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## Description of a new *Coccophagus* of the *lycimnia*-group (Hymenoptera: Aphelinidae) from the Khasi hills, with some other species records from India

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**ABSTRACT.** A new species, *C. shillongensis*, belonging to the *lycimnia*-group of *Coccophagus*, is described. A key to separate the Indian species of this group is provided. Material pertaining to four other Indian species of this genus, mainly collected in Assam, is also recorded, with notes.

### Introduction

Recently, one of us (Sudhir Singh) collected some aphelinids from the north-eastern Indian States of Assam and Meghalaya. Among these were specimens of an undescribed species of *Centrodora* Foerster (being described elsewhere by the first author) and seven species that belonged to the genus *Coccophagus* Westwood. Of these, the identities of two species, one related to *C. ceroplastae* (Howard) and the other to *C. silvestrii* Compere, remain to be determined. The present paper deals with the remaining five species, of which one was found to be an undescribed species. We have also taken this opportunity to include some material from other Indian States.

The new species is placed in the *lycimnia*-group of *Coccophagus*, and a key to separate it from the other two Indian species of this

group is provided. Detailed literature citations to the known species are not included as they are available in the references listed under these species.

### *Coccophagus shillongensis*

Hayat & Sudhir Singh

*sp. nov.*

(Figs 1-10, 17)

*Female* : Length, 1.10 — 1.30 mm (Holotype, 1.30 mm). One paratype on a slide measures 1.45 mm. Body dark brown to black, slightly shiny; head with usual pale lines on frontovertex and face, but these clearly seen in cleared, slide mounted specimens (Fig. 1) : distal three-fourths to two-thirds of scutellum, metanotum (in middle), membranous apex of tergum VII of gaster and extreme tips of third valvulae, pallid, almost white; antennal scape pale yellow, infuscated brown on dorsal margin; pedicel and flagellum brown to dark brown with

dark rhinaria on flagellum; fore wings subhyaline with a very faint and hardly discernible infuscation, and hyaline towards apex; hind wings hyaline; legs pale yellow, fore coxae black and shiny, hind femora infuscated brown to dark brown with basal third yellow and ventral margin and apex yellow brown.

