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On the occurrence of a Palaearctic species of the genus *Aphaereta* Foerster (Braconidae, Alysiinae) and description of a new species of the genus *Leiophron* Nees (Braconidae, Euphorinae) from central India

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Abstract

A new species of parasitoid wasp, *Leiophron crassivena* Gupta & van Achterberg **sp. nov.** (Braconidae, Euphorinae), is described and illustrated from central India along with first report of the Palaearctic species *Aphaereta vondelparkensis* van Achterberg *et al*. (Braconidae, Alysiinae) from India.

Key words: Euphorinae, Alysiinae, India

Introduction

The species of the genus *Aphaereta* Foerster, 1863 (Braconidae: Alysiinae) are solitary or gregarious endoparasitoids of cyclorrhaphous dipteran larvae living in decaying organic matter. Three species of the genus *Aphaereta* are known from India: *A. breviterebrata* Samiuddin, Ahmad & Shamim, *A. indica* Samiuddin, Ahmad & Shamim and *A. minys* Samiuddin, Ahmad & Shamim (Samiuddin *et al*. 2008).

The species of *Leiophron* Nees, 1818 (Braconidae: Euphorinae) are parasitoids of Lygaeidae and Miridae nymphs (Marsh 1979, Chen & van Achterberg 1997). *Leiophron* is divided into three subgenera: *Euphoriana* Gahan, *Leiophron* s. str. and *Euphoriella* Ashmead. Recently, Gupta *et al*. 2022 added one species from the north-eastern zone of India leading to a total of 12 species from the Indian region.

In this paper *Aphaereta vondelparkensis* van Achterberg *et al*. 2020, a gregarious parasitoid of Sarcophagidae and Calliphoridae larvae, which was recently discovered and described from Amsterdam (Vondelpark) through collaborative efforts of experts and citizen scientists (van Achterberg *et al*. 2020), is recorded and illustrated for the first time from India. As well, the new species *Leiophron crassivena* **sp. nov.** is described and illustrated from Chhattisgarh (Central India).

Material and methods

Specimens were collected through yellow pan traps from Chhattisgarh, central India. The following abbreviations are used in the descriptions: F1 and F2 for first and second antennal flagellomeres; POL—Posterior Ocellar Line; OOL—Ocular Ocellar Line; OD—Ocellar Diameter. Morphological terminology in general follows van Achterberg (1993). Photos were taken with a Leica M 205 A stereozoom microscope with Leica DC 420 inbuilt camera using automontage software (version 3.8). All specimens are deposited in the National Insect Museum (NIM) of ICAR-National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bengaluru, India.

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Species description

***Aphaereta vondelparkensis* van Achterberg *et al*. 2020**
Figs 1 & 2

Female, length of body 3.3 mm, of fore wing 3.4 mm.

