



Rec. zool. Surv. India : 111(Part-4) : 1-7, 2011

## SIX NEW SPECIES OF TETRASTICHINAE (HYMENOPTERA : CHALCIDOIDEA : EULOPHIDAE) FROM ARUNACHAL PRADESH (INDIA)

T.C. NARENDRAN AND P.M. SURESHAN\*

C/O Department of Zoology, University of Calicut, Kerala-673635, India

\*Western Ghat Regional Centre, Zoological Survey of India, Kozhikode-673006, Kerala, India

E-mail : drtcnarendran@yahoo.com

### INTRODUCTION

The Subfamily Tetrastichinae of the Eulophidae was recently studied by Narendran (2007) in a preliminary taxonomic revision. Since then the second author of this paper (PMS) had collected several specimens of Tetrastichinae from North eastern part of India viz. Arunachal Pradesh which belongs to the hot-spot areas of biodiversity. Among these collections six species belonging to the genera *Aprostocetus* Westwood and *Tetrastichus* Haliday are found to be new to science. These new species do not fit to the keys by Narendran (2007) and to any of the described species of Oriental and Palearctic region (Narendran, 2005, 2007, Narendran *et al.*, 2004, Graham, 1987, 1991, Noyes, 2003).

### MATERIAL AND METHODS

The specimens were collected and curated by methods described by Narendran (2001). The card mounted specimens were studied in the laboratory using Leica Stereozoom microscope (MZ6). The holotypes are deposited in the Western Ghat Regional Centre, Zoological Survey of India, Kozhikode-673635, India (ZSIK).

*Abbreviations used* : AOL = Distance between front ocellus and hind ocellus; CC = Costal cell; EH = Eye height; EL = Eye L = Length; EPM = Epipygium (= T7) F1 to F4 = Funicular segments 1 to 4; L = Length; LOL = diameter of hind ocellus; MV = Marginal vein; MS = Malar sulcus; OOL = Ocellocular distance; OPS = Ovipositor sheath; PMV = Postmarginal vein; SLG = Sublateral groove(s) of scutellum; SMG = Submedian groove(s) of scutellum; SMV = Submarginal vein; STV = Stigmal vein; T1 to T7 = Gastral tergites 1 to 7; W = Width; WIOS = Width of interocular space.

### DESCRIPTION

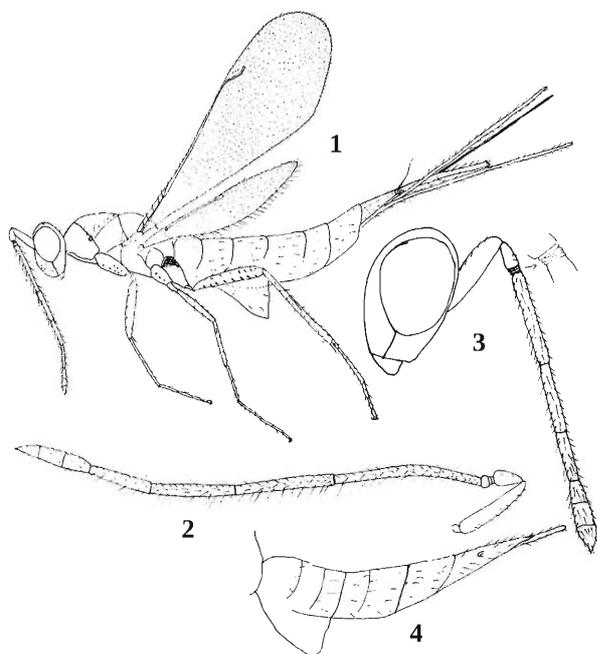
#### 1. *Aprostocetus barnallicus* sp. nov.

(Figs. 1 & 2)

*Female* (Holotype) : L (including ovipositor sheath) : 5.82 mm; OPS 1.8 mm. Black with metallic green refringence except the following parts : eyes and ocelli dark brown; cervix pale yellow; posterior margin of pronotum pale; scape pale yellow; pedicel and anelli pale brownish yellow; lower margin of clypeus and gena pale brownish yellow; mandibles light brown; legs pale whitish yellow except base of hind coxa which is black with metallic green refringence; pretarsi dark brown; ovipositor sheath black; ovipositor pale brownish yellow.

