CLASSIFICATION

The family Encyrtidae are currently divided into two subfamilies, the Tetracneminae and the Encyrtinae (Trjapitzin, 1973a, b; Trjapitzin & Gordh, 1978a, b; Noyes & Hayat, 1984; Hayat, 1985; Noyes, 1988b; Trjapitzin, 1989), with both further divided into several tribes. This classification is quite different from the earlier classification in which the family was divided into three subfamilies, Arrhenophaginae, Antheminae and Encyrtinae, with the Encyrtinae either divided into three tribes, Encyrtini, Bothriothoracini [=Mirini sensu Ashmead, 1900], and Tetracnemini [=Ectromini sensu Ashmead] (Ashmead, 1900; Compere & Annecke, 1960; Tachikawa, 1963; Kerrich, 1967), or into several tribes (Hoffer, 1955; Erdos & Novicky, 1955).

Hoffer (1955) erected Copidosomatini (there as Copidosomini), for Copidosoma Ratzeburg, Litomastix Thomson [=Copidosoma], Paralitomastix Mercet [=Copidosoma], Verdunia Mercet [=Copidosoma], Sectiliclava Hoffer and Cerchysius Westwood, and placed the genera Ageniaspis Dahlbom, Holcothorax Mayr [=Ageniaspis], Geniaspidius Masi [=Parablatticida Girault], Parageniaspis Masi [=Exoristobia Ashmead], and an unpublished name, in another tribe, Ageniaspidini.

It may be noted that of the above mentioned genera, Sectiliclava, Cerchysius, Parablatticida and Exoristobia were removed from these tribes by latter authors (see Trjapitzin,
Almost simultaneously, Erdos & Novicky (1955) proposed the tribe Copidosomatini (there as Copidosomini), and divided it into two subtribes, Copidosomatina (three genera, Copidosoma, Litomastix and Paralitomastix) and Ageniaspidina with 5 genera, of which four genera were included by Hoffer (1955) in his Ageniaspidini and the fifth genus, Athesmus Erdos & Novicky [=Thomsonisca Ghesquiere], was placed in a separate tribe, Thomsoniscini, by Hoffer (1955).

De Santis (1964) followed Hoffer (1955) and further included in Copidosomatini the genera Apsilophrys De Santis Copidencyrtus De Santis [= Apsilophrys] and Gonzalzezia De Santis. The latter genus was regarded by Noyes (1980) as related to Cerchysius, and is, therefore, out of place in Copidosomatini. The genus Apsilophrys was synonymized with Copidosoma (see page 21).

Trjapitzin (1973a, b) published the most detailed classification of the Encyrtidae. He followed Erdos & Novicky in placing Ageniaspis into a subtribe, Ageniaspidina, of the Copidosomatini, transferred Pentacnemini Hoffer (1955) as a subtribe, Pentacnemina, of Copidosomatini and proposed the subtribe Coelopencyrtina for Coelopencyrtus Timberlake and two related genera. He thus recognized 4 subtribes in Copidosomatini and included the following genera under each of them.

Copidosomatina: Copidosoma, Litomastix [= Copidosoma], Paralitomastix [= Copidosoma], Pentalitomastix [= Copidoso-
mopsis]. He doubtfully included Apsilophrys [= Copidosoma] and Copidencyrtus [= Copidosoma] in this subtribe.

Ageniaspidina: Ageniaspis, Holcothorax, Paraleurocerus [Both the latter names are in the present thesis considered as synonyms of Ageniaspis, see page 104].

Pentacnemina: Pentacnemus Howard, Parablastothrix Mercet, Calometopina Mercet.

Coelopencyrtina: Coelopencyrtus, Giraultella Gahan & Fagan [= Coelopencyrtus], Xylencyrtus Annecke.

It may be noted that the genera included in Coelopencyrtina are parasitoids of larvae of bees, whereas members of the other three subtribes parasitize lepidopteran larvae, and a majority of them are polyembryonic.

Trjapitzin & Gordh (1978a, b) followed Trjapitzin (1973, b) except that they removed Pentacnemus (and thus Pentacnemina) from Copidosomatini, and proposed the subtribe Parablastothrichina for Parablastothrix and Calometopia.


Trjapitzin (1989) retained the classification followed by
Trjapitzin & Gordh (1978a, b).

Zolnerowich (personal communication to Dr. M. Hayat) made a phylogenetic analysis and reached the following conclusions:

Coagerus has an aphid host, hence removed from Copidosomatini.

Neapsilophrys removed from Ageniaspidina to Copidosomatina and considered as very close to and may be a synonym of Copidosoma.

Zelencyrtus removed from Copidosomatina to Ageniaspidina.

Ethoris placed in Ageniaspidina.

Apsilophrys, Paralitomastix and Raffaellia synonymized with Copidosoma.

