

SOME SPECIES OF *COCCOPHAGUS* (HYMENOPTERA : APHELINIDAE)

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ABSTRACT. Seven Indian species of the aphelinid genus *Coccophagus* Westwood are treated. Of these, two (*C. shafeei*, *C. sexvittatus*) are described as new, and three (*C. diaspidis* Agarwal, *C. citri* Agarwal, *C. delhiensis* Subba Rao & Rai) are considered synonyms of *Aneristus ceroplastae* Howard. *Coccophagus pseudococci* Compere and *C. silvestrii* Compere are reported, the former for the first time from India, and additional characters observed in the Indian material are given.

1. *Aneristus ceroplastae* Howard

Aneristus ceroplastae Howard, 1895, *Canad. Ent.*, **27** : 351. ♀; Compere, 1936, *Univ. Calif. Publ. Ent.*, **6** : 287-8; Hayat, 1974, *J. Nat. Hist.*, **8** : 183-5.

Coccophagus orientalis Howard, In Howard and Ashmead, 1896, *Proc. U. S. Natl. Mus.*, **18** : 633-4. ♀.

Prococcophagus orientalis : Timberlake, 1918, *Proc. Hawaiian Ent. Soc.*, **3** : 404.

Prococcophagus diaspidis Agarwal, 1964, *Proc. Indian Acad. Sci.*, (B)**59** : 270-3. ♀. figs 6-8. *syn. nov.*

Coccophagus citri Agarwal, 1964, *Proc. Indian Acad. Sci.*, (B) **59** : 273-4. ♀. figs. 9-11. *syn. nov.*

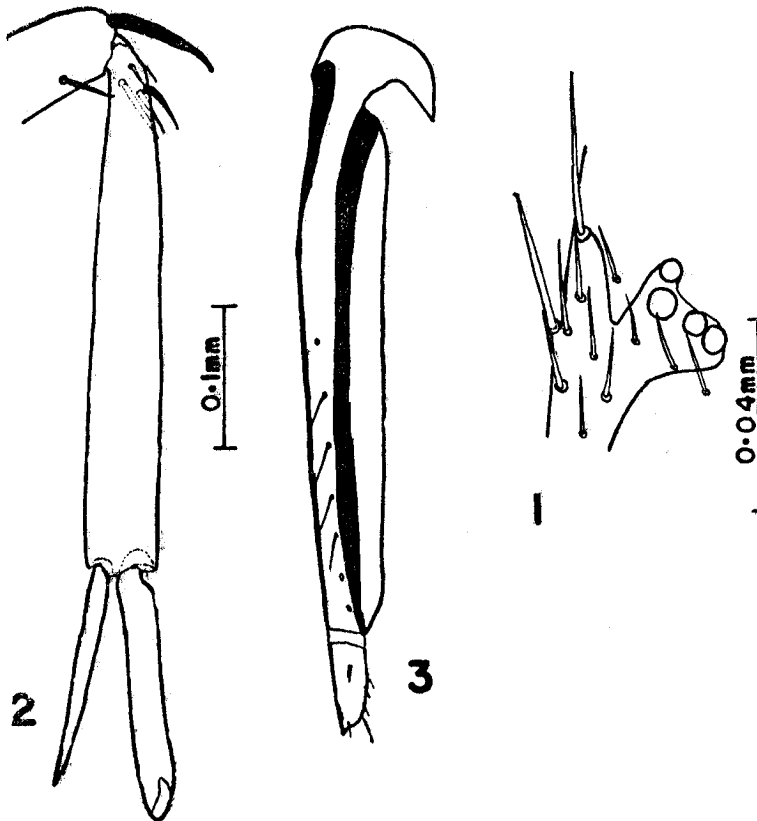
Coccophagus delhiensis Subba Rao and Rai, 1969, *J. Nat. Hist.*, **3** : 382, 383. ♀. figs. 1A-H. *syn. nov.*

Holotypes of *Coccophagus diaspidis* and *C. citri* have been examined by me. A comparison of these with a series of specimens of *Aneristus ceroplastae* collected and identified by me (for details pertaining to this material see Hayat, 1974) showed no differences of specific value. I therefore consider these two species as synonyms of *A. ceroplastae*.

