

A NEW SPECIES OF *STICTOMISCHUS* THOMSON (HYMENOPTERA: PTEROMALIDAE) FROM INDIA, WITH A CHECKLIST OF WORLD SPECIES

T. C. Narendran and Abhilash Peter

C/O, Department of Zoology, University of Calicut, Calicut - 673 635, India.
e mail: drtcnarendran@yahoo.com

(Accepted 5 October 2010)

ABSTRACT – *Stictomischus gangtokicus* Narendran, sp. nov. is described and illustrated from Gangtok, Sikkim. Its differences with its closely resembling species are discussed. A checklist of world species of *Stictomischus* is also provided.

Keywords : *Stictomischus*, new species, checklist, Pteromalidae.

INTRODUCTION

The genus *Stictomischus* was raised by Thompson (1876) with the type species *Stictomischus scaposus* Thompson. The genus belongs to the subfamily Miscogasterinae of the family Pteromalidae. It is widely distributed in Europe, China, Japan and India. So far 30 valid species are known from the world which include one species from Indian subcontinent besides the new species described here under. The distribution of other species are provided in the check list given in this paper.

The members of this genus are parasites of Diptera boring in stems of some herbaceous plants and trees (Boucek, 1988).

MATERIALS AND METHODS

The holotype specimen was collected by sweep net specially made for collecting Chalcidoids. The card mounted specimen is studied by using Leica Stereozoom Microscope (MZ6) (Switzerland made). The holotype is kept in DZUC pending transfer to NPC.

Abbreviations used: CC= Costal cell, F1 to F6= Funicular segments 1 to 6; MV= Marginal vein; OOL= Ocellocular line; PMV= Postmarginal vein; POL= Postocellar line; SMV= Submarginal vein; STV= Stigmal vein; POL= Postocellar line; SMV= Submarginal vein; STV= Stigmal vein; T1= first gastral tergite.

Depositories: BMNH= The Natural History Museum, London. U.K.

DZCU = Department of Zoology, University of Calicut

EIHU= Entomology Institute, Hokkaido University, Sapporo, Japan.

ETHZ= Entomologisches Institute der E.T.H Zurich, Switzerland.

IZAS= Institute of Zoology, Academy of Sciences, Beijing, China.

LUZN= Zoological Museum, Lund University, Sweden.

NHNV= Naturhistorisches Museum, Vienna, Austria.

NPC= National Pusa Collection, Division of Entomology, Indian Agricultural Research Institute, New Delhi, India.

ZSIK= Western Ghat Research Centre, Zoological Survey of India, Kozhikode.

Stictomischus gangtokicus Narendran, sp. nov.

Holotype: Female: Length 2.1mm. Black with metallic greenish blue refringence; eyes dark brown; ocelli reflecting pale whitish yellow; mandibles and maxillary palps pale yellowish brown; scape pale yellow, remaining segments brownish black; all coxae concolorous with mesosoma; femora with black metallic green refringence medially, bases and apices paler; all trochanters, tibiae and tarsi pale yellow; pretarsi black; tegula dark brown; wings hyaline with veins pale brown; stigma dark brown.

Head :distinctly reticulate on vertex and upper (anterior) half of frons, a little weaker on lower half of frons; pubescence short and sparse; vertex without long brown bristles; clypeus weakly reticulate, with 2 sharp teeth; head width in dorsal view 2x its length (28: 14); width in anterior view 1.37x (77: 56) its height; temple length 0.33x eye length in dorsal view; POL 1.54x (10: 6.5) OOL; malar sulcus 0.26x eye height in profile; eye height 1.19x its width in profile; eyes separated by 1.31x eye height; breadth of oral fossa 1.7x malar distance in anterior view; antennal toruli separated from eyes by 1.63x their distance apart. Antenna inserted slightly below middle of face; toruli separated from anterior margin of clypeus by a distance slightly shorter than distance from anterior ocellus; scape 0.53x eye height; pedicel shorter than F1; anelli transverse; F1 longer than F2; F2 and F3 equal; F4 shorter than F4; F5 subequal to F4; F6 shorter than F5; clava longer than preceding two segments combined.

