

## TAXONOMIC STUDIES ON SOME ENCYRTID GENERA (HYMENOPTERA : CHALCIDOIDEA : ENCYRTIDAE)

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ABSTRACT. *Thomsonisca sankarani*, sp. nov. reared from *Pseudaulacaspis barberi* (Green) is described from India, and *Acridencyrtus ambiguous*, gen. et sp. nov. ex *Phenacoccus mangiferae* Green is described from Bangla Desh.

Recently the Commonwealth Institute of Biological Control, Bangalore reared a species of *Thomsonisca* and this species is being propagated for releases in the United States of America for the control of some Diaspidiid scales. A name is required for this very economically important species and hence a study of the related species is made. A new genus and species of an encyrtid parasitic on a mealy bug from Bangla Desh is also described.

### Genus *Thomsonisca* Ghesquiere

*Thomsoniella* Mercet, 1921, *Fauna Iberica Himenopt.*, *Enciritidos* : 90. preoccupied by *Thomsoniella* Signoret, 1880). Type-species *T. typica*; monobasic and original designation.

*Thomsonisca* Ghesquiere, 1946, *Rev. Bot. Zool. Afr.*, 39 : 369.

*Heterencyrtus* Hoffer, 1953. *Ochrana prirody*, 8 : 86. Type-species *H. sumavicus*; monobasic and original designation

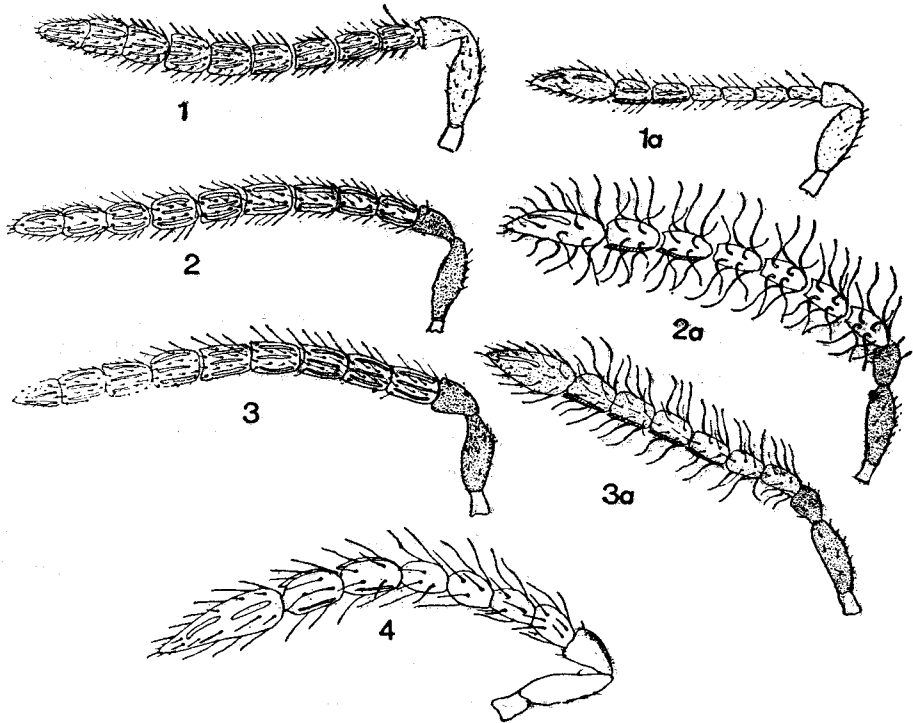
*Athesmus* Erdos & Novitzky, 1957, *Acta Zool. Hungarici*, 3 : 65. Type-species *A. luctuosus*; monobasic and original designation.

*Kostarbia* Erdos, 1957, *Annl. Hist. Nat. Mus. Natl. Hungarici*, (N.S.) 8 : 368; monobasic and original designation.

*Euusuria* Tshumakova, 1957, *Zool. Zhurn.*, 36 : 539. Type-species *E. pallipes*; monobasic and original designation.

*Pakencyrtus* Ahmad, 1970, *Entomophaga*, 15 : 237. Type-species *P. pakistanensis*; monobasic and original designation.