Coccophagus diaspidis : Holotype female labelled "*Coccophagus diaspidis* sp. n. *Diaspis* sp. Elephanta Caves, Bombay" and "*Saccharum spontanium* L. 14.1.60. Holotype." The specimen in Aligarh Univ. Collections (in alcohol) is in a deplorable condition; the head is detached from body, with the left antenna, left middle leg and wings of left side on slide. It is a shrivelled specimen whose colour has faded considerably. The slight differences in colour and antennal dimensions given in the key to species by Agarwal for separating *C. diaspidis* from *C. citri* are, in my opinion, not important in separating the species, and fall within the range of variations observed in a series of specimens examined by me.

Coccophagus citri: Holotype female labelled "*Coccophagus citri* sp. n. *Saccharicoccus* sp., Botany Deptt, Aligarh" and "*Saccharus officina* L. Holotype. 20.2.1957. (177)". The specimen in Aligarh Univ. collections (in alcohol) is in a fairly good condition, with the right antenna, right fore and hind legs, both middle legs and wings of right side on slide. It is a typical specimen of *A. ceroplastae*.

Coccophagus delhiensis: I have not seen the types in I.A.R.I., New Delhi, but from the description and illustrations (Subba Rao and Rai, 1969, p. 383, Fig. 1.A-H) it is indistinguishable from *A. ceroplastae*. I informed Dr. Subba Rao, C.I.E., London, of this synonymy. He (*in litt.*) replied that he has compared paratypes of *C. delhiensis* with *A. ceroplastae* specimens and found them conspecific. He has kindly permitted me to publish this synonymy.



Figs. 1-3. *Coccophagus silvestrii* Compere, ♀ : 1, part of venation of fore wing; 2, part of middle leg; 3, second valvifer and third valvula.

2. *Coccophagus silvestrii* Compere (Figs. 1-3)

Coccophagus silvestrii Compere, 1931, *Proc. U.S. Natl. Mus.*, **78** : 111-2. ♀ . figs. 73, 129; Shafce, 1972, *Bull. Ent.*, **13** : 24. ♀ . figs. 10, 11.

The description and figures supplied by Compere and the following notes and accompanying figures are sufficient to recognise this species :

Thoracic setae dark brown. Ovipositor longer than middle tibia (Figs. 2, 3); distance between propodeal spiracles less than length of middle tibia (22 : 29); third valvulae shorter than tibial spur of middle leg. Costal cell of fore wing with a single row of short setae.

Material examined : INDIA : UTTAR PRADESH : Meerut, 20.ii.1968, 2♀♀ (one specimen dissected and mounted on two slides), ex undetermined coccid, Coll. Shuja-Uddin. Material deposited in the Zoological Survey of India, Calcutta.

3. *Coccophagus pseudococci* Compere (Figs. 4-7)

Coccophagus pseudococci Compere, 1933, *Canad. Ent.*, **65** : 245-6. ♀ , ♂ .

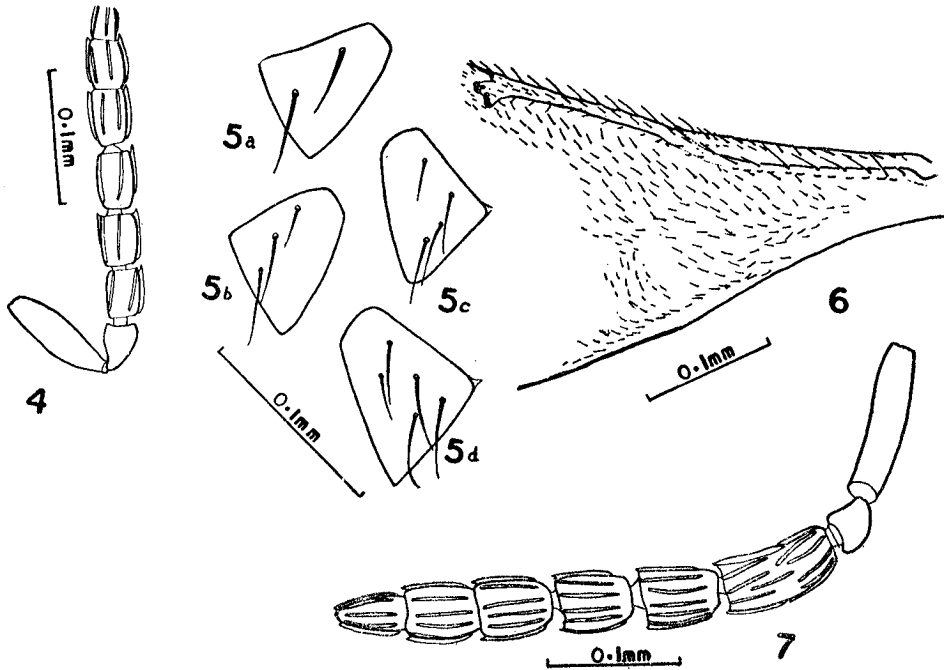
This is the first record of this species from India. Some characters noted in the Indian specimens are given below :

