

# Description of Three New Species of Oriental *Stilbula* Spinola (Hymenoptera: Eucharitidae) with a Key to Indopacific Species

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**Abstract:** Three new species viz. *Stilbula peethavarna* Narendran sp. nov., *Stilbula lata* Narendran sp. nov. and *Stilbula ashokai* Narendran sp. nov. are described from Oriental Region. A key for the identification of Indo-pacific species is also provided.

**Keywords:** Eucharitidae, *Stilbula*, new species, key to Indo-pacific species.

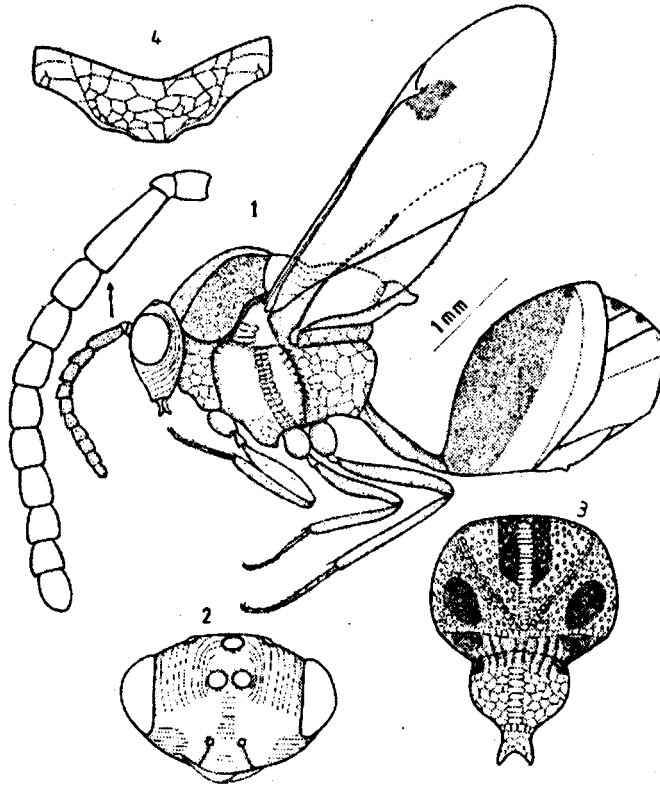
Contributions to our knowledge on the taxonomy of *Stilbula* Spinola of the Indopacific region (including Australia and other islands) were made by Westwood (1874), Cameron (1907, 1909), Girault (1915, 1929), Wheeler and Wheeler (1924), Mani (1935), Watanabe (1958), Mani *et al.* (1974) Hedqvist (1978), Narendran (1985, 1986) and Boucek (1988). Boucek (1988) transferred *Stilbula albipennis* Girault, *Stilbula australiana* Girault, *Stilbula bidentata* Girault and *Stilbula pallidiclava* Girault to *Substilbula* Boucek. The same author also transferred *Schizaspidia manipurensis* Clausen (which was earlier transferred in 1978 by Hedqvist to *Stilbula*) to *Ancylotropus* Cameron. In this present paper we describe three species which are new to science, from the Oriental Region. A key for the identification of Indopacific species is also provided.

## 1. *Stilbula peethavarna* Narendran sp. nov. (Figs. 1-4)

**Holotype Female** Length 5.04 mm. Head blackish green with metallic refringence; thorax pale brownish yellow with following parts metallic brownish green: a pentagonal anteromedian portion of mesoscutum; an oval spot on each scapula and on each axilla and a small spot on mesosternum. Eyes pale brown with darker spots; median ocellus brownish yellow; hind ocelli brownish red. T1 anteriorly black, remaining parts of gaster pale brownish yellow with darker spots on median line of T3, T4 and T5; petiole pale brownish yellow without any dark band or ring; antennae, mandibles and legs pale brownish yellow with slight metallic tinge anteriorly on coxae.