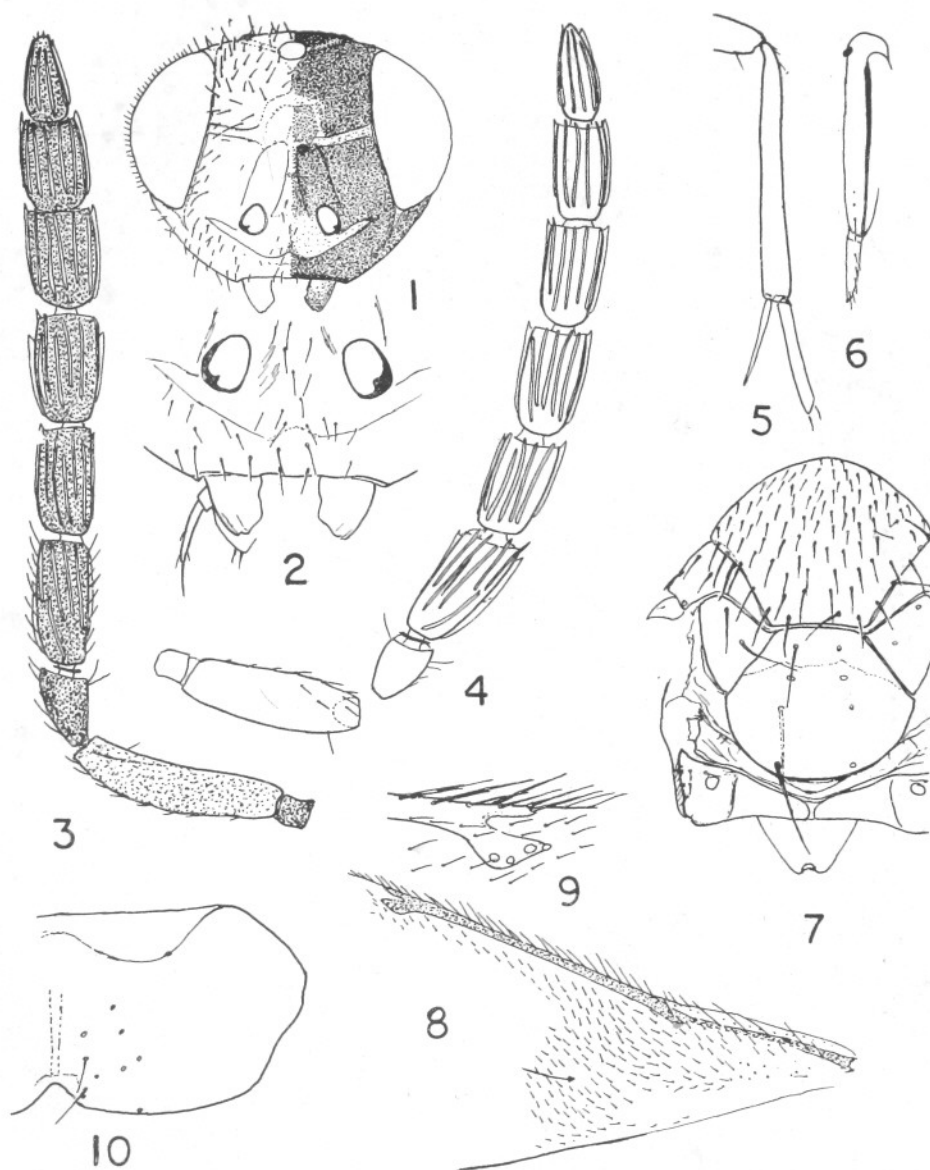
Frontovortex (head cleared and mounted on slide) width at narrowest slightly less than half of head width (Fig. 1), but in carded specimens, due to shrinkage, the frontovortex appears slightly wider than one-third head width (7 : 18) and about as long as wide; ocellar triangle with apical angle obtuse, lateral ocelli separated from eye rim by about the diameter of one ocellus; occipital margin sharp; eyes densely setose, the setae brownish and each about as long as the diameter of one ommatidium; setae on frontovortex dark brown to black, those behind lateral ocelli longer than others; occiput with a row of short setae along sides of eyes and just below occipital margin; frontovortex, face and malar space mostly lineolate-reticulate; ocellar triangle with prominent hexagonal cells; reticulations are hexagonal and fine between scrobes and eye margins. Mandibles with two short teeth and a broad dorsal truncation (Fig. 2). Antenna as in Fig. 3; scape about  $3.5\times$  as long as wide, but it appears longer and narrower in the figure since it tilted during slide mounting; pedicel plus flagellum about a fourth longer than width of mesoscutum (24 : 19).

Thoracic dorsum as in Fig. 7; in carded specimens metanotum appears overlapped in middle by the scutellum; mid lobe of mesoscutum a little longer than scutellum and the latter about one-third to one-fourth wider than long; mid lobe relatively strongly reticulate with hexagonal cells; side lobe with fine sculpture; sculpture on axillae and dark area of scutellum as on mid lobe, sides of axillae with longitudinally drawn-out cells; pale area of scutellum with fine hexagonal