Female : The normal number of setae on each axilla is 2. In three specimens additional number of setae found are, 2+4, 2+5, 3+4. Tibial spur of middle leg subequal to or a trifle shorter than the corresponding basitarsus, and longer than third valvula. Distance between propodeal spiracles less than length of middle tibia. Gaster about as long as or a little longer than thorax but in dried specimens it appears shorter and narrower than thorax. Ovipositor short, extending from distad of middle of gaster and with only the tip of valvulae showing. Ovipositor longer than middle tibia.

Male : Body blackish with parapsides and basal one third to one fourth of gaster yellowish. Mesoscutum and scutellum black to testaceous yellow with suffusions. Antennae as in figure 7.

Material examined : INDIA : HIMACHAL PRADESH : Joginder Nagar, 14♀♀ (No. 105 MD), 27.vi.1967, ex *Nipaeococcus vastator* (Mask.), on *Zizyphus* sp., Coll. M. Hayat. UTTAR PRADESH : Anand Nagar, 1♀, 3♂♂ (No. 411. MD), 9.xi.1969, ex *Nipaeococcus* sp., on *Zizyphus* sp., Coll. M. Hayat. Material deposited in the Zoological Survey of India, Calcutta.

Comments : *Coccophagus pseudococci* is very closely related to *C. manii* Agarwal and *C. indicus* Agarwal, from which it differs by the length of the middle tibial spur (spur shorter than basitarsus in the latter two species). I find no other character to distinguish *C. pseudococci* from these two species.



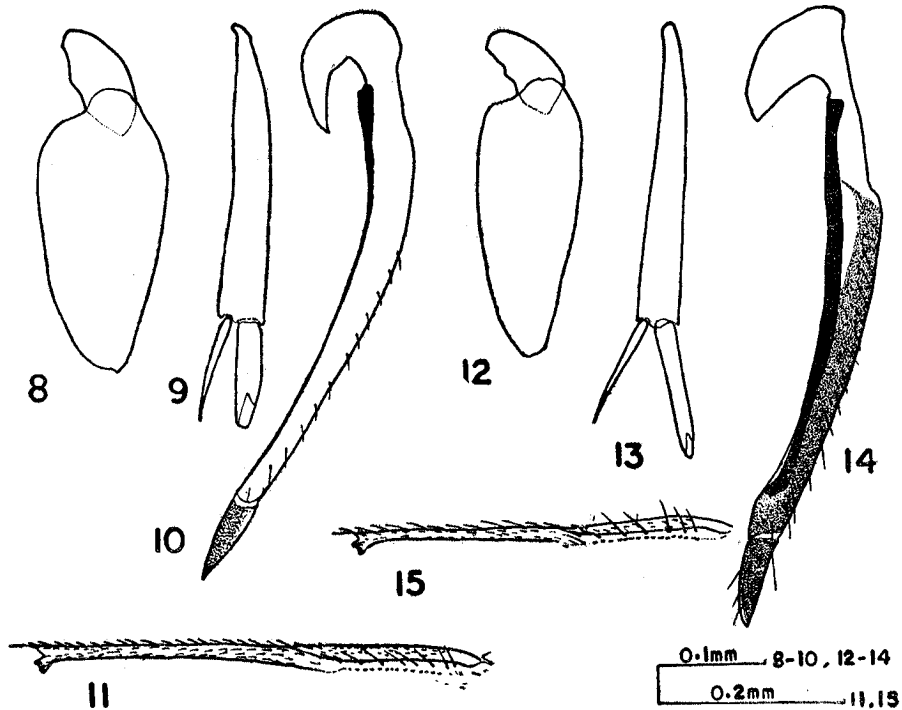
Figs. 4-7. *Coccophagus pseudococci* Compere, ♀, ♂: 4, antenna, ♀; 5 a-d, axillae, ♀; 6, basal half of fore wing, ♀; 7, antenna, ♂.