Mesosoma: Pronotum cross reticulate, lateral panel reticulate, anterior edge rounded; mesoscutum with raised reticulation, with moderately dense pubescence; noatauli complete; scutellum strongly reticulate; axillae less strongly reticulate, with pubescence; frenal groove distinct; posterior margin of scutellum subrounded (not angulate); dorsellum shiny. Propodeum medially convex and shiny, lateral part finely reticulate; median carina complete and raised; spiracle rounded, separated from metanotum by a distance equal to its diameter; postspiracular groove reaching posterior margin; plicae distinct throughout; prepectus length (anterior to posterior) subequal to tegula, weakly reticulate, with sharp anterior carina; mesepisternum reticulate punctuate; upper epimeron smooth and shiny; lower epimeron faintly reticulate but mostly shiny; metapleuron almost shiny with weak reticulation. Forewing 1.31x as long as wide; parastigmal vein weak but distinct; speculum absent; relative length of CC= 38; SMV= 33; MV= 24; PMV= 32; STV= 15; stigma strongly capitate. Legs moderately slender, coxae reticulate, coarser on hind coxae.

Metasoma: Petiole raised reticulate, almost as long as hind coxa, longer than 1.44x propodeum; 1.75x as long as its width, without crest anteriorly; gaster (excluding petiole) shorter than mesosoma; T1 reaching middle of gaster in dorsal view.

Male: Unknown.

Host: Unknown.

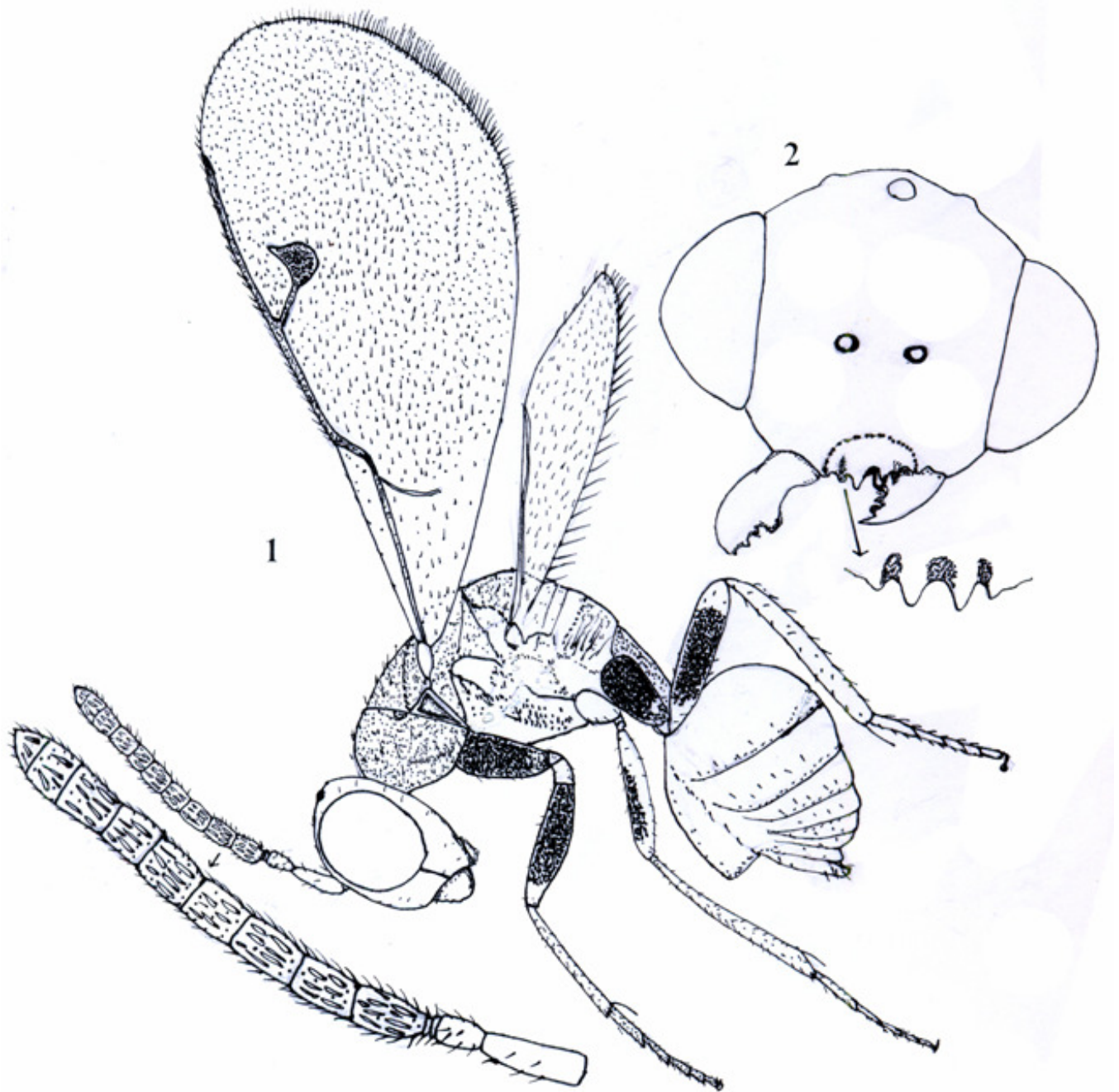
Etymology: Named after the locality of holotype Gangtok.

