

## **Redescription of Two Indian *Stigmina* (Hymenoptera: Crabronidae)**

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**Two Indian species of *Stigmina*: *Stigmus cuculus* Dudgeon and *Carinostigmus aterrimus* (R. Turner), not studied since their descriptions a century ago, are redescribed, and their diagnostic characters are provided. The hitherto unknown male of *Carinostigmus aterrimus* is described, with the first image of genitalia for the whole genus. The current generic assignment of the two species (Bohart and Menke, 1976) is confirmed.**

This paper is a result of our efforts at understanding and identifying Oriental *Carinostigmus*. The first step toward that goal was a study of two species described in *Stigmus*: *S. cuculus* Dudgeon, 1903 and *S. aterrimus* R. Turner, 1917 (the latter being later transferred to *Carinostigmus*). They have never been studied since their descriptions a century ago, and the original description of the first of these two species is highly insufficient. The type material of these two species, preserved in The Natural History Museum, London, United Kingdom, was kindly sent for examination by Mr. David Notton. Their redescription is given below.

The following are the institutional abbreviations used in the text:

BMNH: The Natural History Museum (formerly British Museum Natural History), London, United Kingdom.

CAS: California Academy of Sciences, San Francisco, California, USA.

NBAIR: Division of Molecular Entomology, National Bureau of Agricultural Insect Resources, Bangalore, India.

### ***Stigmus cuculus* Dudgeon**

*Stigmus cuculus* Dudgeon in Nurse, 1903:12, ♀. Syntypes: ♀, India: Himachal Pradesh: Kangra Valley: Holta in Palampur (BMNH), one syntype examined. – Ramakrishna Aiyar, 1916:556 (in catalog of Indian aculeates described after Bingham, 1897); Tsuneki, 1954:5 (in key to Eurasian *Stigmus*), 29 (in revision of Eurasian *Stigmus*); R. Bohart and Menke, 1976:189 (in checklist of world Sphecidae).

This species was described in one brief sentence: “Differs from *S. congruus* (Walk.) in being less than half the size, in the whole of the antennae being testaceous, clypeus subtriangular and slightly produced; tubercles not white.” The reference to *S. congruus*, now placed in *Carinostigmus*, suggests that *S. cuculus* is also a *Carinostigmus*. In fact, the species is a *Stigmus*, as indicated by the hindwing submedian cell not reduced and the crossvein cu-a positioned next to the origin of media (Finnamore, 1995). In addition, the midfrontal carina and the paraorbital groove are lacking, and the gastral petiole is longitudinally carinate. Also, the interantennal tubercle is

absent, the mesopleuron is mostly unsculptured, shiny (as opposed to the coarsely sculptured mesopleuron of *Aykhustigmus*), and the hindwing vein cu-a originates at some distance from apex of submedial cell.

As far as we know, no specimens of this species have been collected since its description.

**RECOGNITION.**— Of the 24 described species of *Stigmus* other than *S. cuculus*, we could examine 12, and we have also seen a number of undescribed species. It appears that *S. cuculus* has a unique combination of the nonmarginate free margin of the clypeal lobe and of the paraorbital sulcus on the frons, whereas the black pronotal lobe is a subsidiary recognition feature. Also, the area between the scrobal sulcus and the hypersternaulus is aciculate, almost unsculptured. An undescribed species from Thailand is similar, but differs in having the mesopleuron conspicuously ridged and rugose above the hypersternaulus, and the anterolateral corner of the clypeal lobe more prominent than in *S. cuculus*.