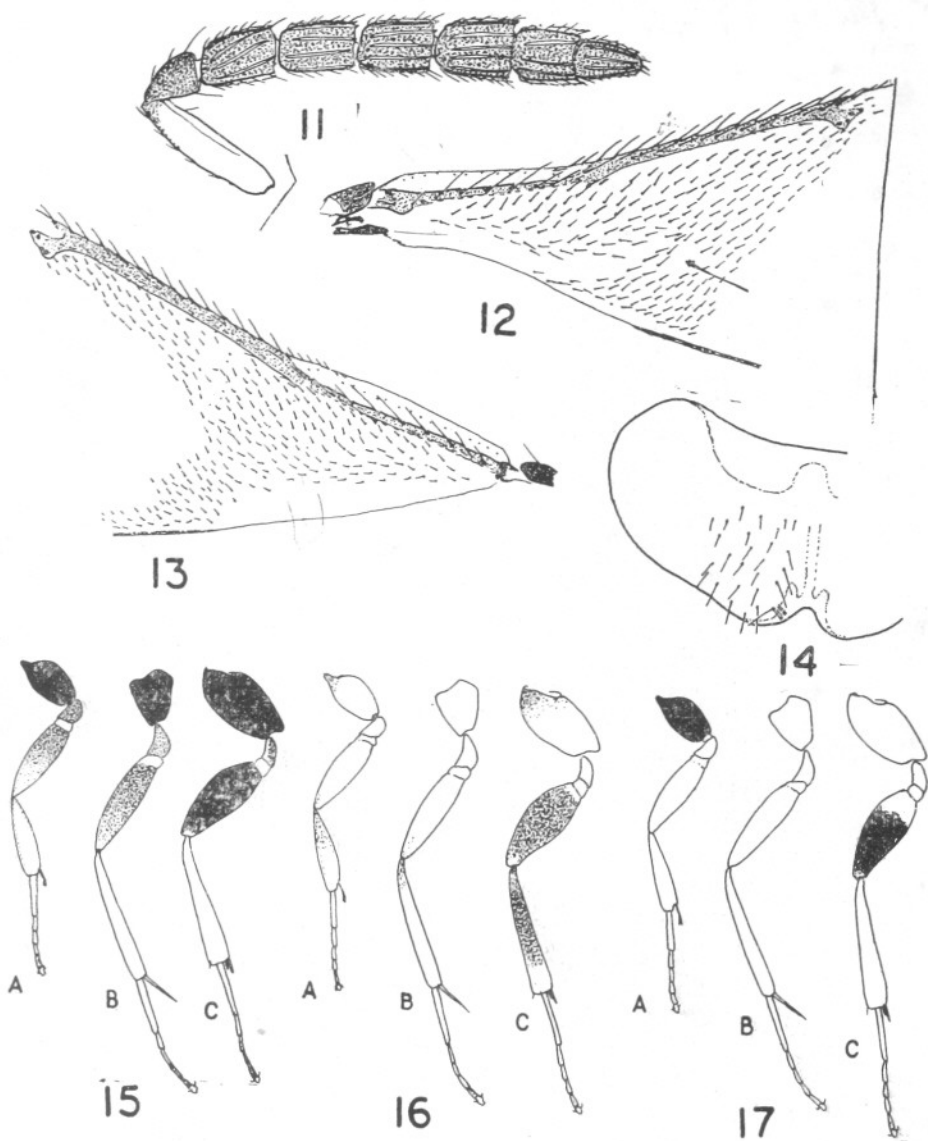
cells; setae dark brown to black; propodeum with several setae on each side distad of spiracles and with a prominent seta adjacent to each spiracle. Fore wings about  $2.2\times$  as long as wide with densely setose disc and with a characteristic oval, bare area (indicated by an arrow in Fig. 8); costal cell with a single row of setae on ventral surface; marginal fringe very short, not longer than the setae along outer margin of marginal vein; hind wings about  $4-4.5\times$  as long as wide, disc bare (except for one or two setae) below submarginal vein; marginal fringe about one fourth of wing width and longer than those of fore wings. Mid tibia about one-third longer than distance between propodeal spiracles (Figs 5, 7); tibial spur distinctly shorter than basitarsus.

Gaster about as long as thorax, but appears shorter if shrunk; ovipositor (in cleared and slide mounted specimen) originates from about posterior half of tergum II and not exerted at apex; relative lengths of second valvifer, third valvula, mid tibia, basitarsus and spur as illustrated in Figs 5 and 6; hypopygium as in Fig. 10; gastral terga mostly finely, hexagonally reticulate, those on sides of tergum VI rather prominent; tergum II with a broadly interrupted row of setae, terga III and IV with the row of setae narrowly interrupted in the middle, tergum V with a continuous row of setae, tergum VI with about 12 setae irregularly arranged, and tergum VII with about 15 setae including a row on posterior margin proximad of the hyaline apex.