Material examined: Holotype: Female: INDIA, Sikkim, Gangtok, Ranipul, 04-vi-2008, Coll. F.R.Khan (NPC).

Discussion: This new species differs from the only other Indian species *Stictomischus turneri* Sureshan (Sureshan, 2002) in having: 1) femora with metallic dark patch medially on front and hind and weakly on mid leg (in *S. turneri* femora testaceous without any dark patches); 2) head width in dorsal view 2x its length (in *S. turneri* head 2.3x as broad as its length in dorsal view); 3) POL 1.54x OOL (in *S. turneri* POL 1.25x OOL); 4) antenna inserted a little below middle of face (in *S. turneri* antenna inserted at middle of face); 5) petiole a little shorter than 2x its width (in *S. turneri* petiole a little longer than 2x its width) and 6) forewing with parastigmal vein (in *S. turneri* forewing without parastigmal vein).

The new species comes to couplet no.6 of the key to North- West European species by Graham (1969) but differs from *Stictomischus gibbus* (Walker), in having: forewing with stigma longer than its height (in *S. gibbus* stigma fully as high as long) and body length shorter than 2.5mm (in *S. gibbus* body 2.7 to 3.2mm in length). The new species differs from *Stictomischus groschkei* Delucchi in having: 1) Scutellar frenal uniformly sculptured (in *S. groschkei* scutellar frenal less uniformly sculptured); stigma not subtriangular in shape (in *S. groschkei* stigma more subtriangular in shape) and frenal without longitudinal carinulae (in *S. groschkei* frenal most often with longitudinal carinulae). The new species differs from *Stictomischus lamprosomus* Graham in having petiole 1.75x as long as broad (in *S. lamprosomus* petiole about 2x as long as broad); 2) frenal without longitudinal carinulae (in *S. lamprosomus* frenal with longitudinal carinulae); 2) tip of hypopygium exceeding half of gaster (in *S. lamprosomus* tip of hypopygium situated about half of gaster) and clava longer than combined length of preceding two segments (in *S. lamprosomus* clava as long as preceding two funicular segments).

This new species comes near the Chinese species *Stictomischus hirsutus* Huang and *Stictomischus fortis* Huang in having parastigmal vein but differs from them in all other major characters. This new species comes to *Stictomischus virtumidus* Huang in the key to species by Huang and Xiao (2005) but differs from it in having: 1) gaster 1.63x as long as broad (in *S. virtumidus* gaster 1.8x- 2x as long as broad); 2) MV 1.6x as long as STV (in *S. virtumidus* MV 1.7- 1.8x as long as STV); 3) POL 1.54x OOL (in *S. virtumidus* POL 1.3x OOL) and 4) parastigmal



Figs. 1 & 2 : *Stictomischus gangtokicus* Narendran, sp. nov. Female. 1) Body Profile (with antenna enlarged). 2) Head anterior view (with clypeal margin enlarged)

vein present (in *S. viritumidus* parastigmal vein absent).

In the key to Japanese species of *Stictomischus* by Kamijo (1960) it comes near *Stictomischus elongatus* Kamijo but differs from it in having: 1) Head 2x as long as wide in dorsal view (in *S. elongatus* head 2.6x as long as wide in dorsal view); 2) POL 1.54x OOL (in *S. elongatus* POL as long as OOL); 3) stigma rounded (in *S. elongatus* stigma subrectangular); 4) speculum absent (in *S. elongates* speculum present); 5) clava distinctly shorter than 2 preceding segments combined (in *S. elongatus* clava as long as preceding segments combined) and 6) petiole 1.44x as long as propodeum (in *S. elongatus* petiole about as long as propodeum).

