

**TAXONOMIC STUDIES ON *CALLITULA* SPINOLA WITH THE  
DESCRIPTION OF FOUR NEW SPECIES FROM INDIAN  
SUBCONTINENT (HYMENOPTERA : CHALCIDOIDEA :  
PTEROMALIDAE)**

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**INTRODUCTION**

*Callitula* Spinola belonging to the subfamily Pteromalinae of Pteromalidae is distributed in all parts of the world. According to Boucek (1988) the members of the genus are parasites of small Diptera especially Agromyzidae and they prefer the host's larvae that burrow in grass stems or other plant parts. Though widely distributed, the genus is little known from the tropics (about 5 species described). From the Indian subcontinent the genus is so far represented by one species viz. *C. rugosa* (Waterston) from India and Sri Lanka. Four new species of *Callitula* are described in this paper based upon the collections from Kerala, India. A key to separate the species of *Callitula* from the Indian subcontinent is also provided.

Type specimens of the species are deposited in Zoological Survey of India, Western Ghats Field Research Station, Calicut, India.

The morphological terminology used in this paper generally follows that of Boucek (1988). The following abbreviations are used in the text : F1–F5–funicular segments 1 to 5; MV–marginal vein; OOL–ocellocular distance; PMV–postmarginal vein; POL–postocellar distance; SMV–submarginal vein; STV–stigmatal vein; T1–T3–gastral tergites 1 to 3; BMNH–British Museum (Natural History), London, U. K.

**Genus *Callitula* Spinola**

1811. 151. *Callitula* Spinola. Type species *Callitula bicolor* Spinola by monotypy.

1833. 371, 464. *Micromelus* Walker. Type species *Micromelus rufomaculatus* Walker by designation of Westwood, 1840.

1856. 145. *Baeotomus* Forster. Unnecessary replacement name for *Micromelus*, supposedly preoccupied.

The other synonyms are *Pterosemoidea* Girault, 1913, *Apteroosemoidea* Girault 1913, *Eurydinotella* Girault, 1913, *Pseudosphegigasterus* Girault, 1913, *Eurydinotelleus* Girault, 1913 and *Polycystomyia* Dodd in Girault, 1915 (syn. by Boucek, 1988; 439).

*Key to the species of Callitula from the Indian subcontinent*

1. Anterior margin of clypeus roundly produced (Figs. 7, 10) ..... 2  
    Anterior margin of clypeus slightly or moderately emarginate ..... 3
2. Gaster (Fig. 5) distinctly longer than mesosoma, not collapsing, in dorsal view length 2.7x width; forewing (Fig. 8) with basal cell open below, speculum broad; antenna (Fig. 6) with pedicel shorter than F1; pronotal collar not margined anteriorly, only little raised in the middle; POL sub equal to OOL; gaster with metallic blue reflection on T1 dorsally. .... *C. keralensis* sp. nov.  
    Gaster (Fig. 13) as long as mesosoma, sunken dorsally, in dorsal view length 1.8x width; forewing (Fig. 12) with basal cell closed below, speculum narrow; pedicel (Fig. 11) little longer than F1; pronotal collar distinctly margined at least medially; POL 1.6x OOL; gaster without metallic blue reflection dorsally on T1. .... *C. anguloclypea* sp. nov.
3. Body (Fig. 1) robust, length 3.7 mm; gaster (Fig. 4) 1.1x as long as head plus mesosoma and length 3.1x width in dorsal view; antenna (Fig. 2) with scape not exceeding level of vertex ..... *C. robusta* sp. nov.  
    Body not robust, smaller species; gaster shorter than head plus mesosoma combined; scape exceeding level of vertex ..... 4
4. Gaster with T2 large (Fig. 16) occupying 0.2x total length; head and mesosoma dark metallic blue; legs with coxae brown ..... *C. rugosa* (Waterston)  
    Gaster with T2 not as above (Fig. 18); head and mesosoma black; legs including coxae testaceous ..... *C. travancorensis* sp. nov.

1. *Callitula robusta* sp. nov.