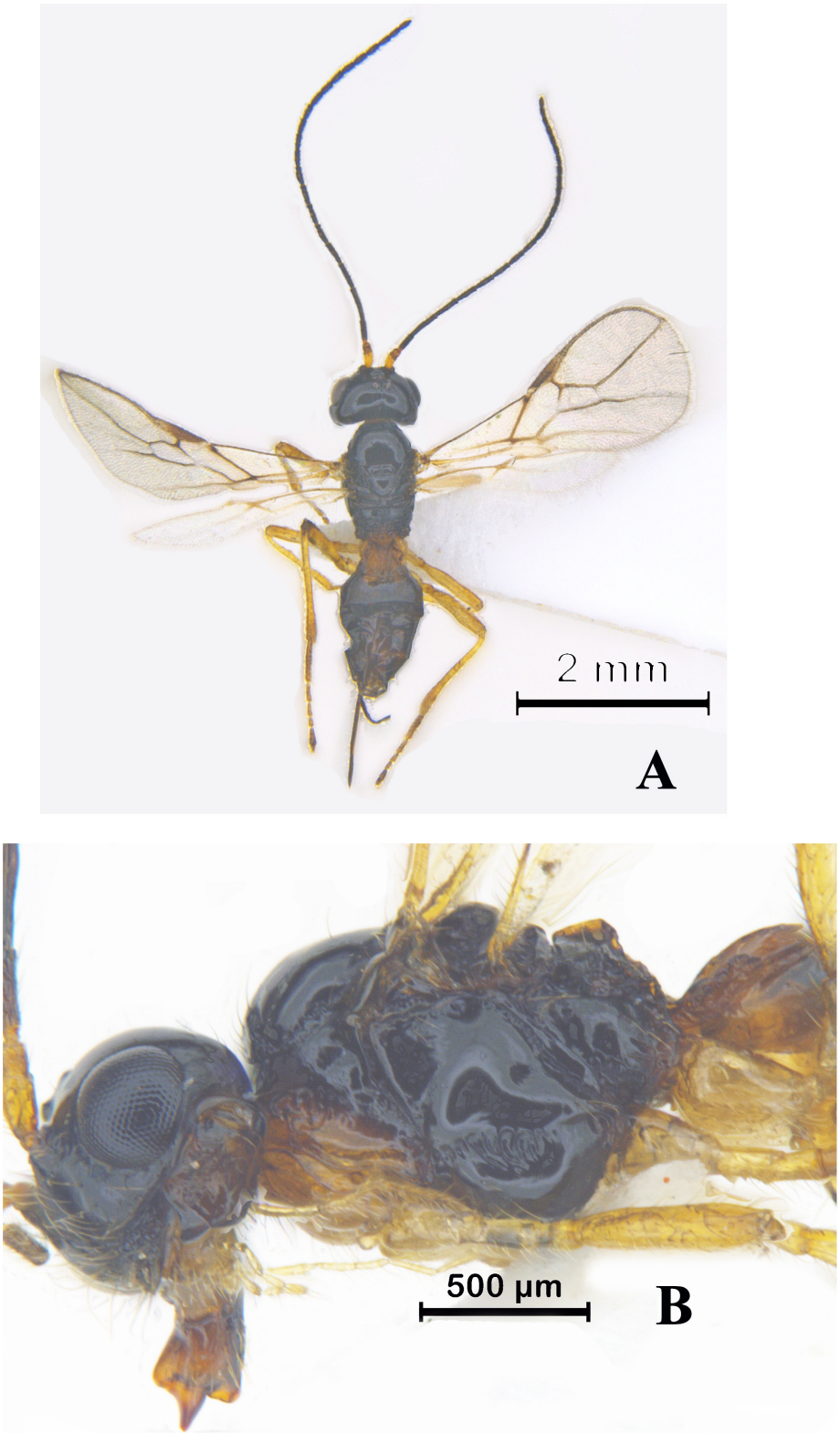

FIGURE 1. *Aphaereta vondelparkensis* van Achterberg *et al*. A—Habitus in dorsal aspect; B—Head and mesopleuron in lateral aspect.

Colour. Black or dark brown (Fig. 1A); scapus yellow and pedicellus of antenna brown; palpi, tegulum, coxae, trochanters, trochantelli pale yellowish; and remainder of legs (but telotarsi infuscate) brownish-yellow; mandibles (margins darkened) and first tergite of metasoma reddish brown; wing membrane slightly infuscate. Propleuron and pronotal side ventrally orange (Fig. 1B).

Head. Antenna with 24 antennomeres, length of third, fourth and penultimate antennomeres 3.7, 6.1 and 2.5 × their maximum width, respectively; OOL:diameter of posterior ocellus:POL = 5.0:1.9:2.0; frons glabrous and smooth (Fig. 2A), nearly flat; length of eye in dorsal view 2.4 × temple; eyes glabrous except for a few setae; temples slightly curved behind eyes; median groove of vertex present (Fig. 2B); head 1.5–1.7 × wider than high medially, smooth; clypeus sparsely finely punctate, rather convex medially, long setose; mandible partially rugulose, its medial length 1.6 × maximum width, second tooth longer than lateral teeth (Fig. 1B).