**REDESCRIPTION.**— ♀. Inner eye margins slightly converging below (Fig. 1). Head subquadrate in dorsal view, lateral margins relatively slightly converging behind eyes (Fig. 3). Gena in profile narrower than eye (Fig. 4). Middle clypeal lobe truncate apically (Fig. 2), not subtriangular as stated in original description. Free margin of labrum truncate. Frons aciculate up to the level of scape length, unsculptured above, with smooth sulcus adjacent to inner eye orbit and extending to upper level of aciculate area; upper frons without longitudinal impression (that is present in *S. pendulus* Panzer). Ocellular distance  $2.0 \times$  as long as interocellar distance. Prothorax side striate. Area between scrobal sulcus and hypersternaulus aciculate, almost unsculptured; area above scrobal sulcus dull, minutely, irregularly ridged longitudinally. Scutum aciculate, with scattered punctures (Fig. 5). Propodeum markedly reticulate (Fig. 6). Hindwing median vein emerging from apex of anal cell (it emerges a short distance from apex of anal cell in *S. convergens* Tsuneki, *S. japonicus* Tsuneki, and *S. quadriceps* Tsuneki, see Budrys, 1987). Gastral petiole with a pair of longitudinal carinae, finely ridged longitudinally on each side of carinae; petiole length in dorsal view equal to hindtarsomeres I and II combined.

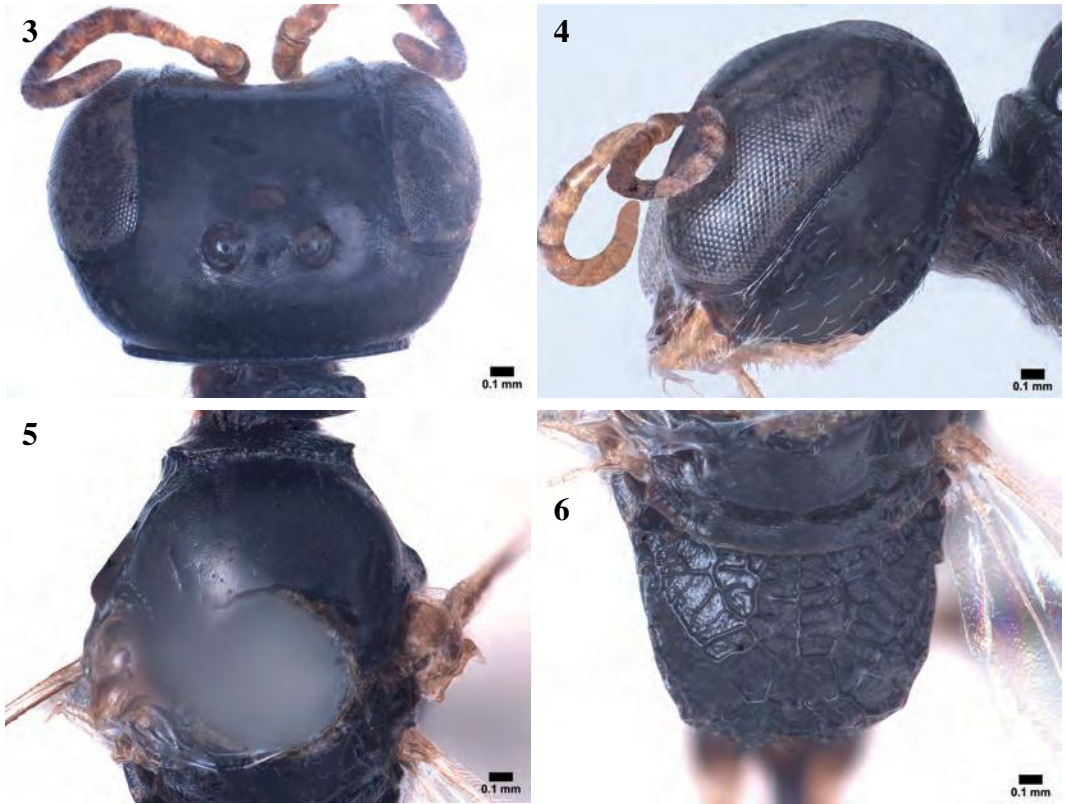
Head, thorax, propodeum, and gaster all black (including pronotal lobe), but mandible yellow (except apically) and antenna largely testaceous. Foretrochanter testaceous, mid- and hindtrochanter testaceous anteriorly, black posteriorly; femora black; tibiae and tarsi testaceous.

