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Taxonomic notes on Indian Encyrtidae (Hym.: Chalcidoidea). II

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Taxonomic notes on Indian Encyrtidae (Hym.: Chalcidoidea). II

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Introduction

The present paper is the second in the series which the author has planned to publish on the Indian Encyrtidae. (The first paper in this series was published in the *Journal of Natural History*, 13 (3), 315-326, 1979). This paper deals with 34 species belonging to 14 genera (one new). Two generic and six specific names are placed in synonymy, nine new combinations and one new name are proposed. Types of several species have been examined and, wherever considered essential descriptive notes are added.

Unless otherwise mentioned, the material reported on in this paper was collected by the author, and the hosts were determined by Mr. S. M. Ali of the Zoological Survey of India, Calcutta.

The following abbreviations are used for the depositories:

B.M.N.H.—British Museum (Natural History), London

U.S.N.M.—U.S. National Museum of Natural History, Washington, D.C.

Z.D.A.M.U.—Zoology Department, Aligarh Muslim University, Aligarh

Z.I.A.S.L.—Zoological Institute, Academy of Science, Leningrad

AENASIUS Walker

Pseudanasius Hayat, Alam and Agarwal, 1975:21. Type species *Pseudanasius clavus* Ht., Al and Ag., by monotypy and original designation; syn. nov.

The holotype of *P. clavus* is a gynandromorph (female with head of male) *Aenasius advena* Compere. Hence the generic name *Pseudanasius* is a synonym of *Aenasius* and the species, *clavus*, a synonym of *A. advena* (syn. nov.).

Callipteroma testacea Motschulsky

Leptomastidea sayadriae Mani and Kaul, in Mani *et al.* 1974: 70-72, ♂ (Type U.S.N.M.); syn. nov.

The holotype of *L. sayadriae* has been examined. It is on a glass slide under a circular coverslip. The head and left fore wing are detached from the rest of the body. The antennae are detached from the head and the latter mounted with the occiput facing upwards.

The synonymy of this species with *C. testacea* was suggested by Dr. J. S. Noyes (B.M.N.H., London) who has seen a female specimen determined by the author as *L. sayadriae*.

MATERIAL EXAMINED: India: Uttar Pradesh, Aligarh, 24. ii. 1979, 2 ♀♀ (M. Hayat and M. Verma).

1 ♀ in B.M.N.H.

***Charitopus panchgania* (Mani and Saraswat)**

Diversicornia panchgania Mani and Saraswat, in Mani *et al.* 1974: 81–83, ♂ (Type U.S.N.M.)
Charitopus panchgania (Mani and Saraswat): Hayat, 1979: 318.

The holotype male on a slide under a circular coverslip. The following notes drawn from the holotype and from further specimens collected in Aligarh supplement the original description:

MALE: Head bluish green, interscrobal prominence with bronzy lustre; meso-scutum bluish green on sides, reddish bronzy in middle; axillae and scutellum bronzy, the latter with coppery shine anteriorly; propodeum bluish green, but less intense than on head; gaster with a large yellowish to pale brown area in middle in anterior half, sides and distal half brownish; venter pale yellow; the brownish colour of gaster with golden bronzy shine. Antennae blackish. Wings hyaline, veins brown. Legs yellowish; basal half of fore coxae, most of the hind coxae and fore tarsi brownish; middle and hind tibiae and hind tarsi dusky yellow.

C. panchgania is closely related to *C. fulviventris* Foerster, but differs as follows: Antennal scape expanded in basal half; F3 slightly longer than wide; F6 distinctly longer than F5 and ramus of F5 more than one half the length of the ramus of F4. It also differs from *apicatus* (Holotype examined) in colour of gaster, different dimensions of the antennal segments (scape expanded in basal half, F4 about half the length of F5, F6 nearly as long as F4 and F5 combined); antennal sockets with their upper margins above a line drawn across lower eye margins; complete parapsidal sutures (incomplete in *apicatus*); and very short middle tibial spur.

MATERIAL EXAMINED: India: Uttar Pradesh, Aligarh, 11. ii. 1979, 4 ♂♂ (M. Hayat and M. Verma).

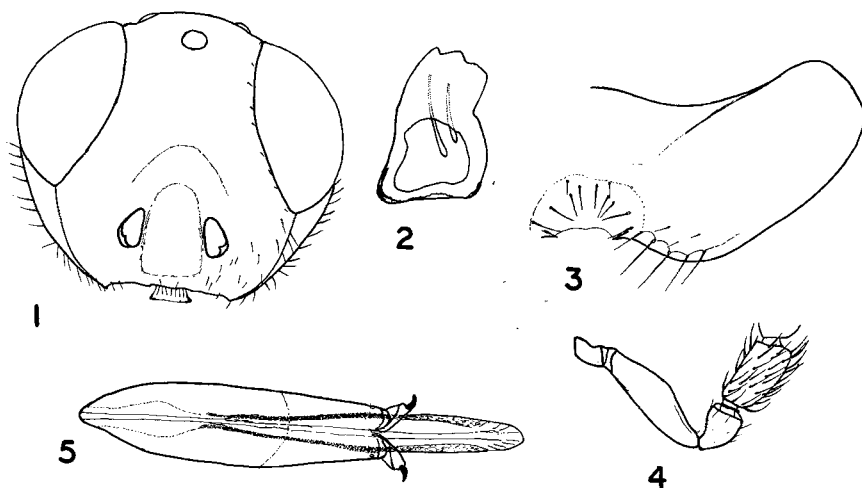
1 ♂ in B.M.N.H.

DIAPHORENCYRTUS Gen. nov.

TYPE SPECIES. *Aphidencyrtus aligarhensis* Shafee, Alam and Agarwal, 1975.