(Figs. 1–4)

*Female* : Length 3.7 mm. Head and mesosoma bright metallic bluish green with golden reflection; gaster metallic blue, almost black dorsally; antennae with scape and pedicel testaceous, remainder dark brown; coxae concolrous with mesosoma, remainder of legs testaceous with tips of tarsi brown; tegulae testaceous; wings hyaline; veins pale brown.

*Head* : (Fig. 1) raised reticulate, finely reticulate on genae. In dorsal view head 1.4x as wide as mesosoma and width 2.2x length; POL : OOL = 8 : 9; temple length half of eye length; anterior margin of clypeus weakly emarginate; malar space length half of eye height. Antennae (Fig. 2) inserted above middle of face; scape length 0.8x eye height, reaching just level of vertex, pedicel plus flagellum little shorter than head width; pedicel shorter than F1; funicular segments slightly widening towards tip; clava as long as two preceding segments combined.

*Mesosoma* : (Fig. 1) length 1.6x width; pronotal collar anteriorly ridged in the middle, moderately reticulate with smooth strip posteriorly. Mesoscutum width 2x length, reticulate punctate. Scutellum as long as wide, similarly sculptured as on mesoscutum. Propodeum (Fig. 4) width 2x median length, median area moderately reticulate, raised in the median line; posterior margin of nucha deeply emarginate; spiracles elongate ovate, close to metanotum. Forewing (Fig. 3) length 2.5 width; marginal fringe small; pubescence less dense, basal vein setate; speculum open below. Relative lengths; SMV 39, MV 22.5, PMV 15, STV 9.

*Gaster* : (Fig. 1, 4) elongate, lanceolate, length 1.1x head plus mesosoma combined; in dorsal view length 3.1x width.

*Holotype* : Female : INDIA : Kerala, Parambikulam wild life sanctuary, Anappady, 6.v.1989, Coll. P. M. Sureshan.

*Remarks* : In having an elongate gaster and larger body size this species resembles *C. elongata* (Thomson) but differs from it in having antennal scape shorter than eye, not reaching well above level of vertex, F1 distinctly longer than pedicel; anterior margin of clypeus weakly emarginate and gaster 3.1x as long as wide (in *elongata* scape longer than eye, reaching well above level of vertex; F1 shorter than pedicel; anterior margin of clypeus deeply emarginate, appearing bidentate and gaster only 2.3–2.4x as long as wide).