Tachikawa (1963) gave a generic synonymy of *Thomsonisca* Ghesquiere. Graham (1969) reviewed the European species and concluded that only one valid species, *Thomsonisca amathus* (Walker), was widely distributed in Europe, and all other species described under genera like *Heterencyrtus*, *Kostarbia* were synonyms of *amathus* (Walker). Trjapitzin (1972) suggested that *Pakencyrtus* Ahmad and *Euusuria* Tshumakova may also be synonyms of *Thomsonisca*. Subba Rao (1976) studied the paratypes of *Pakencyrtus pakistanensis* and formally synonymised *Pakencyrtus* with *Thomsonisca*.



Figs. 1-4. Antenna ♀ & ♂ : 1 & 1a, *Thomsonisca sankarani*, sp. nov.; 2 & 2a, *Thomsonisca amathus* (Walker); 3 & 3a; *Thomsonisca pakistanensis* (Ahmad); 4, *Thomsonisca indica* Hayat ♂.

*Diagnostic characters :*

*Female* : Head viewed from above twice as wide as long, convex, eyes small, finely hairy, maxillary palpi and labial palpi each with 3 and 2 segments, though both 2 segmented in case of *pakistanensis*, mandibles with two distinct teeth and a truncation or somewhat tridentate, antennae inserted just above the level of lower margin of eyes, scape cylindrical funicle six segmented and club 3 jointed, the club and funicle not clearly differentiated. Thorax convex above, axillae contiguous; marginal, postmarginal and stigmal veins well developed. Abdomen oval to heart shaped and slightly longer than thorax, ovipositor sheaths slightly to well exerted.

*Male* : Essentially similar to female except for the antennae

KEY TO SPECIES OF *THOMSONISCA*

- Ovipositor sheaths exerted at least  $0.33-0.5 \times$  the length of the abdomen and the ovipositor originating from the base. Maxillary palpi 3 segmented; labial-palpi 2-segmented . . . . . 2

- Ovipositor sheaths concealed or slightly exerted and the ovipositor originating from the middle of abdomen. Both maxillary and labial palpi 2-segmented . . . . . 2. *pakistanensis* (Ahmad)
2. Fore wings hyaline. Postmarginal vein well developed and clearly defined . . . 3  
Fore wings mostly hyaline but with a strong narrow patch of infuscation below the marginal vein. Postmarginal vein not well developed though strongly indicated by dark pigmentation. Antenna in male with very short straight bristles, the longest a little over the breadth of the funicle . . . . . 3. *sankarani*, sp. nov.
3. Antenna in male with long sigmoid bristles, the longest 1.5-2.0× the breadth of the funicle . . . . . [1. *amathus* (Walker)]  
Antenna in the female without long sigmoid bristles, the longest being less than 1.5× the breadth of the funicle . . . . . *indica* Hayat

1. *Thomsonisca amathus* (Walker) (Figs. 2, 2a, 6 and photomicrograph 1)

*Encyrtus amathus* Walker, 1838, *Ent. Mag.*, 5 : 421.

Graham (1969) has given a detailed synonymy of the species and the readers are referred to this paper for a critical discussion on the European species.

*Specimens examined* : ENGLAND : Berks : Thatcham Moor, from *Salix fragilis* and *Crataegus* sp., 2♀, 27.vii.1975, J.S. Noyes Coll. and det.; Silwood Park, endoparasite of *Chionaspis salicis*, 2♀ paratypes of *T. brittanica* Alam., 12.vi.1955. S. M. Alam (London).