Aphidencyrtus aligarhensis is very closely related to *Coccidoxenus harrisoni* Robinson (Transferred to *Psyllaephagus* by Annecke and Insley 1971: 23, 34). The author, however, considers both these species different from the species included in that genus on a number of characters: mandibular dentition, wing venation, thoracic sculpture, shape of the hypopygium, and the male genitalia. A new genus is therefore proposed for this species. *P. harrisoni* should also belong to this genus, but the author has not seen specimens of that species.

FEMALE: Frontovortex, at narrowest, slightly more than a third of head width; head, in frontal aspect, about a sixth wider than high and with the eyes strongly diverging anterior to front ocellus; genae two-thirds of eye length and with faintly indicated subocular sutures; mouth fossa about as wide as width of frontovortex; antennal sockets removed from facial margin by the major diameter of a socket, their upper margins slightly below a line drawn across lower eye margins; facial impression moderately deep, reaching above to about middle of head (fig. 1); mandibles with two teeth and a truncation, in some aspects the truncation with indication of a third tooth (fig. 2); maxillary and labial palpi 4- and 3- segmented respectively. Antennae short; scape somewhat flattened but not expanded; pedicel longer than F1 and 2 combined; funicle segments not longer than wide; club 3-segmented, not appreciably wider than F6 and shorter than preceding four segments.



FIGS. 1-5. *Diaphorencyrtus aligarhensis* (Shafee *et al.*): ♂♀. 1. Head frontal aspect, ♀; 2. Mandible, ♀; 3. Hypopygium, left half, ♀; 4. Scape, pedicel and F1, ♂; 5. Genitalia, ♂.

Thorax moderately arched, but scutellum strongly so, the latter distinctly shorter than mesoscutum; axillae narrowly united by their mesal angles; propodeum in middle not longer than metanotum. Wings hyaline; fore wings with marginal vein about 2.5 times as long as wide; postmarginal vein subequal to marginal; stigmal vein longer than both individually; speculum narrow.

Gaster heart-shaped; eighth tergum short, broadly convex at apex; hypopygium as in fig. 3. Details of other structures as given in Shafee *et al.* 1975: figs. 247-254.

Head and thorax appear smooth in dry mounted specimens, but fine reticulations visible in slide mounted specimens.

Male: Similar to female except for the antennae, somewhat broader frontovertex and location of antennal sockets with their lower margins in line with lower eye margins. Genitalia with the phallobase almost tubular, conically narrowed anteriorly, and each digitus with a strong, curved denticle (fig. 5).

***Diaphorencyrtus aligarhensis* (Sh., Al. and Ag.) comb. nov.**

(Figs. 1-5)

Aphidencyrtus aligarhensis Sh., Al. and Ag., 1975: 91-93. ♂♀.

The species was described in sufficient details by the authors. In the present paper some illustrations not given with the original description are added. The recently described species, *A. diaphorinae* Myartzeva and Trjapitzin (1978) appears to be conspecific with *aligarhensis*: the host record and the description strongly suggest this possibility.

MATERIAL EXAMINED: India: Uttar Pradesh, Aligarh, xi. 1966, 15 ♀♀, 21 ♂♂ (93) ex psyllids; xii. 1968, 42 ♀♀, 28 ♂♂ (317 MC) ex *Diaphorina ?cardiae* Crawfd.; Maharashtra, Manmad, x. 1967, 1 ♀, 1 ♂, (141 MA) ex *Diaphorina* sp.; Punjab, Bhatinda, ix. 1968, 5 ♀♀, 4 ♂♂ (300 M) ex *D. cardiae* on *Cardia ruyza*; Maur, ix. 1968, 29 ♀♀, 17 ♂♂ (303 M), rest of data as for material No. 300 M. (Hosts determined by Dr. V. F. Eastop).

6 ♀♀, 3 ♂♂ (317 MC) in B.M.N.H.; 5 ♀♀, 4 ♂♂ (300 M) in Z.I.A.S.L.

***Doliphoceras tachikawai* Sh., Al. and Ag.**

Doliphoceras tachikawai Shafee *et al.* 1975: 25–28, ♂♀.

The author accepts this species in *Doliphoceras* with considerable hesitation. The following characters suggest that *tachikawai* belongs to a separate (new) genus: Antennal sockets situated below a line drawn across lower eye margins; gaster short with the ovipositor very short, two-fifths of the length of gaster; ovipositor sheaths absent; eighth tergum (=tenth abdominal tergum) with its basal width equal to its median length; and body normally convex (Shafee *et al.* 1975: figs. 39–47). In *Doliphoceras*† the antennal sockets are situated far above facial margin, with their upper margins above a line drawn across lower eye margins; gaster distinctly longer than thorax, acutely pointed at apex; ovipositor extends from near base of gaster and at least slightly exerted at apex; ovipositor sheaths long, in the form of posterior extensions of the second valvifers; eighth tergum twice as long as its basal width and strongly narrowed to apex; and body slightly depressed and elongate.

MATERIAL EXAMINED: India: Rajasthan, Pali, xi. 1974, 1 ♀ (DRS Reg. No. 932 A) ex *Centroccocus insolitus* on *Solanum melongena*, (T. G. Vazirani and party). The specimen in the collections of the Desert Regional Station, Z.S.I., Jodhpur.

***Erencyrtus dewitzi* Mahdihassan**

Erencyrtus dewitzi Mahdihassan; Ferrière, 1935: 396–398, ♂♀.

Parageniaspis indicus Alam, 1970: 137–139, ♀; syn. nov.

Parageniaspis indicus Alam is undoubtedly a synonym of *E. dewitzi* and has no relation with *Parageniaspis*. The detailed description, illustrations and the host record support this conclusion. The name *Parageniaspis indicus* was used first as a *nomen nudum* by Alam (1963).