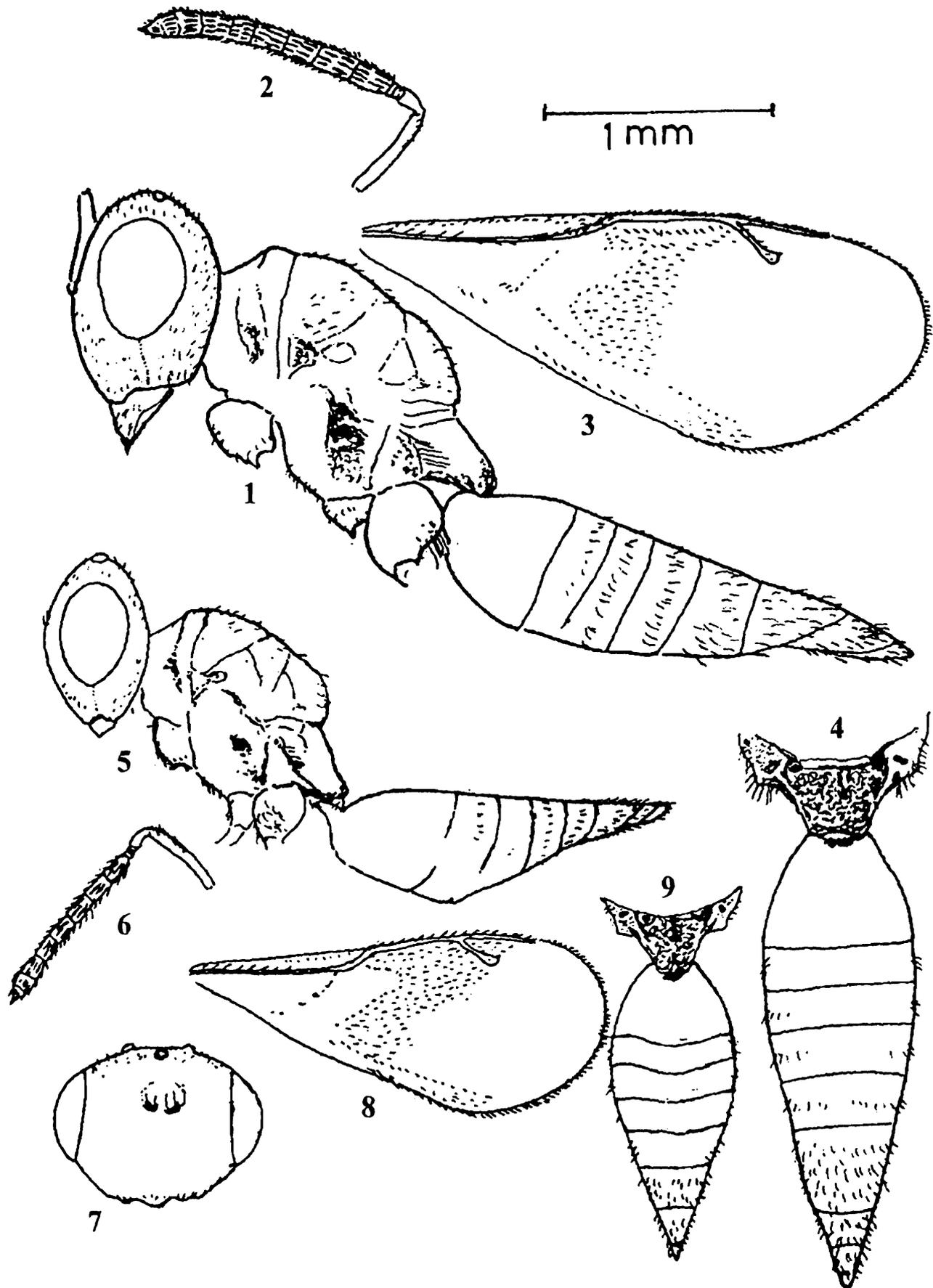
## 2. *Callitula keralensis* sp. nov.

(Figs. 5–9)

*Female* : Length 1.7–2.7 mm. (Holotype 2.7 mm). Head and mesosoma dark metallic blue; gaster almost black with metallic blue reflection on T1 dorsally and on other tergites dorso-laterally; antennae brown except scape and pedicel testaceous; fore and hind coxae concolorous with mesosoma; mid coxae and remainder of legs testaceous; tegulae testaceous; wings hyaline; veins brown.

*Head* : (Figs. 5, 7) 1.14x as wide as mesosoma, moderately reticulate. In dorsal view head width 2x length and in front view width 1.3x height; POL : OOL = 6.5 : 6; temple length 0.34x eye length; malar space length half of eye height; eyes separated by 1.4x their height; lower margin of clypeus slightly convex and roundly produced. Antennae (Fig. 6) inserted slightly above middle of face; scape length 0.9x eye height, exceeding level of vertex; pedicel plus flagellum length 1.12x head width; pedicel shorter than F1 (3.5 : 4.5); clava little longer than two preceding segments combined, terminal stylus sharp.

*Mesosoma* : (Fig. 5) length 1.7x width; pronotal collar not margined but little raised in the middle. Mesoscutum width 2x length, coarsely reticulate. Scutellum almost as wide as long, little longer than mesoscutum, sculptured as on middle lobe of mesoscutum. Propodeum (Fig. 9) shorter than scutellum, width 2.3x median length, median area moderately reticulate; plicae reaching up to middle; spiracles



Figs. 1-9. : 1-4. *Callitula robusta* sp. nov. Female : 1, body in profile; 2, antenna; 3, forewing; 4, propodeum and gaster in dorsal view. 5-9. *Callitula keralensis* sp. nov. Female : 5, body in profile; 6, antenna; 7, head in front view; 8, forewing; 9, propodeum and gaster in dorsal view.

long, oval. Forewing (Fig. 8) length 2.3x width; basal part bare; basal hairline indicated, costal cell with an incomplete row of hairs; stigma slightly capitate. Relative lengths : SMV 31, MV 16, PMV 11.5, STV 6.5.