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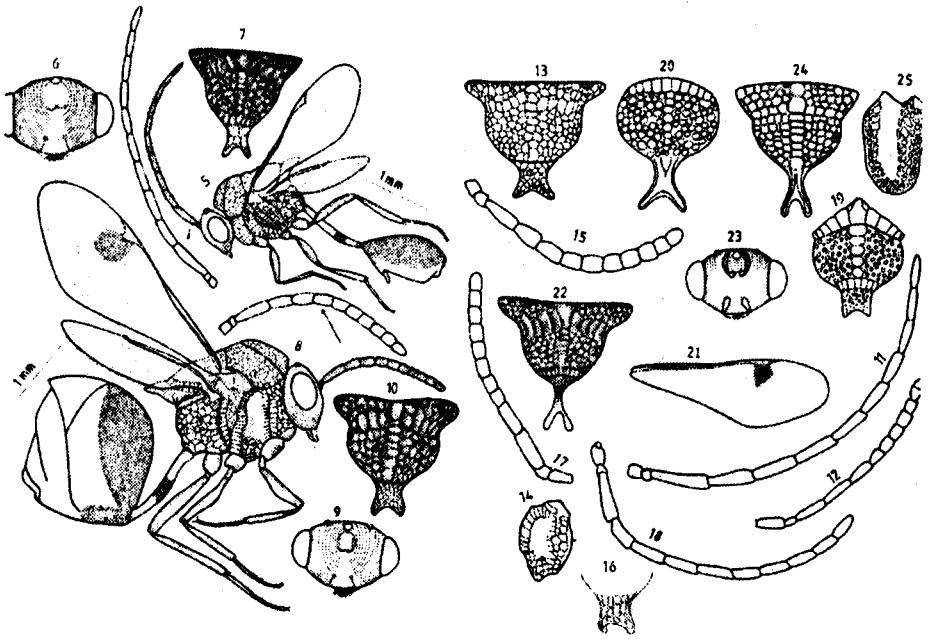
Received in May, 1995



Figs. 1-4. *Stilbula peethavarna* Narendran sp. nov. Female. 1. Side view. 2. Head front view. 3. Thorax dorsal view. 4. Propodeum dorsal view.

Head (Fig. 2) width in anterior view  $1.6\times$  its median length (excluding mandibles); mandibles); POL  $2.2\times$  OOL; vertex striate; face and frons striate as in figure 2; eyes bare; epistomal sulcus indistinct; clypeogenal sulcus and tentorial pits distinct; mouth plate 8 digitate, these radiating outside over mandibles; gena striate obliquely; malar space  $0.7\times$  eye length in profile; eyes separated by  $1.8\times$  its height in front view. Antenna 12 segmented, scape not reaching front ocellus; relative proportions of length and width of antennal segments as follows: scape - 12: 10; pedicel = 8:9; F1= 33: 11; F2= 17:11; F3= 15: 11; F4= 15: 11; F5 = 15 : 11; F6= 14: 11; F7= 14: 11; F8 = 12: 11; F9 = 11: 11; F10 = 14 : 11. Length of flagellum  $1.8\times$  length of head in profile.

Thorax with distinct pits on dorsal side, interstices smooth on sides, carinate in middle; SSS transversely carinate; several longitudinal, raised, carinate ridges connect SSS to base of scutellum, enclosing deep foveolate pits in between ridges; scutellum with a median longitudinal-fovea containing a median longitudinal row of pits, each pit separated from adjacent one by transverse carinate ridge; scutellum with a single



Figs. 5-7. *Stilbula lata* Narendran sp. nov. Male. 5. Side view. 6. Head front view. 7. Scutellum dorsal view. Figs. 8-11. *Stilbula ashokai* Narendran sp. nov. Female. 8. Side view. 9. Head front view. 10. Scutellum dorsal view. 11. Male antenna. Figs. 12-14. *Stilbula peduncularis* Westwood. 12. Female antenna. 13. Female scutellum. 14. Male mesopleuron. 15. *Stilbula octodigitata* Girault female antenna. Figs. 16-17. *Stilbula polyrhachicida* Wheeler and Wheeler female. 16. Scutellar horn. 17. Antenna. Figs. 18-19. *Stilbula mysorensis* (Mani and Dubey) female. 18. Antenna. 19. Scutellar horn. 20. *Stilbula atkinsoni* (Mani and Dubey) Female scutellum dorsal view. Figs. 21-23. *Stilbula tanjorensis* (Mani and Dubey) female. 21. Fore wing. 22. Scutellum dorsal view. 23. Head front view. 24. *Stilbula palawanensis* Hedqvist female scutellum. 25. *Stilbula carolinensis* Watanabe female mesopleuron.

narrow horn directed straight posteriorly, widely incised at apex (Fig. 3); mesoscutum slightly depressed in anterior median portion; prosternum with moderately deep alveolate sculpture; mesopleuron and metapleuron sculptures as in figure 1. Median length from SSS to apical tip of scutellar horn 1.3x maximum width of scutellum in dorsal view; fore and hind coxae subequal in length; hind coxa length 1.3x its width. Forewing (Fig. 1) bare, about 3x as long as broad.