MATERIAL EXAMINED: India: Uttar Pradesh, Aligarh, 10. xi. 1966, 36 ♀♀ (91 A) ex *Kerria lacca* on *Acacia arabica*. 4 ♀♀ in B.M.N.H.

***HOMALOTYLUS* Mayr**

Hayat *et al.* (1975) synonymized *Neoaenasioidea* with *Homalotylus*. In a recent paper, Khan (1976) tried to distinguish the former genus on the bases of two characters, supposedly of generic value: first valvifers (=triangular plates) with basal and apical angles in one plane and second valvifers (=inner plates) long, of more or less uniform width. It is impossible to find any difference of generic value in the shape of the second valvifers of *H. flaminus* and the three species placed in *Neoaenasioidea* as illustrated by Khan (his figs. 11–14); and the slight difference in the shape of the first valvifers (undoubtedly coupled with the elongated third valvulae) alone cannot form a reliable basis for generic distinctions. In regarding *Neoaenasioidea* as distinct from *Homalotylus*, Khan (1976) overlooked *H. oculata* (Grlt.), type species of *Hemaenasioidea* Grlt. (already correctly synonymized with *Homalotylus* by Timberlake (1919) and several other species with exerted ovipositors.

The genus *Homalotylus* is represented in the Indian fauna by seven species (see Hayat *et al.* 1975). In the present paper *N. albiscutellaris* Khan is considered a

†The author has seen paratypes of *D. pseudococci* Alam (= *belibus* Walker) and four further British specimens (2 ♀♀, 2 ♂♂) of *belibus* sent by Dr. J. S. Noyes. He has also with him a long series (♀♀, ♂♂) of specimens of *D. gracilis* Hayat collected in Delhi, Guntur (A.P.) and Aligarh (U.P.).

synonym of *H. albiclavatus*. One more species, *Prochilonurus nipaecocci* Subba Rao, also belongs here (Dr. Subba Rao, *per. comm.*), but it will be considered after examination of the types.

***Homalotylus albiclavatus* (Agarwal)**

Neoenasioidea albiclavatus Agarwal, 1970: 27, ♀; Khan, 1976: p. 181, ♀.

Homalotylus albiclavatus (Agarwal); Ht., Al. and Ag., 1975: 69, ♂♀.

Neoenasioidea albiscutellaris Khan, 1976: 180, ♀: *syn. nov.*

N. albiscutellaris is indistinguishable from *H. albiclavatus*. The specimens referred to the latter species by Khan (1976) appear to be paler forms of that species. Though the author has not seen the types, he has no hesitation in placing *albiscutellaris* as a synonym of *H. albiclavatus*.

MATERIAL EXAMINED: India: Uttar Pradesh, Aligarh, 24. xi. 1967, 1 ♀ (FC5D) swept over grasses; Gonda, 9. xi. 1969, 1 ♀; 1 ♀ collected by Dr. Shuja-Uddin but no data. (See also Hayat *et al.* 1975). 1 ♀ (Gonda specimen) in B.M.N.H.

***Mayrencyrtus fusiscapus* (Agarwal)**

Cheilonurus fusiscapus Agarwal, 1965: 63-65, ♀ (Type Z.D.A.M.U.); Ht., Al. and Ag., 1975: 47, ♂♀.

Mayrencyrtus fusiscapus (Agarwal); Hayat, 1979: 319, ♀.

Holotype in alcohol in a glass vial with the head detached from the rest of the body. One mandible, both antennae, wings of right side and all but left hind leg, on a slide. The original description of the body colour is erroneous. The specimens referred to this species by Hayat *et al.* (1975) agree with the holotype. A brief description mainly of the body colour is given here so as to avoid any future misidentification:

FEMALE: Head and thorax yellow with some dusky suffusions; scrobes pale yellow; anterior half of scutellum whitish; pronotum with a triangular brownish patch in middle; metanotum and propodeum yellow; gaster dark, metallic shiny; exerted part of ovipositor yellow to pale yellow. Antennal radicle except brownish apical margin pale yellow; scape orange yellow, apex white, basal half or so of ventral margin and whole of dorsal margin brownish; dorsal of pedicel and F1-3 brownish; F4-6 whitish; club blackish brown. Fore wings infuscated to apex with basal third (except a small infuscated patch at extreme base) hyaline; a triangular space between stigmal and postmarginal veins and a transverse strip in middle of disc two thirds away from anterior margin, hyaline. Legs orange yellow to slightly dusky in parts, with an oblique brownish strip at apex of middle tibia and the following parts whitish to pale yellow: coxae and trochanters of all legs; basal half or so of middle femora; apex of middle tibia narrowly above the brownish strip; and apex and distal third of hind tibia; tarsi of middle and hind legs pale yellow, the last tarsal segments brown.

Head in dorsal view, about one and three-fourth times as wide as long; frontovertex, at narrowest, slightly less than one third of head width. Scutellum with scale-like setae in distal half. Other details as given in the original description and those illustrated and described by Hayat (1979).

***PARECHTHRODRYINUS* Girault**

The genus *Protyndarichus* Mercet is a synonym of *Parechthrodryinus* (see Trjapitzin and Gordh 1978). Hence all the Indian species until now referred to the former genus are transferred to *Parechthrodryinus* as new combinations, and *Protyndarichus submetallicus* Alam is placed in synonymy with *Parec. clavicornis*.

***Parechthrodryinus albiclavatus* (Sh., Al. and Ag.) comb. nov.**

Protyndarichus albiclavatus Shafee *et al.* 1975: 63. ♀.