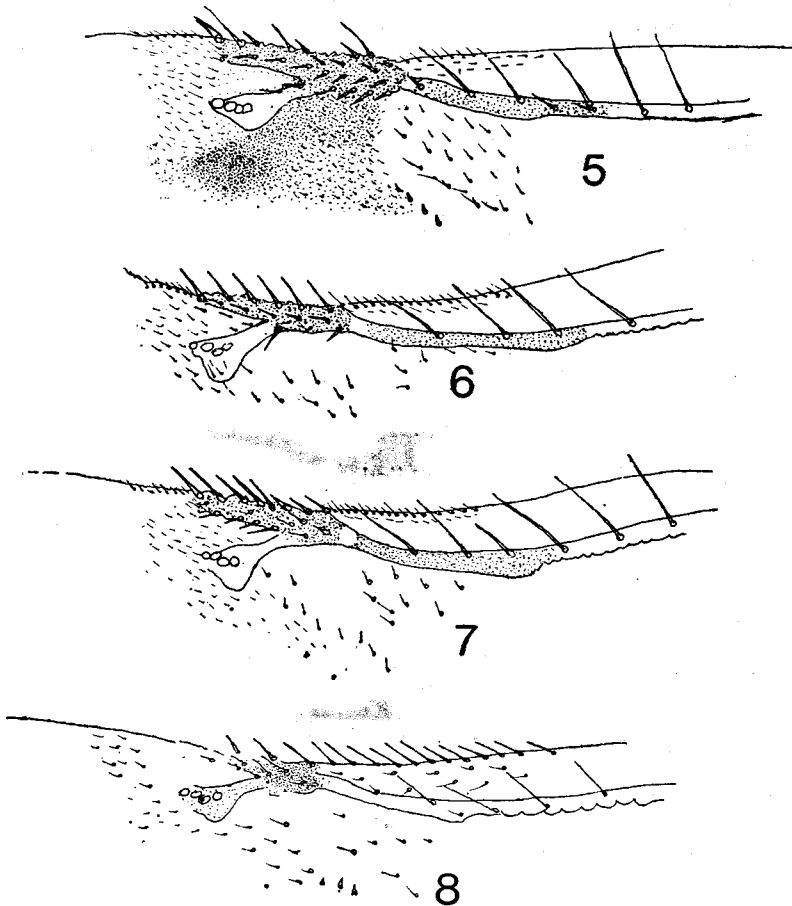
2. *Thomsonisca pakistanensis* (Ahmad) (Figs. 3, 3a, 7 and photomicrographs 2, 5)

*Pakencyrtus pakistanensis* Ahmad, 1970, *Entomophaga*, 15 : 237-40.

*Thomsonisca desantisiellus* Shaffee, Alam & Agarwal, 1975, *Alig. Musl. Univ. Publ. (Zool. Ser.) Indian Insect. Types*, 10 : 89-90. Syn. nov.

Subba Rao (1976) suggested that *Thomsonisca pakistanensis* may be a synonym of *amathus* (Walker). Reexamination of the paratypes in the British Museum (Nat. Hist.) which are in very bad condition and further paratypes from the United States National Museum made available through the kind courtesy of Dr. Grissell enabled me to conclude that *pakistanensis* though congeneric with *Thomsonisca* is not conspecific with *amathus*. Moreover these studies enabled me to find an other synonymy in *desantisiellus* Shaffee et al. Shaffee et al. (1975) state that two paratypes of *desantisiellus* are deposited in United States National Museum. However, Dr. Grissell informs me that the specimens are not in the collection. A very long series of a species of *Thomsonisca* was submitted by the Central Mango Research Institute, India, and this species conform to the original description of *desantisiellus* in every respect but cannot be separated from *pakistanensis*. In view of this I have no hesitation in synonymising *desantisiellus* with *pakistanensis*.

*Specimens examined* : PAKISTAN : Sahiwal, ex *Aspidiotus destructor* Signoret on *Mangifera indica* Linnaeus, 3♀, 3♂, paratypes, iii.1967 (in USNM). Karachi, ex scales on *Hibiscus rosasinensis*, 1♀, 1♂, 7.xi.1970 (CIBC); Gujarnwala, ex



Figs. 5-8. Fore wing, venation ♀ : 5, *Thomsonisca sankarani*, sp. nov.; 6 *Thomsonisca amathus* (Walker); 7, *Thomsonisca pakistanensis* (Ahmad); 8, *Thomsonisca indica* Hayat.

scales on *M. indica* and *Aspidiotus destructor* Signoret, 4♀3♂, 11.i.1962 and 22.xi.1965 (CIBC). INDIA : Lucknow, Rahman Khera, ex *Aspidiotus destructor* on *Mangifera indica*, 70♀, 40♂, 24-29.vii.1978, N. K. Sharma; 1♀ 1♂, ex *Aulacaspis* sp. on Mango, 11.ii.1976 (Central Mango Res. Instt.); Gorakhpur, 1♂ 1♀, ex *Phenaspis* sp. on *Mangifera indica*, xi.1969, M. Hayat Coll. and det.