♂.— Unknown.

**RECORDS** (Fig. 7).— Known only from the type locality.



FIGURES 1–2. *Stigmus cuculus* Dudgeon, syntype female. (1) Head in frontal view; (2) Clypeus and adjacent frons.



FIGURES 3–6. *Stigmus cuculus* Dudgeon, syntype female. (3) Head in dorsal view; (4) Head in lateral view; (5) Scutum in dorsal view; (6) Propodeal dorsum.

### *Carinostigmus aterrimus* (R. Turner)

*Stigmus aterrimus* R. Turner, 1917:174, ♀. Holotype: ♀, India: Tamil Nadu: Nilgiri Hills: Coonoor (BMNH), examined. – Tsuneki, 1954:3 (in key to Eurasian *Stigmus*), 10 (original description copied). – As *Carinostigmus aterrimus*: R. Bohart and Menke, 1976:191 (new combination, in checklist of world Sphecidae).

Tsuneki (1954) included this species in his revision of the Eurasian *Stigmus*, but had seen no specimens. Based on the original description, however, he correctly recognized that the species was a *Carinostigmus* (treated as a subgenus of *Stigmus* at that time). He also correctly recognized the diagnostic characters.

**RECOGNITION.**— *Carinostigmus aterrimus* differs from its congeners in having the mandible black at least basally (brownish apically to mostly brown) rather than yellow, and the trochanters black (at least mid- and hindtrochanters) rather than testaceous.

**REDESCRIPTION.**— Inner eye margins slightly converging below in female (Fig. 8), more so in male (Fig. 15). Frons microareolate, outside of scapal basin also minutely ridged. Paraorbital groove crenulate, moderately broad along anterior head surface. Horizontal portion of frons and postocellar area almost unsculptured, with only widely spaced microscopic punctures. Midfrontal carina well defined but markedly thinner just before midocellus, below midlength forming narrow, erect projection. Occipital carina narrow, not crenulate in female, crenulate ventrally in male

