



***Diglyphomorphomyia* Girault (Chalcidoidea: Eulophidae) new to the Neotropical region including nine new species**

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Abstract

The genus *Diglyphomorphomyia* Girault is newly reported from the Neotropical region, with the majority of material and species from Costa Rica. It is represented by nine species in the region, and all are new species described here: *D. albiclava*, *D. albicoxa*, *D. carinifer*, *D. costulata*, *D. cristata*, *D. metallica*, *D. parva*, *D. pedunculata*, *D. pilosa*. An identification key for the species is included. The Neotropical species of this genus differ in one morphological feature from Old World species, but share several important characters with the type species of *Diglyphomorphomyia* from Australia. The biology of *Diglyphomorphomyia* species is unknown, but they are probably parasitoids of concealed lepidopteran larvae.

Key words: Eulophinae, Elachertini, Belize, Costa Rica, Honduras

Introduction

Taxonomic knowledge of the Eulophinae fauna (Chalcidoidea: Eulophidae) in the Neotropical region is poor, at both the genus and species level. LaSalle *et al.* (2006) listed 37 genera in the subfamily from the Neotropical region, Hansson (2020) added two genera and Hansson *et al.* (2021) included a third genus to the list, so now 40 genera of the subfamily have been recorded from the Neotropical region. However, very few of these genera have been investigated on a more comprehensive basis, and the presence of a large number of undescribed taxa, including taxa at the genus level, is anticipated in this taxa rich region (Gauld & Gaston 1995, LaSalle & Schauff 1995). Furthermore, in the Neotropical region there are also unrecorded groups that are known from other zoogeographical regions. One such genus, *Diglyphomorphomyia* Girault, is introduced here.

Diglyphomorphomyia is thus newly recorded from the Neotropical region here. The genus was described by Girault (1913), based on an Australian species (*D. nigriscutellum* Girault). Currently there are 18 species included in this genus, and all are from the Old World.

The material forming the base for this study has either been swept or caught in malaise traps over several years, mainly in Costa Rica. No material has been reared or is otherwise associated with the biology of the species, so biological data, including host information, remain to be discovered.

Terminology and abbreviations

Morphological terms follow Gibson (1997) with the following exceptions or additions: F1–4 = flagellomeres 1–4; mesoscutellum is used instead of scutellum; gonoplac = the apical part of ovipositor sheaths (Grimaldi and Engel 2005); Gt₁₋₇ = gastral tergites 1–7; OOL = shortest distance between one posterior ocellus and eye; POL = shortest distance between posterior ocelli; T1–4 = tarsomeres 1–4. For illustrations of the morphological terms see Gibson (1997) and www.neotropicaleulophidae.com.

The following abbreviations are used for museums in which specimens are deposited: CNC = Canadian National Collections of Insects and Arachnids, Ottawa, Canada; MZLU = Entomological collections, Biological Mu-

seum, Lund University, Sweden; MZUCR = Museo de Zoología, Universidad de Costa Rica, San José, Costa Rica; NHMUK = Natural History Museum, London, United Kingdom.

The ratios in the descriptions are based on the holotypes and, if applicable, one of the paratypes of the other sex.

Imaging

The colour images of the specimens were made using Canon camera equipment including an EOS 5D Mark IV body, a telezoom lens, 70–300mm (but using only 200mm), with a 10× or a 5× Mitutoyo microscope lens attached, and macro twin lite MT-24 EX for illumination. The camera was attached to a Cognisys stackshot macrorail system. The picture stacking was done with Helicon Focus version 6, and Adobe Photoshop was used for image processing.

Identification

There are currently no identification tools for Eulophinae Neotropical genera. In the key to Nearctic genera by Schauff *et al.* (1997) most species of Neotropical *Diglyphomorphomyia* run to couplet 30 (*Deutereulophus* Schulz), while some continue to couplets 33 (*Cristelacher* Schauff & LaSalle), 39 (*Hyssopus* Girault) or 40 (*Diglyphomorpha* Ashmead/*Elachertus* Spinola). In the key to Austral-Asian Eulophidae (Bouček 1988) some species of Neotropical *Diglyphomorphomyia* run to couplet 24 (*Euplectrophelinus* Girault), while some continue to couplet 34 (*Elachertus*) or 35 (*Entedonomorpha* Girault/*Diglyphomorphomyia* Girault). In all cases Neotropical *Diglyphomorphomyia* species are easily recognized through the shape of the expanded dorsal part of Gt₁. Neotropical species of *Diglyphomorphomyia* differ from Old World species in not having deep punctures or foveae on mesoscutum and mesoscutellum.

Diglyphomorphomyia Girault, 1913

Diglyphomorphomyia Girault, 1913:281. Type species *Diglyphomorphomyia nigriscutellum* Girault, 1913:281, by original designation.

Elachertus (*Neolachertus*) Narendran, 2004:129–130. Type species *Elachertus nexius* Narendran, 2004:130–132, by original designation and monotypy. Synonymized by Narendran *et al.* (2005b:33).

Diagnosis. Mandibles with two large teeth at apex and with a row of four small teeth above these (Fig. 25). Occipital margin with sharp edge (Figs 5, 6). Mesoscutellum with sublateral grooves consisting of pit-rows, grooves either converging in posterior part and joining posteromedially (Fig. 13) or missing in posteromedian part (Fig. 6), lateral part of grooves either ±straight (Fig. 9) or distinctly sinuate and converging medially (Fig. 4). Dorsellum with small dents along posterior margin (Fig. 37). Propodeum (Figs 37, 38) with complete plicae, callus with a longitudinal, complete and sharp carina in median part, carina ending in a blunt spine posteriorly, and with 5–9 setae in a single row along carina; supracoxal flange large and ±transparent (Figs 37, 38). Fore wing with postmarginal vein 1.0–1.4× as long as stigmal vein. Gaster with dorsal part of Gt₁ strongly expanded backwards with posterior margin semicircular (Fig. 13), covering about one-half of gaster, and with distinct groove in anterior-median part (Figs 6, 23). All species from the Old World have deep punctures or foveae on mesoscutum and mesoscutellum, but these are not present in Neotropical species of the genus.

Description of Neotropical *Diglyphomorphomyia*. Eyes hairy; malar sulcus present; clypeus convex, with ventral margin protruding and rounded, part just above clypeus with strong reticulation; mandibles with two large teeth at apex and with a row of four small teeth above these; antennal scrobes undelimited; occipital margin with a sharp edge. Antenna inserted just above lower level of eyes, scape not reaching anterior ocellus; male scape not enlarged, as narrow as in female; with six flagellomeres: four funiculars and two clavomeres, funiculars with a short to long stalk in anterior part, female with one small anellus, no anellus visible in male; male with unbranched flagellomeres. Pronotum short, with or without a carina along anterior margin of pronotal collar. Mesoscutum with narrow and complete notauli; midlobe with 2–4 pairs of setae. Mesoscutellum with sublateral grooves consisting of pit-rows, grooves either converging and joining posteromedially, or missing in posteromedian part, with two pairs

of long and strong setae, attached just lateral to sublateral grooves close to lateral margin of mesoscutellum, one pair in median part and one pair close to posterior margin. Axillae advanced forward just slightly in front of transscutal articulation. Dorsellum with small dents along posterior margin. Propodeum with a strong and complete median carina with a large \pm semicircular cup in very anterior part; with complete plicae; propodeal callus with a longitudinal, sharp and complete carina in median part, carina ending in a blunt spine posteriorly, with 5–9 setae in a single row along carina; supracoxal flange large and \pm transparent. Fore wing with 3–9 setae on dorsal surface of submarginal vein; speculum present, closed below and towards base of wing; costal cell with a \pm complete row of setae on ventral surface or with scattered setae, and with 3–25 setae along apico-dorsal margin; with a row of 9–20 admarginal setae below \pm entire marginal vein on ventral side of membrane; postmarginal vein 1.0–1.4 \times as long as stigmal vein. Hind leg with two short tibial spurs, longest spur about half as long as T1. Petiole as a narrow band to transverse with strong sculpture on dorsal surface. Gastral tergites \pm strongly sclerotized, non-collapsing, smooth or with very weak reticulation and shiny; dorsal part of Gt₁ strongly expanded backwards with posterior margin semicircular, covering about one half of gaster.

Distribution. Australia (Girault 1913, 1915), China (Zhu and Huang 2003, Fan and Li 2022), India (Narendran 2004, 2011, Narendran *et al.* 2005a, 2005b), Indonesia (Ubaidillah 2003), Korea (Bouček 1988), Malaysia (Bouček 1988), Papua New Guinea (Bouček 1988), Sri Lanka (Motschulsky 1863), Taiwan (Zhu and Huang 2003), Uganda (Bouček 1988), Yemen (Yefremova 2007). Neotropical species of *Diglyphomorphomyia* are this far recorded from Central America, from Belize to Costa Rica. The actual distribution in the Neotropical region is very probably much larger, including also tropical parts of South America.