*Head* : W in anterior view as long as its height, W in dorsal view 2x its L; frons and vertex weakly reticulate, lower margin of clypeus with two teeth medially; each mandible with two teeth visible; POL 1.75x OOL; AOL shorter than OOL; LOL slightly longer than AOL but shorter than OOL; WIOS 3.14x POL; MS distinct, 0.38x height of eye in profile; eye L in profile 0.69x its height. Antennal formula 11343; third anellus longer than first and second; scape exceeding level of vertex; relative L : W of antennal segments: scape 28 : 5; pedicel 10 : 5; F1 = 50 : 4; F2 = 35 : 4; F3 = 30 : 4; F4 = 23 : 4; clava = 28 : 5.

*Mesosoma* : Pronotum weakly reticulate, cross carina or ridge absent; posterior margin weakly concave with a row of 12-14 setae; 1.8x as broad as long; spiracle at joining corner with mesoscutum well visible from dorsal side; mesoscutum with 5 adnotaular setae, median longitudinal sulcus absent; surface weakly reticulate, mostly smooth and shiny, median lobe of mesoscutum slightly longer than wide; scutellum with sculpture as



**Figs. 1-2.** *Aprostocetus barnallicus* Narendran & Sureshan sp. nov. Female : 1. Body Profile; 2. Antenna.

**Figs. 3-4.** *Aprostocetus neovanilae* Narendran & Sureshan sp. nov. Female : 3. head and antenna profile; 4. Gaster.

on mesoscutum, slightly wider than long; W of space between SMG half its L; SMG deep, dorsellum mostly smooth and shiny with faint aciculations; propodeum faintly reticulate; median carina present; spiracle partly covered, separated from metanotum by a distance more than its diameter; each callus with 4-5 setae; prepectus reticulate; legs with stout setae (with their bottom (each seta arising from a slightly raised brown spot). Forewing 2.97x as long as wide; speculum closed behind cubital line of setae; forewing not exceeding beyond EPM; relative L of CC = 20; SMV = 15; MV = 43; PMV = 0; STV = 8; SMV with 4-5 dorsal setae.

*Metasoma* (excluding OPS and ovipositor) : 2.8x L of mesosoma; EPM relatively very long, 0.38x length of gaster, 1.2x as long as hind tibia; OPS 0.91x length of hind tibia; hypopygium not exceeding beyond T3.

*Male* : Unknown.

*Host* : Unknown.

*Etymology* : Named after its locality Barnalla.

*Material examined* : Holotype Female : India : Arunachal Pradesh, Namdapha National Park, Barnalla, N.27° 32' 18.8", E.96°28' 36.9" Alt. 808 mtrs; 07.xi.2009, P.M. Sureshan.

*Discussion* : This new species comes near *Aprostocetus percaudatus* (Silvestri) in the key to

species of *Aprostocetus* by Narendran (2007) but differs from it in having : (1) antenna with 3 anelli (in *A. percaudatus* antenna with 4 anelli); (2) EPM 3.5x as long as preceding tergite (in *A. percaudatus* EPM shorter than half of preceding tergite); and (3) hind coxa only basally concolorous with mesosoma (in *A. percaudatus* hind coxa completely concolorous with mesosoma).