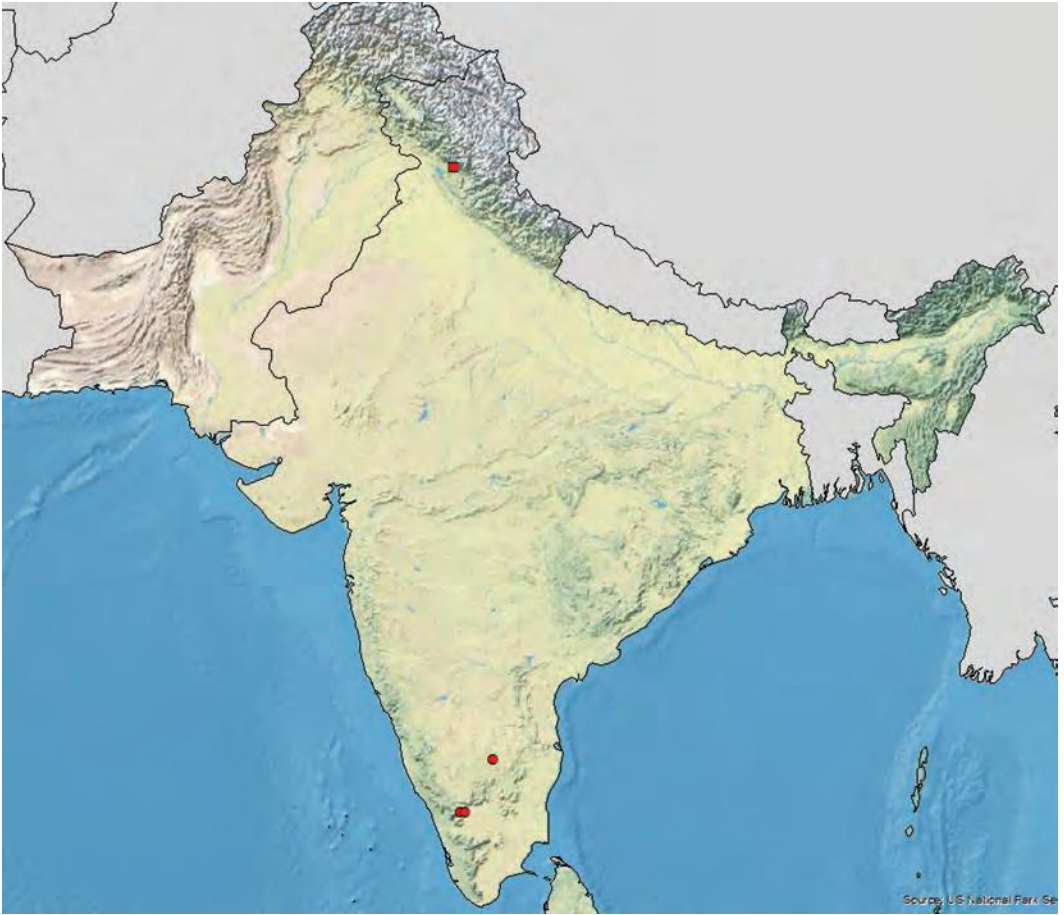
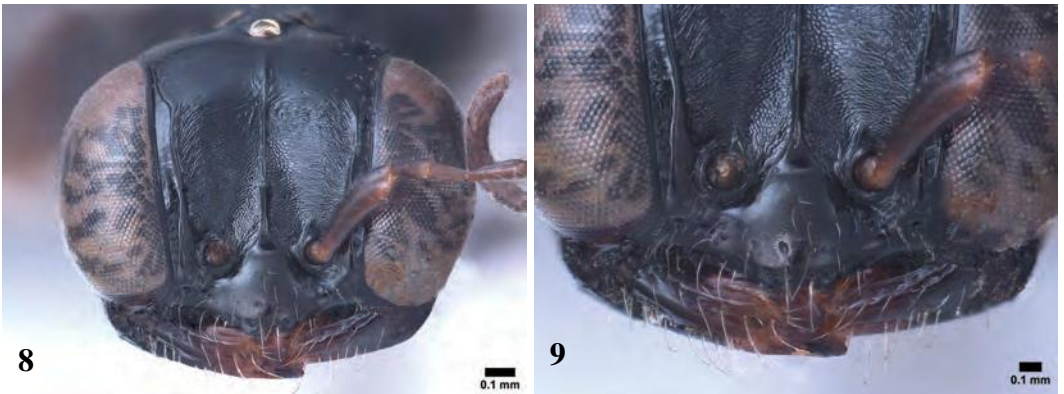