Mesosoma. Mesoscutum glabrous, smooth, strongly shiny and with complete lateral carina (Fig. 2D); scutellar sulcus transverse and deep with one median carina; scutellum slightly convex; metanotum with two diverging sub median carinae; surface of propodeum mainly rugulose, with two sub medio-longitudinal carinae forming an areola in apical half (Fig. 2F).

Wings. (Fig. 2E) Fore wing: 2-SR oblique; r:3-SR:SR1(relative) = 11.5:40.6:115.2; r about 1.3 × as long as width of pterostigma, pterostigma narrow elliptical; SR1 straight and ending nearly at apex of wing; 2-SR:3-SR: r-m (relative) = 23.8:40.6:13.1; r-m and 2-SR (apical third) interstitial. Hind wing: narrow apically; no trace of cu-a. Ratio of m-cu: 2-SR 37.7: 23.8. Second submarginal cell 2.2 × as long as its maximum width.

Legs. Length of femur about 5.0 × as long as its maximum width. Ratio of ovipositor: hind femur and first tergite 13.9: 75.6: 47.8.

Metasoma. Length of first tergite about 0.9 × as long as apical width, its surface distinctly convex medially and rugose, longitudinal sub median carinae distinct in basal 0.5 and tergite widened behind spiracles; dorsope rather large (Fig. 2G). Length of setose part of ovipositor sheath (Fig. 2H) 0.4 × fore wing length, sub equal to metasoma, 1.7 × hind femur length and 1.1 × hind tibia length, with very long setae.

Material examined. 4♀; India, Chhattisgarh, Kanker, 20°14′48.416″N, 81°30′28.873″E, yellow pan trap, 8–14.ii.2022; leg Kriti A. Minz. code—NBAIR/Brac/Aly/Aphae/08222A–D (NIM).

Remarks. The species has a wide distribution as it is encountered in inhabited areas. So far known from Europe and the East Palaearctic region (pers. comm. CvA). The Indian specimens resemble *A. vondelparkensis* in almost all the characters and also possess the pale pronotum (ventrally) and propleuron, however, slight variations are observed which are shown in Table 1.

TABLE 1. Comparison between the European and Indian specimens of *A. vondelparkensis*

Characters	European *A. vondelparkensis* (original description)	Indian specimens
Body size; fore wing	1.8 mm; 2.0 mm	3.3 mm; 3.4 mm
Propleuron, pronotal side ventrally and first tergite orange	Yes	Yes
Mandible	Middle tooth sharply pointed and longest	Middle tooth slightly longer than third tooth
Third antennal segment	3.8–5.0 × longer than wide	3.7 ×
Second submarginal cell of fore wing	2.5–2.8 × longer than its maximum width	2.2 ×
Vein 2-SR of fore wing	2.4–2.8 × as long as vein r	2.1 ×
Length of femur, tibia and basitarsus of hind leg × their width, respectively	5.4, 10.1 and 6.0 ×	5.0, 10.5 and 5.4 ×
Propodeum	smooth, without lateral protuberance, its medio-longitudinal carina distinctly lamelliform and protuberant and posteriorly with narrow triangular medial area	rugose with distinct lateral protuberances; with two sub medio-longitudinal carinae forming an areola in apical half
First tergite	less rugose	comparatively more rugose