Gaster (Fig. 1) laterally compressed forming a median line of ridge on dorsal side except on T1. Petiole a trifle shorter than hind femur and a little less than half length of remaining part of gaster; petiole a little broader at middle.

*Female* unknown

*Host* unknown

*Holotype* Male. Thailand, Locality Unknown; Coll. Unknown. Deposited in Natural History Museum Wien, Austria.

### Remarks

The species *Stilbula trimaculata* (Cameron) from Borneo (Kalimantan) resembles this new species in the general appearance but differs from *S. peethavarna* in having forewing without fuscous patch or mark adjoining *St.*; in having gastral petiole longer than remaining part of gaster and in having a triangular bluish and violaceous mark on apex of scutellum. The species *Stilbula quinqueguttata* (Girault) from Australia also resembles this new species in the colour of thorax but differs from *S. peethavarna* in having gastral petiole distinctly longer than remaining part of gaster, petiole white with a fuscous ring distad of middle and in having frons finely and circularly striate.

*Etymology* The species name is taken from the Sanskrit words. Peetha = yellow, Varna from 'varnum' meaning colour.

### 2. *Stilbula lata* Narendran sp. nov. (Figs. 5–7)

*Holotype Male* Length 3.3 mm. Head and thorax bluish green with metallic re-fringence; interstices of thorax with slight purple reflections; mandibles, ocelli and antenna pale brownish yellow; eye brownish yellow; coxae brown with apices paler; remaining parts of legs pale yellow; distal part of scutellar teeth brown; gastral petiole pale yellow with darker band near middle, remaining part blackish brown with ventral side slightly paler. Wings hyaline, stigma pale brown; *sm* pale yellow.

Head (Fig. 6) width in anterior view 1.6x its median length (excluding mandibles); POL 2.5x OOL; median ocellus separated from occipital margin by less than its own diameter; frons with distinct oblique and semicircular striations (Fig. 6); clypeal area slightly striate and shiny; supraclypeal area smooth and shiny; epistomal sulcus faintly distinct; clypeogenal sulci and tentorial pits deep and distinct; vertex and scrobe longitudinally and transversely striate, upper part of scrobe rugosopunctate; mouth plate 12 digitate, these radiating outside over mandibles; gena obliquely striated; eyes separated in front view by 1.8x height of eye. Antenna (Fig. 5) 12 segmented; relative proportions of length: width as follows: scape = 4.5: 4.5; pedicel = 3: 4.5; F1 = 21:4.5; F2 = 15:4.5; F3 = 15:4.5; F4 = 15:4; F5 = 14:4; F6 = 13:4; F7 = 13:4; F8 = 12:4; F9 = 12: 4; F10 = 12: 4.

Thorax with mesoscutum and scutellum deeply and closely punctate, interstices carinate; notauli distinct and alveolate; mesoscutum without a median fovea; SSS carinate; scutellum with a median longitudinal fovea; scutellum wider than distance between SSS and frenal carina; each tooth of posterior scutellar process shorter than stalk of scutellar process which is 1.3x as long as its width (Fig. 7). Propodeum completely punctate, interstices carinate, without median carina, callus bare; mesopleuron (Fig. 5) distinctly and closely punctate without a patch of smooth area; fore and mid coxae mostly smooth and shiny. Forewing (Fig. 5) 2.9x as long as its maximum width, without marginal fringe.

Gaster (Fig. 5) (excluding petiole) 1.9x its height in side view; tergites smooth and polished; petiole smooth, distinctly shorter than remaining part of gaster (41: 33), longer than hind femur (23.5: 33), middle part in dorsal view slightly thickened; gaster (excluding petiole) shorter than thorax (41:46).

*Female* Unknown

*Host* Unknown

*Holotype* Male, India, Kerala, Trichur, Coll. T. C. Narendran, 4.xii. 1988 (Dept. of Zoology, University of Calicut; depository DZCU).