3. *Thomsonisca sankarani*, sp. nov. (Figs. 1,1a, 5 and photomicrographs 3,4)

*Female* : Length including the exerted ovipositor 1.0-1.35 mm.

Head, thorax and ovipositor sheaths almost black; though in some

specimens the scutellum somewhat brown; abdomen brown to dark brown; antennae pale except the scape and apical part of pedicel which are black; fore legs pale, femora and tibiae of middle and hind legs with dark patches; fore wings hyaline with dark infuscation beneath the marginal vein.

**Sculpturing :** Head and thorax except axillae cellulate reticulate, axillae somewhat strigose; abdomen shining with very fine honeycomb patterns.

Head in frontal view wider than long; vertex measured across the median ocellus slightly wider than width of eye; ocelli in an equilateral triangle, the posterior pair separated from the ocular border by about  $0.75 \times$  their diameter; cheeks (malar space) as long as the transverse diameter of the eye; eyes delicately hairy; mandible with a short acute tooth and a broad curved truncation; antennae inserted slightly above the lower margin of eyes, scape with the radicle  $0.25 \times$  its length, slightly dilated at apex, pedicel  $0.5 \times$  the length of scape, funicle segments 1-4 almost quadrate and equal, 5-6 somewhat shorter, club distinctly three-segmented and slightly shorter than the combined lengths of the last three funicle segments.

Scutellum slightly shorter than scutum (14 : 15); axillae clearly meeting in the middle; in cleared mounted specimens the mesophragma long, conical and well advanced in to the abdomen. Fore wings slightly more than  $2.0 \times$  as long as broad, costal cell broad; submarginal vein with 9-11 long setae; marginal, stigmal and postmarginal veins in the ratio of 18 : 17 : 14.

Abdomen in slide mounted specimens including the exerted ovipositor, longer than thorax (40 : 30); ovipositor originating from the base of the abdomen sheaths exerted about 0.33 or more as long as the abdomen.

*Holotype* ♀, INDIA : Karnataka : Hoskote, mounted on a slide in Gum chloral, ex *Pseudaulacaspis barberi* (Green) 1978. *Paratypes* 21 ♀, 5♂; INDIA : Karnataka, collected from Bannerghutta, Hessarghatta, Hoskote and Whitefield, ex *Pseudaulacaspis barberi* (Green) on *Mangifera indica* L. on various dates in September, 1978 (CIBC, Indian Station); Bangalore 4♀3♂, ex *Aulacaspis* sp., xii. 1974, G.K.V. 2♀ and 1♂ paratypes will be deposited in the U.S National Museum, Washington, D. C., Zoological Institute, Leningrad and Plant Protection Research Institute, Pretoria, South Africa. Holotype and the rest of paratypes in the British Museum (Nat. Hist.).

The new species is named in honour of my esteemed friend and colleague Dr. T. Sankaran, Entomologist-in-charge, CIBC., Indian Station, Bangalore for his interest in the natural control of insect pests.

#### 4. *Thomsonisca indica* Hayat (Figs. 4, 8)

*Thomsonisca indica* Hayat, 1970, *Mushi*, 44 : 55-58.

Hayat (1970) described *indica* from Uttar Pradesh in India, reared from *Aonidiella orientalis* on Ficus. Through the kindness of Dr. Hayat, I was able to examine a ♂ and ♀ paratypes, dissected and mounted on slides. Though the female antenna is very close to that of *T. amathus*, the male antenna differs

considerably. In all probability *indica* may be a valid species.

*Specimen examined* : INDIA : Uttar Pradesh : Aligarh, ♀♂ paratypes on 2 slides, ex *Aonidiella orientalis* on Ficus, 18. vii. 1968, M. Hayat (Hayat collection, Aligarh).