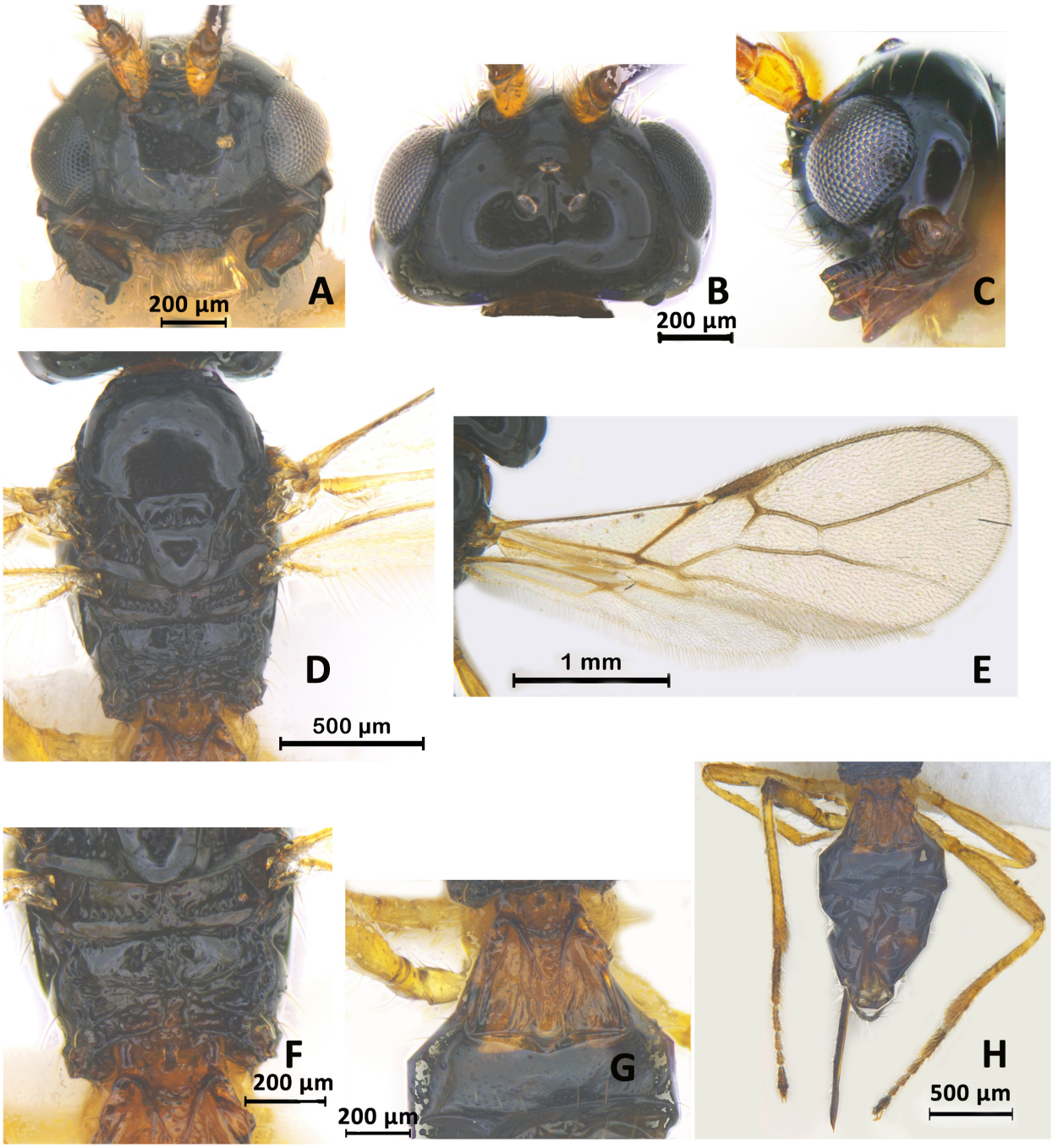

FIGURE 2. *Aphaereta vondelparkensis* van Achterberg *et al*. A—Head in frontal aspect; B—Vertex; C—Head showing mandibles; D—Mesosoma; E—Fore wing; F—Propodeum; G—T1 and T2; H—Metasoma.