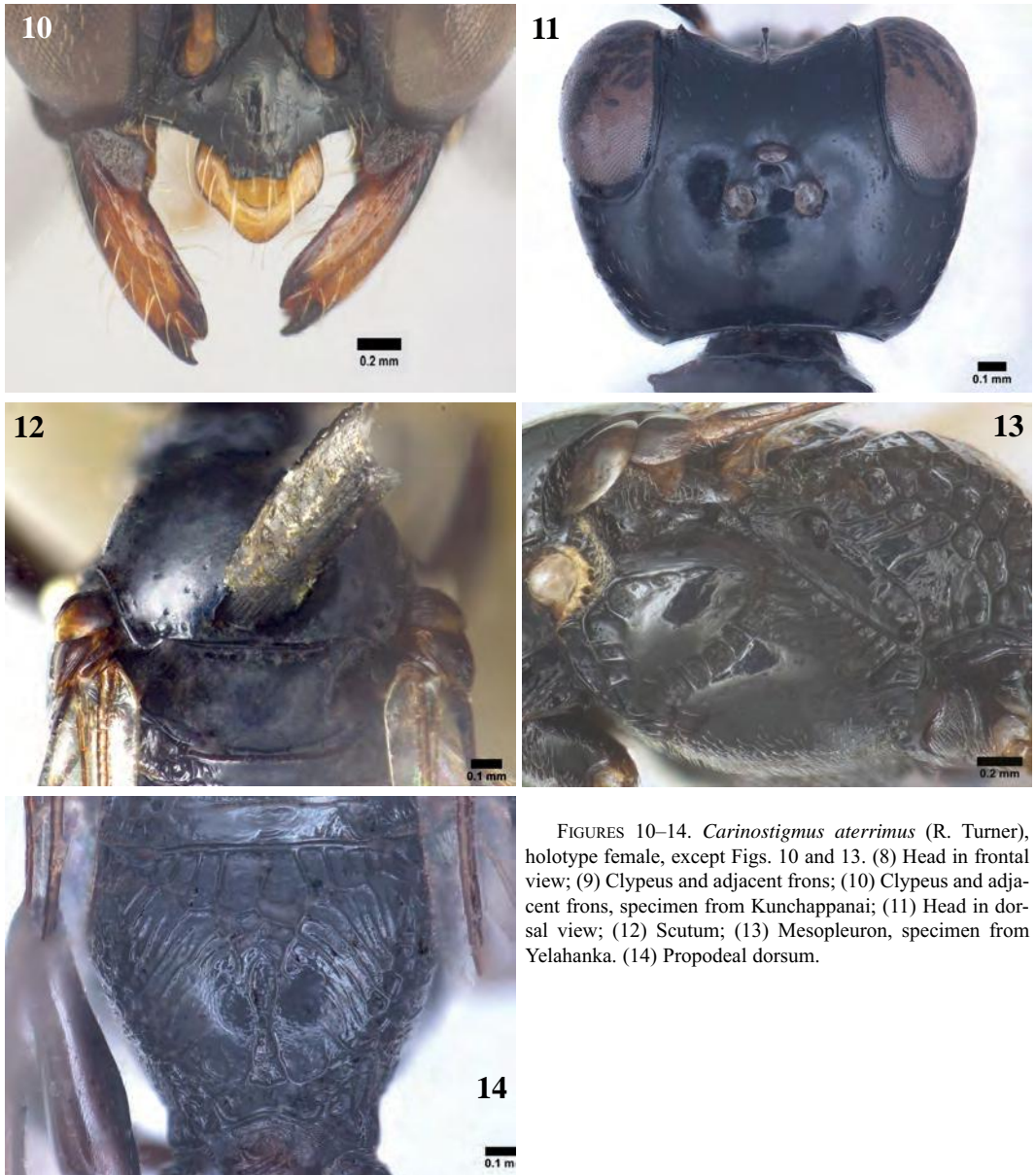