Biology. An undescribed species of this genus was reared in Uganda from a stem borer (presumably a Lepidoptera) on *Physalis* (Solanaceae) (Bouček 1988). Thompson (1955) recorded *D. rufescens* (Motschulsky) from *Saissetia coffeae* (Walker) (Hemiptera: Coccidae), but this is a mistake, a misreading from Motschulsky (1863). The record for *S. coffeae* is for the species that follows after *D. rufescens*, *Encyrtus? nietneri* Motschulsky (now *Microterys nietneri* (Motschulsky)).

Diglyphomorphomyia belongs in the “*Elachertus* complex” (see discussion), and species of *Elachertus* and some related genera are primary parasitoids on larvae of various Lepidoptera groups living in concealed situations (Schauff 1985a, 1985b, Schauff *et al.* 1997). The record from *Physalis* agrees with this ecology.

Key to species

1. Females (the female is unknown for *D. carinifer*) 2
- Males (males are unknown for *D. albiclava*, *D. albicoxa*, *D. cristata*, *D. metallica*, *D. parva*) 9
2. Pronotal collar with a carina along anterior margin (Figs 4, 8) 3
- Pronotal collar without a carina along anterior margin (e.g. Figs 2, 16) 4
3. Fore and hind coxae yellowish-brown (Fig. 7) *D. cristata* sp. nov.
- All coxae white (Fig. 3) *D. albicoxa* sp. nov.
4. Head yellowish-brown (Fig. 25) *D. albiclava* sp. nov.
- Head dark brown to black (with or without metallic tinges) 5
5. Head black with metallic blue tinges (Figs 9, 28) *D. metallica* sp. nov.
- Head dark brown to black, not metallic (e.g. Fig. 31) 6
6. Mesosoma predominantly yellowish-brown (Figs 12, 16) 7
- Mesosoma dark brown to black (Figs 6, 13) 8
7. Large species (2.9mm); costal cell with 15 setae along apico-dorsal margin (Figs 15, 16) *D. pilosa* sp. nov.
- Small species (0.9–1.4mm); costal cell with 2–4 setae along apico-dorsal margin (Figs 11, 12) *D. parva* sp. nov.
8. Hind coxa white (Fig. 14); propodeum without costula (Fig. 37) *D. pedunculata* sp. nov.
- Hind coxa dark brown (Fig. 5); propodeum with costula (Fig. 6) *D. costulata* sp. nov.
9. Antennal funiculars strongly pedunculate (Fig. 20), e.g. stalk in anterior part on F4 ca 0.8 \times as long as width flagellomere *D. pedunculata* sp. nov.
- Antennal funiculars weakly pedunculate (e.g. Fig. 36), e.g. stalk in anterior part on F4 at most 0.2 \times as long as width flagellomere 10
10. Pronotal collar with a carina along anterior margin (Fig. 18) *D. carinifer* sp. nov.
- Pronotal collar without a carina along anterior margin (Figs 22, 23) 11
11. Flagellomeres with long setae, about as long as flagellomere they are attached to (Fig. 35); propodeum with costula (Fig. 23) *D. costulata* sp. nov.
- Flagellomeres with short setae, much shorter than flagellomere they are attached to (Fig. 36); propodeum without costula (Fig. 22) *D. pilosa* sp. nov.

Species treatments

Diglyphomorphomyia albiclava sp. nov.

Figs 1, 2, 25

Diagnosis. Body including legs and entire frons yellowish-brown to pale brown (Figs 1, 2), antenna with F1–3 dark brown, F4 and clava yellowish-white (Fig. 1), fore wing infumate with median one-third darker (Figs 1, 2); pronotal collar without a carina along anterior margin (Fig. 2); midlobe of mesoscutum with two pairs of long and strong setae (Fig. 2); mesoscutellum with sublateral grooves \pm straight in lateral part, joining in posterior part (Fig. 2).

Description (female holotype). Length 1.9mm. Frons and vertex with weak reticulation; Pronotal collar without a carina along anterior margin. Mesoscutum, mesoscutellum, dorsellum and propodeum with very weak reticulation, almost smooth; midlobe of mesoscutum with two pairs of long and strong setae; mesoscutellum with sublateral grooves joining in posterior part; propodeal callus with six setae. Fore wing with six setae on dorsal surface of submarginal vein; with 20 admarginal setae; costal cell with a row of ten setae on ventral surface, apico-dorsal margin with three setae. Gaster short ovate.

Colour. Head including antennal scrobes yellowish-brown, occiput around occipital foramen dark brown. Antennae with scape yellowish-brown, pedicel and F1–3 dark brown, F4 and clava yellowish-white. Mesoscutum, mesoscutellum, dorsellum and propodeum yellowish-brown, mesoscutum darkest. Legs with coxae and trochanters pale brown, remaining parts of legs yellowish-brown. Wings infumate, fore wing with median one-third infusate. Petiole and gaster yellowish-brown, Gt₂₋₃ dark brown, gonoplac pale brown.

Relative measurements. **Head:** length in dorsal view 22; length in frontal view 34; width 53; POL 10; OOL 7; mouth width 16; malar space 9.5; eye height 23; lateral ocellus maximum width 4; scape length 22; scape width 3.5; pedicel length 7; pedicel width in dorsal view 4; pedicel+flagellum length 52; F1 length 11; F2 length 8; F3 length 8; F4 length 6.5; antennal clava length 11; F1 width 4; F2 width 5; F3 width 6; F4 width 6.2; antennal clava width 6.2. **Mesosoma:** length 63; width 44; midlobe of mesoscutum length 22; mesoscutellum length 28; mesoscutellum width 22; dorsellum length 2; propodeum length 12; mid tarsus length 23.5; mid tarsus T4 length 5; hind tarsus length 23; hind tarsus T4 length 4.5; fore wing length 67; fore wing width 45; costal cell length 28; costal cell width 2; marginal vein length 33; postmarginal vein length 9; stigmal vein length 9.5. **Gaster:** length 60; width 47; Gt₁ length 33; Gt₇ length 4; Gt₇ width 14.

Variation in paratypes. Length 1.7–1.8mm. Antenna with pedicel yellowish-brown to dark brown. Fore wing submarginal vein with 4–5 setae on dorsal surface. Otherwise as in holotype.

Male. Unknown.

Distribution. Belize, Costa Rica.

Etymology. From the Latin *albus* = white, and *clava* = club, referring to the yellowish-white antennal clava.

Material. Holotype female: BELIZE, Las Cruces, iii.1996, T. King & D. Howe (NHMUK). Paratypes (2♀, MZLU, NHMUK): 1♀ COSTA RICA, Cartago, Turrialba, 650m, viii.1994, P. Hanson; 1♀ COSTA RICA, Limón, Reserva Biológica Hitoy Cerere, 9°40'N, 83°02'W, 100m, 24–25.ii.2004, J.S. Noyes..

Diglyphomorphomyia albicoxa sp. nov.

Figs 3, 4, 26

Diagnosis. Body (Figs 3, 4) yellowish-brown, except dark brown flagellum, antennal scrobes (Fig. 26), hind tibia, Gt₄₋₆ and gonoplac, and white coxae and trochanters, fore wing hyaline with median one-third infusate with part below stigmal vein and below base of marginal vein dark brown (Fig. 3); pronotal collar with a carina along anterior margin (Fig. 4); midlobe of mesoscutum with three pairs of long and strong setae (Fig. 4); mesoscutellum with sublateral grooves sinuate in lateral part, joining in posterior part (Fig. 4).

Description (female holotype). Length 1.8mm. Frons and vertex smooth, without reticulation; Pronotal collar with a carina along anterior margin. Mesoscutum with weak reticulation; midlobe with three pairs of long and strong setae. Mesoscutellum, axillae, dorsellum and propodeum smooth, without reticulation; mesoscutellum with sublateral grooves joining in posterior part; propodeal callus with seven setae. Fore wing with five setae on dorsal surface of submarginal vein; with ten admarginal setae; costal cell with a row of eight setae on ventral surface, apico-dorsal margin with two setae. Gaster short ovate.

Colour. Head yellowish-brown with antennal scrobes black. Antennae with scape and pedicel yellowish-brown, flagellum F1–3 dark brown dorsally and yellowish-brown ventrally, F4 and clava dark brown. Mesoscutum, mesoscutellum, dorsellum and propodeum yellowish-brown, propodeum darkest. Legs with coxae and trochanters white, remaining parts of legs yellowish-brown, except dark brown hind tibia. Fore wing hyaline with median one-third infuscate with part below stigmal vein and below base of marginal vein darker; hind wing hyaline. Petiole and gaster yellowish-brown, Gt_{4–6} and gonoplac dark brown.