**Acridencyrtus, gen. nov.**

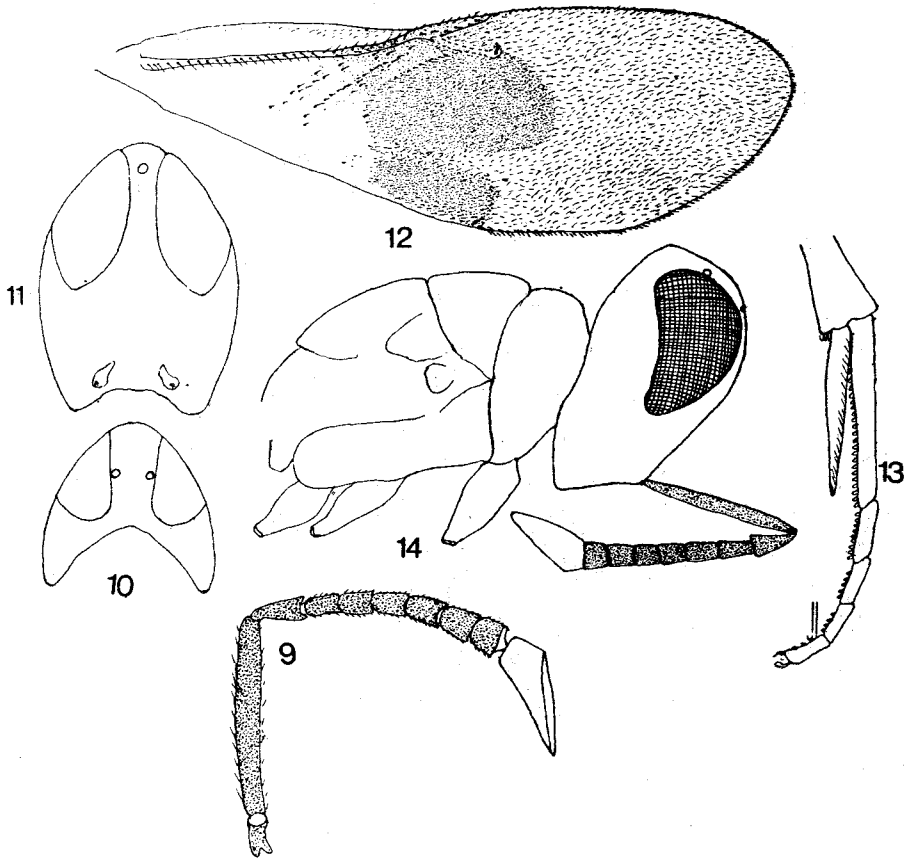
*Female* : Head when viewed from side extremely large, the occiput raised very much higher than pronotum; fronto-occipitally the face somewhat inflexed, the facial outline of the dorsal part somewhat convex, the face forming an angle at the insertion of antennae; when viewed from above the head almost triangular, vertex very narrow, ocelli in an acute angle triangle, but the front ocellus not seen as it is advanced forward and very much below; scrobes absent. Eyes elongate, not hairy, cheeks, very long, malar furrow absent. Mandibles with three teeth. Antennae with 1161 composition, club triangularly truncate. Thorax, legs and gaster more or less as in *Homalotylus* Mayr. Axillae not separated. Fore wings with a smoky patch in the middle; stigmal and postmarginal veins meeting in an acute angle, postmarginal vein only slightly shorter than stigmal. Ovipositor sheaths well exerted, a little more than 0.33 the length of abdomen.

*Male* : Essentially similar to the female.

*Type-species* : *Acridencyrtus ambiguous*, sp. nov. The generic name is derived from the fact that the head viewed in profile appears like that of a grasshopper.

*Acridencyrtus*, gen. nov., is closely allied to *Homalotylus* Mayer, *Anisotylus* Timberlake, *Cyrtocoryphus* Timberlake and *Isodromus* Howard. These genera can be separated by the following key (♀♀):