Paraleurocerus, Ageniaspis and Holcothorax are very close (monophyletic) but are not synonymized.

His analysis showed Coelopencyrtina to be the basal subtribe, followed by Parablastothrichina, and then Ageniaspidina + Copidosomatina. He is also of the view that Coelopencyrtina probably does not belong in Copidosomatini, but considers the evidence insufficient to remove them from Copidosomatini.

Discussion. The present author has independently reached conclusions similar to those by Zolnerowich regarding the synonymies of the genera of this tribe, except he considered Holcothorax and Paraleurocerus as synonyms of Ageniaspis (synonymies implemented in this work).

The author considers Coelopencyrtina as out of place in
Copidosomatini. The morphology of the genus indicates its close relationships with the genera of Bothriothoracini and therefore, Coelopencyrtina should be transferred to that tribe.

**Tribe COPIDOSOMATINI HOFFER**


**DIAGNOSIS.**

Occipital margin sharp. Frontovertex and thoracic dorsum with reticulate sculpture but not punctate reticulate. Mandible 3-dentate, the three teeth sharp or the upper narrowly rounded. Polyembryonic parasitoids of larvae of Lepidoptera.

**INDIAN GENERA:** Copidosoma Ratzeburg, Copidosomopsis Girault, Ageniaspis Dahlbom, Ethoris Noyes & Hayat, [?] Parablastothrix Mercet.

**Comments.**

As defined above, the tribe Copidosomatini contains 4 genera from India. Zolnerowich (in litt.) considers the placement of Parablastothrix in a separate subtribe, Parablastothrichina, by Trjapitzin & Gordh (1978a, b) as correct, whereas Noyes & Hayat (1984) considered it best placed in Aphycini. The Present author cannot comment on the syste-
matic placement of this genus as he has not seen any material of *Parablastothrix* from India, though one species, *P. zygonomus*, was described on males from India by Khan (1983). However, that species appears misplaced in *Parablastothrix* and probably belongs in *Manicnemus* Hayat, a genus belonging to the subfamily Tetracneminae. [Request to the author for loan of types of *P. zygonomus* have not materialised till date].

**Subtribe COPIDOSOMATINA HOFFER**


**DIAGNOSIS.**

Stigmal vein with sensilla arranged symmetrically in a square, and without uncus. Postmarginal vein not longer than stigmal vein. Third valvula in a membranous articulation with second valvifer.

INDIAN GENERA: *Copidosoma* Ratzeburg, *Copidosomopsis* Girault.

**Comments.**

Contrary to Article 40a(i) of the Code (ICZN, 1985), Shafee et. al. (1989: 29, 34-35) considered the sub-tribal name Copidosomatina Hoffer (1955: p.20) as a synonym of Pentacnemina Hoffer (1955: p.18) even though *Pentacnemus*
Howard, the type genus of subtribe Pentacnemii Hoffer [=Pentacnemina] was synonymized with Litomastix Thomson, 1876 [= Copidosoma] by Trjapitzin & Gordh (1978a: 365) and with Copidosoma by Noyes & Hayat (1984: 354).

Subtribe AGENIASPIDINA HOFFER


DIAGNOSIS.

Stigmal vein with sensilla not arranged symmetrically in a square, with a distinct uncus. Postmarginal vein longer than stigmal vein. Articulation of third valvula with second valvifer normal, not membranous.

INDIAN GENERA: Ageniaspis Dahlbom, Ethoris Noyes & Hayat.
KEY TO INDIAN GENERA OF COPIDOSOMATINI, FEMALES.

1. Stigmal vein with sensilla arranged symmetrically in a square (Fig. 9); postmarginal vein not longer than the stigmal vein; third valvula in membranous articulation with second valvifer (Fig. 13) .......................... 2

-. Stigmal vein with sensilla not arranged symmetrically in a square (Fig. 142); postmarginal vein longer than stigmal vein; third valvula distinctly articulated with second valvifer (Fig. 13a) .......................... 3

2. Hypopygium atmost slightly broader than long, trilobed anteriorly with lateral lobes longer (Fig. 48) ......... ........................................... 1. Copidosoma Ratzeburg

-. Hypopygium transverse, more than 2.0x as broad as long, with anterior margin concave, not with lobes (Fig. 136) ...................... 2. Copidosomopsis Girault

3. Antennal torulus separated from mouth margin atmost by its own major diameter; scape shorter than minimum width of frontovertex; postmarginal and stigmal veins not forming an acute angle (Fig. 142); scutellum at least in anterior half with longitudinally lineolate reticulate sculpture (Fig. 139) ..........................

................................. 3. Ageniaspis Dahlbom

-. Antennal torulus separated from mouth margin by twice its own diameter; scape longer than minimum width of frontovertex; postmarginal and stigmal veins forming an acute angle (Noyes & Hayat, 1984: Fig. 156); scutellum