Relative measurements. **Head:** length in dorsal view 21; length in frontal view 32; width 46; POL 9.5; OOL 6.5; mouth width 14; malar space 8.5; eye height 21; lateral ocellus maximum width 4; scape length 18.5; scape width 3; pedicel length 6; pedicel width in dorsal view 3.5; pedicel+flagellum length 43; F1 length 7; F2 length 6; F3 length 6; F4 length 5.5; antennal clava length 11; F1 width 3; F2 width 3.5; F3 width 4; F4 width 5; antennal clava width 5.5. **Mesosoma:** length 62; width 39; midlobe of mesoscutum length 25; mesoscutellum length 25; mesoscutellum width 20; dorsellum length 2; propodeum length 12; mid tarsus length 22; mid tarsus T4 length 6; hind tarsus length 23; hind tarsus T4 length 5; fore wing length 71; fore wing width 44; costal cell length 33; costal cell width 2; marginal vein length 27; postmarginal vein length 11; stigmal vein length 11. **Gaster:** length 63; width 42.5; Gt₁ length 32; Gt₇ length 4; Gt₇ width 10.

Variation in paratypes. Length 1.4–1.7mm. Fore wing submarginal vein with 5–7 setae on dorsal surface. Propodeal callus with 5–8 setae. Otherwise as in holotype.

Male. Unknown.

Distribution. Costa Rica.

Etymology. From the Latin *albus* = white, referring to the white coxae.

Material. Holotype female: COSTA RICA, Guanacaste, B.N. Diría, Retallano, alrededores de Torre de Control de Incendio, LN 238550_358650, 600–700m, 16.xii.2001–16.i.2002, Malaise trap, I. Jiménez (NHMUK). Paratypes (5♀, MZLU, MZUCR, NHMUK): 1♀ COSTA RICA, Alajuela, 5km W San Ramón on Route 1, 1200m, iv.1997, P. Hanson; 1♀ COSTA RICA, Alajuela, 5km W San Ramón, 1200m, vi.1997, O. Castro & P. Hanson; 1♀ COSTA RICA, Limón, Reserva Biológica Hitoy Cerere, Valle de Estrella, LS 398100_572800, vi–viii.1994, G. Carballo; 2♀ COSTA RICA, Puntarenas, Reserva Privada Karen Mogensen, 9°52'N, 85°03'W, 305m, 14–15.ii.2005, J.S. Noyes.

Diglyphomorphomyia carinifer sp. nov.

Figs 17, 18, 33

Diagnosis. Head, including antennal flagellum, and mesosoma dark brown to black (Fig. 18), legs with coxae, trochanters and femora dark brown, tibiae and tarsi yellowish-brown (Fig. 17), fore wing infuscate with part below stigmal vein dark brown (Figs 17, 18), Gt₁ yellowish-brown, Gt_{2–7} dark brown (Fig. 18); antenna with F2–4 (excluding apical stalk) about as long as wide with a short stalk in anterior part (Fig. 17); pronotal collar with a carina along anterior margin (Fig. 18); midlobe of mesoscutum with three pairs of long and strong setae (Fig. 18); mesoscutellum with sublateral grooves joining in posterior part (Fig. 18); propodeum smooth (Fig. 18).

Description (male holotype). Length 1.5mm. Frons and vertex with weak reticulation. Pronotal collar with a carina along anterior margin. Mesoscutum and mesoscutellum with weak reticulation; midlobe of mesoscutum with three pairs of long and strong setae; mesoscutellum with sublateral grooves joining in posterior part. Dorsellum and propodeum smooth; propodeal callus with six setae. Fore wing with six setae on dorsal surface of submarginal vein; with 12 admarginal setae; costal cell with a row of seven setae on ventral surface, apico-dorsal margin with three setae. Gaster short ovate.

Colour. Head dark brown to black. Antennae dark brown. Mesosoma dark brown to black. Legs with coxae, trochanters and femora dark brown, tibiae and tarsi yellowish-brown. Fore wing infuscate with part below stigmal vein dark brown. Petiole black. Gaster with Gt₁ yellowish-brown, Gt_{2–7} dark brown.

Relative measurements. **Head:** length in dorsal view 15; length in frontal view 26; width 35; POL 8.5; OOL 4; mouth width 12; malar space 8; eye height 16.5; scape length 14; scape width 3; pedicel+flagellum length 45; F1 length 8; F2 length 7; F3 length 7; F4 length 7; antennal clava length 11; F1 width 4; F2 width 5; F3 width 5.5; F4 width 6; antennal clava width 5.5. **Mesosoma:** length 50; width 30; midlobe of mesoscutum length 19; mesoscutellum length 20; mesoscutellum width 14.5; dorsellum length 2; propodeum length 10; mid tarsus length 21; mid

tarsus T4 length 4; hind tarsus length 21; hind tarsus T4 length 4.5; fore wing length 70; fore wing width 45; costal cell length 26; costal cell width 2; marginal vein length 29; postmarginal vein length 10; stigmal vein length 10. **Gaster:** length 47; width 27; Gt₁ length 24.

Variation in paratypes. Length 1.1–1.7mm. Scape pale brown to dark brown. Hind tibia and tarsus yellowish-brown to dark brown. Otherwise as in holotype.

Female. Unknown.

Remarks. The sharp carina along anterior margin of the pronotal collar is a distinctive feature for this species. Two other species, *D. albicoxa* and *D. cristata*, described from females (males unknown) also have this feature. Specimens of both these species are predominantly yellowish-brown, while specimens of *D. carinifer* are dark brown to black. While the colour of head and mesosoma might differ between the sexes of the same species (see *D. pilosa*) and are thus unreliable characters when associating conspecific females and males, the dark areas in the fore wing are similar in both sexes. *Diglyphomorphomyia albicoxa* and *D. cristata* both have two distinct dark brown areas in the fore wing, one below marginal vein and one below stigmal vein (Figs 3, 7), while *D. carinifer* has only part below stigmal vein dark (Fig. 17). Thus *D. carinifer* is not conspecific with either *D. albicoxa* or *D. cristata*.

Distribution. Costa Rica, Honduras.

Etymology. From the Latin *carina* = keel, and the suffix *-fer* = carry, referring to the pronotal carina.

Material. Holotype male: COSTA RICA, Puntarenas, Estación Altamira, Sendero a Casa Coca, 9°02'N, 83°00'W, 1450–1700m, 7.ii–5.iii.2002, C. Hansson & Parataxonomos (MZLU). Paratypes (53♂, CNC, MZLU, MZUCR, NHMUK): 48♂ COSTA RICA, Puntarenas, Estación Altamira, Sendero a Casa Coca, Sendero Los Gigantes & Estación, 9°02'N, 83°00'W, 1450–1700m, 7.ii–5.iii.2002, C. Hansson & Parataxonomos; 1♂ COSTA RICA, Alajuela, Parque Nacional Arenal, 10°28'N, 84°45'W, 617m, 21–28.ii.2005, C. Hansson; 1♂ COSTA RICA, Cartago, Parque Nacional Tapantí, 9°45'N, 83°47'W, 1200–1550m, 20.iii–10.iv.2000, swept, C. Hansson & D. Rubí; 1♂ COSTA RICA, San José, San Pedro, University of Costa Rica Campus, 1200m, 28.ii.1997, C. Hansson; 2♂ HONDURAS, Cortés, Parque Nacional San Cusuco, 5km N Buenos Aires, 15°29'N, 83°13'W, 8.iii.1997, C. Hansson.

Diglyphomorphomyia costulata sp. nov.

Figs 5, 6, 23, 24, 32, 35

Diagnosis. Head, including antennal flagellum, and mesosoma dark brown to black (Figs 5, 6), legs with coxae dark brown, fore leg with trochanter and femur dark brown, mid leg with trochanter and femur brown, hind leg with trochanter white and femur with basal one-half white and apical one-half yellowish-brown, tibiae and tarsi on all legs yellowish-brown (Fig. 5), fore wing infumate (Fig. 5), Gt_{1–2} yellowish-white, Gt_{3–7} dark brown (Fig. 6); pronotal collar without a carina along anterior margin (Fig. 6); midlobe of mesoscutum with three pairs of long and strong setae (Fig. 6); mesoscutellum with sublateral grooves slightly sinuate in lateral part, not joining in posterior part (Fig. 6); propodeum with costula, i.e. with a transverse carina between plica and median carina, one on each side of median carina (Fig. 6); male antennae with long setae on flagellomeres, setae about as long as flagellomere attached to (Fig. 35).