4. *Coccophagus shafeei*, sp. nov. (Figs. 8-11)

Coccophagus gilvus: Shafee, 1972, *Bull. Ent.*, 13: 24, ♀, figs. 6-9, (not Hayat, 1971); misidentification.

Shafee (1972) referred to *Coccophagus gilvus* Hayat, four females bred from *Coccus* sp. collected by him from Bangalore. I have compared these specimens with the types of *C. gilvus*. These are not conspecific. The specimens from Bangalore are very distinctive and are here described as representing a new species. I take pleasure in naming this species after Dr. S. A. Shafee.

Female: The new species is very closely related to *C. gilvus*, and if it were not for the following differences, it might easily be mistaken for *C. gilvus*. The figures supplied by Shafee (1972, Figs. 6-9) and the accompanying illustrations and brief comparative description are sufficient to recognise this species. For comparison illustrations of some structures of *C. gilvus* (Figs. 12-15) which were not given along with the original description, are also included in the present paper.



Figs. 8-11. *Coccophagus shafeei*, sp. nov. ♀ : 8, hind trochanter and femur; 9, part of middle leg; 10, second valvifer and third valvula; 11, venation of fore wing.

Figs. 12-15. *Coccophagus gilvus* Hayat, ♀ : 12, hind trochanter and femur; 13, part of middle leg; 14, second valvifer and third valvula; 15, venation of fore wing.

C. gilvus Hayat

C. shafeei, sp. nov.

1. Fore wings : Disc sparsely ciliated; submarginal and marginal veins with 7 and 13 setae respectively; costal cell with about 15 short setae arranged in a single row.
2. Middle legs : Tibial spur shorter than basitarsus; basitarsus slightly less than one-half of tibia.
3. Hind legs : Femora flattened, length two and a half times width (5:2).
4. Gaster : Pale yellow with a pale brown spot in centre of each of terga 1 to 5; distal two-thirds of second valvifers and whole of third valvulae brown.

Disc densely ciliated; submarginal and marginal veins with 9 and about 22 setae respectively; costal cell with about 30 setae arranged in two rows.

Tibial spur subequal to basitarsus; basitarsus a trifle over one-third of tibia.

Femora greatly flattened, length a little over twice width (20:9)

Pale yellow; second valvifers pale yellow; third valvulae brown.

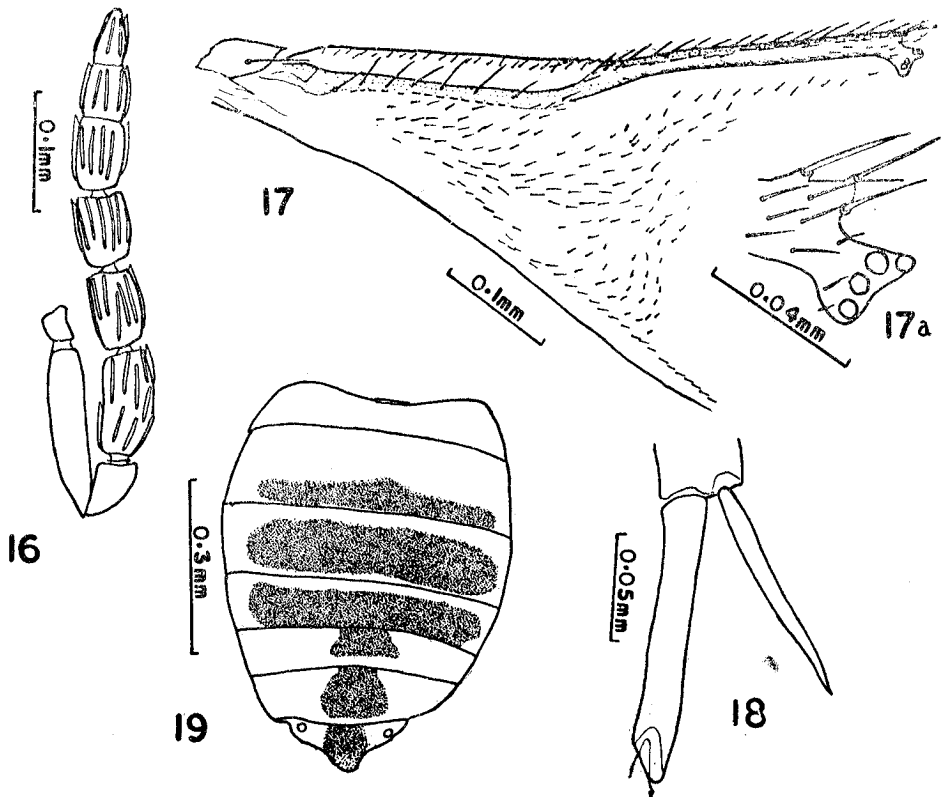
Holotype ♀ and *Paratype* ♀, INDIA : KARNATAKA : Bangalore, 5.vii.1968, ex *Coccus* sp., on *Mangifera indica* L., Coll. S.A. Shafee. *Holotype* (in spirit) and