*Gaster* : (Figs. 5, 9) distinctly longer than mesosoma, not collapsing; petiole finely reticulate; gaster length 2.7x width in dorsal view and 2.5x hind tibia; hind margin of T1–T3 slightly produced.

*Holotype* : Female : INDIA : Kerala, Malappuram district, Vaniyampuzha, 30.iv.1993, Coll. P. M. Sureshan.

*Paratypes* : 1 Female, Kerala, Kannur district, Tellicherry, 4.xi.1995; 1 Female, Palghat district, Silent valley, 10.xii.1987; 1 Female, Kasaragod district, Manjeswaram, 27.ii.1988; 1 Female, wayanad district, Vattappoyil, 2.iii.1994; 1 Female, Ernakulam, 9.ii.1989; 1 Female, Trichur district, Pecchi, 6.ii.1989; 2 Female, Malappuram district, Calicut University campus, 20.iv.1988, 7.ix.1988, Coll. P. M. Sureshan.

*Remarks* : This species resembles *C. nigricoxa* Kamijo in the nature of clypeus, antennae and forewing venation but differs in having a long gaster (length 2.7x width) distinctly longer than mesosoma, forewing with basal cell bare, pronotal collar not margined anteriorly and POL only very little longer than OOL (in *nigricoxa* gaster short, length 1.63x width, slightly shorter than mesosoma, basal cell of forewing closed below, pronotal collar distinctly margined and POL 1.5x OOL).

### 3. *Callitula anguloclypea* sp. nov.

(Figs. 10–13)

*Female* : Length 1.2–1.7 mm. (Holotype 1.6mm). Head and mesosoma black; gaster brown with an yellowish spot at base dorsally; scape, pedicel and anelli testaceous, remainder of antenna brown; legs including coxae testaceous except fore coxae basally and tips of tarsi brown; tegulae pale brown; wings hyaline; veins pale brown.

*Head* : (Fig. 10) 1.3x as wide as mesosoma, uniformly engraved reticulate, finely on lower face and vertex; vertex curving over strongly to occiput. In dorsal view head width 2x length and in front view width 1.3x height; POL 1.6x OOL; temple almost half of eye length; clypeus finely radiately striated, smooth in the centre; anterior margin roundly produced; eyes separated by 1.4x their height; malar space length about half of eye height. Antennae (Fig. 11) inserted almost in the middle of face, scape as long as eye, reaching very little above level of vertex; pedicel plus flagellum length almost equal to head width; pedicel twice as long as wide, third anellus slightly wider; F1 little shorter than pedicel; F2 little longer than F1; clava as long as two preceding segments combined; terminal stylus distinct, sensillae in one row on each segment.

*Mesosoma* : Length 1.6x width with scattered long white hairs; pronotal collar distinctly margined at least medially with a broad smooth strip in posterior half. Mesoscutum width 2.3x length, coarsely

reticulate. Scutellum as long as mesoscutum, little wider than long. Propodeum (Fig. 13) width 1.8x median length, strongly produced posteriorly, median area coarsely reticulate; plicae weakly indicated up to middle; nucha occupying one third length of propodeum; spiracles close to hind margin of metanotum, separated by less than their diameter. Forewing (Fig. 12) length 2.4x width, marginal fringe long; basal vein setate; basal cell closed below; costal cell with a single incomplete row of hairs. Relative lengths : SMV 19, MV 12, PMV 9.5, STV 4.5.

*Gaster* : (Fig. 13) as long as mesosoma, acuminate, sunken dorsally; petiole finely reticulate; T1 occupying one third length of gaster, hind margin curved medially.

*Male* : Length 1.3mm. Resembles female but differs in having antennae with third anellus elongate, equal to first and second combined, flagellum with long hairs and gaster shorter than mesosoma, compressed and broadly ovate towards the tip.

*Holotype* : Female : INDIA : Kerala, Parambikulam wild life sanctuary, Orukomban, 3.xi.1995, Coll. P. M. Sureshan.