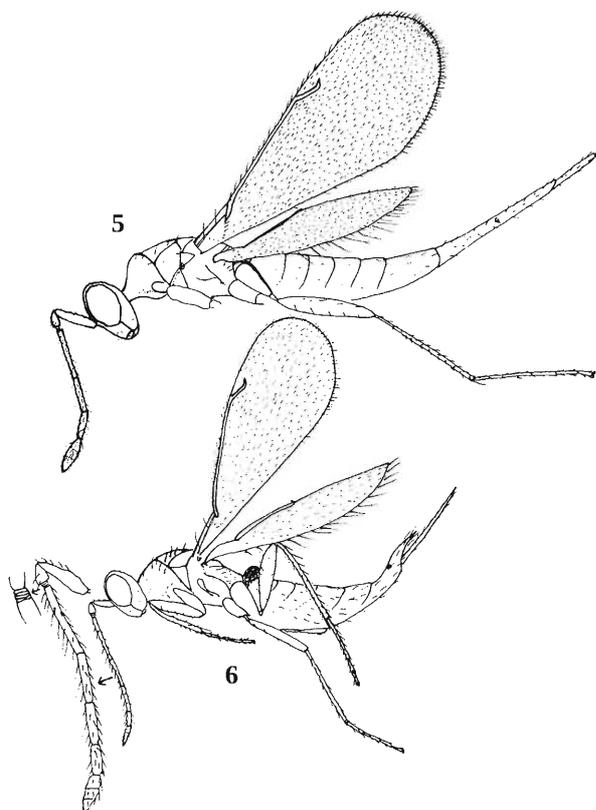
This new species comes near *Aprostocetus vanilae* Narendran in general appearance but differs from it in having: antenna with 3 anelli (in *A. vanilae* antenna with 4 anelli); 2) distal most anellus much larger than preceding ones (in *A. vanilae* all anelli subequal or equal in size); 3) SMV with 4-5 dorsal setae (In *A. vanilae* SMV with 2 dorsal setae); and 4) General body colour more blackish with metallic refringence (in *A. vanilae* general body colour more yellowish brown with metallic green refringence on mesosoma and brightly on metasoma).

This new species comes near *A. elongatus* Graham in the key to species by Graham (1987) but differs from it in having (1) POL 1.75x OOL (in *A. elongatus* POL approximately equal to OOL); (2) pedicel 0.1x length of F1 (in *A. elongatus* pedicel 2x length of F1); (3) F1 longest (in *A. elongatus* F1 not longest); and (4) body with metallic refringence (in *A. elongatus* body without metallic refringence).

## 2. *Aprostocetus neovanilae* sp. nov. (Figs. 3 and 4)

*Female* (Holotype): L : 2.85 mm (excluding ovipositor sheath and ovipositor); black with slight metallic green refringence on head and mesosoma except following parts as follows: eyes brown; ocelli pale reflecting yellow; scape, pedicel and anelli pale yellow; remaining antennal segments black; cervix pale yellow; anterior-lateral part of pronotum yellow; ventral part of promesosoma yellow; Prepectus and parts of meso and metapleura yellowish brown; legs including hind coxa completely yellow; wings hyaline, veins pale brown.

*Head* : W in anterior view 1.1x its height; W in dorsal view 2.46x its L; frons moderately aciculate-reticulate; vertex faintly reticulate, shiny; lower margin of clypeus bilobed; mandible bidentate; POL 2x OOL; AOL shorter than OOL; LOL slightly longer than AOL; WIOS 2.83x POL; MS distinct, 0.29x height of EH in profile; EL in profile 0.77x EH. Antennal formula 11433; scape exceeding level of vertex; relative L : W of antennal segments: scape = 31:8; pedicel = 9:5; F1 = 34:4; F2 = 24 : 4; F3 = 18 : 4; clava = 26 : 7.



**Fig. 5.** *Aprostocetus arunachalicus* Narendran & Sureshan sp. nov. Female : Body Profile.

**Fig. 6.** *Aprostocetus namdaphicus* Narendran & Sureshan sp. nov. Female : Body profile.

**Mesosoma :** Pronotum weakly reticulate; cross carina or ridge absent, 1.56x as broad as long; spiracle not well visible from dorsal side; mesoscutum moderately reticulate, median sulcus absent, with 5 adnotular setae on either side; median lobe of mesoscutum as long as wide; scutellum reticulate as in mesoscutum, a little wider than long; W of space between SMG half its L, nearer to each other than to SLG; dorsellum slightly reticulate; propodeum weakly reticulate; median carina present; spiracle separated from metanotum by more than its diameter; each callus with 3-4 setae; prepectus faintly reticulate; legs with setae weaker than that of *Aprostocetus barnallicus*; forewing 2.7x as long as wide, slightly exceeding tip of ovipositor sheath; speculum relatively smaller, closed behind by cubital line of setae; SMV with 2 dorsal setae; relative L of CC = 12; SMV = 9; MV = 20; PMV = 4.

**Metasoma :** L (excluding ovipositor sheath and ovipositor) 2.2x length of mesosoma, EPM 0.31x length of gaster, 0.77x length of hind tibia; ovipositor sheath 0.4x as long as EPM in dorsal view, 0.44x length of hind tibia; hypopygium not exceeding T3.