This new species does not come near the Papua New Guinean species *Stictomischus remotus* Boucek (Boucek, 1988).

Checklist of species of *Stictomischus* Thompson of the world

1. *Stictomischus alveolus* Huang

Stictomischus alveolus Huang, 1990. 7: 230. Female, China (Sinkiang) (IZAS).

Stictomischus alveolus Huang; Huang 1993. 41: 92- 93.

Stictomischus alveolus Huang; Huang & Xiao 2005: 75. Redescription with key to species.

Host: Unknown.

Distribution: China (Sinkiang).

2. *Stictomischus apoianus* Kamijo

Stictomischus apoianus Kamijo 1960. 23: 24. Female, Japan (EIH).

Host: Unknown.

Distribution: Japan.

3. *Stictomischus bellus* Huang

Stictomischus bellus Huang 1990: 7: 224. Female, China (IZAS).

Stictomischus bellus Huang, Huang 1993: 41: 85- 86.

Stictomischus bellus Huang, Huang & Xiao 2005: 67. Redescription with key.

Host: Unknown.

Distribution: China.

4. *Stictomischus cumatilis* Delucchi

Stictomischus cumatilis Delucchi 1953: 26: 210. Female, Austria (NHMV).

Host: *Agromyza spiraeoidearum* Hering (Diptera: Agromyzidae).

Distribution: Austria (Delucchi 1953), Sweden (Hadquvist, 2003).

5. *Stictomischus curvatus* Kamijo

Stictomischus curvatus Kamijo 1960: 23: 33 Female, Japan (EIHU)

Host: Unknown.

Distribution: Japan.

6. *Stictomischus elongatus* Kamijo

Stictomischus elongatus Kamijo 1960: 22: 30 Female, Japan (EIHU).

Host: Unknown.

Distribution: Japan.

7. *Stictomischus fortis* Huang

Stictomischus fortis Huang 1990: 7: 230- 231. Male, China (Yunan) (IZAS).

Stictomischus fortis Huang; Huang 1993: 41: 93- 94. Redescription.

Stictomischus fortis Huang; Huang & Xiao 2005: 76- 77. Redescription with key.

Host: Unknown.

Distribution: China (Yunan).

8. *Stictomischus gibbus* (Walker)

Stictomischus gibba (Walker) 1833: 459. Female, Britain (BMNH).

Chrysolampus sublaevis Forster 1841: 37. Male, Germany (lost?) (Graham 1969 synonymized).

Chrysolampus phyllochlorus Forster 1841: 37. Female, Germany (?) (Graham 1969 synonymized).

Chrysolampus lagenarius Nees, 1834:132, Female, ? Germany (Lost)

Chrysolampus pleuralis Thopson 1876:236; Lectotype Female, Lund(Sweden)(LUZN)
(Graham, 1969 synonymized).

Stictomischus gibbus (Walker) Delucchi 1955: 77, 81-83, Male, Female

Host: *Pegohylemyia pherenione* (Seguy) (Diptera:anthomyiidae), *Amaurosoma armillatum*

Zetterstedt (Diptera: Sarcophagidae), *Amaurosoma flavipes* (Fallen); *Chrylzosoma vittatum*
Zetterstedt(Sarcophagidae).(Herting, 1978; Dzhanokmen, 1978; Graham, 1969; Noyes, 2003).

Distribution: Germany, Netherlands, Sweden, United Kingdom, (Forster, 1841; Herting, 1978;
Nees, 1834; Vidal 2001; Dzhanokmen, 1978; Walker, 1833; Thopson, 1876; Graham, 1969;
Hedqvist, 2003; Noyes, 2003).

9. *Stictomischus groschkei* Delucchi

Stictomischus groschkei Delucchi, 1953: 212. Lectotype Female (designated by Baur, 2001),
Germany (ETHZ)

Host: Diptera:Agromyzidae: *Agromyza potentillae* (Kaltenbach), *A. spiraeae* (Kaltenbach),

Calomyza artemesiae(Kaltenbach), *Napomyza aconitophila* Hendel, *Phytopmyza sphondylivora* Spencer
(Graham, 1969, Dzhanokmen, 1978; Herting, 1978, O'Connor & Baur, 2002.

Distribution: Europe, France, Germany, Kazakhstan, Netherland, China, Sweden, Tselinogradobl, U.K (England)
(Huang & Xiao, 2005; O'Conor *et al.*, 2002; Delucchi 1953; Graham, 1969; Vidal, 2001; Dzhanokmen, 1978, 2005;
Askew & Shaw, 1976; Boucek & Graham, 1978; Vago, 1993; Gijwijt, 2003; Hedqvist, 2003.