one paratype (on slides) deposited in the Zoological Survey of India, Calcutta. Two females (not designated as types) are with the collector, Dr. Shafee.

5. *Coccophagus sexvittatus*, sp. nov. (Figs. 16-19)

Female: Length, 1.33 mm. Head and thorax yellow with the following parts brownish: Occiput on sides of foramen, pronotum except sides, anterior margin of mesoscutum, scuto-scutellar suture and anterior margin of scutellum, metanotum and propodeum. Gaster whitish with three brown cross-bands on terga 2, 3 and 4, and three brown spots in centre of terga 5, 6 and 7. Antennae pale yellow with brown rhinaria. Tips of mandibles brownish. Legs including coxae pallid.

Head: Dorsum two and two-thirds times as wide as long (8 : 3); frontover-
tex more than one and a half times wider than long (19.5: 12); ocelli arranged in obtuse triangle, lateral ocelli removed from eye margin by less than one



Figs. 16-19. *Coccophagus sexvittatus*, sp. nov. ♀: 16, antenna; 17, basal half of fore wing; 17a, stigmal and postmarginal vein; 18, part of middle leg; 19, gaster, dorsum.

ocellus diameter and from occipital margin by less than its own diameter. Frontoververtex with pale setae; eyes with very minute pale setae visible at $50\times$.

Antennae : Radicle short; scape cylindrical, about 4.5 times longer than wide; pedicel (major length) shorter than F1 (22 : 33); F1 twice longer than wide and clearly longer than F2 and F3 separately. F2 and F3 subequal in length to each other and to basal club segment. Club as long as F1 and F2 combined, segments all longer than wide. Funicle and club segments with rhinaria as shown in Fig. 16. Segments sparsely setose, the setae short.

Thorax : Mesoscutum densely setose, setae pale in colour; each parapsis and axilla with 4 and 2 setae respectively. Scutellum as long as wide, with 3 pairs of brown setae. *Wings* : Hyaline; fore wings twice as long as wide with short marginal fringe; marginal and submarginal veins subequal in length, these veins with 16 and 7 setae. Arrangement of discal cilia in basal half of wing as shown in Fig. 17; postmarginal vein vestigial, stigmal vein as in Fig. 17a. *Legs* : Middle tibial spur shorter than basitarsus (Fig. 18); tibia longer than ovipositor; third valvulae apparently shorter than tibial spur of middle leg; basitarsus as long as following 3 segments combined.

Gaster : Longer than thorax (50 : 33); ovipositor shorter, less than one-half length of gaster (about 11 : 25), not exerted at apex.

Male : Unknown.

Holotype ♀, (No. 432 M.A) INDIA : MADHYA PRADESH: Bhopal, 21.ix.1970, ex mealy bug, Coll. M. Hayat. The holotype deposited in the Zoological Survey of India, Calcutta.

Comments : The new species appears to be closely related to *C. triangulatinotus* Girault and *C. leptospermi* Girault (see Compere, 1931, *Proc. U.S. Natl. Mus.*, 78 : 47-50) from which it differs mainly by the presence of six bands on the gaster and the different antennal dimensions.

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