*Paratype* Male, India, Kerala, Kayamkulam, coll. T. C. Narendran, 19.ii.1989 (DZCU).

### Remarks

This new species comes near *Stilbula mysorensis* (Mani and Dubey) in general appearance but *S. mysorensis* differs from this new species in having forewing with slight infumation adjoining *st*, scutellar process blunt and straightly bifurcated (Fig. 19) and eyes separated in front view 1.6x height of eye.

*Etymology* The species name is just a combination of letters, feminine gender.

### 3. *Stilbula ashokai* Narendran sp. nov. (Figs. 8–11)

*Holotype Female* Length 4.1 mm. Head and thorax black with metallic green refringence; antenna yellowish brown with scape, pedicel, last two funicular segments and club paler; mandibles pale yellow; ocelli brown; eyes brown with darkish spots; coxae brown, remaining parts of legs straw yellow; tegulae brown; forewing with brown infumation adjoining stigmal vein; stigma dark brown; *sm* yellowish brown; gastral petiole yellow with pale brown band in middle; gaster yellowish brown with T1 black.

Head (Fig. 9) width in anterior view 1.5x its median length (excluding mandibles); POL 2.5x OOL; median ocellus separated from occipital margin by less than its own diameter; frons with more or less oblique and semicircular striations (Fig. 9) extending from ocellar area to supraclypeal and clypeal margins; clypeus and supraclypeal areas smooth; vertex longitudinally striated; scrobe striated on sides, upper part rugosopunctate; mouth plate 14 digitate; gena obliquely striate; malar space in profile 0.6x height of eye; epistomal sulcus indistinct; tentorial pits and clypeogenal sulci distinct and deep; eyes separated by less than 2x height of eye in front view. Antenna (Fig. 8) 12 segmented; relative measurements of the proportions of length: width of segments as follows: scape = 5.5:5; pedicel = 3:5; F1 = 17:5.5; F2 = 11:5; F3 = 10:5.5; F4 = 9:5.5; F5 = 8.5:5.5; F6 = 7.5:6; F7 = 7:6; F8 = 6.5:6; F9 = 6.5:6; F10 = 8:5.

Thorax with mesoscutum and scutellum deeply and closely punctate, interstices carinate; notauli distinct and foveolate; mesoscutum without a median fovea. SSS ecarinate; scutellum wider than the median distance between SSS and carinate frenal groove at base of scutellar process (Fig. 10); width of scutellar stalk subequal to its length (excluding teeth); scutellum with a median longitudinal pitted fovea; mesopleuron (Fig. 8) with a smooth area on anterior half; propodeum completely punctate, interstices carinate, without a median carina, callus bare; fore and mid coxae striate ventrally on sides; hind coxae smooth and shiny. Forewing (Fig. 8) 2.83x as long as its maximum width, without marginal fringe.

Gaster (excluding petiole) shorter than thorax, subglobose and smooth. Petiole smooth, distinctly shorter (45:56) than remaining part of gaster, longer than hind femur (45:38), slightly swollen at middle.

*Male*

Length 3.43 mm. Similar to female except in following: Antennal segments more elongated (Fig. 11); head width 1.6x its length in front view.

*Host* Unknown

*Holotype* Female, India, Kerala, Malampuzha, Coll. T. C. Narendran (DZCU).  
*Paratypes*: 2 females and 4 males of same collection data. 1 female, India, Kerala, Sreekaryam, T. C. Narendran, 25. ii. 1989 (DZCU); 2 females, Kerala, Kayamkulam, T. C. Narendran, 21.ii. 1989 (DZCU).

*Variations* In two paratypes thoracic pleura shows purple tinge in some areas.

*Etymology* The species is named after the wise King ASHOKA of India.

**Remarks**

This new species comes near *Stilbula mysorensis*(Mani and Dubey) in general appearance but *S. mysorensis* differs from this new species in having 1) scutellar teeth not diverging and 2) flagellar segments (Fig. 18) not shorter as in the new species (Fig. 8).