***Parechthrodryinus clavicornis* (Cameron)**

Parechthrodryinus clavicornis (Cameron): Ferrière. 1935: 398–400. ♂♀.

Protyndarichus submetallicus Alam, 1970: 140–142, ♂♀: syn. nov.

The author has no doubt of the identity of *Prot. submetallicus* with *Parec. clavicornis*. The description, illustrations and the host record given by Alam (1970) suggest this conclusion. The name *Protyndarichus submetallicus* was first used as a *nomen nudum* by Alam (1963).

MATERIAL EXAMINED: India: Uttar Pradesh, Aligarh, 10. xi. 1966, 1 ♂ (91) on *Acacia arabica*; Maharashtra, Manmad, 8. x. 1967, 3 ♀♀, 2 ♂♂ (138 MA) on *Anona squamosa*; Nasik Road, 10. x. 1967, 4 ♀♀, 2 ♂♂ (148 M); the host is *Kerria lacca*.

2 ♀♀ (148 M) in B.M.N.H.

***Parechthrodryinus hemiaspidoproctis* (Subba Rao) comb. nov.**

Tyndarichus hemiaspidoproctis Subba Rao, 1967: 4–6, ♀.

Protyndarichus hemiaspidoproctis (Subba Rao); Subba Rao, 1976: 687.

***Parechthrodryinus nigriclavatus* (Sh., Al. and Ag.) comb. nov.**

Protyndarichus nigriclavatus Shafee *et al.* 1975: 60–62. ♂♀.

PROCHILONEURUS Silvestri

Prochiloneuroides Hayat, Alam and Agarwal, 1975: 61. TYPE SPECIES *Prochiloneurus comperei* Viggiani (= *P. clavatus* Compere *nec* Girault), by original designation: syn. nov.

Prochiloneuroides is an unnecessary name. Through the courtesy of Dr. J. S. Noyes (B.M., London) the author has seen a British specimen of *P. bolivari* Mercet (type species of *Neoprochiloneurus* Viggiani) and is satisfied that *Prochiloneuroides* is a junior synonym of *Prochiloneurus*.

The synonymy of *Neoprochiloneurus* with *Prochiloneurus* was proposed by Noyes (1978) and the present author agrees with this synonymy. His studies on the Indian and Australian† species showed that the presence or absence and the degree of development of the scutellar 'hair brush' cannot form a reliable basis for generic distinction. The extent of development of the brush varies greatly in different species, and shows some variation even within a single species. It may be well-developed consisting of several long bristles arranged in a more or less compact bundle (*P. aegyptiacus*), it may consist of about a dozen or two short bristles (*hayati*, *oviductus*, *testaceus*), it may be represented by a few bristles irregularly scattered in distal third of the scutellum (*insolitus*), or just a pair of bristles (*clavatus*).

Prochiloneurus is represented in the Indian fauna by ten species (Alam 1961, Agarwal 1965, Mani *et al.* 1974, Hayat *et al.* 1975, Shafee *et al.* 1975). Study of the types of some of these species has brought down the number of species to eight and indicated two further possible synonyms. Dr. Subba Rao (C.I.E., London) has informed the author that *P. nipaecocci* Subba Rao, 1967 (transferred to *Neoprochiloneurus* by Subba Rao, 1976: 688) actually may belong to *Homalotylus*. So this species is excluded from *Prochiloneurus*.

† The author has studied the types of Australian species of this genus described by Arsene A. Girault. Notes on these species will be published elsewhere in due course.

Since illustrations for the Indian species were already published by several authors (see above) these are not repeated here, but reference is made to these wherever necessary. However, in the present paper a key to the species is given to facilitate their recognition.

Males are not studied in detail. In several instances these were bred along with females belonging to two or more species, so that it is not possible to assign these to the correct species.

***Prochiloneurus aegyptiacus* (Mercet)**

Achrysoophagus aegyptiacus Mercet, 1929: 360–361, ♀.

Prochiloneurus aegyptiacus (Mercet); Viggiani, 1970: 67.

(?)*Prochiloneurus valparianus* Mani and Kaul, in Mani *et al.* 1974: 66–68, ♀ (Type U.S.N.M.).

(?)*Prochiloneurus indicus* Sh., Al. and Ag., 1975: 49–50, ♂♀.

P. valparianus: The holotype on a glass slide under a circular coverslip. Head with antennae, one middle leg and both the fore wings detached from the rest of the body, and the fore wings missing. Head and thorax slightly crushed, the gaster stretched out, and the bristles of the scutellar brush all detached. The specimen agrees in all respects with the specimens the author has initially determined as *indicus*, but which he now considers indistinguishable from *aegyptiacus*.

The following material is referred to *aegyptiacus* mainly because it agrees with the original description of that species in almost all respects except for the colour of the funicle segments: F1–5 from almost completely yellowish white to dusky yellow and F6 in most of the specimens dark brown. Dr. Subba Rao compared our specimens with the South African specimens determined by Compere (1938) as *aegyptiacus* and informed the author that these differ from our specimens in the shape of the antennal scape (strongly widened in basal half), presence of a narrow dark streak on ventral margin of scape; finely rugose frontovertex (rugose punctate in our specimens); longer malar space; and less deep scrobes. He, however, says that on a balance of characters our specimens are very close to *aegyptiacus*.

It may further be noted here that the material referred to *aegyptiacus* by Shafee *et al.* (1975) most probably is a misidentification for *javanicus* (Ferrière). The longer middle tibial spur, very dark antennae with shorter funicle segments and large club, and the rounded apex of the stigmal vein (apex of stigmal vein truncate in other species) suggest this possibility.