*Male*: Similar to female except for colour of body and legs and different conformation of the antennal segments. Body completely dark brown to black including scutellum; colour of antennae as in female; legs with all coxae and hind femora dark brown, hind tibiae with some brownish suffusions in basal half or so, otherwise rest



**Figs 1-10.** *Coccophagus shillongensis* Hayat & Sudhir Singh, sp. nov., female, except Fig. 4: (1) head in front view, showing setae on right half and colour in left half; (2) facial area enlarged, showing setae, mandibles and maxillary palp; (3) antenna; (4) antenna, male; (5) mid tibia and basitarsus; (6) second valvifer and third valvula; (7) thorax, dorsal; (8) part of fore wing showing venation and setation; (9) distal veins of fore wing; (10) hypopygium, left half. Figs 1 and 5-8 each drawn on same scale, and 2-4 each on another scale. All figures are based on paratypes.



Figs 11-17. (11, 12) *Coccophagus bogoriensis* (Koningsberger), female: (11) antenna; (12) part of fore wing showing venation and discal setae, the bare spot indicated by an arrow. (13, 14) *C. cowperi* Girault, female: (13) part of fore wing; (14) hypopygium, right half. (15-17) Fore (A), mid (B) and hind (C) legs, diagrammatic representation of colour: 15, *C. cowperi* Girault; 16) *C. bogoriensis* (Koningsberger); 17) *C. shillongensis* Hayat & Sudhir Singh, sp. nov.

of legs pale yellow. Antennal toruli placed relatively higher, their lower margins slightly below a line drawn across lower eye margins. Antennae as in Fig. 4; flagellum not differentiated into funicle and clava; pedicel distinctly shorter than F6 (subequal in female). The single male is partly dissected and mounted on a slide, hence it was not possible to measure the length of the body.

**SPECIMENS EXAMINED:** Holotype ♀ & Paratypes 5 ♀ 1 ♂. **India:** MEGHALAYA: Shillong, 14.v.1986, ex coccids (*Sudhir Singh*).

The holotype and one female paratype deposited in the British Museum (Natural History), London; rest of the paratypes in Hayat Collection.

**REMARKS:** The new species belongs to the *lycimnia*-group and differs from all the other species of that group (Compere, 1931; Ferriere, 1965; Annecke & Insley, 1974) by the longer flagellar segments and by having only the fore coxae dark brown to black, and the hind femora partly brownish to dark brown. Among the species of this group, *C. shillongensis* appears close to the type-species of the genus, *C. scutellaris* (Dalman), but differs as follows: pedicel plus flagellum much longer than width of mesoscutum; pedicel distinctly shorter than F1; F1 more than  $2\times$  as long as wide, clava about  $4\times$  as long as wide; body entirely dark brown to black except for most of the scutellum, legs yellow except the fore coxae and partly the hind femora. *C. scutellaris* has the pedicel plus flagellum slightly longer than width of mesoscutum; pedicel slightly shorter than F1; F1 about  $1.75\times$  and clava about  $3.5\times$ , as long as wide; body black except the largely yellow scutellum; legs bright yellow with mid and hind coxae, and hind femora mainly, blackish (see Graham, 1976). Some specimens of *C. japonicus* Compere have similarly coloured legs, but that species is quite different in its antennal dimensions (see Compere, 1931: Fig. 40). The new species differs from the two other Indian species of the *lycimnia*-group by the following key characters:

#### Key to females of the Indian species of *Coccophagus* (*lycimnia*-group)

1. F1 at most  $1.5\times$  as long as pedicel; funicle segments shorter, F1 not more than  $1.5\times$  as long as wide (Fig. 11); hypopygium relatively densely setose, with 18-27 setae on each side of the plate (Fig. 14). ..... 2
- F1 longer than  $1.5\times$  pedicel; funicle segments longer, F1 more than  $2\times$  as long as wide (Fig. 3); hypopygium sparsely setose, with about 10 setae on each side of the plate (Fig. 10); Legs pale yellow, with fore coxae black and hind femora partly dark brown (Fig. 17); fore wing with a small, bare spot in basal third (Fig. 8) ..... *shillongensis* Hayat & Sudhir Singh, **sp. nov.**
2. Scutellum yellow with anterior fourth or fifth dark brown to black; all coxae and hind femora dark brown to black, fore and mid femora brown to dark brown, all tibiae entirely yellow or pale (Fig. 15); fore wing without a small bare spot (Fig. 13); hypopygium in Fig. 14 ..... *cowperi* Girault
- Scutellum almost entirely yellow or white; hind coxae narrowly at base and hind femora and tibiae except apices, brown, rest of legs yellow or pale (Fig. 16); fore wing with a small, bare spot (Fig. 12); antenna in Fig. 11 ..... *bogoriensis* (Koningsberger)

#### *Coccophagus bogoriensis* (Köningsberger) (Figs 11-12)

Compere (1931) and Hayat (1971) should be consulted for details on this species. The species belongs to the *lycimnia*-group and differs from the other two species of this group as shown in the key.

**SPECIMENS EXAMINED:** 38 ♀. **India:** ASSAM: Kaziranga National Park, 35 ♀, 2. vi. 1986; 3 ♀, 31.v.1986, ex coccids (*Sudhir Singh*) [in Hayat Collection].

#### *Coccophagus ceroplastae* (Howard)

Compere (1936) and Hayat (1974a, 1974b) should be consulted for details on this species. The specimens recorded by Ahmed & Shafee (1978) need to be confirmed. The fore wing is shown there as densely

setose below submarginal vein (their Fig. 15), whereas in *C. ceroplastae* this area has only about 20 setae.

**SPECIMENS EXAMINED:** 70 ♀ 1 ♂. **India:** ASSAM : Gauhati, 2 ♀ 1 ♂, -v. 1986, ex coccids (Sudhir Singh); DELHI : IARI area, 2 ♀, -iii. 1979, on grass, (*C. S. Roy*). UTTAR PRADESH: Aligarh, 48 ♀, 5.iii. 1979, ex coccids on guava (*M. Verma*), 18 ♀, -vi. 1981, ex *Ceroplastes* sp. on *Ficus* sp. (*M. Hayat*) [all in Hayat Collection].

### *Coccophagus longiclavatus* Shafee

This species was described by Shafee (1973) from specimens collected in Bihar. Later, Ahmed & Shafee (1978) reported two females from Aligarh (Uttar Pradesh), without dates, but reproduced the original figures (including that of the male antenna) given by Shafee (1973).

The specimens examined agree with the original description and illustrations given by Shafee (1973), except that the colour of the gaster is different in our specimens: dark brown with centre and posterior half of tergum I, whole of terga II and VII yellow, and tergum III dark brown or with anterior half and sides yellow. However, this slight colour difference is not considered here to be of specific value. *C. longiclavatus* is very close to, and may eventually prove to be a senior synonym of, *C. matsuyamensis* Ishihara (1977). This species belongs to the *ochraceus*-group (Annecke & Insley, 1974).

**SPECIMENS EXAMINED:** 2 ♀. **India:** ASSAM : Gauhati, 1 ♀, -v. 1986 (Sudhir Singh) [in Hayat Collection]. KARNATAKA : locality ?, 1 ♀ (*CIBC collection*), 13836 CIBC No. 29 [in British Museum (Natural History), London].

### *Coccophagus tschirchii* Mahdihassan

**SPECIMENS EXAMINED:** 6 ♀. **India:** ASSAM : North Lakhimpur, 6 ♀, 25.v. 1986 (Sudhir Singh).

### Acknowledgement

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