**Male :** Unknown.

**Host :** Unknown.

**Etymology :** Named after *Aprostocetus vanilae* Narendran.

**Material examined :** Holotype Female, India, Arunachal Pradesh, Namdapha National Park, Barnalla N27°32' 18.8" E96°26' 27.5" Alt. 808 mtrs. 07.xi.2009; P.M. Sureshan (ZSIK).

**Discussion :** This species comes near *Aprostocetus vanilae* Narendran in general appearance but differs from it in having : (1) mesoscutum with median sulcus absent (in *A. vanilae* mesoscutum with median longitudinal sulcus present); (2) colour black with slight metallic green refringence (in *A. vanilae* general body colour yellowish brown with metallic green refringence on mesosoma and slightly on gaster); (3) mesoscutum with 5 adnotular setae on each side (in *A. vanilae* mesoscutum with 2 adnotular setae on either side); and (4) POL 2x OOL (in *A. vanilae* POL 2.6x OOL).

This new species differs from *A. percaudatus* in having : (1) ovipositor sheath 0.11x length of gaster (in *A. percaudatus* ovipositor sheath 0.70x longer than whole L of body); (2) SMV with 2 dorsal setae (in *A. percaudatus* SMV with 3-5 dorsal setae); and (3) hind coxa yellow (in *A. percaudatus* hind coxa concolorous with mesosoma, not yellow).

### 3. *Aprostocetus arunachalicus* sp. nov.

(Fig. 5)

**Female (Holotype) :** L : 4.36 mm. Black with metallic green refringence, except the following parts : eyes grey; ocelli pale brown; scape and pedicel pale yellow, anelli and scape brown; remaining antennal segments black; cervix pale yellow; anterior-lateral part of pronotum yellow; legs including all coxae completely pale yellow; wings hyaline with veins pale yellowish brown.

**Head :** Width in anterior view slightly longer than its height, W in dorsal view 2.4x its L; frons and vertex faintly aciculate - reticulate, mostly shiny; lower margin of clypeus weakly bidentate; mandibles with two teeth visible; POL 1.75x OOL; AOL shorter than OOL; WIOS 3x POL; malar sulcus distinct, not curved, 0.29x height of eye in profile; L of eye in profile 0.64x its height. Antennal formula 11433; scape exceeding a little over level of vertex; relative L : W of antennal segments : scape 13 : 3; pedicel = 6 : 3; F1=15 : 2; F2=11 : 2; F3 = 8 : 2; clava = 11 : 4.

*Mesosoma* : Pronotum weakly reticulate, 1.57x as broad as long; cross carina or ridge absent; spiracle visible from dorsal side; mesoscutum weakly reticulate; median longitudinal sulcus absent; median lobe of mesoscutum as broad as long, with 3 stout, sub erect adnotaular setae on either side; scutellum moderately reticulate, SMG slightly nearer to SLG than each other; W of space between SMG 0.33x its L; dorsellum 0.42x as long as scutellum; propodeum weakly reticulate with a complete median carina; spiracle relatively smaller separated from metanotum by about its diameter; each callus with 3 setae; prepectus with raised reticulation; legs with weaker setae than those of *A.barnallicus* sp.nov. Forewing 2.7x as long as broad, not exceeding EPM; speculum small, closed behind by cubital line of setae; SMV with 2 dorsal setae; relative L of CC = 16; SMV = 13; MV = 39; PMV = 0; STV = 8.

*Metasoma* : Sessile, 2.4x as long as mesosoma (excluding OPS); EPM 0.44x length of gaster 1.31x as long as hind tibia; OPS 0.36x length of EPM, 0.43x length of hind tibia; hypopygium exceeding T3.

*Male* : Unknown.

*Host* : Unknown.

*Material examined* : Holotype Female, India, Arunachal Pradesh, Namdapha National Park, Barnalla, N 27° 32' 18.8" E 96° 26' 27.5" Alt. 808 mtrs., 07.xi.2009, P.M. Sureshan (ZSIK).