MATERIAL EXAMINED: India: Kerala, Kalamasseri, 12. iii. 1967, 1 ♀ (63 MA) ex coccid on *Hemigraphes* sp.; Tamil Nadu, Salem, 21. iv. 1969, 29 ♀♀ (331 M), rest of data as in the preceding; Dindigul, 24. iv. 1969, 3 ♀♀ (341 M) ex coccids on *Tamarindus indica*; Tuticorin, 1. v. 1969, 4 ♀♀ (354 MB) ex coccids on *Hemigraphes* sp.

***Prochiloneurus agarwali*, nom. nov.**

Prochiloneurus albifuniculus Sh., Al. and Ag., 1975: 49, 52, ♀; preoccupied by *P. albifuniculus* (Hayat *et al.* 1975).

***Prochiloneurus albifuniculus* (Hayat *et al.*) comb. nov.**

Prochiloneuroides albifuniculus Ht., Al. and Ag., 1975: 62–64, ♀ (Type Z.D.A.M.U.).

Study of the holotype and two further specimens collected necessitates the following corrections to the original description: Lateral ocelli about 2–2½ times their diameters from occipital margin (not four ocellar diameters); temples and genae

dusky; posterior half of pronotum yellowish, anterior half brownish; thoracic venter yellowish; mesopleura and all coxae whitish; fore tibiae pale yellow; and sides and venter of gaster yellowish brown.

MATERIAL EXAMINED: India: Uttar Pradesh, Aligarh, 30. viii. 1978, 1 ♀ (M. Verma); Rajasthan, Jodhpur, 15. x. 1976, 1 ♀ (DRS Reg. No. 921 A).

1 ♀ (Aligarh specimen) in B.M.N.H.; the other specimen in the collections of the Desert Regional Station, Z.S.I., Jodhpur.

Prochiloneurus comperei Viggiani

Prochiloneurus clavatus Compere, 1938: 325, ♂♀ Preoccupied by *P. clavatus* (Girault, 1915).

Prochiloneurus comperei Viggiani, 1970: 68. Replacement name for *P. clavatus* Compere nec Girault.

Prochiloneuroides clavatus (Compere); Ht., Al. and Ag., 1975: 61, ♂♀.

Neoprochiloneurus clavatus (Compere); Subba Rao, 1976: 688.

The specific name *clavatus* is not available for *comperei* as it is preoccupied by *P. clavatus* (Girault). It is a very distinctive species and differs from the other Indian species of the genus by the characters given in the key.

MATERIAL EXAMINED: See Hayat *et al.* 1975.

Prochiloneurus hayati Sh., Al. and Ag.

Prochiloneurus hayati Shafee *et al.* 1975: 53–55, ♀.

The types of this species were collected by the author (author's collection No. 310 MB) and he has studied these specimens before passing these on to Dr. Shafee. *P. hayati* is very closely related to and might eventually prove to be nothing more than smaller specimens (0.84 mm) of *testaceus*. The differences between these two species are given in the key.

Prochiloneurus insolitus (Alam)

Achrysoophagus metallicus Agarwal, 1965: 66–68, ♀ (Type Z.D.A.M.U.); syn. nov.

Subba Rao (1976) should be consulted for synonyms and citations to this species.

P. insolitus: The author has seen the female paratype. It is dissected and mounted on five slides, but the slides bear no data other than the name of the species. Since the illustrations given by Alam (his figures 1, 3–8) were from these slide mounted parts and since the original description was based on two females, the author considers this specimen as the paratype.

A. metallicus: Holotype female in alcohol in a vial, with the antennae, legs and wings of right side on a slide. The original description of the body colour is erroneous. The specimen agrees in all respects with *insolitus*.

P. insolitus is provisionally treated here as valid. From the description and illustrations given for *P. pulchellus* by Silvestri (1915) it is not possible to separate these two species. The author has also examined the holotype female of *P. taurus* (Girault), and despite the deplorable condition of the slide mounted type (coverslip crushed directly over the body) he has no doubt of its identity with *insolitus*. But this synonymy is not introduced here since both these species ultimately may have to be synonymized with *pulchellus*.

MATERIAL EXAMINED: A large series (174 ♀♀) of specimens collected on different dates during 1967–1969 from the following localities: India: Tamil Nadu: Sri Rangam, Valandur, Shencottah, Salem, Tuticorin; Kerala: Karunagapally,

Kalamasseri, Shoranur; Maharashtra: Manmad, Nasik; Goa: Chicolim, Vasco-da-Gama; Karnataka: Hubli; Punjab: Hoshiarpur, Bhatinda, Patiala, Nabha; Haryana: Hissar; Uttar Pradesh: Shahjahanpur, Lakhimpur, Gorakhpur.

The hosts are *Centrococcus insolitus*, *Centrococcus* spp., *Nipaeococcus* spp., *N. viridis*, *Icerya aegyptica*, and several undetermined coccids.

7 ♀♀ (59 M, Karunagapally) in U.S.N.M.; 8 ♀♀ (351 M, Tuticorin) in Z.I.A.S.L.

Prochiloneurus testaceus (Agarwal)

Achrysoophagus testaceus Agarwal, 1965: 65, 66, 68–69, ♀.

Prochiloneurus testaceus (Agarwal); Shafee *et al.* 1975: 49, 53, ♀.

This is a widely distributed Indian species. The material listed below is all referred to *testaceus* though not all the specimens agree entirely with the original description, but which fall within the range of variations to be expected in such a widely distributed species.