10. *Stictomischus haleakalae* Ashmead

Stictomischus haleakalae Ashmead 1901: 311. Female (?) Hawaii (BMNH).

Host: Unknown.

Distribution: Hawaii.

11. *Stictomischus hirsutus* Huang

Stictomischus hirsutus Huang 1990: Holotype Female, China (Sichuan) (IZAS)

Stictomischus hirsutus Huang; Huang, 1993:41:89-90.

Stictomischus hirsutus Huang; Huang & Xiao, 2005:71,72, Redescribed.

Host: Unknown

Distribution: China (Sichuan, Szechwan)

12. *Stictomischus japonicus* Kamijo

Stictomischus japonicus Kamijo, 1960:36. Female, Japan (EIHU).

Host: Unknown.

Distribution: Japan.

13. *Stictomischus lanceus* Huang

Stictomischus lanceus Huang, 1990: 255,233; Holotype: Female, China (Yunan) (IZAS).

Stictomischus lanceus Huang; Huang, 1993:86-87.

Stictomischus lanceus Huang; Huang & Xiao, 2005:69. Redescribed.

Host: Unknown

Distribution: China(Yunan)

14. *Stictomischus lesches* (Walker)

Lamprotatus lesches Walker, 1844:336. Lectotype: Male, Norway (Alten) (BMNH)

Designated and transferred to *Stictomischus* by Graham (1969).

Host: Unknown.

Distribution: Europe (Norway, Sweden) (Dzhanokmen, 1978; Graham, 1969; Hedqvist, 2003).

15. *Stictomischus longipetiolus* Huang

Stictomischus longipetiolus Huang 1990: 7: 223- 224. Male, China (Yunan) (IZAS).

Stictomischus longipetiolus Huang; Huang 1993: 41: 84- 85.

Stictomischus longipetiolus Huang; Huang 2005: 66- 67. Redescribed.

Host: Unknown.

Distribution: China (Yunan).

16. *Stictomischus longiventris* Thompson

Stictomischus longiventris Thompson 1876: 237. Lectotype Female, Somaland, (Sweden) (LUZN). Designated by Graham (1969).

Stictomischus longiventris Thompson, Delucchi 1955: 77, 79, 81.

Host: Unknown

Distribution: Europe (Australia, Germany, Sweden) (Graham, 1969; Vidal, 2001; Dzhanokmen, 1978; Noyes, 2003.)

17. *Stictomischus longus* Huang

Stictomischus longus Huang 1990. 7: 231- 232, Male, China (Yunan) (IZAS).

Stictomischus longus Huang; Huang 1993: 41: 94- 95

Stictomischus longus Huang; Huang & Xiao, 2005: 77- 78. Redescribed.

Host: Unknown.

Distribution: China (Yunan).

18. *Stictomischus maculatus* Delucchi

Stictomischus maculatus Delucchi, 1953. 26: 213. Female, Austria (NHMV).

Host: *Phytomyza angelicae* Kaltenbach (Hering 1978).

Distribution: Australia, Sweden (Delucchi, 1953; Graham, 1969; Herteng, 1978; Hedqvist 2003).

19. *Stictomischus marginatus* Kamijo

Stictomischus marginatus Kamijo 1960: 23: 29. Female, Japan (EIHU).

Host: Unknown.

Distribution: Japan.

20. *Stictomischus miniatus* Delucchi

Stictomischus miniatus Delucchi 1953: 214. Female, Czech Republic (NHMV).

Host: *Phytomyza actaeae* Hendel

Distribution: Europe (Australia, Czech Republic, Germany, Sweden) (Herting 1978; Delucchi 1953; Dzhanokmen 1978; Graham 1969; Hedqvist 2003).

21. *Stictomischus momoi* Kamijo

Stictomischus momoi Kamijo 1960: 23: 32, Female, Japan (EIHU).

Host: Unknown.

Distribution: Japan.

22. *Stictomischus nitens* Huang

Stictomischus nitens Huang 1990: 7: 229. Holotype, Female, China (Yunan) (IZAS).

Stictomischus nitens Huang: Huang, 1993: 41: 91- 92.

Stictomischus nitens Huang: Huang Xiao, 2005: 74. Redescribed.