**Key to Indopacific Species of *Stilbula* Spinola (Hymenoptera: Eucharitidae)**

- 1. Female ..... 2.
- Male ..... 13.
- 2. Frons completely striated more or less in a circular manner (Figs. 6, 9)..... 3.
- Frons with longitudinal striations mostly on upper half (Figs. 2, 23)..... 12.
- 3. Petiole with a brownish or blackish ring or band at or near middle, rest of portions pale yellow or white or pale brown..... 4.
- Petiole without a distinct ring or band ..... 9.
- 4. Petiole coriaceous with a lateral carina, 2.5x longer than wide; scape 3x longer than its width, equal in length of F1; F2 a little longer than wide at apex; F5 to F6 quadrate; F7 wider than long; club as long as scape; general colour aeneous; scape, pedicel, legs (except coxae), femora (except apices), club, distal funicular segments and tegulae pale yellow or yellow; scutellum strongly bidentate at apex but not produced posteriorly, teeth short; mouth plate 4 digitate, Australia  
 ..... *S. quadridigitata* Girault
- Petiole distinctly much longer than above; other characters completely or partly different ..... 5.
- 5. Antennal scape (Fig 12) 3x longer than pedicel length; posterior horn of scutellum (Fig. 13) short with diverging teeth; mesoscutum with median longitudinal sulcus; general colour of body coppery green; gaster darkish; legs brownish yellow; femora darker medially, Australia..... *S. peduncularis* Westwood.

- Characters not as in above combinations, partly or completely different . . . . . 6.
- 6. Petiole 5x longer than wide; scape one-fourth longer than its width (Fig. 15), not quite half length of F1; gaster (excluding petiole) longer than petiole; mesoscutum and scutellum with median sulci; posterior horn of scutellum with teeth shorter than basal stalk; general colour purple; legs except coxae yellowish brown; femora darker; scape concolorous with body; plate of mouth 8 digitate, Australia . . . . . *S. octodigitata* Girault
- Characters not as in above combination, partly or completely different . . . . . 7.
- 7. Scutellar horn (Fig. 16) short, one-third length of scutellum, terminating in two short asymmetrical teeth separated by a distance greater than length of each tooth; petiole less than 1.5x length of remaining part of gaster, 4.3x longer than width of petiole; antenna (Fig. 17) with scape a little less than 2x as long as pedicel; forewing without infuscation adjoining *sr*; head and thorax aeneous with antennae and mandibles pale brownish yellow; legs yellow with dark brown hind coxae; gaster (except petiole) dark brown, T1 darker; mouth plate 8 digitate; host: *Polyrhachis dives* F. Smith; Australian . . . . . *S. polyrhachicida* Wheeler and Wheeler
- Scutellar horn not as above; other characters partly or completely different . . . . . 8.
- 8. Scutellar horn (Fig. 19) bluntly and shortly bifurcate; antennal scape (Fig. 18) less than 2x length of pedicel; body black with metallic copper reflections; head black; antenna (Fig. 18) dark brown; forewing with a brown infuscation adjoining *st*.; mouth plate 11 digitate India . . . . . *S. mysorensis* (Mani and Dubey) Scutellar teeth (Fig. 10) diverging; scape 2x as long as pedicel (Fig. 8); head and thorax green with metallic reflections; antenna yellowish brown with scape, pedicel and last two funicular segments and club pale yellow; forewing with large brown infuscation adjoining *st* (Fig. 8); India *S. ashokai* Narendran sp. nov.
- 9. General body colour black; antenna reddish yellow; coxae concolorous with body; petiole finely punctured; scutellar bifids short, thick; forewing smoky apically; head circularly striate on frons and face; female flagellum 9 segmented, 3 preclaval segments transverse; mouth plate 5 digitate; Australia . . . . . *S. arenae* Girault
- Characters not in above combination, partly or completely different . . . . . 10.
- 10. General body colour purplish; legs (except coxae), petiole, tegulae, scape (except ventrally at base) and pedicel white; forewing lightly infuscated from near bend of *sm*; scutellar teeth of posterior projection longer than basal stalk of posterior process of scutellum; median sulcus of scutellum obscure; petiole about 2x longer than its width, finely and longitudinally grooved, narrowed at base; propodeum with a median ruga; mouth plate 8 digitate; scape a little shorter than F1; gaster deeply punctate on sides and apex of T2; Australia