*Paratypes* : 1 Female, 1 Male, Kerala, Trichur district, Vazhani, 7.iii.1988; 1 Female, Kerala, Kannur district, Aralam farm, 25.ii.1988; 3 Female, Kerala, Peechi, 5.ii.1989; 2 Female, Kerala, Malampuzha, 16.i.1986; 2 Female, Kerala, Malappuram district, Chungathara, 24.iv.1989; 1 Female, Kerala, Kovalam, 24.ii.1989. Coll. P. M. Sureshan.

*Remarks* : *C. anguloclypea* closely resembles *C. nigricoxa* Kamijo in general morphology, but differs in having antenna with F1 little shorter than pedicel, clava as long as two preceding segments combined, forewing with PMV not much shorter than MV; gaster as long as mesosoma and all coxae testaceous (in *nigricoxa* F1 as long as or slightly longer than pedicel, clava little longer than two preceding segments combined; PMV much shorter than MV; gaster slightly shorter than mesosoma and all coxae blackish).

#### 4. *Callitula travancorensis* sp. nov.

(Figs. 18–20)

*Female* : Length 1.1–1.4mm. (Holotype 1.4mm). Head and mesosoma black; gaster mostly yellowish brown, dark brown towards the tip dorsally and dorsolaterally; antennae dark brown except scape and pedicel testaceous. Legs reddish brown except tips of tarsi darker; tegulae pale brown; wings hyaline; veins pale brown.

*Head* : (Fig. 20) 1.3x as broad as mesosoma, engraved reticulate with broad meshes on upper face and vertex. In dorsal view head width 1.9x length and in front view width 1.3x height; POL 1.7x OOL; temple length 0.4x eye length; anterior margin of clypeus weakly emarginate; malar space length 0.8x eye height; eyes separated by 1.8x their height. Antennae (Fig. 20) inserted a little above middle of face; scape length 1.2x eye height, reaching above level of vertex; pedicel plus flagellum little longer

than head width (22.5 : 21); pedicel slightly longer than F1; clava as long as two preceding segments combined; terminal stylus short.

*Mesosoma* : (Fig. 20) length 1.5x width. Pronotum finely reticulate, anterior margin of collar finely but sharply carinate. Mesoscutum width 2.2x length. Scutellum little wider than long, coarsely reticulate. Propodeum (Fig. 18) with median area coarsely reticulate; plicae less sharp, reaching upto base of nucha; spiracles round, separated by more than their diameter from metanotum. Forewing (Fig. 19) length 2.5x width; basal cell closed below, more hairy towards the distal end; speculum very narrow, almost closed below; costal cell with a single row of hairs. Relative lengths : SMV 18, MV 12, PMV 8, STV 5.

*Gaster* : (Figs. 18, 20) short, ovate, non collapsing, length 0.72x head plus mesosoma combined and 1.5x width in dorsal view; petiole wider than long, shiny, T1 reaching more than one third length (10.5 : 24).

*Holotype* : Female : INDIA : Kerala, Ernakulam, 9.ii.1989, Coll. P. M. Sureshan.

*Paratypes* : 5 Female, Kerala, Palghat district, Agali, 12.xii.1987; 1 Female, Trichur district, Peechi, 5.ii.1989; 2 Female, Shertallai, 14.iv.1988, 27.ii.1989; 1 Female, Quilon district, Chavara, 22.ii.1989; 1 Female, Trivandrum district, Kattakada, 24.ii.1989, Coll. P. M. Sureshan.