*Discussion* : This species comes near *Aprostocetus neovanilae* in general appearance but differs from it in having : (1) forewing not exceeding tip of ovipositor sheath (in *A. neovanilae* forewing not at all exceeding tip of ovipositor sheath (not even exceeding tip of epipygium); (2) mesoscutum with 3 stout adnotaular setae on each side (in *A. neovanilae* mesoscutum with 5 adnotaular setae on each side); (3) epipygium 1.31x as long as hind tibia (in *A. neovanilae* epipygium 0.77x as long as hind tibia).

This new species does not fit to the key to species of *Aprostocetus* by Narendran (2007) and Graham (1987).

#### 4. *Aprostocetus namdaphicus* sp. nov.

(Fig. 6)

*Female* (Holotype) : L (excluding OPS) 3.8 mm. Black with slight metallic green refringence except the following parts as follows : eyes grey; ocelli dark brown; scape pale yellow with dorsal margin dark; pedicel pale yellow with dorsal part darker; remaining antennal segments black; tegula pale yellow; legs pale yellow with base of hind coxa brownish black and pretarsi

dark brown; wings hyaline with veins pale brownish yellow.

*Head* : W in anterior view slightly more than its height (34 : 32); W in dorsal view 2x its L; frons and vertex faintly aciculate-reticulate; lower margin of clypeus distinctly bidentate; POL 2x OOL; AOL slightly shorter than OOL; LOL longer than OOL; WIOS 3.25x POL; malar sulcus distinct, 0.36x height of eye in profile; eye L in profile 0.64x its height. Antennal formula 11443; scape exceeding level of vertex; relative L : W of antennal segments : scape = 17 : 4; pedicel = 6 : 4; F1 = 21 : 3; F2 = 15 : 3; F3 = 13 : 3; F4 = 9 : 3; clava = 12 : 4.

*Mesosoma* : Pronotum faintly reticulate with 10 stout sub erect setae near posterior margin and some scattered setae; spiracle visible from dorsal side; pronotum 1.7x as wide as its L; mid lobe of mesoscutum W subequal to its L, without a median longitudinal sulcus, with 5 adnotaular setae on either side; scutellum a little wider than long (10 : 9); SMG as nearer to SLG as each other; dorsellum weakly aciculate, 0.33x as long as scutellum; propodeum granulate, median carina complete; spiracle relatively small, rim exposed, separated from metanotum by its own diameter; each callus with 3 setae; prepectus distinctly reticulate; hind femur and tibia with stout setae; setae of fore and mid legs slender; forewing 2.75x as long as broad, a little exceeding tip of EPM; speculum closed behind by cubital line of setae; relative L of CC = 16; SMV = 14; MV = 36; PMV = 0; STV = 7.

*Metasoma* : 1.76x as long as mesosoma (excluding OPS); EPM 0.35x length of gaster, 0.58x length of hind tibia; ovipositor sheath 1.33x length of EPM in side view, 0.9x length of EPM in dorsal view, distinctly shorter than hind tibia in dorsal view; hypopygium distinctly exceeding T3.

*Male* : Unknown.

*Host* : Unknown.

*Material examined* : Holotype Female, India, Arunachal Pradesh, Namdapha, Hornbill, N 27° 32' 17.6" E 96° 26' 30.2" Alt. 585 mtrs., 04.xi.2009, P.M. Sureshan.

*Discussion* : This new species comes near *Aprostocetus neovanilae* in general appearance of gaster but differs from it in having : (1) antenna with 4 funicular segments (in *A. neovanilae* antenna with 3 funicular segments); (2) hind coxa with base brownish black (in *A. neovanilae* hind coxa completely yellow); (3) ventral part of promesosoma black with metallic green refringence (in *A. neovanilae* ventral part of promesosoma yellow) and (4) hypopygium exceeding T3 (in *A. neovanilae* hypopygium not exceeding T3).