- ..... *S. albipetiole* Girault
- Characters not as in above combination, partly or completely different ..... 11.
- 11. General body colour purple; legs, scape, petiole and gaster brownish yellow; antenna reddish brown; wings clear; base of scutellar process a little longer than wide, longer than teeth; propodeum with a pair of wide median grooves; petiole 3x longer than wide; scape a little shorter than F1; mouth plate 7 digitate; Australia ..... *S. brunneipetiole* (Girault)
- General body colour dark metallic bluish green; head nearly black with blue reflections; antennae brownish black; wings with a diffuse conspicuous infuscation adjoining *st*: coxae concolorous with thorax, rest of legs brown; petiole brownish black to very dark brown; gaster black; scutellar process (Fig. 20) with a 'Y' shaped carina; petiole 0.55x gaster length, smooth, abruptly wider in apical 0.50 part ..... *S. atkinsoni* (Mani and Dubey)
- 12. Head blue; antenna with basal three segments and apical two segments testaceous; thorax yellowish testaceous with a large blue and violaceous almost semicircular (but longer than wide) mark on basal half of mesoscutum; a smaller oblique mark on each scapula; a line on apex touching scutellum; a smaller triangulate mark on apex of scutellum; petiole without any band or ring of dark colour; scutellar process as wide as long at its base with roundly curved forks which diverge obliquely and as long as basal part; petiole as long as thorax; Borneo (Kalimantan) ..... *S. trimaculata* (Cameron)
- Body black with dark green or bluish reflections; petiole pale brown or pale yellow with a pale brown band in middle (band light coloured in some specimens) scutellar process (Fig. 22) distinctly longer than its basal width; petiole shorter than thorax (including length of scutellar teeth); forewing with brown infuscation adjoining *st*; India (in part) ..... *S. tanjorensis* (Mani and Dubey)
- 13. Forewing with brown infuscation adjoining *st* ..... 14.
- Forewing without brown infuscation adjoining *st* ..... 19.
- 14. Gastral petiole longer than (or equal to) remaining part of gaster ..... 15.
- Gastral petiole distinctly shorter than remaining part of gaster ..... 17.
- 15. Gastral petiole without a ring of brown or pale brown or black colour; head and thorax blue with dark green reflections, the blue on pleurae with slight violaceous tinge; pronotum without a yellow colour; basal part of scutellar process longer than apical forks which are roundly curved; Borneo (Kalimantan) ..... *S. leucopoda* (Cameron)
- Gastral petiole with a median brown or pale brown band or ring; other characters partly or completely different ..... 16.



16. General body colour yellowish brown with following parts as follows: head, propodeum (except anterolaterally), metapleuron, mesopleuron (except dorsally), venter of meso and metathorax, coxae, venter of prothorax anterior to coxa; scutellar teeth (except base), a large hive-shaped spot at anterior margin of mesoscutum at meson, reaching middle, an oblique ovate spot a little posterior of middle of each scapula, dark metallic purple with bronze reflections; petiole and legs white, the former broadly ringed with fuscous colour distad of middle; rest of body yellowish brown with dorsum of gaster jet black; scutellum armed with a quadrate stalk which is longer than each teeth; Australia  
 ..... *S. quinqueguttata* (Girault)
- General body colour not as above; head and thorax green with purplish and golden green reflections on thorax; pronotum yellow with a green spot anterior to fore coxae; area of fused prepectus green; legs yellow with basal part of coxae brown; tegula yellow; petiole yellow with brown reflection medially; gaster dorsally dark brown, ventrally yellowish brown; stalk of scutellar process (Fig. 24) longer than teeth; Philippines ..... *S. palawanensis* Hedqvist
17. General body colour pale brownish yellow with following parts as follows: head, a pentagonal area at anterior margin of mesoscutum at meson reaching middle; an oblique ovate spot a little posterior of middle of each scapula, a transverse elliptical spot on each axilla, metallic brownish green; T1 black anteriorly; T3 to T5 with blackish spots on median line (Fig. 1); mouth plate 8 digitate, Thailand ..... *S. peethavarna* Narendran sp. nov.
- General body colour not as above, completely different ..... 18.
18. Frons with longitudinal striations weak and seen mostly on upper half; scutellum with a slender stalk (Fig. 22) diverging into elongated spines; body black with dark green or blue metallic reflections; India  
 ..... (in part) *S. tanjorensis* (Mani and Dubey)
- Frons with longitudinal striations not weak and seen on upper and lower halves of frons (Fig. 9); scutellar process entirely different (Fig. 10)  
 ..... *S. ashokai* Narendran sp. nov.
19. Gastral petiole shorter than remaining part of gaster ..... 20.
- Gastral petiole longer than remaining part of gaster ..... 24.
20. Gastral petiole with dark ring or band medially or submedially ..... 21.
- Gastral petiole of uniform colour ..... 22.
21. Posterior process of scutellum (Fig. 22) with a slender elongated stalk; *st* distinct; mesopleuron with a large smooth area, stalk of scutellar process brown with teeth paler; head and thorax shiny bluish green with a few striations reaching below antennal toruli; mouth plant 8 or 9 digitate; India  
 ..... (in part) *S. tanjorensis* (Mani and Dubey)