Host: Unknown

Distribution: China (Yunan).

23. *Stictomischus nitentis* Delucchi

Stictomischus nitentis Delucchi 1955: 50: 90. Holotype Male, Germany (ETHZ).

Stictomischus lamprosomus Graham 1969: 222- 224. Holotype Female, England (HDOU) (Baur, 2001 synonymized with *S. nitentis* Delucchi).

Hosts: *Chyizosoma (Parallelomma)* sp. (Diptera: Scatophagidae) on *Majanthemum* (Delucchi, 1990), *Chylizosoma medium*, *C. vittata* (Graham, 1969; Herting, 1978; Baur, 2001).

Distribution: Germany, Belgium, Sweden, United Kingdom (Vago, 2006; Delucchi, 1955; Graham, 1969; Herting, 1978, Dzhankmen, 1978).

24. *Stictomischus obscurus* (Walker)

Miscogaster obscura Walker, 1833: 1: 459. Lectotype Female, England (BMNH) (Graham 1969 selected Lectotype). Delucchi, 1955 transferred to *Stictomischus*.

Miscogaster obscuripennis Walker, 1833: 460. Lectotype Female, England (BMNH) (Graham selected Lectotype and synonymized with *Stictomischus obscurus* (Walker).

Miscogaster chrysochlora Walker, 1833: 461. Lectotype Female, England (BMNH) (Graham, 1969 selected Lectotype and synonymized with *Stictomischus obscurus* (Walker).

Chrysolampus splendens Forster, 1841: 37. Female, Aachen (ETHZ) (Delucchi, 1955 synonymized with *Stictomischus obscurus* (Walker).

Lamprotatus mallinus Walker, 1848: 111-116. Lectotype Male, London (BMNH) (Graham 1969 selected lectotype and synonymized with *Stictomischus obscurus* (Walker).

Host: *Scolytus ensifer* (Coleoptera: Scolitidae), *Hylemya seneciella* (Diptera: Anthomyiidae), *Spilographa zoe* (Diptera: Tephritidae), *Hyalopterus pruni* (Aphididae, Hemiptera). (Herting 1972, 1973; Thompson, W.R, 1958; Thompson C. G, 1876; Boucek, 1977; Dzhankmen, 1978; Graham, 1969; Mitroiu, 2001).

Distribution: Austria, Belgium, Czech Republic, France, Germany, Hungary, Ireland (both North & South); Kazakhstan, Netherlands, Poland, Romania, Slovakia, Sweden, Switzerland, Tselinograd obl. (Kazakhstan.), United Kingdom, Old USSR, Former Yugoslavia (Federal Republic) (Graham, 1969; Mitroiu, 2001; Vago, 2006; Kalina, 1989; Forster, 1841; Vidal, 2001; Dzhankmen, 1978, 2005; Bouček & Graham, 1978; Thompson, 1958; Walker, 1833, 1848; Herting, 1972; O'Connor *et al.*, 2000; Hanson, 1991; Hedqvist, 2003.

25. *Stictomischus processus* Huang

Stictomischus processus Huang 1990: 7:228- 229. Holotype Female, China (Yunan) (IZAS).

Stictomischus processus Huang; Huang, 1993: 41: 90.

Stictomischus processus Huang; Huang & Xiao, 2005. Redescribed.

Host: Unknown.

Distribution: China (Yunan).

26. *Stictomischus remotus* Boucek

Stictomischus remotus Boucek 1988: 468- 469. Holotype, Female, Papua New Guinea (BMNH).

Host: Unknown.

Distribution: Papua New Guinea.

27. *Stictomischus scaposus* Thompson

Stictomischus saposus Thompson 1876: 235. Lectotype Female, Somaland (Sweden) (LUZN)
Graham (1969) selected the holotype.

Hosts: *Phytobia* (= *Dizygomyza*) *hilarrella* (Zett.), *Phytobia hystrix* (Diptera: Agromyzidae) (Graham 1969).

Distribution: Europe (United Kingdom, Sweden, Germany, Austria, Romania, Belgium, Hungary, former USSR) (Graham 1969; Dzhankmen, 1978, O; Connor, 1996; Hansson, 1987; Erdos, 1947).

28. *Stictomischus tumidus* (Walker)

Miscogaster tumida Walker, 1833: 463. Lectotype, Female, Sweden (LUZN) (Graham 1969 selected the Lectotype

Stictomischus rugicollis Thompson, 1876: 236. Lectotype Female, Sweden (LUZN) (Graham 1969 selected the Lectotype and synonymized with *Stictomischus tumidus* (Walker) (*nec.* Delucchi, 1955).