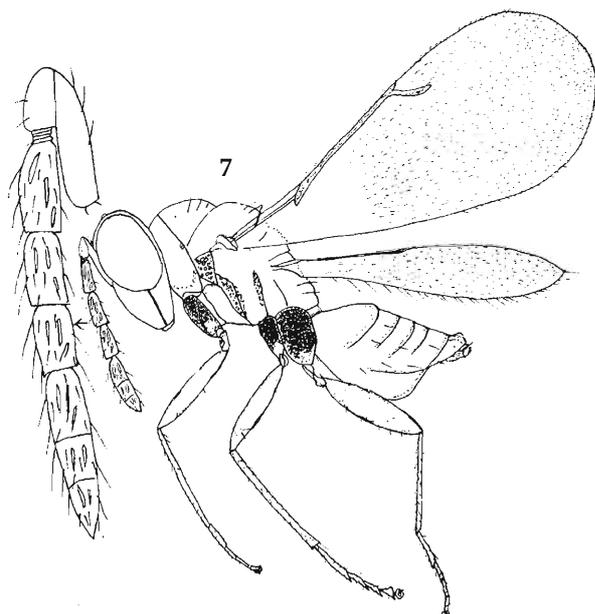
5. *Tetrastichus anamikicus* sp. nov.

(Fig. 7)

*Female* (Holotype) : L : 1.29 mm. Black with following parts as follows : eyes and ocelli brown; scape pale yellow; pedicellus yellowish brown; all remaining antennal segments concolorous with head; legs pale yellow with all coxae concolourous with body except their pale apices; wings hyaline with veins pale brownish yellow.

*Head* : W in anterior view subequal to its height, W in dorsal view 2.17x its L; frons and vertex distinctly reticulate; lower margin of clypeus bilobed; POL 2.8x OOL; AOL subequal to OOL; LOL shorter than OOL; WIOS 2x POL; malar sulcus distinct, straight, 0.48x height of eye in profile; L of eye in profile 0.62x its height. Antennal formula 11433; scape not reaching level of vertex; relative L : W of antennal segments : scape = 34 : 8; pedicel = 16 : 8; F1 = 23 : 10; F2 = 18 : 10; F3 = 17 : 10; clava = 43 : 10.

*Mesosoma* : Pronotum distinctly reticulate, mesoscutum with raised reticulation, spiracle visible from dorsal side but not projecting sideward; median longitudinal sulcus complete, with 3 suberrect adnotaular setae on either side; median lobe of mesoscutum 1.25x as broad as its L; scutellum 1.33x as broad as long, with 2 pairs of stout suberrect setae; SMG nearer to SLG than to each other; W of space between SMG 0.44x its L; propodeum with median carina



**Fig. 7.** *Tetrastichus anamikicus* Narendran & Sureshan sp. nov. Female : Body profile.

and bifurcated paraspiracular carina, surface distinctly reticulate on anterior part and on inner part adjoining outer branch of paraspiracular carina, remaining part mostly smooth or faintly reticulate; spiracle separated from metanotum by its own diameter; prepectus reticulate; hind coxa coarsely and irregularly carinate-reticulate on dorsal part. Forewing 2.33x as long as broad; speculum open behind, relative L of CC = 20; SMV = 18; MV = 31 : PMV = 2; STV = 9; SMV with a single dorsal seta.

*Metasoma* : Petiolate, 0.83x length of mesosoma, petiole 0.27x length of hind coxa, broader than long; ovipositor sheath hardly visible from dorsal side; hypopygium exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Etymology* : Named after area Anamika Water Falls, Arunachal Pradesh.

*Material examined* : Holotype Female, India, Arunachal Pradesh, Namdapha National Park, Deban, Anamika Falls, N 27° 29' 30" E 96° 22' 32.4" Alt. 410 mtrs., 2.xi.2009, P.M.Sureshan (ZSIK).