As illustrated by Agarwal (1965: fig. 53) the eyes strongly converge anterior to front ocellus so that the frontovertex at the narrowest point is only slightly wider than the diameter of the front ocellus; pronotum with a triangular brownish patch; F6 erroneously shown as brownish, but correctly described as whitish; and gaster described as dark with metallic lustre, but in the key it is stated that the 'basal half of abdomen completely metallic'. In the specimens studied by the author the width of frontovertex varies from as wide as to nearly twice the diameter of the front ocellus and the pronotum with a triangular to almost rectangular patch. Colour of the gaster also varies from brownish to dark brown in basal half or so, yellowish to pale brownish yellow in the rest. Allowance should also be made for slight variations in the length and width of the funicle segments, but F1 is nearly always somewhat longer than wide.

MATERIAL EXAMINED: 55 ♀♀ collected on different dates during 1967–1970 from the following localities: India: Andhra Pradesh: Tirupati; Tamil Nadu: Arkonam, Kancheepuram, Ranipet, Avadi, Sri Rangam, Nagoor, Shencottah; Maharashtra: Nasik; Uttar Pradesh: Aligarh; Punjab: Phillaur, Mullanpur, Nabha.

The hosts are *Nipaeococcus* spp., *N. viridis*, *Rastrococcus iceryoides*, and undetermined coccids.

8 ♀♀ (290 M, Phillaur) in B.M.N.H.; 1 ♀ (153 MA, Nasik) in U.S.N.M.; 3 ♀♀ (310 MC, Nabha) in Z.I.A.S.L.

Key to Indian species of *Prochiloneurus*, ♀♀

- 1 Antennal scape flattened and expanded beneath, not more than 2.5 times as long as wide; the infuscated area of the fore wing with a distinct, club-shaped, transverse hyaline band 2
- Antennal scape more or less cylindrical or only somewhat flattened, but not expanded, at least five times as long as wide; fore wing with the hyaline transverse band either absent or very narrow 3
- 2 Funicle segments all transverse and club longer than funicle and pedicel combined; scutellum without a hair brush; body wholly dark brown to blackish with metallic reflections; antennae blackish with apex of scape, apex of pedicel narrowly, F2 partly and F3–5, pale yellow to whitish *P. comperei* Viggiani
- Funicle segments at most somewhat wider than long and club not longer than funicle; scutellar brush composed of irregularly arranged bristles in distal third of scutellum; body not wholly dark, most of head, thorax except a patch in middle of pronotum and distal third or so of mesoscutum, yellowish; gaster blackish brown,

- shiny; scape yellowish with basal two-thirds of ventral margin brownish; F1 and F2 (F2 sometimes partly) brownish, F6 and club blackish brown, rest of the funicle segments whitish ***P. insolitus***
(Alam) (*P. pulchellus* Silv. and *P. taurus* (Grlt.) also belong here.)
- 3 Body, excluding legs, almost wholly dark brown to blackish with metallic reflections, except sometimes the axillae, thoracic pleura and facial area 6
– Body differently coloured, not wholly dark; most of head and thorax except a patch in centre of pronotum and distal third or so of the mesoscutum, yellowish suffused with brownish, especially on frontovertex: (funicle segments white) 4
- 4 Width of frontovertex, at narrowest, about three times the diameter of front ocellus; scutellum without a hair brush; fore wing at least three times as long as wide, with the apical hyaline border distinguished into two areas: a semicircular hyaline band with transparent setae bordering the infuscation and distad of this band to apex of the blade with brownish setae; hind femur with a dark strip in distal half and hind tibia with a similar strip in basal half. ***P. albifuniculus***
(Ht., Al. and Ag.)
– Width of frontovertex, at narrowest, less than three diameters of front ocellus; scutellum with a hair brush; fore wing about two and a half times as long as wide; apical border of fore wing distad of infuscation wholly with transparent setae 5
- 5 Width of frontovertex, at narrowest, from one to nearly two diameters of front ocellus; pedicel not less than twice as long as wide; F1 clearly longer than wide; scutellar brush composed of about 24 bristles arranged in two irregular rows; tibial spur of middle leg somewhat longer than basitarsus. ***P. testaceus*** (Agarwal)
– Width of frontovertex slightly more than two diameters of front ocellus; pedicel 1.75 times as long as wide; F1 as long as wide and club longer than funicle; scutellar brush composed of about 14 setae arranged in two rows; tibial spur of middle leg as long as basitarsus ***P. hayati*** Sh., Al. and Ag.
- 6 Distance between antennal sockets about three times the width of frontovertex; width of the hyaline apical border of fore wing about 1/8–1/7 of the width of the infuscated area; funicle segments whitish ***P. agarwali, nom. nov.***
(= *P. albifuniculus* Sh., Al. and Ag. *nec* Ht., Al. and Ag.)
– Distance between antennal sockets about twice the width of frontovertex; width of the hyaline apical border of fore wing about 1/10 of the width of the infuscated area; colour of funicle segments variable, but F6 and club blackish brown ***P. aegyptiacus*** (Mercet); ***P. valparianus*** Mani and Kaul; ***P. indicus*** Shafee *et al.*

RHOPUS Foerster

Following Graham (1969) and others, *Xanthoencyrtus* Ashmead is treated as a subgenus of *Rhopus*. Recently, Subba Rao and Hayat (1979) synonymized *Scelioencyrtus* Girault with *Rhopus*.

The genus is represented in the Indian fauna by six species and several apparently undescribed species in the author's collection. These need further studies based upon not only study of the types but upon further collections and comparison with types of species from other regions. In this paper no attempt is made beyond listing the Indian species with a view to make the nomenclature consistent with the currently accepted concept of the genus.

Rhopus (Rhopus) desantisiellus Ghesquière

Rhopus desantisiellus Ghesquière; Sh., Al. and Ag., 1975: 35, ♀; Rajasthan, Udaipur; ex mealybug on sugarcane.

Rhopus (Rhopus) gramineus Hayat

Rhopus gramineus Hayat, 1970: 110–111, ♀; Punjab, Patiala; ex *Antonina* sp.