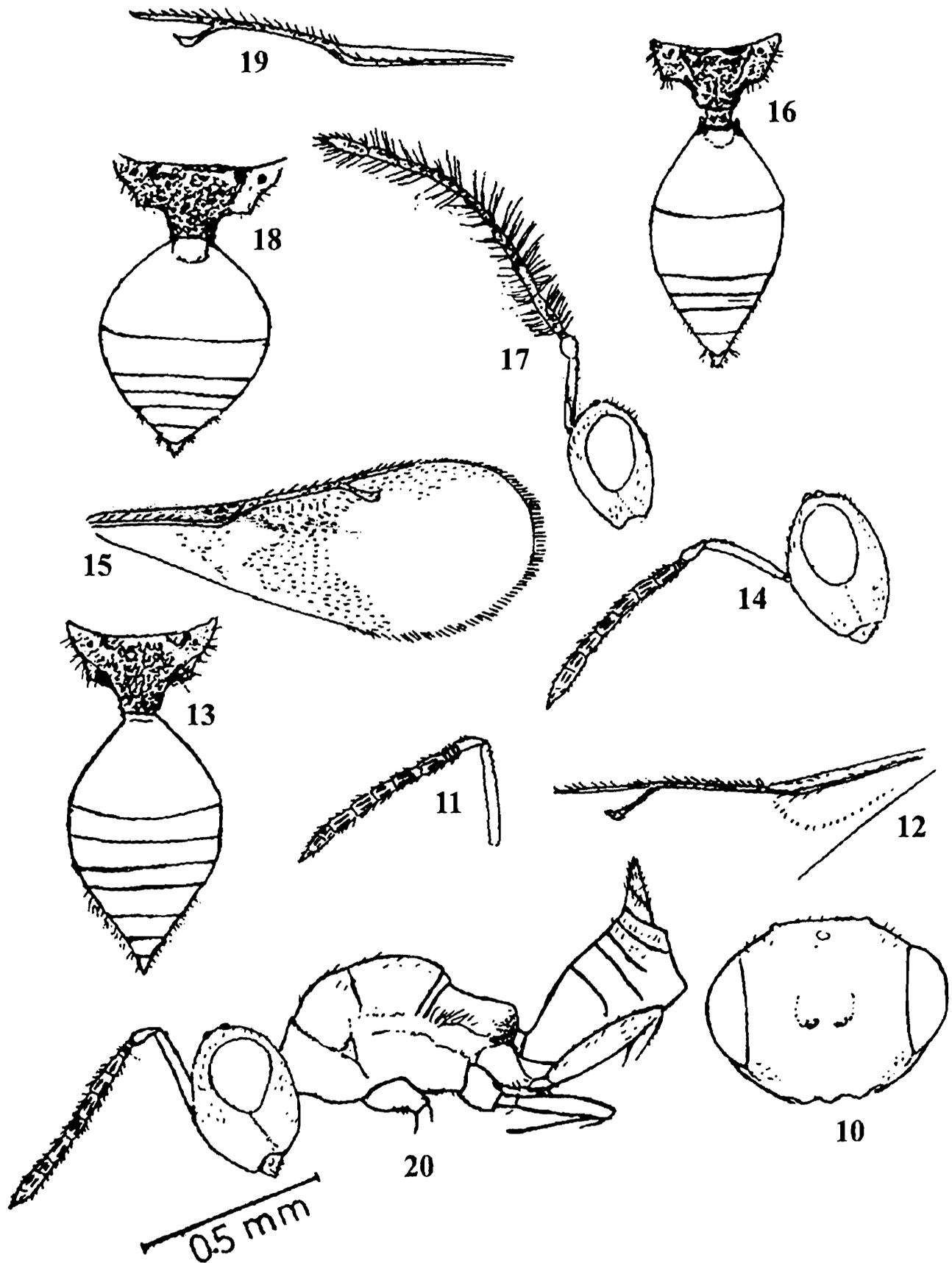
*Remarks* : This species can be distinguished from other species in having antenna with terminal stylus less distinct; forewing with basal cell hairy towards the distal end, speculum very narrow, almost closed below, smaller body size and colour black. In the nature of forewing venation, narrow basal cell and general morphology it resembles *C. nigricoxa* Kamijo but differs in the nature of clypeus, antenna, gaster and colour of coxae.

### 5. *Callitula rugosa* (Waterston)

(Figs. 14–17)

*Trigonogastra rugosa* Waterston, 1915. *Bull. ent. Res.* V. 326–328. M, F. Sri Lanka (BMNH) (examined).

Waterston (1915) described the species based on male holotype and also provided description of female. I have examined the male holotype in BMNH (Type No. BM 5–867) in a very poor condition with only one antenna, gaster, part of one wing and parts of legs. The description of male holotype by Waterston tallies with the type material, but in the description and figures of female the antennal formula is shown as 11263 which is quite unusual for the females of *Callitula* genus which has 11353 in all other known species. It is possible that Waterston (1915) might have misidentified the female. I got males and females of *C. rugosa* in my collection and a redescription of the species is provided here based on my collection.