Description (female holotype). Length 1.7mm. Frons and vertex with weak reticulation. Pronotal collar without a carina along anterior margin. Mesoscutum, mesoscutellum, dorsellum and propodeum with weak reticulation; midlobe of mesoscutum with three pairs of long and strong setae; mesoscutellum with sublateral grooves not joining in posterior part; propodeum with costula; propodeal callus with seven setae. Fore wing with three setae on dorsal surface of submarginal vein; with 16 admarginal setae; costal cell with a row of 20 setae on ventral surface, apico-dorsal margin with five setae. Gaster short ovate.

Colour. Head black. Antennae with scape yellowish-brown, pedicel pale brown, flagellum dark brown. Mesosoma dark brown. Legs with coxae dark brown, fore leg with trochanter and femur dark brown, mid leg with trochanter and femur brown, hind leg with trochanter white and femur with basal one-half white and apical one-half yellowish-brown, tibiae and tarsi on all legs yellowish-brown. Wings infumate. Petiole dark brown. Gaster with Gt_{1–2} yellowish-white, Gt_{3–7} and gonoplac dark brown.

Relative measurements. **Head:** length in dorsal view 20; length in frontal view 32; width 43; POL 9; OOL 5; mouth width 13; malar space 6.5; eye height 23; lateral ocellus maximum width 3.2; scape length 18.5; scape width

4; pedicel length 6; pedicel width in dorsal view 3.5; pedicel+flagellum length 41; F1 length 6; F2 length 5.5; F3 length 5.5; F4 length 5.5; antennal clava length 12; F1 width 3; F2 width 4; F3 width 4.5; F4 width 5; antennal clava width 6. **Mesosoma**: length 53; width 38; midlobe of mesoscutum length 18; mesoscutellum length 22; mesoscutellum width 17.5; dorsellum length 2.5; propodeum length 13; mid tarsus length 22; mid tarsus T4 length 6; hind tarsus length 21; hind tarsus T4 length 4.5; fore wing length 72; fore wing width 44; costal cell length 29; costal cell width 3; marginal vein length 28; postmarginal vein length 13.5; stigmal vein length 9.5. **Gaster**: length 62; width 43; Gt₁ length 26; Gt₇ length 2.5; Gt₇ width 11.

Variation in paratypes. Length 1.5–1.8mm. One paratype with F4 and antennal clava yellowish-white. Fore wing submarginal vein with 3–4 setae on dorsal surface. Propodeal callus with 7–8 setae. Otherwise as in holotype.

Male. Length 1.1–1.7mm. Antennal flagellomeres with long setae (Fig. 35), e.g. setae on funiculars as long as funicular they are attached to. Mid leg with dark brown trochanter and femur, hind leg with basal one-third white and apical two-thirds pale brown and tibia pale brown. Otherwise as in female.

Relative measurements. **Head**: length in dorsal view 17; length in frontal view 30; width 39; POL 9; OOL 5; mouth width 13; malar space 8.5; eye height 19.5; scape length 18; scape width 4; pedicel+flagellum length 52; F1 length 7.5; F2 length 7; F3 length 7; F4 length 7; antennal clava length 13; F1 width 4; F2 width 4; F3 width 5; F4 width 5; antennal clava width 4.5. **Mesosoma**: length 55; width 38; midlobe of mesoscutum length 19; mesoscutellum length 22; mesoscutellum width 19; dorsellum length 4; propodeum length 13. **Gaster**: length 59; width 37; Gt₁ length 28.

Distribution. Costa Rica.

Etymology. Named for the costulae on propodeum.

Material. Holotype female: COSTA RICA, San José, San Antonio de Escazú, 9°54'N, 84°09'W, 1300m, viii–ix.1997, P. Hanson (NHMUK). Paratypes (2♀ 5♂, MZLU, NHMUK): 1♀ COSTA RICA, Heredia, Santo Domingo, Santa Rosa, INBio Parque, Bosque Humedo, LN 217300_526200, 27.vi–6.viii.2001, malaise trap, R. Zuñiga; 1♀ COSTA RICA, Limón, Reserva Biológica Hitoy Cerere, Estación, LN 184250_640500, 640m, 15.vi.1999, swept, F. Umaña; 2♂ COSTA RICA, Puntarenas, Estación Altamira, Sendero a Casa Coca, 9°02'N, 83°00'W, 1450–1700m, 7.ii–5.iii.2002, C. Hansson & Parataxonomos; 1♂ COSTA RICA, Puntarenas, Monteverde, LN 250850_449250, 1000–1350m, 3–31.i.1993, Z. Fuentes; 2♂ from same locality as previous but collected xi.1993.

Diglyphomorphomyia cristata sp. nov.

Figs 7, 8, 27

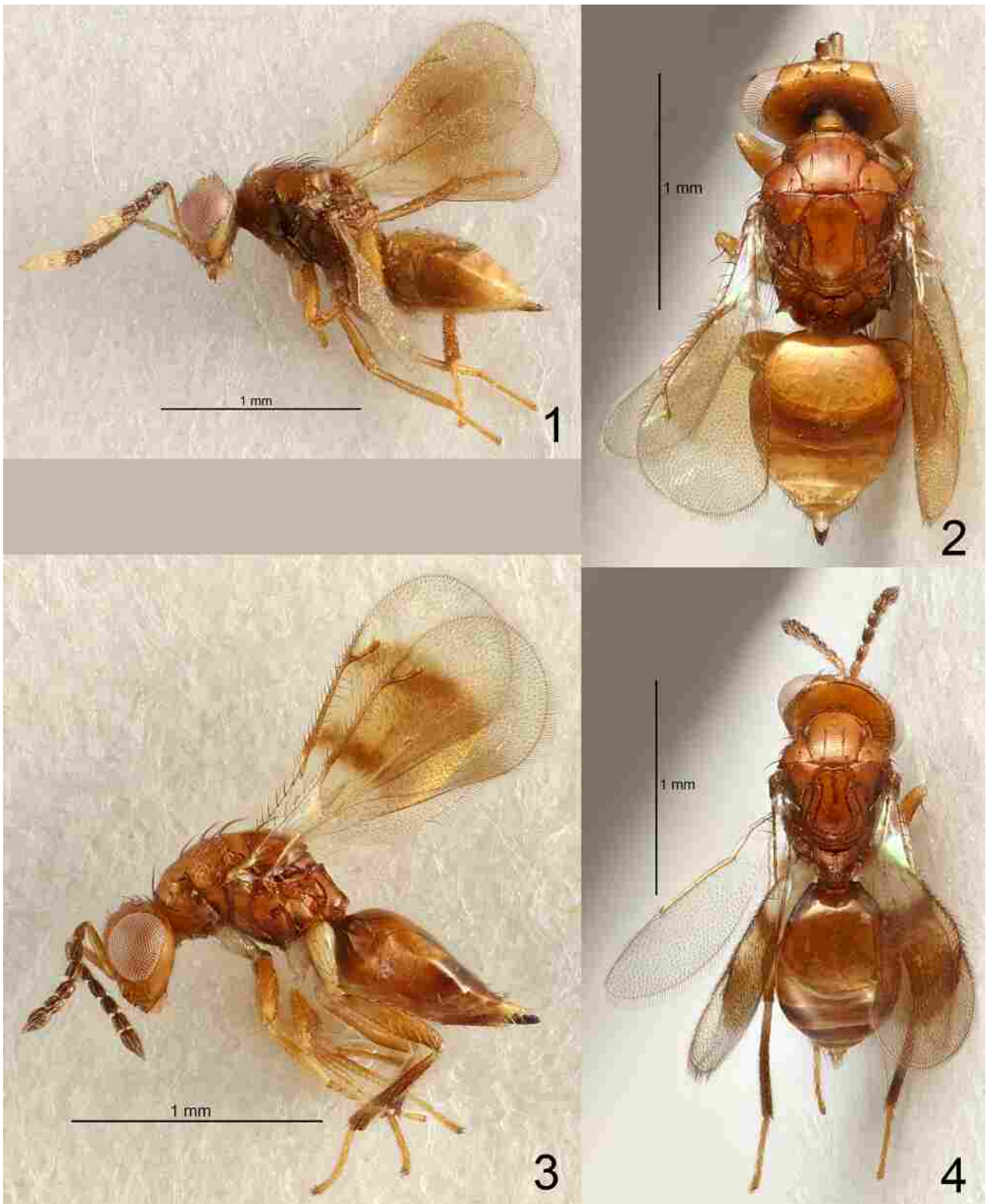
Diagnosis. Body (Figs 7, 8) yellowish-brown, except dark brown flagellum and black antennal scrobes (Fig. 27), hind tibia and gonoplac, fore wing hyaline with median one-third infuscate with part below stigmal vein and below base of marginal vein dark brown (Fig. 7); pronotal collar with a carina along anterior margin (Fig. 8); midlobe of mesoscutum with three pairs of long and strong setae (Fig. 8); mesoscutellum with sublateral grooves sinuate in lateral part, joining in posterior part (Fig. 8).