Rhopus (Rhopus) sacchari* (Alam) comb. nov.Xanthoencyrtus sacchari* Alam, 1961: 239–240, ♀; Bihar, Pusa; ex *Ripersia sacchari*.***Rhopus (Xanthoencyrtus) fullawayi* (Timberlake)***Xanthoencyrtus comperei* Subba Rao, 1960: 276–279, ♀; Delhi; ex *Saccharicoccus sacchari* (Synonymy by Subba Rao, 1976: 668).***Rhopus (Xanthoencyrtus) longiclavatus* (Sh., Al. and Ag.) comb. nov.***Xanthoencyrtus longiclavatus* Shafee *et al.* 1975: 31, ♀; Bihar, Narkatiaganj; ex *Maronelicoccus hirsutus*.***Rhopus (Xanthoencyrtus) qadrii* (Sh., Al. and Ag.) comb. nov.***Xanthoencyrtus qadrii* Shafee *et al.* 1975: 30–31, ♂; Uttar Pradesh, Choubatia; ex *Ripersia* sp.***Tetracnemus heterocornis* Mani and Saraswat**

Hayat (1979) should be consulted for citations to this species. The author has examined the holotype (from U.S.N.M.). It is on a slide under a circular coverslip. The body is somewhat laterally mounted, pressed and partly crushed. Except as noted below, the holotype agrees with the original description:

Head, in frontal aspect, with the eyes 1.5 times as long as genae; upper margins of antennal sockets slightly above lower eye margins; antennae with F4 slightly longer than F3; genitalia with well developed, elongate parameres, each paramere with a long apical seta, and digitus volsellaris with two denticles at apex and a short subapical denticle.

Tetracnemus peninsularis* (Mani and Saraswat) comb. nov.Tricnemus peninsularis* Mani and Saraswat, in Mani *et al.* 1974: 73–75, ♂ (Type U.S.N.M.)

The holotype on a slide under a circular coverslip. The head detached from the rest of the body with one antenna wholly and the other beyond scape detached from head. Both pairs of wings, one hind and one middle leg detached from thorax. Thorax and gaster somewhat laterally mounted and crushed.

The author agrees with Mani and Saraswat (1974) that this species is out of place in *Tricnemus* Mercet (= *Tricladia* Mercet *nec* Felder, 1874, *Reise Novara, Zool.* 2: p. 9, in Lepidoptera), but does not consider that a separate genus is required. The species agrees with *Tetracnemus* males in all respects including sculpture of body, mandibular dentition (bidentate, not tridentate as stated by Mani and Saraswat), 4-segmented maxillary and 3-segmented labial palpi, fore wing venation, and genitalia. So the author considers it best placed in *Tetracnemus* in spite of the number of rami, and until the female is collected. The number of rami seems not to be a reliable character; species in *Tricnemus* and *Tetracnemoidea* are known to possess an additional ramus although only a vestigial one, and in *Hexacladia blanchardi* De Santis the sixth ramus is very short, almost rudimentary.

T. peninsularis is closely related to *T. maculipennis* (De Santis), but differs by the absence of ramus of F5 and the number of segments in the palpi (3-segmented maxillary and 2-segmented labial palpi in *maculipennis*).

Summary

The paper deals with 34 encyrtid species belonging to 14 genera. Two generic and six specific names are placed in synonymy, one new name and nine new combinations are proposed. The proposed changes are as follows:

Aenasius Walker (= *Pseudanasius* Hayat *et al.*; syn. nov.)

A. advena Compere (= *Pseudanasius clavus* Hayat *et al.*; syn. nov.)

Callipteroma testacea Motschulsky (= *Leptomastidea sayadriae* Mani and Kaul; syn. nov.)

Diaphorencyrtus (gen. nov.) *aligarhensis* (Shafee *et al.*) comb. nov. from *Aphidencyrtus*.

Erencyrtus dewitzi Mahdihassan (= *Parageniaspis indicus* Alam; syn. nov.)

Homalotylus albiclavatus (Agarwal) (= *Neoaenasioidea albiscutellaris* Khan; syn. nov.)

Parechthrodryinus albiclavatus (Shafee *et al.*) comb. nov. from *Protyndarichus*.

P. clavicornis (Cameron) (= *Protyndarichus submetallicus* Alam; syn. nov.)

P. hemiaspidoproctis (Subba Rao) comb. nov. from *Tyndarichus*.

P. nigriclavatus (Shafee *et al.*) comb. nov. from *Protyndarichus*.

Prochiloneurus Silvestri (= *Prochiloneuroides* Hayat *et al.* syn. nov.)

P. agarwali, nom. nov. for *P. albifuniculus* Shafee *et al.* not Hayat *et al.*

P. albifuniculus (Hayat *et al.*) comb. nov. from *Prochiloneuroides*.

P. insolitus (Alam) (= *Achrysoophagus metallicus* Agarwal; syn. nov.)

Rhopus (*Rhopus*) *sacchari* (Alam) comb. nov. from *Xanthoencyrtus*.

R. (*Xanthoencyrtus*) *longiclavatus* (Shafee *et al.*) comb. nov. from *Xanthoencyrtus*.

R. (*X.*) *qadrii* (Shafee *et al.*) comb. nov. from *Xanthoencyrtus*.

Tetracnemus peninsularis (Mani and Saraswat) comb. nov. from *Tricnemus*.