- Posterior process of scutellum (Fig. 7) stouter; *st* not as distinct (Fig. 5) as above; mesopleuron rugosopunctate (Fig. 5); stalk of scutellar process and teeth concolorous with thorax which is bluish green; mouth plate 14 digitate; India ..... *S. lata* Narendran sp. nov.
- 22. Head bare, shiny, frons closely covered with round curved striae which become weaker on lower half; scutellar process thick and broad at base, spines longer than broad, diverging; general body colour green, largely variegated with blue, brassy and purple tints; legs pale brownish yellow; antennae brownish yellow, darker at base and thickly covered with stiff fuscous hairs; mesoscutum with clearly defined furrows; gastral petiole smooth and shiny; Sechelles  
..... *S. insularis* Cameron
- Characters not as in above combination, partly or completely different ..... 23.
- 23. Body generally black with dark metallic green reflections; head black; coxae concolorous with thorax; rest of legs brown; antennae brownish yellow; gaster dark metallic green, terminal segment somewhat brown along margins; head coarsely and umbilicately punctate; antenna with dense pubescence; pedicel short and transverse; forewing with *st* sessile; *pm* very long; scutellar process bidentate, about as long as gastral petiole; India ..... *S. Indica* (Mani)
- Body generally purple; legs except coxae yellowish brown; femora red-brown; gastral petiole concolorous with body; antenna with a conspicuous spicule at apical segment; F1 three times longer than broad, mesoscutum with less distinct shallow median groove than that of scutellum; mouth plate 10 digitate; Australia  
..... *S. toga* Girault
- 24. Gastral petiole white with a median black ring; scutellar process formed (Fig. 13) with teeth subequal in length to basal stalk; mesoscutum with a median longitudinal sulcus; gaster black; mesopleuron with a smooth median portion (Fig. 14); gaster 1.1 to 1.31x as long as petiole; Australia  
..... *S. peduncularis* Westwood
- Gastral petiole not as above; other characters partly or completely different ... 25.
- 25. Head blue, basal 3 segments and apical 2 segments of antenna yellowish brown with the apical ones more rufous than basal ones; thorax yellowish brown with a large blue and violaceous almost semicircular mark (longer than wide) on basal half of central mesoscutum, a similar coloured oblique mark (longer than wide with rounded base) on each scapula, a bluish violaceous line on apex touching scutellum, a bluish violaceous triangular mark on apex of scutellum; mesopleuron smooth with a broad band of stout longitudinal striae at base; Kalimantan (=Borneo)..... *S. trimaculata* (Cameron)
- Head and thorax metallic green, antennae yellowish brown with basal two segments paler; thorax with yellow colour; mesopleuron with a narrow long smooth area (Fig. 25), without a basal band of striae; mouth plate 8 digitate; Caroline Islands ..... *S. carolinensis* Watanabe

### Acknowledgements

We thank Dr. Michael Madl of Natural History Museum, Wien, Austria and Dr. David Wahl of American Entomological Institute, Gainesville, Florida for loan of several specimens of Eucharitidae. I am also grateful to Dr. John Heraty of Biosystematic Research Centre, Canada, to Dr. John La Salle and to Dr. John S. Noyes (of CAB International Institute of Entomology and The Natural History Museum respectively) of London and to Dr. I. D. Naumann of CSIRO, Canberra City, Australia for sending photocopies of some valuable papers of literature which were not readily available to me. The junior author is grateful to Council of Scientific and Industrial Research, New Delhi for financial help.

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