Description (female holotype). Length 2.1mm. Frons and vertex with weak reticulation. Pronotal collar with a carina along anterior margin. Mesoscutum with weak reticulation; midlobe with three pairs of long and strong setae. Mesoscutellum, axillae and dorsellum with weak reticulation; mesoscutellum with sublateral grooves joining in posterior part. Propodeum between plicae smooth, without reticulation; callus with eight setae. Fore wing with eight setae on dorsal surface of submarginal vein; with 13 admarginal setae; costal cell with a row of 15 setae on ventral surface, apico-dorsal margin with four setae. Gaster short ovate.

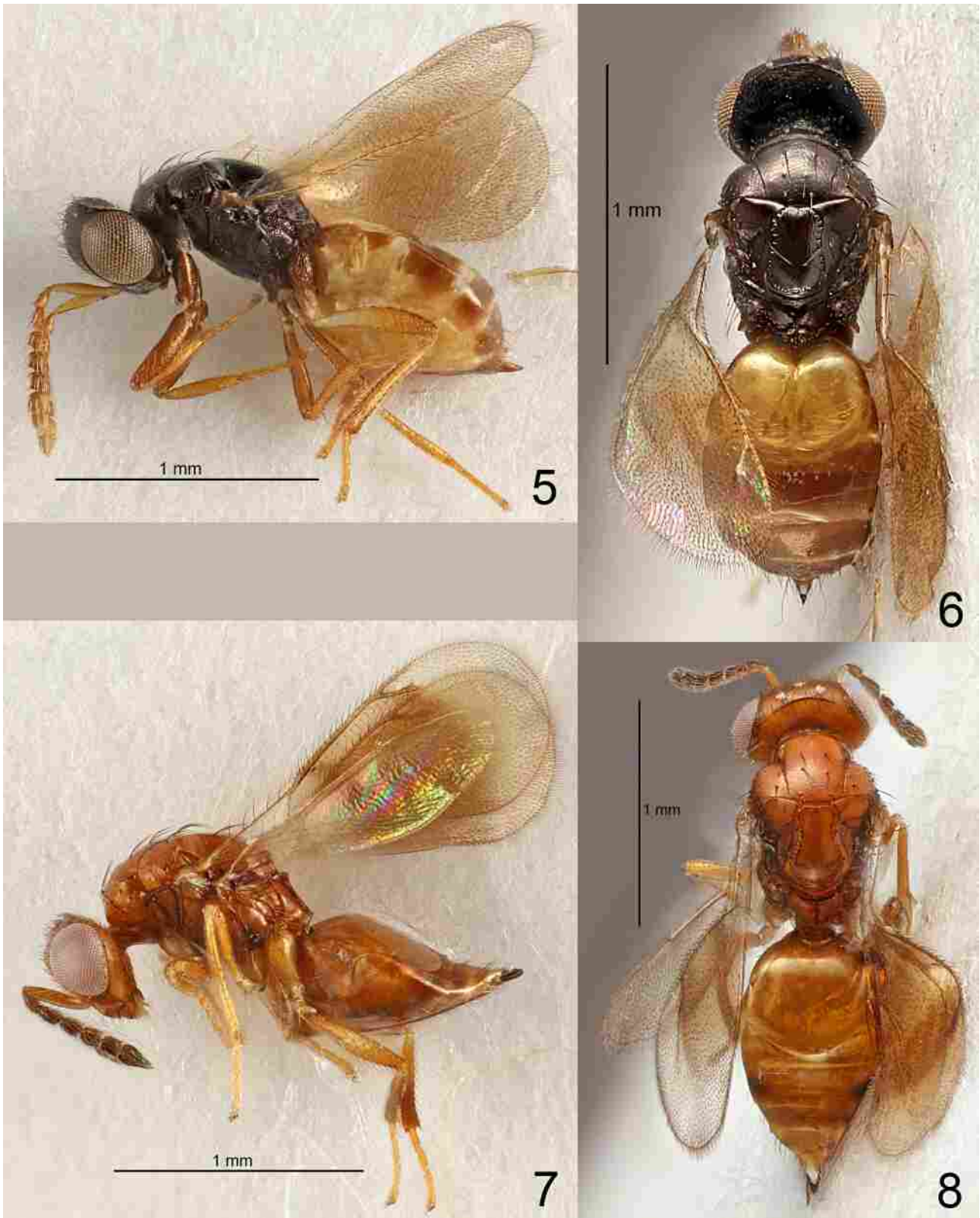
Colour. Head yellowish-brown with antennal scrobes black. Antennae with scape yellowish-brown, pedicel and flagellum dark brown. Mesoscutum, mesoscutellum, dorsellum and propodeum yellowish-brown. Legs yellowish-brown, mid coxa yellowish-white and hind tibia dark brown. Fore wing with median one-third infuscate with part below stigmal vein and below base of marginal vein darker; hind wing hyaline. Petiole and gaster yellowish-brown, gonoplac dark brown.

Relative measurements. **Head**: length in dorsal view 22; length in frontal view 33; width 47; POL 10; OOL 6; mouth width 15; malar space 8.5; eye height 22; lateral ocellus maximum width 4.5; scape length 20; scape width 3.5; pedicel length 7.5; pedicel width in dorsal view 3.5; pedicel+flagellum length 48; F1 length 7.5; F2 length 7; F3 length 7; F4 length 6; antennal clava length 12; F1 width 4; F2 width 4.5; F3 width 5; F4 width 5.5; antennal clava

width 6. **Mesosoma**: length 67; width 41; midlobe of mesoscutum length 28; mesoscutellum length 27.5; mesoscutellum width 21; dorsellum length 3; propodeum length 13.5; mid tarsus length 25; mid tarsus T4 length 5.5; hind tarsus length 27; hind tarsus T4 length 6.5; fore wing length 87; fore wing width 56; costal cell length 36; costal cell width 3; marginal vein length 35; postmarginal vein length 13; stigmal vein length 12. **Gaster**: length 76; width 45; Gt₁ length 39; Gt₂ length 5; Gt₃ width 14.



FIGURES 1–4. *Diglyphomorphomyia* spp. nov., females; 1–2. *D. albiclava*; 1 body in lateral view, paratype; 2 body in dorsal view, holotype; 3–4. *D. albicoxa*; 3 body in lateral view, paratype; 4 body in dorsal view, holotype.



FIGURES 5–8. *Diglyphomorphomyia* spp. nov., females; **5–6.** *D. costulata*; **5** body in lateral view, holotype; **6** body in dorsal view, holotype; **7–8.** *D. cristata*; **7** body in lateral view, paratype; **8** body in dorsal view, holotype.

Variation in paratype. Length 1.8mm. Fore wing submarginal vein with six setae on dorsal surface. Propodeal callus with nine setae. Otherwise as in holotype.

Male. Unknown.

Distribution. Costa Rica.

Etymology. From the Latin *cristata* = ridged, referring to the ridge (carina) along anterior margin of pronotal collar.

Material. Holotype female: COSTA RICA, Puntarenas, Estación Altamira, Sendero a Casa Coca, 9°02'N, 83°00'W, 1450–1700m, 7.ii–5.iii.2002, C. Hansson & Parataxonomos (MZLU). Paratype 1♀ COSTA RICA, Puntarenas, Estación Altamira, Estación, 9°02'N, 83°00'W, 1450–1700m, 7.ii–5.iii.2002, C. Hansson & Parataxonomos (NHMUK).

***Diglyphomorphomyia metallica* sp. nov.**

Figs 9, 10, 28

Diagnosis. Head black with metallic blue tinges (Figs 9, 28), antennal flagellum pale brown (Fig. 10); mesoscutum with midlobe, and anterior half of axillae yellowish-brown, sidelobes, posterior half of axillae, mesoscutellum, dorsellum and propodeum pale brown (Fig. 9), legs white, fore wing hyaline (Fig. 10); pronotal collar without a carina along anterior margin (Fig. 9); midlobe of mesoscutum with three pairs of long and strong setae (Fig. 9); mesoscutellum with sublateral grooves slightly sinuate in lateral part, joining in posterior part (Fig. 9).

Description (female holotype). Length 1.5mm. Frons and vertex with weak reticulation. Pronotal collar without a carina along anterior margin. Mesoscutum, mesoscutellum, dorsellum and propodeum with weak reticulation; midlobe of mesoscutum with three pairs of long and strong setae; mesoscutellum with sublateral grooves joining in posterior part; propodeal callus with six setae. Fore wing with four setae on dorsal surface of submarginal vein; with eleven admarginal setae; costal cell with a row of six setae on ventral surface, apico-dorsal margin with four setae. Gaster short ovate.

