
G. litoralis (Haliday), but differs from that species in having F1-4 each slightly longer than broad; largely white to pale yellow legs (except dark brown mid and hind coxae, hind tibiae and tarsi) and in having basal third to half of gaster pale yellow to white. Also the new species, compared to litoralis, (See Matthews, 1986, Figs. 16, 28, 29) shows relatively little variation. A large number of specimens from Sussex (UK) (collected by M. Hayat in 1981) shows variation in relative dimension of flagellar segments, fore wings and body length, but all have mid and hind coxae, all femora except pale bases and apices, and all tibiae except pale bases and apices, dark brown. I have also seen a female (on slide No. M 1026/2) from Scotland, Perths, determined as litoralis by Matthews.

6.8. Species Incertae Sedis

Gonatocerus longicrus Kieffer

Gonatocerus longicrus Kieffer, 1913: 201. Female, India, Orissa, Puri (?)..

The types of this species are not located in the collections of the Zoological Survey of India, Calcutta (Mr. K.K. Ray, per. com. 26.6.1994) and are presumably lost. It is not possible to refer the species even to its species group based on the original description. Therefore, it is regarded as a species incertae sedis.
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Figs. 2-5. Explanation of terms. Females: 2, head dorsum, generalised Gonatocerus; 3, head front view, G. ater Foerster; 4, head side view, G. brevifuniculatus Subba Rao; 5, antenna, G. pahlgamensis (Narayanan).
Figs. 14, 15. Explanation of terms. (14), Gonatocerus munnarus Mani & Saraswat, female: thorax and gaster, dorsal. (15), G. longicornis Nees, part of ovipositor.
Figs. 16-20. (16-19) Gonatocerus asulcifrons sp.nov., holotype female: 16, head front view; 17, lower part of face showing left mandible; 18, antenna, scape and radicle drawn from another antenna; 19, fore wing, basal part enlarged. (20) G. devikulamus Mani & Saraswat, holotype female: head front view.
Figs. 21-24. Gonatocerus devikulamus Mani & Saraswat, holotype female: 21, antenna; 22, fore wing, 23, fore wing, basal part enlarged; 24, part of thorax and gaster.
Figs. 25-31. (25-28) *Gonatocerus kodaianus* (Mani & Saraswat), holotype female: 25, head front view; 26, antenna; 27, fore wing; 28, fore wing, basal part enlarged. (29-31) *G. monticolus* sp. nov., holotype female: 29, antenna; 30, fore wing; 31, fore wing, basal part enlarged.
Figs. 32-36. Gonatocerus trialbifuniculatus Subba Rao, holotype female: 32, head front view; 33, antenna; 34, fore wing; 35, fore wing, basal part enlarged; 36, thorax and gaster, dorsal.
Figs. 44-48. *Gonatocerus ater* Foerster, female fore wings:
44, 45, 47, fore wings showing variation; 46, fore wing, basal part enlarged of Fig. 44; 48, fore wing, basal part enlarged of Fig. 47.
Figs. 49-54. *Gonatocerus sahadevani* (Subba Rao & Kaur), female: 49, antenna from holotype of *Lymaenon sahadevani*; 50-52, antennae showing variation; 53, fore wing; 54, fore wing, basal part enlarged.
Figs. 55-61. Gonatocerus shamimi Subba Rao & Hayat, female: 55, 56, antennae from two specimens showing variation; 57, fore wing; 58, fore wing, basal part enlarged; 59, gaster, lateral view, drawn from distended specimen; 60, gaster lateral view, normal; 61, ovipositor valves, left half.
Figs. 62-69. (62-65) Gonatocerus edentulus sp.nov., holotype female: 62, lower part of face showing clypeus without lateral teeth; 63, antenna; 64, fore wing; 65, fore wing, basal part enlarged. (66-69) G. utkalensis Subba Rao, female: 66, head occipital region; 67, antenna; 68, fore wing; 69, fore wing, basal part enlarged.
Figs. 70-76. (70-73) Gonatocerus longicornis Nees, female: 70, antenna, from holotype of Lymaenon shasthryi; 71, antenna, from holotype of G. uttarodeccanus; 72, fore wing, basal part enlarged, from holotype of G. shasthryi; 73, fore wing, basal part enlarged, from holotype of G. uttarodeccanus. (74-76) G. huberi sp. nov., holotype female: 74, antenna; 75, fore wing; 76, fore wing, basal part enlarged.
Figs. 77-83. (77-82) Gonatocerus tarae (Narayanan & Subba Rao), female: 77, antenna, from holotype of Lymaenon tarae; 78-80, antennae showing variation; 81, fore wing; 82, fore wing, basal part enlarged. (83) G. tarae, male antenna.
Figs. 84-90. (84-87) Gonatocerus orientalis sp.nov., holotype female, except figure 87: 84, antenna; 85, fore wing; 86, fore wing, basal part enlarged; 87, antenna, male. (88-90) G. sulphuripes (Foerster), female: 88, antenna; 89, fore wing; 90, fore wing, basal part enlarged.
Figs. 91-97. *Gonatocerus brevifuniculatus* Subba Rao: 91-93, antennae showing variation, female; 94, fore wing, female; 95, fore wing, basal part enlarged, female; 96, antenna, male; 97, fore wing, basal part enlarged, male.