- 1. Mandibles bidentate . . . . . 2  
    Mandibles tridentate . . . . . 3
- 2. Body non metallic. Stigmal vein making a wider angle with the postmarginal vein; postmarginal vein only half as long as the stigmal; fore wing highly infusate in the middle; club solid. Parasitic on Coccinellids. North America . *Anisotylus* Timberlake  
    Body brilliantly metallic green. Stigmal vein as long as the combined lengths of the marginal and postmarginal; club distinctly three segmented. Host unknown Fiji . . . . . *Cyrtocoryphus*, Timberlake
- 3. Head abnormally large, viewed from above triangular; facial line making an angle at the insertion of antennae above clypeus. Parasitic on mealy bugs. Bangla Desh and India . . . . . *Acridencyrtus*, gen nov.  
    Head normal, viewed from above semicircular; facial line gently curving. . . . . 4
- 4. Face without scrobes, cheeks very short; stigmal vein making an acute angle with the postmarginal vein. Parasitic on Coccinellids Cosmopolitan, world wide. . . . .  
    . . . . . *Homalotylus* Mayr  
    Face with small shallow meeting apically in a crescent shaped groove. Stigmal vein almost at right angles to postmarginal vein. Parasitic on chrysopids. Cosmopolitan, world wide. . . . . *Isodromus* Howard



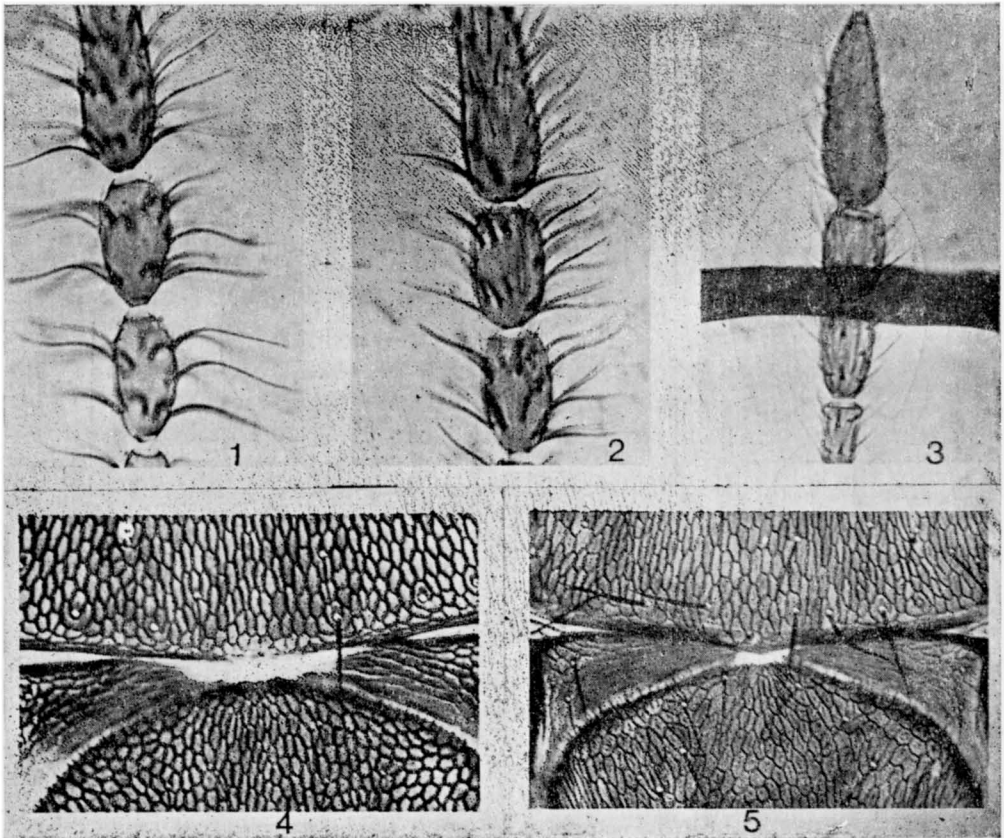
Figs. 9-14. *Acridencyrtus ambiguus*, gen et. sp. nov. ♀ : 9, Antenna; 10, Head, dorsal view; 11, Head, frontal view; 12, Fore wing; 13, Middle tibial spur and tarsi; 14, Head and thorax, side view.

5. *Acridencyrtus ambiguus*, sp. nov. (Figs. 9, 10, 11, 12, 13, 14)

*Female* : Length 1.75 to 2mm.

Body black except the following parts : Antennae except the club brown, club pale yellow; middle femora and tibiae, basal part of hind tibiae white; apices of middle tibiae, spurs, middle tarsi pale white to yellow, hind tarsi dark brown. Fore wings with a dark smokey patch in the middle. Ovipositor sheaths yellow with the apex somewhat dark.

