

TAXONOMIC STUDIES ON *APHELINUS* (HYMENOPTERA :
APHELINIDAE). 5. DESCRIPTION OF A NEW SPECIES
AND FURTHER RECORDS OF *A. GOSSYPHII*,
WITH A NEW SYNONYMY

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Aphelinus albipodus, sp. nov. is described from materials earlier misidentified as *flavipes* in India. This species has also been recorded from the Chad Republic and Paraguay. *A. kashmiriensis* Hayat is placed in synonymy with *A. gossypii* Timberlake, and the species is recorded not only from several Indian states, but also from the Reunion and Guadeloupe Islands.

(Key words: Aphelinidae, *Aphelinus albipodus* sp. nov., *A. gossypii*)

This is the fifth paper in a planned series on the taxonomy of the genus *Aphelinus* Dalman. It deals with two apparently widely distributed species, of which one is described as new. *A. gossypii* Timberlake is already known from India (see Hayat, 1986) and is here recorded from material collected from several States in India as well as from the Reunion and Guadeloupe Islands. *A. albipodus*, sp. nov. is described for material earlier misidentified in India as *flavipes* by Hayat (1972) and Ramaseshiah & Dharmadhikari (1969). This species has also proved to be widely distributed, being recorded here from India, the Chad Republic and Paraguay. Both the species appear to be parasitoids mainly on *Aphis gossypii*, though several other aphid species are also parasitized, and may eventually prove to be of use in the control of this aphid.

Aphelinus albipodus, sp. nov.
(Figs 1-4)

[*Aphelinus flavipes* (Foerster): Ramaseshiah & Dharmadhikari, 1969: 158. Hayat, 1972: 52, 57. Misidentification.]

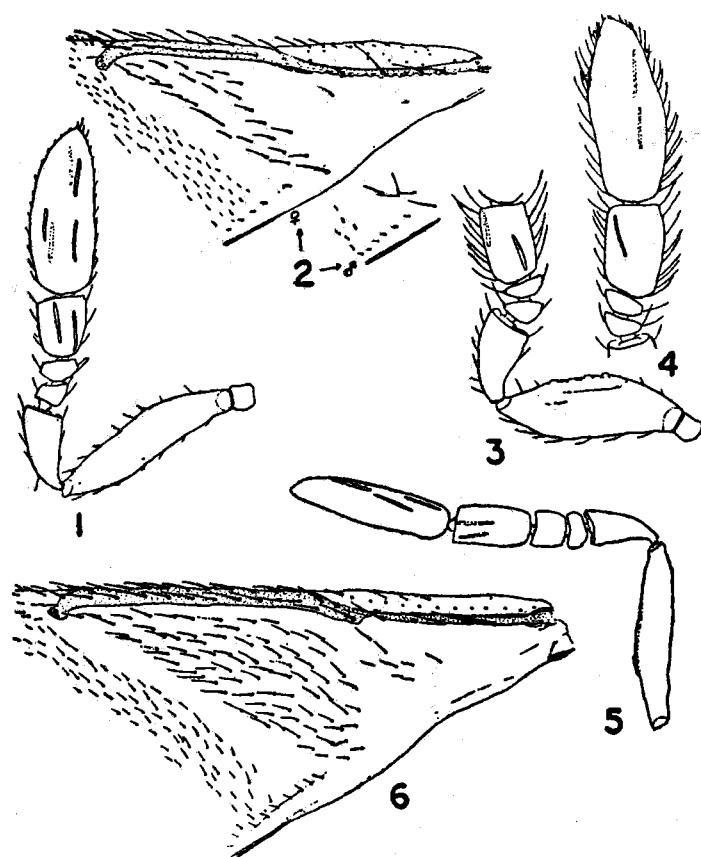
Female : Length, 0.82 - 1.06 mm (Holotype, 0.97 mm). Head and thorax dark brown to nearly black (critical point dried specimens appear brown), gaster brown to dark brown with base (terga I and part of II or tergum I) yellow; third valvulae brown; antennae pale yellow to nearly white, scape and clava lightly infusate brown in some specimens; wings hyaline, forewing sometimes with a very faint infumation below marginal; legs white to pale yellow, with middle and hind-coxae except apices, dark brown; middle coxae sometimes brown only at base; forecoxae usually yellow to pale brown at base; tibiae, especially the hind-pair, rarely pale brown; last tarsal segments brown.

Head dorsum (occiput perpendicular) slightly more than $2 \times$ as wide as long (24.5-30.5 : 11-13), rarely $2.5 \times$ as wide as long; frontovertex, at level of front-ocellus, clearly less than half of head width (10.5-13.5 : 24.5-30.5), and usually very slightly longer than wide (10-13 : 10.5-13.5); ocellar triangle with apical angle obtuse, each lateral ocellus separated from eye margin by about one ocellus diameter and

by about half the diameter of an ocellus from occipital margin; eyes setose; fronto-vertex with dark brown setae of which two pairs at occipital margin are longer as in most other species of the genus.