Leiophron crassivena **Gupta & van Achterberg sp. nov.**
Figs 3–5

Type material. Holotype. ♀; India, Chhattisgarh, Mainpat, 22°48′33.146″ N, 83°17′38.919″ E, yellow pan trap, 25–30.iii.2022; leg Kriti A. Minz. code—NBAIR/Brac/Euph/Leio/25322H (NIM). Paratype, one female and one male, same data as holotype, code—NBAIR/Brac/Euph/Leio/25322P1 and NBAIR/Brac/Euph/Leio/25322P2 (NIM).

Holotype. Body length 3.2 mm; fore wing length 2.3 mm; exserted part of ovipositor 0.15 mm.

FIGURE 3. *Leiophron crassivena* Gupta & van Achterberg **sp. nov.**, holotype (female).

Colour. Body mainly brownish (Figs 3 & 4); antennomeres yellowish but 3–4 apical antennomeres dark brown; legs in general yellowish with comparatively paler fore and mid legs; fore wings prominently infuscated, fore wing with pterostigma dark brown in apical half and remainder pale yellowish; first tergite and majority of the second tergite yellowish brown, following tergites black.

Head. Antenna with 15 antennomeres; F1 3.8 × as long as wide and 1.1 × F2; penultimate antennomere 1.4 × as long as wide; head rather square (Fig. 5A), ca. 1.4 × as wide as long in dorsal view, 1.3× as wide as long in frontal view; temple smooth; eye length 1.6 × temple in dorsal view (Fig. 5B); POL:OOL: OD = 14.3: 12.4: 4.5; POL 1.1 × OOL; malar suture present, malar space subequal to 0.7 × basal width of mandible; occipital carina ventrally present; face smooth and setose, clypeus smooth and intertentorial line 3.2 × tentorio-ocular line; vertex smooth around ocelli, with shallow punctures near temple and occiput.

Mesosoma. Mesosoma 1.8 × as long as wide in dorsal view, notauli entirely absent, median and lateral lobes of mesoscutum smooth (Fig. 5C). Propodeum irregularly reticulate rugose with no median carina. Fore wing 3.3 × as long as wide (Fig. 5E); pterostigma 2.8 × as long as wide; 1-R1 0.35–0.37 × length of pterostigma; 1-M thickened; 1-CU1, 2-CU1 present; r+3-SR+SR1 well developed; 1-SR+M weakly developed; basal cell glabrous and subbasal cell largely so. Hind femur, hind tibia and hind basitarsus 4.9, 8.0, 8.9 × as long as their width, respectively.

Metasoma. Metasoma 2.5 × its width in dorsal view and 2.7 × its height in lateral view; first tergite longitudinally striate (Fig. 5D), 3.9 × longer than its apical width; spiracles situated at middle of tergite and ventral one third of T1 closed in middle; T2 smooth, 0.4 × length of metasoma, remaining tergites smooth.

Variation. The male paratype (Fig. 4) is very similar to the holotype but differs in having 16 antennomeres.

Etymology. Named after the thickened vein 1-M of the fore wing: "crassus" is Latin for thickened and "vena" is Latin for vein.

Remarks. This species comes close to *L. hayati* by having the length of the malar space and the basal width of the mandible subequal, the face smooth, the colour pattern similar and the notauli entirely absent (Shamim *et al*. 2009). However, it can be differentiated with the following set of characters: length of metasoma 2.6 × its height (4.2 × its height in *L. hayati*); hind femur 4.9 × as long as wide (3.0 × as long as wide); T1 3.9 × longer than its apical width (3.3 × longer than its apical width) and T2 0.4 × as long as metasoma (more than 0.5 × as long as metasoma).