Stictomischus tumidus (Walker), Delucchi 1955: 78, 84- 85.

Host: Unknown.

Distribution: Europe (United Kingdom, Sweden, Germany, Austria, Old Czechoslovakia, Belgium, Croatia, France, Hungary, Netherlands, China, Romania (Mitroiu & Popescu, 2006; Mitroiu & Andrieseu, 2006; Gigsjijt, 2003; Erdos, 1947; Vago, 2006; Huang & Xiao (2005); Boucek, 1977; Kalina, 1989; Vidal, 2001; Vago, 1993; Dzhankmen, 1978; Boucek & Graham, 1978; Hedqvist, 2003; Thompson, 1876).

29. *Stictomischus turneri* Sureshan

Stictomischus turneri Sureshan 2002: 28- 29, Holotype Female, India, Kerala (ZSIK).

Host: Unknown.

Distribution: India (Kerala).

30. *Stictomischus varitumidus* Huang

Stictomischus varitumidus Huang 1990: 7: 225- 227. Holotype Female, China (Sichuan) (IZAS).

Stictomischus varitumidus Huang; Huang, 1993: 41: 87- 89.

Stictomischus varitumidus Huang; Huang & Xiao 2005: 70- 71. Redescribed.

Host: Unknown

Distribution: China (Sichuan, Yunan).

ACKNOWLEDGEMENTS

We are grateful to the Head of the Department of Zoology, University of Calicut and Dr. M. Nasser of the same Department for giving facilities to work. We also thank Dr. M. Hayat, Department of Zoology, Aligarh Muslim University, for sending to T C N this interesting pteromalid specimen apart from other chalcidoids.

REFERENCES

- Ashmead W H (1901) Hymenoptera Parasitica. *Fauna Hawaii* **1**, 277- 364.
- Askew R R and Shaw M R (1976) Chalcidoidea (Hymenoptera) at Abbot's Moss, Cheshire. *Laecashire and Cheshire Fauna Society* 69: 19- 22.
- Baur H (2001) The Hymenoptera (Chalcidoidea, Ichneumonoidae, Platygastroidea) described by Vittorio Delucchi an annotated Catalogue. *J. Natural History* **35**, 55- 125.
- Boucek Z (1977) A faunistic review of the Yugoslavian Chalcidoidea (Parasitic Hymenoptera). *Acta Entomologica* (Supplement) **13**, 145.
- Boucek Z and Graham M W R de V (1978) Chalcidoidea. In: *A checklist of British Insects* (Second Edition). *Hand Books for the identification of British Insects* XI (4) 76. (eds. Fitton M G, Graham M W R de V, Boucek Z R J, Fergusson N D M, Huddleston T, Quinlan J and Richards O W)
- Boucek Z (1988) *Australasian Chalcidoidea (Hymenoptera)* CAB International, Wallingford, U.K. pp 832.
- Delucchi V (1953) Neue Chalcidier aus der subfamilie der Lamprotatinae (Pteromalidae). *Mitt. Schweiz. Ent. Ges.* **26**, 201- 218.
- Delucchi V (1955) Contribution a l'etude des Lamprotatinae (Chalcid. Pteromalidae). *Acta Univ. lund.* (n. s) Avd. 2. 50 (20): 1- 97.
- Dzhankmen K A (1978) Hymenoptera III. Chalcidoidea 5. Pteromalidae. *Opredelitel Nasekomikh Evropeyskoy Chasti SSS R* pp.101.
- Dzhankmen K A (2005) Synoptic list of the Pteromalidae (Hymenoptera, Chalcidoidea) from Kazakhstan and middle Asia.