Antenna (Fig. 1). Scape $4.5-5\times$ as long as wide; pedicel (ventral length) slightly less than $2\times$ of width; F1 with ventral margin longer than dorsal margin; F2 broader than long; F3 quadrate to a little longer than broad. Relative dimensions: length (width): scape, 35-38.5 (7-8.5); pedicel, 14-15 (8-8.75); F3, 9.5-10.5 (9-9.5); clava, 30-34 (11.5-12).

Thorax normal for the genus in sculpture and setation; mid-lobe of mesoscutum with two pairs of primary setae and 30-40 smaller setae. Forewing (Fig. 2) slightly more than $2\times$ as long as wide (44.5-54 : 18.5-23.5); costal cell slightly longer than marginal vein and with two lines of setae on ventral surface; basal cell bare, rarely with one or two setae; lineae calvae at least partly closed posteriorly by setae, and proximally with one complete and 2-3 incomplete lines of setae (27-37 setae); smaller specimens (from Chad and Paraguay) with 19-22 setae.



Figs. 1-6. (1-4) *Aphelinus albipodus*, sp. nov.: 1. Antenna, female; 2. Part of forewing of female, and end of lineae calvae of male fore wing; 3. Antenna excluding clava, male; 4. Flagellum, male. (5, 6) *A. abdominalis* (Dalman): 5. Antenna, male; 6. Part of forewing, female. Figs. 5 and 6 from British specimens (coll. M. Hayat).

Gaster, depending on the state of preservation, slightly longer than thorax to as long as head plus thorax; ovipositor not or very slightly exerted. [Relative lengths: ovipositor = second valvifer plus third valvula, 23.5–27.5; third valvula 7–8.5; middle tibia, 16.5–19.5; middle basitarsus, 4.75–6; hind-tibia, 18–21.5. Male. Length, 0.63–0.95 mm. Similar to female except the fronto-vertex slightly broader and gaster may be nearly completely brown. Antennal scape brown, pedicel yellow to pale brown, and rest of antenna yellow to sometimes yellow brown. Antenna (Figs 3, 4) with F1 and F2 broader than long, F3 at least 1.25× as long as broad, but usually 1.5× as long as broad; in a male from Chad, F3 fully 2× as long as broad. Relative dimensions: length (width) : scape, 34–37 (10–12.5); pedicel, 14–15.5 (8.5–9); F3, 15–17.5 (9.5–11.5); clava, 37–39 (10–11.5).

Holotype ♀, 23 ♀, 17 ♂ **paratypes**, INDIA: Andhra Pradesh, Guntur, 15.i.1967 ex *Aphis gossypii* on *Coriandrum sativum*, (M. Hayat).

Holotype and a male paratype (critical point dried and mounted on cards) deposited in the British Museum (Natural History) London. Rest of the paratypes in Hayat collection.

The following material was studied, but not included in the type series:

From Hayat collection: INDIA: Andhra Pradesh, Guntur, 2 ♀, 2 ♂ 20.i.1967, ex aphids on *Cajanus indicus*, (S.A. Shafee); Rajasthan, Udaipur, 1 ♀, 1 ♂ (3.x.1970, ex aphids on *Vigna catjung*, (Shuja-Uddin); Jammu & Kashmir, R. S. Pura, 2 ♀, 31. viii. 1968, ex aphids on *Sesbania* sp., (M. Hayat); Goa, Vasco-da-Gama, 2 ♀, 22. xii. 1988 (M. Hayat); Uttar Pradesh, Aligarh, 2 ♀, 1 ♂, 1969, (M. Hayat), 2 ♀, 1 ♂, 7. xii. 1978, (M. Hayat & M. Verma).

From the British Museum (Natural History) London, collection: INDIA: Andhra Pradesh, W. Godavari, 3 ♀, ? ex whitefly on cotton; Guntur, 3 ♀, ? ex whitefly on cotton; Tamil Nadu, Coimbatore, 4 ♀, 1 ♂, ix. 1982, ex *Myzus persicae* (det. by B. R. Subba Rao, as *Aphelinus kurdjumovi*); Karnataka, Bangalore, 1 ♀, 1 ♂, 19–23. ix. 1979, (J. S. Noyes); 4 ♀, vi. 1966, ex *A. gossypii*; Kerala, Periyar Animal Sanctuary, 1 ♀, 5–15. x. 1979 (J. S. Noyes). PAKISTAN: Rawalpindi, 1 ♀, 1 ♂, ex aphids in Lab. 1967.