Head viewed from above and side appears like the head of a grasshopper (Acridiidae); ocelli in an acute angled triangle, the posterior pair almost touching the ocular borders. Antennal scape narrow, cylindrical,  $9.0\times$  as long as broad (36 : 4); pedicel narrow, a little less than 0.25 the scape, funicle segments



Photomicrographs 1-5. *T. amathus* (Walker), antenna ♂; 2, *T. pakistanensis* (Ahmad), antenna ♂; 3, *T. sankarani*, sp. nov. antenna ♂; 4, *T. sankarani*, sp. nov., part of scutum and scutellum; 5, *T. pakistanensis*, part of scutum and scutellum.

1-4 longer than broad, 5th almost quadrate, 6th broader than long, club longer than the combined lengths of the last three funicle segments, triangularly truncate.

Venation typical of the group of genera discussed. Postmarginal vein very long, shorter than stigmal; costal cell broad, with two rows of fine setae; marginal fringe very short; middle tibial spur very long, only slightly shorter than the basitarsus (29 : 34).

Abdomen much shorter than the thorax (35 : 20). Ovipositor sheaths exerted a little over  $0.33 \times$  the length of the abdomen.

*Male* : Essentially similar to female except for the following colour variations : Head except vertex pale yellowish white; antennal scape pale white in the basal 0.33, funicle dark brown, club yellow.



*Holotype* ♀, BANGLA DESH : Rajshahi University Campus, ex *Phenococcus mangiferae* Green on *Mangifera indica* L., iii. iv. 1976, Mehtab Ali. *Paratypes* 2♀ 1♂, same data; 1♀, INDIA : Bangalore, ex *Chrysopa* pupa on *Citrus*, i. 1961, CIBC (Types in BMNH).

Though the labels on the holotype and paratypes from Bangla Desh show that the species was reared from mealy bug, the host record may not be true. The related genera keyed out in this paper except *Homalotylus* are reared from chrysopids and this observation is supported by the single specimen submitted by the Commonwealth Institute of Biological Control, Bangalore.

## 6. *Ooencyrtus papilionis* Ashmead

*Ooencyrtus papilionis* Ashmead, 1905, *Canad. Ent.*, 37 : 4-6.

*Ageniaspis pyrillae* Mani, 1939, *Indian J. Ent.*, 1 : 4. Syn. nov.

*Ageniaspis pyrillae* Mani : Pruthi & Mani, 1940, *ICAR Misc. Bulletin*, No. 30 : 15.

Mani (1939) described *Ageniaspis pyrillae* from several females and one male. The species was reared from the eggs of *Pyrilla purpusilla* by K.V.Rao and also by Lakshmanan from Delhi. The holotype and paratypes were supposedly deposited in the Pusa collections, Indian (formerly Imperial) Agricultural Research Institute, New Delhi. I have searched for this material and efforts to locate the types by my erstwhile colleagues at IARI have also failed. Evidently the types are lost. Among several lots of parasites received from India reared from *Pyrilla* eggs, I have not come across a species of *Ageniaspis* parasitizing *Pyrilla* eggs.

Recently a long series of specimens were submitted for identification by the Haryana Agriculture University. These specimens in every respect agree with the description of *Ooencyrtus papilionis* Ashmead and also conspecific with the specimens identified by Dr. Ferriere as *O. papilionis*. The description and figure of *A. pyrillae* are also in entire agreement with the description of *O. papilionis*. *Ageniaspis* is a genus whose species are polyembryonic and show morphological characters such as composition of antennae, wing venation, sculpturing of the scutum and scutellum which are not featured in the species studied. In my opinion *Ageniaspis pyrillae* Mani clearly belongs to the genus *Ooencyrtus* Ashmead and is a synonym of *O. papilionis* Ashmead.

*Specimens examined* : INDIA : Karnal, Uchani, 10 ♀ on card mount and 4♀ on slide mounted in Gum chloral, ex *Pyrillae purpusilla* Walker eggs, 1978 (Haryana Agric. University). PAKISTAN : Peshawar and Lyalpur, ex *Pyrilla purpusilla* eggs, large series consisting of both ♀ and ♂, 22. ix. 1975 and 7.viii.1975 (CIBC Pakistan).

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