Colour. Head black with metallic blue tinges. Antennae with scape white, pedicel and flagellum pale brown. Mesoscutum with midlobe, and anterior half of axillae yellowish-brown, sidelobes, posterior half of axillae, mesoscutellum, dorsellum and propodeum pale brown. Legs white. Wings hyaline. Petiole pale brown. Gaster with Gt₁₋₂ white, Gt₃₋₇ and gonoplac dark brown.

Relative measurements. **Head:** length in dorsal view 18.5; length in frontal view 27.5; width 38; POL 7.5; OOL 4; mouth width 11.5; malar space 5.5; eye height 21; lateral ocellus maximum width 3; scape length 14.5; scape width 3; pedicel length 5.5; pedicel width in dorsal view 3; pedicel+flagellum length 37; F1 length 5; F2 length 5; F3 length 5.5; F4 length 5; antennal clava length 10; F1 width 3.5; F2 width 3.5; F3 width 3.5; F4 width 3.5; antennal clava width 4. **Mesosoma:** length 46; width 29; midlobe of mesoscutum length 16; mesoscutellum length 17; mesoscutellum width 16; dorsellum length 2; propodeum length 8; mid tarsus length 19; mid tarsus T4 length 4.5; hind tarsus length 20; hind tarsus T4 length 5; fore wing length 60; fore wing width 37; costal cell length 21; costal cell width 2; marginal vein length 26; postmarginal vein length 9.5; stigmal vein length 9.5. **Gaster:** length 53; width 34; Gt₁ length 20; Gt₇ length 3; Gt₇ width 12.

Male. Unknown.

Distribution. Peru.

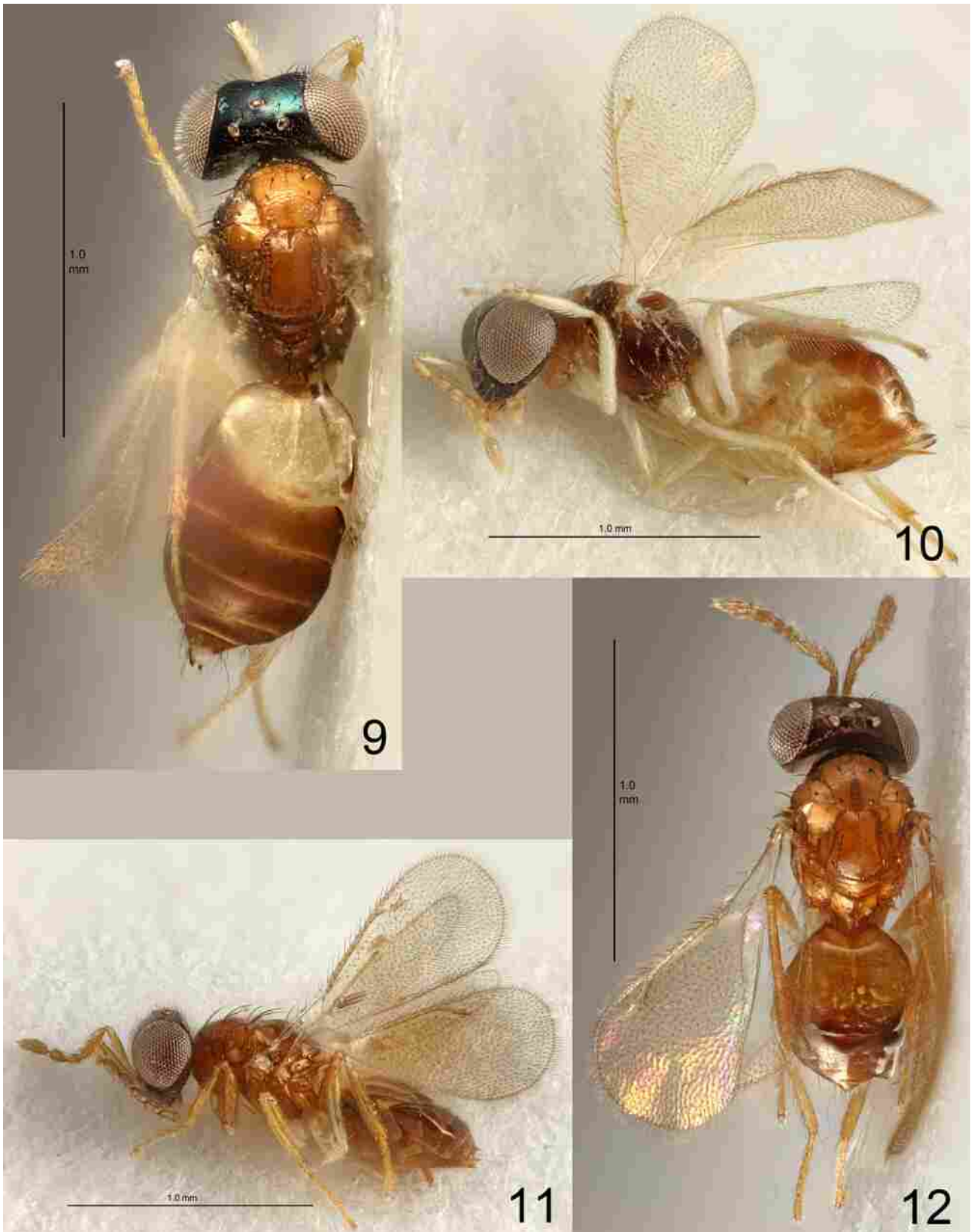
Etymology. Referring to colour of the head.

Material. Holotype female: PERU, Madre de Dios, Tambopata Reserve, 30km SW Puerto Maldonado, 290m, 3–16.x.1983, N.E. Stork (NHMUK).

***Diglyphomorphomyia parva* sp. nov.**

Figs 11, 12, 29

Diagnosis. Head dark brown to black, antennal flagellum yellowish-brown (Figs 11, 12); mesoscutum, axillae, dorsellum and propodeum yellowish-brown (Fig. 12), mesoscutellum yellowish-brown to dark brown; legs with coxae and trochanters whitish, remaining parts of legs yellowish-brown (Fig. 11), fore wing hyaline (Fig. 11); pronotal collar without a carina along anterior margin (Fig. 12); midlobe of mesoscutum with three pairs of setae, middle pair short and weak (Fig. 12); mesoscutellum with sublateral grooves slightly sinuate in lateral part, joining in posterior part (Fig. 12).



FIGURES 9–12. *Diglyphomorphomyia* spp. nov., females; 9–10. *D. metallica*; 9 body in dorsal view, holotype; 10 body in lateral view, holotype; 11–12. *D. parva*; 11 body in lateral view, paratype; 12 body in dorsal view, paratype.

Description (female holotype). Length 1.2mm. Frons and vertex with very weak reticulation. Pronotal collar without a carina along anterior margin. Mesoscutum and mesoscutellum with weak reticulation; midlobe of mesoscutum with three pairs of setae, middle pair short and weak; mesoscutellum with sublateral grooves joining in posterior part. Dorsellum and propodeum smooth, without reticulation; propodeal callus with five setae. Fore wing with four setae on dorsal surface of submarginal vein; with nine admarginal setae; costal cell with a row of eight setae on ventral surface, apico-dorsal margin with four setae. Gaster short ovate.

Colour. Head dark brown to black. Antennae yellowish-brown. Mesoscutum, axillae, dorsellum and propodeum dark yellowish-brown, mesoscutellum dark brown. Legs with coxae and trochanters whitish, remaining parts of legs yellowish-brown. Wings hyaline. Petiole yellowish-brown. Gaster with Gt₁ yellowish-brown with darker sides, Gt₂₋₇ and gonoplac dark brown.

Relative measurements. **Head:** length in dorsal view 15; length in frontal view 24; width 31; POL 7; OOL 3.5; mouth width 10; malar space 6.5; eye height 16; lateral ocellus maximum width 2.5; scape length 14; scape width 3; pedicel length 5.5; pedicel width in dorsal view 2.5; pedicel+flagellum length 35; F1 length 4.5; F2 length 4.5; F3 length 5; F4 length 5; antennal clava length 9; F1 width 2.6; F2 width 3; F3 width 3; F4 width 3; antennal clava width 4. **Mesosoma:** length 38; width 35; midlobe of mesoscutum length 13; mesoscutellum length 14; mesoscutellum width 13; dorsellum length 2; propodeum length 7; mid tarsus length 18; mid tarsus T4 length 3.5; hind tarsus length 18; hind tarsus T4 length 3.5; fore wing length 53; fore wing width 30; costal cell length 19; costal cell width 1.2; marginal vein length 19; postmarginal vein length 10; stigmal vein length 7. **Gaster:** length 42; width 30; Gt₁ length 18; Gt₇ length 2; Gt₇ width 8.