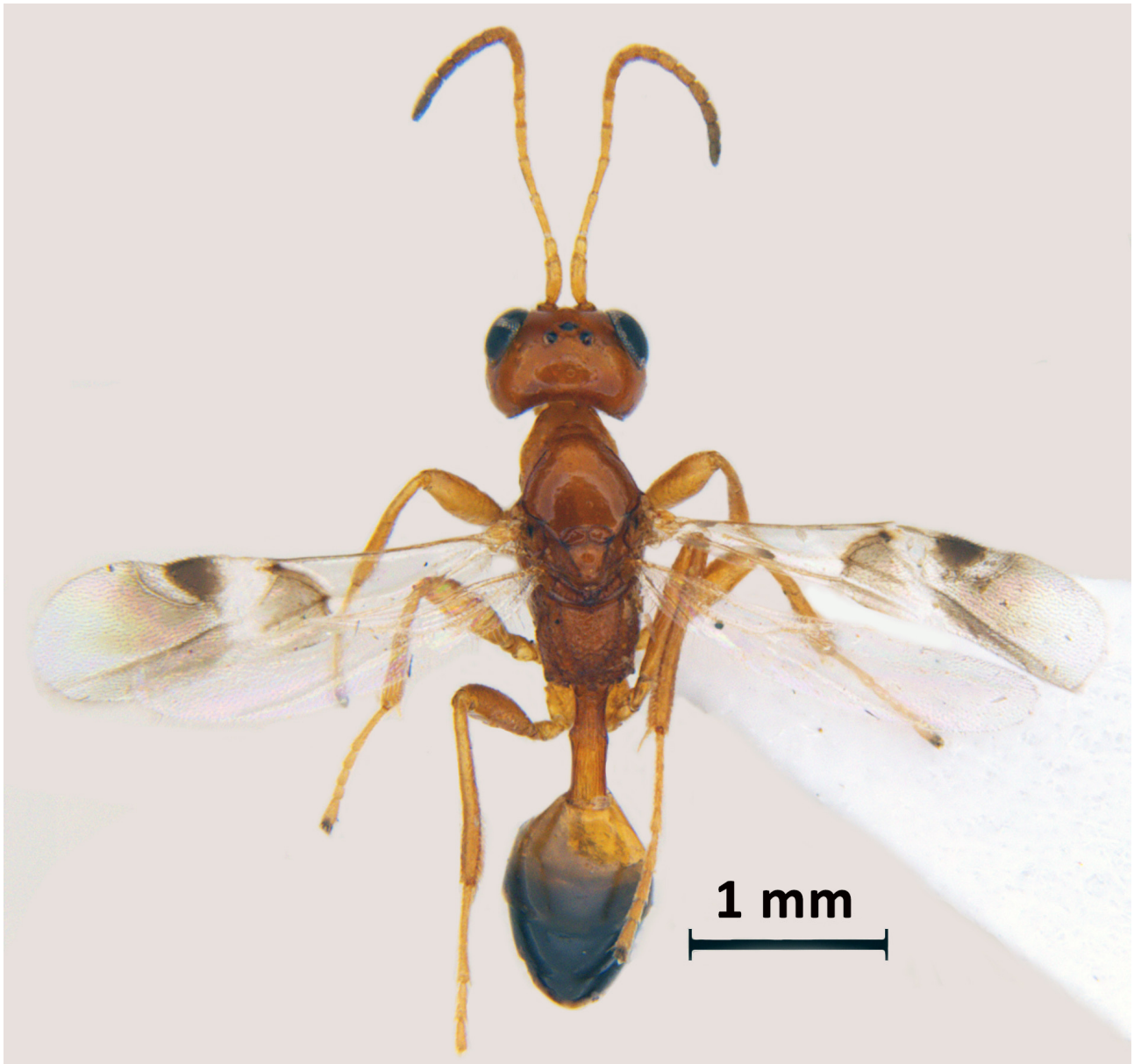

FIGURE 4. *Leiophron crassivena* Gupta & van Achterberg **sp. nov.**, male.