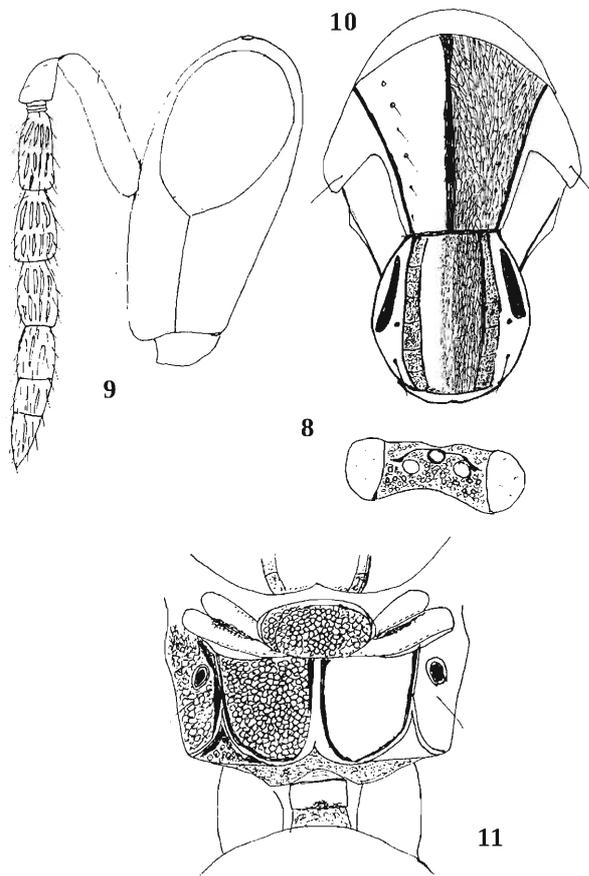
*Discussion* : This species comes near *Tetrastichus iaricus* Narendran in the key to species of *Tetrastichus* by Narendran (2007) but differs from it in having : (1) F1 distinctly longer than F2 (in *T. iaricus* F1 equal in L to F2); (2) gaster distinctly shorter than mesosoma (in *T. iaricus* gaster as long as mesosoma); (3) body without metallic refringence (in *T. iaricus* body with metallic green or blue refringence); (4) propodeal spiracle separated from metanotum by its own diameter (in *T. iaricus* propodeal spiracle almost touching metanotum); (5) MV 3.44x as long as STV (in *T. iaricus* MV 5x as long as STV) and (6) speculum open behind (speculum closed behind by setae in *T. iaricus* ).

6. *Tetrastichus ramakrishnae* sp. nov.

(Figs. 8-11)

*Female* (Holotype) : L 2.43 mm. Black except following parts : eyes and ocelli brown, scape pale yellow; pedicel and anelli pale brownish yellow; remaining antennal segments black; apices of femora, tibia completely and all tarsi pale yellow, remaining parts of femora, trochanters coxae completely and pretarsi concolourous with mesosoma; wings hyaline with veins pale yellowish hyaline.

*Head* : W in anterior view 1.11x its height; W in dorsal view 2.6x its L; frons reticulate with shallow scattered setigerous pits on upper frons, vertex with coarse pits and reticulation; a distinct cross carina



**Figs. 8-11.** *Tetrastichus ramakrishnae* Narendran & Sureshan sp. nov. Female : 8. Head dorsal view; 9. Head and antenna profile; 10. Mesosoma dorsal view (partly); 11. Propodeum & Petiole dorsal view.

present on anterior half of vertex (Fig. 8) anterior to ocelli; posterior part vertical; POL 2x OOL; AOL shorter than OOL; LOL subequal to OOL; WIOS 3.25x POL; malar sulcus straight, 0.64x height of eye in profile; eye L in profile 0.67x its height; each eye with 3- 4 widely spaced short hairs. Antennal formula 11333; scape not exceeding level of vertex; relative L : W of antennal segments : scape = 39: 8; pedicel = 12 : 8; F1 = 20 : 9; F2 = 18 : 10; F3 = 16 : 10; clava = 37 : 10.

**Mesosoma :** Pronotum raised reticulate, spiracle visible; mesoscutum with distinct longitudinal raised reticulation, with a complete deep median longitudinal sulcus, with 6 adnotaular setae on either side; W of median lobe of mesoscutum subequal to its L; scutellum similarly sculptured as in mid lobe of mesoscutum; SMG broad and foveolate (Fig. 10) nearer to SLG than to each other; W between SMG 0.4x its L; dorsellum distinctly reticulate; propodeum distinctly reticulate; spiracle separated from metanotum by a distance shorter than its diameter; prepectus with raised

reticulation; hind coxa coarsely reticulate and irregularly carinate. Forewing 2.4x as long as wide, speculum open behind; relative L of CC = 24; SMV = 18; MV = 20; PMV = 0; STV = 8.

**Metasoma** as long as mesosoma, petiole wider than long, 0.38x length of hind coxa, anterior half of petiole smooth, posterior half reticulate; OPS not visible from dorsal side; EPM shorter than half of T6.