Figs. 10–20. : 10–13. *Callitula anguloclypea* sp. nov. Female : 10, head in front view; 11, antenna; 12, forewing venation; 13, propodeum and gaster in dorsal view. 14–17. *Callitula rugosa* (Waterston) Female : 14, head and antenna in profile; 15, forewing; 16, propodeum and gaster in dorsal view; 17, male head and antenna in profile. 18–20. *Callitula travancorensis* sp. nov. Female : 18, propodeum and gaster in dorsal view; 19, forewing venation; 20, body in profile.

*Female* : Length 1.5–1.8mm. Head and mesosoma dark metallic blue, almost black; gaster brownish black; scape yellowish brown, remainder of antenna brown; coxae brown; hind coxae darker, remainder of legs testaceous; tegulae pale yellow; wings hyaline, veins pale yellow.

*Head* : (Fig. 14) 1.3x as broad as mesosoma, moderately reticulate. In dorsal view head width 1.8x length and in front view width 1.3x height; temple length 0.53x eye length; POL 1.5x OOL; anterior margin of clypeus slightly emarginate. Antennae with scape reaching above level of vertex, length 1.2x eye height; pedicel plus flagellum length 1.2x head with; F1 little shorter than pedicel; clava little longer than two preceding segments combined.

*Mesosoma* : 1.6x as long as broad. pronotal collar sharply margined, almost smooth. Mesoscutum width 2.3x length, coarsely reticulate. Scutellum medially longer than mesoscutum. Propodeum (Fig. 16) as long as scutellum, median area strongly sculptured; plicae indicated posteriorly, becoming weaker medially; spiracles small, round, separated by their diameter from hind margin of metanotum. Forewing (Fig. 15) length 2.5x width; basal vein hairy; basal cell closed below with few scattered hairs; speculum open below; MV 2x STV; PMV little shorter than MV; underside of forewing with a row of 8 long hairs below MV.

*Gaster* : (Fig. 16) petiole finely reticulate with sharp lateral ridges; gaster 0.8x as long as head plus mesosoma combined and 1.9x as long as broad; T2 large, little longer than half length of T1 dorsally.

*Male* : Length 1.1mm. Closely resembles female but differs in the nature of antenna and gaster; toruli situated higher on face with 2 short anelli and long funicular segments; gaster short, shiny blackish brown with a pale brown spot dorsally, reaching up to middle.

*Remarks* : *C. rugosa* (Waterston) closely resembles *C. yasudai* Kamijo but differs from it in having propodeum as long as scutellum; gastral petiole reaching apices of hind coxae; forewing with MV longer than PMV; propodeum with spiracles separated from hind margin of metanotum by their diameter and gaster 1.9x as long as broad. (in *yasudai* propodeum distinctly shorter than scutellum, petiole not reaching apices of hind coxae; MV about as long as PMV; spiracles separated by less than their diameter from metanotum and gaster 1.5–1.6x as long as broad).

*Material examined* : Holotype : Male : CEYLON : Paradeniya, Coll. Rutherford (BMNH); 7 female, 1 male, INDIA : Kerala, Malappuram district, Chungathara, 24.iv.1989; 2 Female, Kerala, Calicut University campus, 10.iv.1989; 2 Female, Kerala, Payyannur, 26.ii.1988; 4 female, Kerala, Kayamkulam, 21.ii.1989; 1 Male, Kerala, Chavara, 22.ii.1989; Coll. P. M. Sureshan; 1 Male, Kerala, Trivandrum, 24.ii.1989; 1 male, Calicut University campus, 2.iv.1985, Coll. T. C. Narendran & party.

*Host* : Bean fly *Agromyza phaseoli* Coq. (Waterston, 1915).

### SUMMARY

Four new species of *Callitula* Spinola viz. *C. robusta*, *C. keralensis*, *C. anguloclypea* and *C. travancorensis* are described from India. *C. rugosa* (Waterston) is redescribed based on the study of male holotype and other Indian specimens. A key to separate the species of *Callitula* from the Indian subcontinent is provided.

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