Variation in paratypes. Length 0.9–1.4mm. Mesoscutellum yellowish-brown to dark brown. Propodeal callus with 5–7 setae. Costal cell with 2–4 setae on apico-dorsal margin. Otherwise as in holotype.

Male. Unknown.

Distribution. Costa Rica.

Etymology. From the Latin *parva* = small, referring to the small size of specimens of this species.

Material. Holotype female: COSTA RICA, Guanacaste, Parque Nacional Santa Rosa, 2–24.iv.1987, D.H. Janzen & I.D. Gauld (NHMUK). Paratypes (25♀, CNC, MZLU, MZUCR, NHMUK): following from same locality as holotype but collected 26.x–16.xi.1985 (4♀), 7–28.xii.1985 (1♀), 18.i–8.ii.1986 (1♀), 24.v–14.vi.1986 (1♀), 5–26.vii.1986 (1♀), 14.viii–6.ix.1986 (1♀), 6–27.ix.1986 (1♀), 27.ix–18.x.1986 (2♀), 18.x–8.xi.1986 (2♀), 21.ii–14.iii.1987 (3♀), 14.iii–4.iv.1987 (1♀), 24.iv.1987 (1♀), 25.iv–16.v.1987 (3♀); 1♀ COSTA RICA, Heredia, Estación Biológica La Selva, 75 m, 10°26'N, 84°01'W, 14.ix.1995; 1♀ from same locality as previous but collected ii.1996; 1♀ COSTA RICA, Limón, Reserva Biológica Hitoy Cerere, Estación, LN 184250_641800, 300m, 17.vi–17.vii.1999, F. Umaña.

***Diglyphomorphomyia pedunculata* sp. nov.**

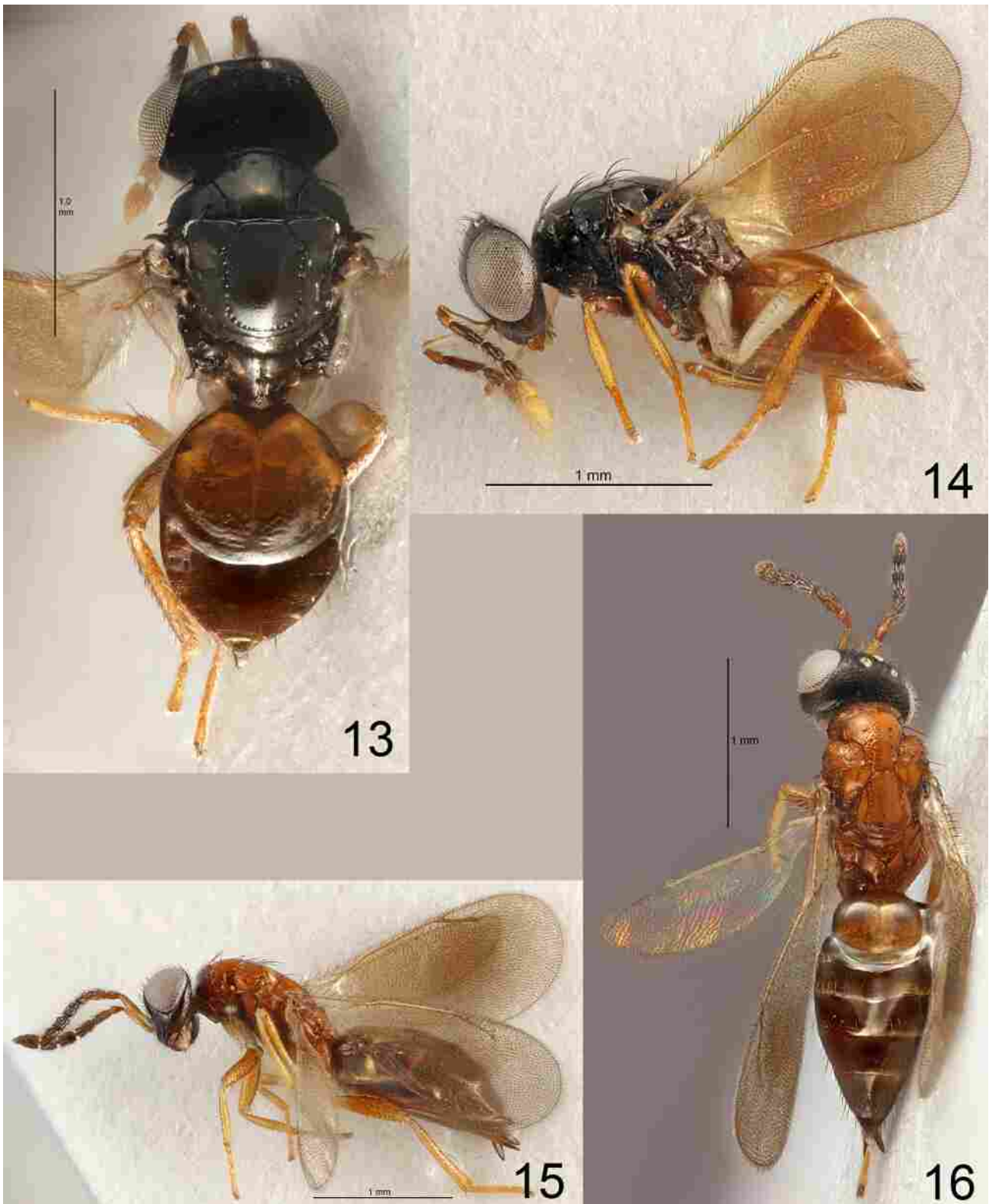
Figs 13, 14, 19, 20, 30, 34, 37, 38

Diagnosis. Female with yellowish-white antennal clava (Fig. 14); hind leg with coxa, trochanter and major part of femur white (Fig. 14), fore wing infumate with median one-third darker brown (Fig. 14); male with strongly pedunculate funiculars (Fig. 20); both sexes with head and mesosoma dark brown to black (Figs 13, 19), pronotal collar without a carina along anterior margin (Figs 13, 19), with two pairs of long and strong setae on midlobe of mesoscutum (Figs 13, 19), and with sublateral grooves on mesoscutellum ±straight in lateral part, joining in posterior part (Figs 13, 19).

Description (female holotype). Length 1.7mm. Frons and vertex with weak reticulation; Pronotal collar without a carina along anterior margin. Mesoscutum with weak reticulation; midlobe with two pairs of long and strong setae. Mesoscutellum and axillae smooth and shiny; mesoscutellum with sublateral grooves joining in posterior part. Dorsellum and propodeum with weak reticulation; propodeal callus with eight setae. Fore wing with five setae on dorsal surface of submarginal vein; with 20 admarginal setae; costal cell with a row of eleven setae on ventral surface, apico-dorsal margin with three setae. Gaster semicircular.

Colour. Head black. Antennae with scape whitish with dorsal edge yellowish-brown, pedicel and F1 pale brown, F2–3 dark brown, F4 pale yellowish-brown with base slightly darkened, clava yellowish-white. Mesoscutum, mesoscutellum and dorsellum black; propodeum dark brown. Fore and mid legs with coxae, trochanters and femora dark

brown, tibiae and tarsi yellowish-brown; hind leg with coxa, trochanter and basal two-thirds of femur white, apical one-third of femur, tibia and tarsus yellowish-brown. Wings infumate, fore wing with median one-third darker brown. Petiole dark brown. Gaster yellowish-brown with posterior margin of Gt₁ dark brown.



FIGURES 13–16. *Diglyphomorphomyia* spp. nov., females; **13–14.** *D. pedunculata*; **13** body in dorsal view, paratype; **14** body in lateral view, paratype; **15–16.** *D. pilosa*; **15** body in lateral view, holotype; **16** body in dorsal view, holotype.

Relative measurements. **Head:** length in dorsal view 22; length in frontal view 42; width 53; POL 11; OOL 6.5; mouth width 14; malar space 10; eye height 28.5; lateral ocellus maximum width 4; scape length 24.5; scape width 4.2; pedicel length 7; pedicel width in dorsal view 4; pedicel+flagellum length 60; F1 length 13; F2 length 9; F3 length 8; F4 length 8; antennal clava length 14; F1 width 3.5; F2 width 5; F3 width 5.5; F4 width 6; antennal clava width 6. **Mesosoma:** length 69; width 47; midlobe of mesoscutum length 23; mesoscutellum length 28; mesoscutellum width 23.5; dorsellum length 4; propodeum length 16; mid tarsus length 26; mid tarsus T4 length 4.5; hind tarsus length 26; hind tarsus T4 length 5.5; fore wing length 85; fore wing width 51; costal cell length 29; costal cell width 2; marginal vein length 40; postmarginal vein length 13.5; stigmal vein length 10. **Gaster:** length 64; width 51; Gt₁ length 32; Gt₇ length 4; Gt₇ width 12.