FIGURE 7. Map of Indian subcontinent with collecting localities of *Stigmus cuculus* Dudgeon (square) and *Carinostigmus aterrimus* (R. Turner) (circles).



FIGURES 8–9. *Carinostigmus aterrimus* (R. Turner), holotype female., (8) Head in frontal view; (9) Clypeus and adjacent frons.



FIGURES 10–14. *Carinostigmus aterrimus* (R. Turner), holotype female, except Figs. 10 and 13. (8) Head in frontal view; (9) Clypeus and adjacent frons; (10) Clypeus and adjacent frons, specimen from Kunchappanai; (11) Head in dorsal view; (12) Scutum; (13) Mesopleuron, specimen from Yelahanka. (14) Propodeal dorsum.

(Fig. 18). Underside of head lineate laterally but not mesally (Fig. 18). Free margin of clypeal lobe shallowly emarginate, slightly more so in male (Fig. 15) than in female (Figs 9, 10), free margin laterally of lobe gently incurved, not forming projection (Figs. 9, 10, 15). Transverse carina of pronotal collar well defined, spicate laterally, not emarginate mesally in female, slightly emarginate in male (emargination smaller than in *C. costatus* Krombein). Scutum with scattered punctures slightly larger and denser than those on head, not foveate along flange (Fig. 12); notaulus impressed, crenulate, shorter than distance between notauli; parapsidal line inconspicuous in female, conspicuous in male; posterior part of scutum conspicuously foveolate adjacent to hind-

margin (middle pair of foveae the largest). Scutellum with deeply impressed, crenulate groove along foremargin, with a few scattered punctures on disk. Postscutellum unsculptured mesally, rugulose laterally. Omalus well defined, broader than hypersternaulus, divided into two sulci that are separated by vertical carina (not divided in *C. filippovi* Gussakovskij); crenulation along omalus posterior margin varying: markedly less conspicuous than that of hypersternaulus in holotype, but equal in size or larger than hypersternaulus in other specimens examined; omalus joining scrobal sulcus; scrobal sulcus in holotype about one midocellar diameter wide next to pronotal lobe, but soon narrowing and forming narrow sulcus posteriorly, longer than in holotype in one female from Yelahanka and in male; area between hypersternaulus and scrobal sulcus unsculptured

15



16



17



19



FIGURES 15–19. *Carinostigmus aterrimus* (R. Turner), male. (15) Head in frontal view; (16) Clypeus and adjacent frons; (17) Head in dorsal view; (18). Underside of head; (19) Genitalia.

or nearly so, markedly larger than greatest width of hypersternaulus (smaller in *C. costatus*); ridges along mesopleuron posterior margin (between hypersternaulus and midcoxa) fine, somewhat conspicuous in female from Kunchappanai, and well defined in male. Propodeal enclosure with median carina and oblique, somewhat irregular ridges emerging from it (Fig. 14), without unridged area apically; propodeal dorsum outside of enclosure obliquely ridged; propodeal side longitudinally ridged; posterior surface coarsely rugose ventrally, in holotype dorsally unsculptured on each side of median sulcus (unsculptured area attaining apex of enclosure), but all rugose in other specimens examined. Gastral petiole in dorsal view  $6.0 \times$  as long as wide at middle in female,  $8.2 \times$  in male.

Body black, shiny except for pale yellow pronotal lobe, with the following testaceous: scape ventrally in some specimens, labrum, palpi, articulation between trochanters and femora, foretrochanter in one female from Yelahanka and in male, also articulation between forefemur and foretibia in male, anterior surface of foretibia, posterior surfaces of mid- and hindtibia, and tarsi; mandible black except brownish apically, but brown except black basally in female from Kunchappanai, and black basally and apically and light brownish mesally in male.

♀.— Head moderately narrowed behind eyes in dorsal view (Fig. 11), its width next to occipital carina equal to  $0.56 \times$  its greatest width. Postocellar area elongate (Fig. 11). Labrum (invisible in holotype) pentagonal, its lateral margins diverging ventrally near base, converging and straight over most of their length, apex rounded (Fig. 10). Pygidial plate oval, microsculptured. Length 4.7–5.3 mm

♂.— Head markedly narrowed behind eyes in dorsal view (Fig. 17), its width next to occipital carina equal to  $0.33\text{--}0.35 \times$  its greatest width. Postocellar area markedly shorter than in female (Fig. 17). Labrum shallowly, broadly emarginate apically (Fig. 18). Three apical flagellomeres with placoids. Genitalia: Fig. 19. Length 5.6–5.9 mm.

**RECORDS** (Fig. 7).— **INDIA: Karnataka:** Attur: Yelahanka at  $13^{\circ}10'N$   $77^{\circ}56'E$  (1 ♀, CAS; 1 ♀, 2 ♂, NBAIR:). **Tamil Nadu:** Nilgiri Hills: Coonoor at  $11.3530^{\circ}N$   $76.7959^{\circ}E$  (1 ♀, BMNH, holotype of *Stigma aterrimus* R. Turner) and Kunchappanai 15 km SE of Kotagiri at  $11^{\circ}22'N$   $76^{\circ}56'E$  (1 ♀, CAS).

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