From the U. S. National Museum, Washington D. C., collection: INDIA: Karnataka, Bangalore, 4 ♀, 2 ♂, v. 1965, ex *Brevicoryne brassicae* on cabbage; 1 ♀; 23. iii. 1964, ex aphids on *Bacopa moniera*.

The following material received from Dr. G. Delvare, C. I. R. A. D., Montpellier, France, was identified by one of us (M.H.) as belonging to this species:

CHAD: Bebedjia, 4 ♀, 2 ♂, 31. viii. 1987, ex *A. gossypii* on cotton, (P. Silvie). PARAGUAY: Caocupe, 1 ♀, 22. i. 1985, ex *A. gossypii*, on cotton, (B. Michel).

Hosts: *Aphis gossypii* Glover; *Aphis citricola* van der Goot; *Brevicoryne brassicae* (Linnaeus); *Lipaphis erysimi* Kalténbach; *Myzus persicae* (Sulzer); *Rhopalosiphum maidis* (Fitch); indet. aphids on several plants. (See Ramaseshiah & Dharmadhikari, 1969, and Hayat, 1972, 1986.)

Distribution: India, Pakistan, Chad Republic, Paraguay.

Comments.— The description of *A. albi-podus* sp. nov. for the material recorded earlier from India under the name *A. flavipes* (Foerster), is in consequence to the synonymy of *flavipes* with *abdominalis* (Dalman) by Graham (1976), and because the Indian

specimens so identified are definitely not conspecific with *abdominalis*; There still appears to persist some confusion regarding the identity of *A. kurdjumovi* Nowicki in Mercet. Mercet (as noted from Ferriere, 1965; Nikol'skaya & Yasnosh, 1966) proposed the name *kurdjumovi* for the material ~~supposedly misidentified as~~ *flavipes* by Kurdjumov (1913). Ferriere (1965: p. 70) did not consider *flavipes* ~~same~~ Kurdjumov as different from *flavipes* (Foerster) as is apparent from the citations given by him. Nikol'skaya & Yasnosh (1966), on the other hand, treated *kurdjumovi* as a valid species, but in a later contribution, Yasnosh (1978) kept *flavipes* (Foerster) as a valid species with *kurdjumovi* as its synonym. This leads us to believe that it is most appropriate to follow Graham (1976) in considering *flavipes* (based on male types), and thus also *kurdjumovi*, as synonyms of *abdominalis* because, apart from several distinguishing characters mentioned by Graham (and confirmed in my study of both Indian and British specimens), the male antennae (Fig. 5) are quite distinct in having F2 only slightly broader than long about $1.5 \times$ as long as F1, and in the setation of the fore wing (Fig. 6).

A. albipodus is very close to *varipes* (Foerster), *maidis* Timberlake and *desantisi* Hayat. It differs from *desantisi* in having the ovipositor slightly less than $1.5 \times$ of middle tibia, and F3 in male distinctly longer than broad with long setae; from *varipes* and *maidis* (paratype from U. S. N. M. examined) by the yellow base of the gaster and the longer F3 in male. It is thus evident that, apart from the colour of the gaster (which may at times be of low diagnostic value at the species level), it is the male that provides character for the reliable separation of *albipodus* from the three species mentioned above. In the absence of males, the larger and

darker female specimens of *albipodus* may be confused with those of either *varipes* or *maidis*, though the latter two species have the hind-tibiae and sometimes also the middle tibiae, distinctly brown to dark brown. For this reason, we are unable to compare *albipodus* with *dies* Girault and *nox* Girault as both are known only from females (see Hayat & Fatima, 1990).

Aphelinus gossypii Timberlake *Aphelinus gossypii* Timberlake, 1924: 408. Female, male. U.S.A., Hawaii, Honolulu. Paratypes in the U. S. N. M. examined. *Aphelinus kashmiriensis* Hayat, 1972: 50. Female, male. India, Srinagar. Syn. Nov.

An error was made in the original description of *A. kashmiriensis*: the hind-femora are yellow to nearly white, not brown, and the hind tibiae are dark brown.

We have compared paratypes of *gossypii* with those of *kashmiriensis*, and consider the two species synonymous. *A. gossypii* is a widely distributed species and is a common parasitoid of *Aphis gossypii* and related species of aphids.

Material studied: Apart from the types of *A. kashmiriensis* listed by Hayat (1972), we have studied material collected in the Indian States of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Assam and Uttar Pradesh, from Hayat collection and the B. M. N. H. collections.

One of us (M. H.) has also identified material received from Dr. G. Delvare, C. I. R. A. D., Montpellier, France, and bred from *A. gossypii* collected in the Reunion and Guadeloupe Islands.

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