Figs. 98-103. (98-100) Gonatocerus bicoloriventris sp. nov., paratype female: 98, antenna; 99, fore wing; 100, fore wing, basal part enlarged. (101-103). G. ramakrishnai (Subba Rao & Kaur), holotype female: 101, antenna; 102, fore wing; 103, fore wing, basal part enlarged.
Figs. 104-109. *Gonatocerus tamilanus* Mani & Saraswat, female: 104, antenna, holotype; 105, fore wing, basal part enlarged, holotype; 106, 107, antennae showing variation; 108, fore wing; 109, fore wing, basal part enlarged.
Figs. 115-120. *Gonatocerus bakrotus* Mani & Saraswat, female: 115, antenna; 116, fore wing; 117, fore wing, basal part enlarged; 118, antenna, holotype; 119, fore wing, holotype; 120, fore wing, basal part enlarged, holotype.
Figs. 121-128 (121-123) Gonatocerus devitatakus Mani & Saraswat, holotype female: 121, antenna; 122, fore wing; 123, fore wing, basal part enlarged. (124-128) G. bouceki, sp. nov., female: 124, antenna, paratype; 125, funicle, holotype; 126, fore wing, paratype; 127, fore wing, basal part enlarged of Fig. 126; 128, fore wing, basal part enlarged, showing variation in a paratype.
Figs. 129-134. Gonatocerus narayani (Subba Rao & Kaur), female except Fig. 134: 129, antenna, holotype; 130, fore wing, basal part enlarged, holotype; 131, fore wing; 132, fore wing, basal part enlarged of Fig. 131; 133, fore wing, basal part enlarged showing variation; 134, antenna, male.
Figs. 135-140. (135-137) Gonatocerus narayani, female antennae, showing variation. (138-140), G. spectabilis sp.nov., holotype female: 138, antenna; 139, fore wing; 140, fore wing, basal part enlarged.
Figs. 148-154. Gonatocerus pahlgamensis (Narayanan), female: 148, antenna, from holotype of G. kanheriensis; 149, antenna, from holotype of Lymaenon pahlgamensis; 150, fore wing, from holotype of G. kanheriensis; 151, fore wing, basal part enlarged of Fig. 151; 152, fore wing, basal part enlarged, from holotype of L. pahlgamensis; 153, fore wing, showing variation; 154, fore wing, basal part enlarged.
Figs. 141-147. (141-144) Gonatocerus munnarum Mani & Saraswat, female: 141, antenna, holotype; 142, fore wing, holotype; 143, fore wing, basal part enlarged of Fig. 142; 144, antenna, showing variation. (145-147) G. maculatus sp.nov., holotype female: 145, antenna; 146, fore wing; 147, fore wing, basal part enlarged.
Figs. 155-163. *Gonatocerus delhiensis* (Narayanan & Subba Rao), female: (155-161) antennae: 155, holotype of *Lymaenon delhiensis*; 156, holotype of *G. relictus*; 158, holotype of *G. noyesi*; 159, paratype of *G. virgatus*; 157, 160, 161, antennae showing variation in three specimens; 162, head front view, from paratype of *G. virgatus*; 163, fore wing, basal part enlarged, holotype of *L. delhiensis*. 
Figs. 171-177. (171-173) *Gonatocerus bashai* sp.nov., holotype female: 171, antenna; 172, fore wing; 173, fore wing, basal part enlarged. (174-177) *G. venustus* sp.nov., paratype female: 174, antenna; 175, fore wing; 176, fore wing, basal part enlarged; 177, fore wing, basal part enlarged, showing variation.
Figs. 178-182. (178) Gonatocerus longicornis Nees, male antenna. (179-182) Gonatocerus spp., male genitalia: 179, last sternite and genitalia, left parameral stylet omitted; 180, last sternite showing parameres, and parameral stylet of left side, aedeagus removed; 181, aedeagus and aedeagal apodemes; 182, last sternite with parameres and parameral stylets, aedeagus removed and shown in Fig. 181.
Figs. 183-187. SEM micrographs: *Gonatocerus orientalis* sp.nov., female: 183, head, front view; 184, mouth region, enlarged; 185, thorax dorsal; 186, thorax, showing dorsellum and medial carina of propodeum (indicated by an arrow); 187, thorax, ventral.
Figs. 188-192. SEM micrographs: *Gonatocerus munnarus* Mani & Saraswat, female: 188, head, front view; 189, head, occipital region; 190, pronotum, the three lobes indicated by arrows; 191, thorax, dorsal, showing strap shaped dorsellum and submedian suture of propodeum, indicated by arrows; 192, gaster dorsal.
Figs. 193-195. SEM micrographs: Gonatocerus shamimi Subba Rao & Hayat, female: 193, head, front view; 194, mouth region showing clypeal tooth, indicated by an arrow; 195, thorax showing biconvex dorsellum (indicated by an arrow) and medially smooth propodeum.
Figs. 196, 197. SEM micrographs: Gonatocerus longicornis Nees, female: 196, thorax, side view, 197, thorax showing biconvex dorsellum and propodeal carinae, indicated by arrows.
Figs. 198-201. *Octonus himalayus* Subba Rao, female: 198, head, front view; 199, fore wing, basal part enlarged; 200, thorax, dorsal, showing transverse ridge on pronotum and carinae on propodeum; 201, apex of gaster showing cerci.