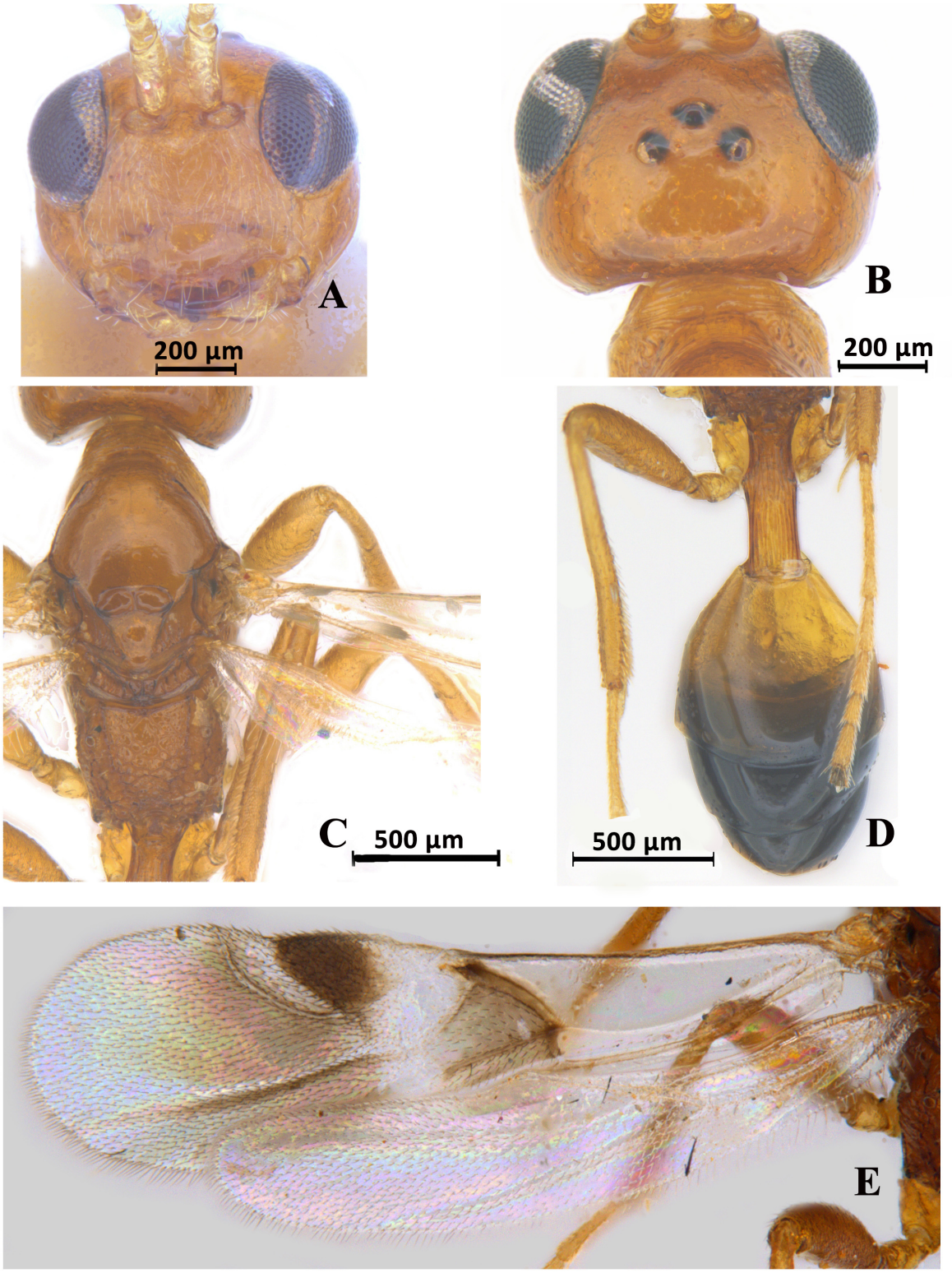

FIGURE 5. *Leiophron crassivena* Gupta & van Achterberg **sp. nov.** A—Head in frontal aspect; B—Vertex; C—Mesosoma; D—Metasoma; E—Wings.

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