- Erds J (1947) *Additamenta and Cognitonem* faunae Chalcidoidarum (Hymenoptera) in alveo carpathoram III. *Fragmenta Faunistica Hungarica* **10**, 113.
- Forster A (1841) *Beitrage zur* monographie der Pteromalinen, Nees 1. Heft. Aachen, 46 pp 1 plate.
- Gigswijt M J (2003) Naamlijst van de Nederlandse bronswespen (Hymenoptera: Chalcidoidea). *Nederlandse Faunistische Mededelingen* **18**, 54.
- Graham M W R de V (1969) The Pteromalidae of North- Western Europe (Hymenoptera: Chalcidoidea). *Bull. Br. Mus. Nat. Hist (Ent.)* Suppl. **16**, 1- 908.
- Hansson C (1991) A catalogue of Chalcidoidea described by C. G. Thompson, with a checklist of Swedish species. *Entomologica Scandinavica Supplement* No. 38: 56.
- Hedqvist K J (2003) Katalog over Svenska Chalcidoidea. *Entomologisk Tidskrift* **124**, 118.
- Herting B (1972) Homoptera. *A catalogue of parasites and predators of terrestrial arthropods* Section A. Host or Prey/ Enemy 2: 83-84.
- Herting B (1973) Coleoptera to Strepsiptera. *A catalogue of parasites and predators of terrestrial arthropods. Section A Host or Prey / Enemy* 3: 153. CAB; Commonwealth Institute of Biological Control.
- Herting B (1978) Neuroptera, Diptera, Siphonaptera. *A catalogue of parasites and predators of terrestrial arthropods. Section A. Host or Prey/ Enemy* 5: 86. Commonwealth Agricultural Bureaux. Commonwealth Institute of Biological Control. England.
- Huang D W (1993) Economic Insect Fauna of China fax. 41. Hymenoptera. Pteromalidae (1) Science Press. Beijing, pp. 196.
- Huang D W and Xiao H (2005) Fauna Sinica 42: Hymenoptera, Pteromalidae. Science Press Beijing, pp. 388.
- Kalina V (1989) Checklists of Czechoslovak Insects III (Hymenoptera). Chalcidoidea. *Acta Faunistica. Entomologica Musei Nationalis Pragae* **19**, 105.
- Kamijo K (1960) Descriptions of a new genus and ten new species of Lamprotatinae (Hymenoptera. Pteromalidae). *Ins. Matsum* **23**, 28- 45.
- Mitroiu M D (2001) Pteromalids (Hymenoptera, Pteromalidae) new to Romania's fauna collected around Varatec Neamt County, Romania (1) Rezervatia Codrii- 30 ani. Realisari, probleme, perspective 11: 55 Lozova Rep. Moldova.
- Mitroiu M D and Popescu I E (2006) Pteromalidae (Hymenoptera: Chalcidoidea) identified in Piatra Craiului National Park, including two genera and six species new to Romania Research in Piatra Craiului National Park 3: 141 Editura Universitatii "Thansilvania" Brasov.
- Nees ab Esenbeck C G (1834) Hymenopterorum Ichneumonibus offinium Monographiae, genera Europaea et. Species illustrantes 2: 448 pp.
- Noyes, J. S. *Universal Chalcidoidea Data Base*. <http://www.nhm.ac.uk/jdsml/research-curation/projects/chalcidoids> (Referred updated version 2010).
- Sureshan P M (2002) Insecta: Hymenoptera: Chalcidoidea. Fauna of Eravikulam National Park, Conservation Area Series 13: 21- 33 Zoological Surevy of India. Kolkatta.
- Thompson C G (1876) *Hymenoptera Scandinaviae* 4. *Pteromalus (Svederus)* pp. 193- 259.
- Thompson W R (1958) *A catalogue of parasites and predators of insect pests. Section 2. Host parasite catalogue Part 5.* pp. 563 Commonwealth Agricultural Bureaux, Commonwealth Institute of Biological Control, Ottawa, Ontario, Canada.
- Vago J L (2006) Revision of the collections of Chalcidoidea Pteromalidae (Hymenoptera) of Belgian Royal Institute of Natural Science and the University faculty of agronomic sciences of Gembloux and the discovery of 145 new species of Belgium. *Bullrtin de la Societe Royal Belge d' Entomologie* 142 (1- 6): 98.
- Vidal S (2001) Entomofauna Germanica. B and 4. *Verszeichnis der Hautflugler Deuschalnds. Chalcidoidea. Entomologische Nachrichten und Berichte* Beiheft 7: 66. Eds: Dathe, H.H.; Taeger, A; Blank, S. M.).
- Walker F (1833) Monographia Chalciditum. *Ent. Mag.* **1**, 367- 384; 455- 466.
- Walker F (1844) On the species of Chalcidites inhabiting the Arctic Region. *Annals and Magazine of Natural History* **14**, 336.
- Walker F (1848) List of the specimens of Hymenopterous insects in the collection of the British Museum part2. pp. III. 166. E. Newman, London.