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References

- AGARWAL, M. M., 1965, Taxonomy of encyrtid parasites (Hymenoptera: Chalcidoidea) of Indian Coccoidea, *Acta Hymenopterologica. Fukuoka*, **2** (2), 37–97.
- 1970, Some new chalcidoid parasites recorded from Aligarh (India) (Hymenoptera, Encyrtidae), *Mushi*, **44**, 25–29.
- ALAM, S. M., 1961, Undescribed encyrtid parasites (Hym.: Chalcidoidea) of Indian coccids, *XI. Internationaler Kongress fur Entomologie Wien 1960*, **1**, 235–240.

- 1963, Two new encyrtid parasites (Hymenoptera: Chalcidoidea) reared from *Laccifer lacca* (Kerr.), *Proceedings of the 50th Indian Science Congress*, pt. III, p. 517 (Abstract).
- 1970, Encyrtid parasites reared from *Laccifer lacca* (Kerr.) (Hymenoptera), *Mushi*, **43**, 137–142.
- ANNECKE, D. P., and INSLEY, H. P., 1971, Catalogue of Ethiopian Encyrtidae and Aphelinidae (Hymenoptera: Chalcidoidea). *Republic of South Africa, Department of Agricultural Technical Services Entomology Memoir* No. **23**, 1–53.
- COMPÈRE, H., 1938, A report on some miscellaneous African Encyrtidae in the British Museum, *Bulletin of Entomological Research*, **29**, 315–337.
- FERRIÈRE, C., 1935, The Chalcidoid parasites of lac insects. *Bulletin of Entomological Research*, **26**, 391–406.
- GIRAULT, A. A., 1915, Australian Hymenoptera Chalcidoidea—VII. The family Encyrtidae with descriptions of new genera and species, *Memoirs of the Queensland Museum*, **4**, 1–184.
- GRAHAM, M. W. R. DE V., 1969, Synonymic and descriptive notes on European Encyrtidae (Hym., Chalcidoidea), *Polskie Pismo Entomologiczne*, **39**, 211–319.
- HAYAT, M., 1970, Three new species of Encyrtidae (Hymenoptera: Chalcidoidea) from India, *Bulletin of Entomology, New Delhi*, **10**, 110–115.
- 1979, Taxonomic notes on Indian Encyrtidae (Hym.: Chalcidoidea). I, *Journal of Natural History*, **13**, 315–326.
- HAYAT, M., ALAM, S. M., and AGARWAL, M. M., 1975, Taxonomic survey of encyrtid parasites (Hymenoptera: Encyrtidae) in India, *Aligarh Muslim University Publications (Zoological Series) on Indian Insect Types*, **9**, 1–112.
- KHAN, M. Y., 1976, New species of the genus *Neoaenasioidea* Agarwal (Hymenoptera: Encyrtidae), *Journal of the Bombay Natural History Society*, **73**, 179–181.
- MANI, M. S., DUBEY, O. P., KAUL, B. K., and SARASWAT, G. G., 1974, Descriptions of some new and new records of some known Chalcidoidea (Hymenoptera) from India, *Memoirs of the School of Entomology, St. John's College Agra*, No. **3**, 1–108.
- MERCET, R. G., 1929, Los generos *Prochiloneurus* y *Achrysoophagus*, *EOS, Madrid*, **5**, 359–363.
- MYARTZEVA, S. N., and TRJAPITZIN, V. A., 1978, *Aphidencyrtus diaphorinae* sp. n. (Hymenoptera, Encyrtidae), a parasite reared from *Diaphorina citri* in Vietnam, *Zoologicheskii Zhurnal*, **57**, 793–795, [In Russian].
- NOYES, J. S., 1978, Additions and corrections to the British list of Encyrtidae (Hymenoptera; Chalcidoidea), *Entomologist's Gazette*, **29**, 221–224.
- SHAFEE, S. A., ALAM, S. M., and AGARWAL, M. M., 1975, Taxonomic survey of encyrtid parasites (Hymenoptera: Encyrtidae) in India, *Aligarh Muslim University Publications (Zoological Series) on Indian Insect Types*, **10**, 1–125.
- SILVESTRI, F., 1915, Descrizione di nuovi Imenotteri Calcididi africani, *Bollettino del Laboratorio di Zoologia Generale e Agraria, Portici*, **9**, 337–377.
- SUBBA RAO, B. R., 1960, A new species of *Xanthoencyrtus* from India. *Proceedings of the Indian Academy of Sciences, B*, **51**, 276–279.
- 1967, Descriptions of some new species of encyrtids from India, *Bulletin of Entomology, New Delhi*, **8**, 1–7.
- 1976, Description of a new species of *Anthemus* Howard (Hymenoptera: Encyrtidae) parasitic on *Diaspidiotus pronorum* Liang (Coccoidea: Diaspididae) with some new combinations and synonyms, *Journal of Natural History*, **10**, 685–689.
- SUBBA RAO, B. R., and HAYAT, M., 1979, A note on the genus *Scelioencyrtus* Girault and description of a new genus, *Hamusencyrtus* (Hymenoptera: Encyrtidae), from India, *Journal of Entomological Research*, **2**, 1–4.
- TIMBERLAKE, P. H., 1919, Revision of the parasitic Chalcidoid flies of the genera *Homalotylus* Mayr and *Isodromus* Howard, with descriptions of two closely related genera, *Proceedings of the United States National Museum*, **56**, 133–194.
- TRJAPITZIN, V. A., and GORDH, G., 1978, Review of genera of nearctic Encyrtidae (Hymenoptera, Chalcidoidea). II, *Entomologicheskoe obozrenie*, **56**, 636–653, [In Russian].
- VIGGIANI, G., 1970, Note su alcuni Cheiloneurini con considerazioni sui generi *Cheiloneurus* Westw., *Neoprochiloneurus* Vigg. e *Prochiloneurus* Silv. (Encyrtidae), *Bollettino della Società Entomologica Italiana*, **102**, 64–69.