**Male :** Unknown.

**Host :** Unknown.

**Etymology :** Named after Dr. Ramakrishna, former Director, Zoological Survey of India for his encouragement and support for this work.

**Material examined :** Holotype Female: India, Arunachal Pradesh, Namdapha, Barnalla, N 27° 32' 18.8" E 96° 26' 27.5" Alt. 808 mtrs., 07.xi.2009, P.M. Sureshan (ZSIK).

**Discussion :** This species comes to *Tetrastichus vayalicus* Narendran in the key to species by Narendran (2007). However it differs from *T. vayalicus* in having : (1) body with metallic refringence absent (in *T. vayalicus* body bright metallic green or blue refringence); (2) gaster as long as mesosoma (in *T. vayalicus* gaster distinctly longer than head plus mesosoma) and (3) hypopygium exceeding middle of gaster (in *T. vayalicus* hypopygium not exceeding middle of gaster).

This new species comes near *Tetrastichus anamikicus* sp. nov. in general appearance but differs from it in having : (1) each antenna with 3 anelli (in *T. anamikicus* each antenna with 4 anelli); (2) POL 2x as long as OOL (in *T. anamikicus* POL 2.8x OOL); (3) mesoscutum with 6 adnotaular setae on either side (in *T. anamikicus* mesoscutum with 3 stout sub erect adnotaular setae on either side); (4) MV shorter 3x length of STV (in *T. anamikicus* MV longer than 3x STV); (5) metasoma as long as mesosoma (in *T. anamikicus* metasoma distinctly shorter than mesosoma) and (6) femora black with apices paler (in *T. anamikicus* femora pale brownish yellow).

#### SUMMARY

Six new species of *Tetrastichinae* viz *Aprostocetus barnallicus* sp. nov., *Aprostocetus neovanillae* sp. nov., *Aprostocetus arunachalicus* sp. nov., *Aprostocetus namdaphicus* sp. nov., *Tetrastichus anamikicus* sp. nov. and *Tetrastichus ramakrishnae* sp. nov. are described and compared with their nearest closely resembling species.

**ACKNOWLEDGEMENTS**

One of us (T.C.N.) is grateful to Dr. N. Ramani, Head of the Department of Zoology, University of Calicut and to Dr. M. Nasser, Senior Lecturer of the same Department for facilities to do this research. We are

also grateful to Dr. K. Venkataraman, Director, Zoological Survey of India, Kolkata and Shri C. Radhakrishnan, Officer-in-Charge Zoological Survey of India, Calicut for encouragement and for facilities to P.M.S. to carry out this work.

**REFERENCES**

- Graham, M.W.R. de. V. 1987. A reclassification of the European Tetrastichinae (Hymenoptera : Eulophidae) with a revision of certain genera. *Bull. Br. Mus. Nat. Hist. Ent.*, **5** (1) : 1-392.
- Graham, M.W.R. de. V. 1991. A reclassification of the European Tetrastichinae : revision of the remaining genera. *Mem. Ann. Entomol. Inst.* No. **49** : 1-322.
- Narendran, T.C. 2001. Parasitic Hymenoptera and Biological control. Palani Paramount Publications, Palani, India, 215 pp.
- Narendran, T.C. 2005. Two new species of *Tetrastichus* Haliday (Hymenoptera : Eulophidae) displaying some characters of *Aceratomyia* Girault. *Bull. Pure and Appl. Sciences*, (A) **24** (1) : 37-42.
- Narendran, T.C. 2007. A taxonomic review of *Tetrastichus* Haliday (Hymenoptera : Eulophidae) from Borneo. *Entomon*, **31** (4) : 293-305 (2006).
- Narendran, T.C., Lambert Kishore, Vyjayandi, M.C., Santosh, S., Girish Kumar, and Sheeba, M. 2004. A new subgenus and two new species of Tetrastichinae from Borneo. *Bull. Pure. Appl. Sci.*, **23** A (2) : 117-123.
- Noyes, J.S. 2003. Universal Chalcidoidea data base. The Natural History Museum, London. <http://www.nhm.ac.uk/entomology.Chalcidoidea>. (Accessed in 2010).