Variation in paratypes. Length 1.7–2.3mm. Antenna with F4 yellowish-white to dark brown. Fore wing submarginal vein with 4–5 setae on dorsal surface. Propodeal callus with 8–9 setae. Otherwise as in holotype.

Male. Length 1.1–1.9mm. Antennal flagellum dark brown, funiculars with apical part strongly pedunculate. Mesoscutellum with weak reticulation. Hind leg with coxa dark brown and femur with basal half white and apical half dark brown. Otherwise as in female.

Relative measurements. **Head:** length in dorsal view 16; length in frontal view 29; width 36; POL 7.5; OOL 4.5; mouth width 10.5; malar space 8; eye height 20; scape length 16; scape width 3.5; pedicel+flagellum length 75; F1 length 14; F2 length 13; F3 length 13; F4 length 11.5; antennal clava length 18; F1 width 4.5; F2 width 4.5; F3 width 5; F4 width 5; antennal clava width 5. **Mesosoma:** length 49; width 30; midlobe of mesoscutum length 15; mesoscutellum length 20; mesoscutellum width 15; dorsellum length 3; propodeum length 11. **Gaster:** length 37; width 29; Gt₁ length 23.

Distribution. Belize, Costa Rica.

Etymology. From the Latin *pedunculata* = with slender stalk, referring to pedunculate funiculars in male antennae.

Material. Holotype female: COSTA RICA, Puntarenas, San Vito, Las Cruces, Wilson Botanico, 8°47'N, 82°58'W, 1000–1300m, 19–29.ii.2008, C. Hansson (MZLU). Paratypes (46♀ 97♂, CNC, MZLU, MZUCR, NHMUK): 6♀ 6♂ with same label data as holotype; following from same locality as holotype but collected v.1988 (1♂), 7–19.ii.2007 (1♀ 5♂), 15–16.ii.2006 (1♀); 27♀ 39♂ COSTA RICA, Puntarenas, Estación Altamira, 9°02'N, 83°00'W, 1450–1700m, 7.ii–5.iii.2002, C. Hansson & Parataxonomos; 1♂ from same locality as previous but collected 20.i–28.ii.1995; 1♂ COSTA RICA, Puntarenas, D.C.L.D.C., Buenos Aires, LS 338200_570350, 1840m, 24.iv–6.vi.1999, R. Villalobos; 1♀ COSTA RICA, Alajuela, 7km N Boca Tapada, Laguna Lagerta Lodge, 10°41'N, 84°11'W, 55m, 18–19.ii.2019, J.S. Noyes; 2♂ COSTA RICA, Cartago, Humo, El Copal, 9°47'N, 83°45'W, 1050–1250m, 29.ii–6.iii.2008, C. Hansson; 1♂ COSTA RICA, Cartago, Dulce Nombre, Vivero Linda Vista, 1300m, viii–x.1993, P. Hanson; 3♀ COSTA RICA, Heredia, 11km SE La Virgen, 10°20'N, 84°04'W, 450–550m, 13.ii–20.iv.2003; 2♂ COSTA RICA, Heredia, Estación Biológica La Selva, 50m, 10°26'N, 84°01'W, ii.1991, J.S. Noyes; 1♂ from same locality as previous but collected xi.1995; 4♀ 1♂ COSTA RICA, San José, San Antonio de Escazú, 9°54'N, 84°09'W, 1300m, vi–ix.1997, P. Hanson; 1♂ from same locality as previous but collected ix.1998; 2♂ COSTA RICA, Limón, Reserva Biológica Hitoy Cerere, 9°40'N, 83°02'W, 100m, 14–18.i.1991, J.S. Noyes; following from same locality as previous but collected 24–25.ii.2004 (2♀ 7♂), 20–21.ii.2006 (2♀ 13♂), 24–26.ii.2008 (1♀ 9♂), 22–23.ii.2010 (2♂); 1♂ BELIZE, Las Cuevas, vi.1995, T. King & D. Howe.

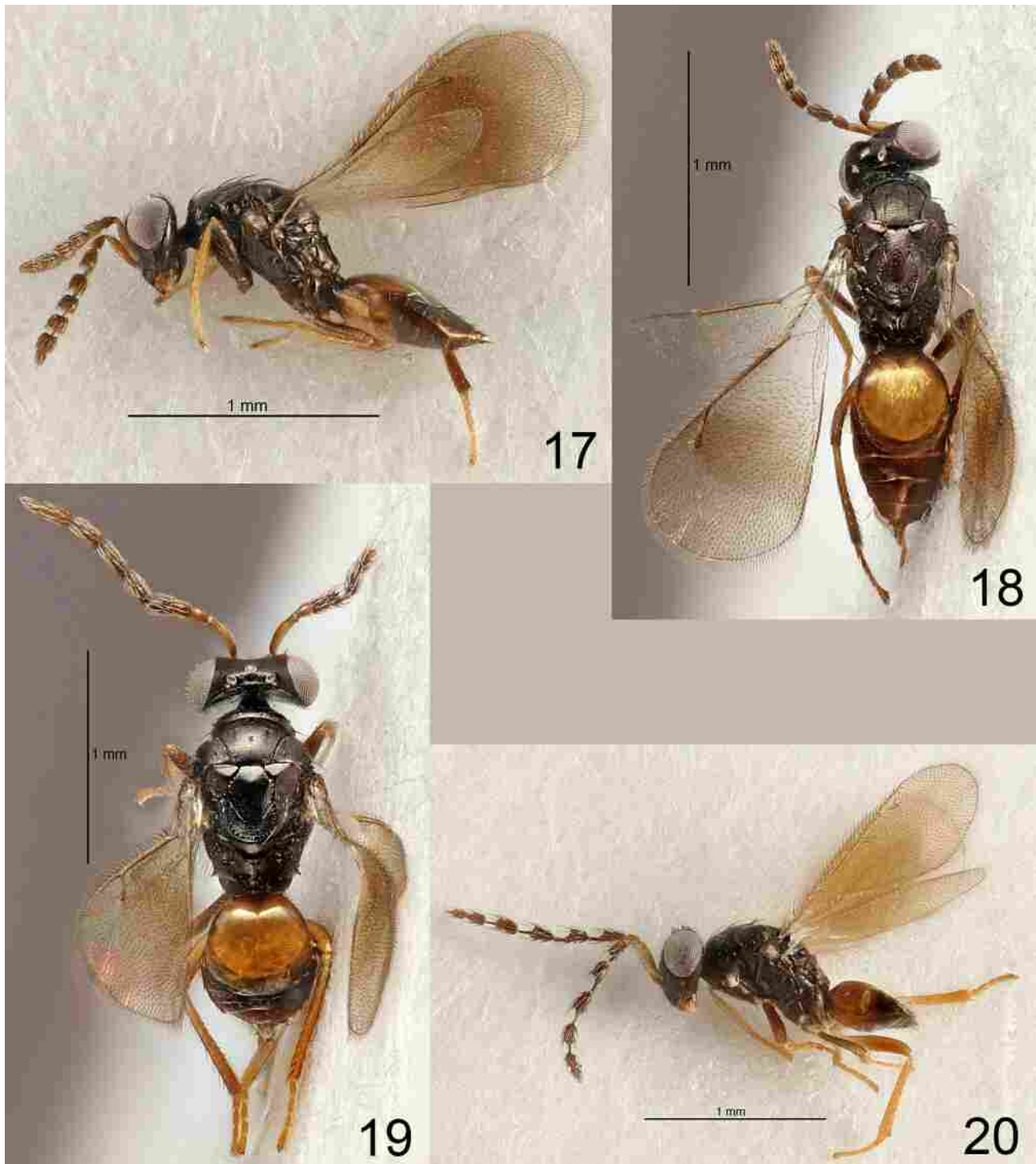
Diglyphomorphomyia pilosa sp. nov.

Figs 15, 16, 21, 22, 31, 36

Diagnosis. Female with head and antennal flagellum dark brown to black, mesosoma yellowish-brown, gaster brown (Figs 15, 16), male with head and mesosoma dark brown to black (Figs 21, 22); fore wing infumate with part below stigmal vein slightly darker (Fig. 15); pronotal collar without a carina along anterior margin (Fig. 16); midlobe of mesoscutum with four pairs of setae (Fig. 16); mesoscutellum with sublateral grooves slightly sinuate in lateral part, not joining in posterior part (Figs 16, 22); fore wing with 25+ scattered setae on ventral surface of costal cell, and with 15 setae along apico-dorsal margin (Fig. 15).

Description (female holotype). Length 2.9mm. Frons and vertex with weak reticulation, antennal scrobes smooth. Pronotal collar without a carina along anterior margin. Mesoscutum with weak reticulation; midlobe with

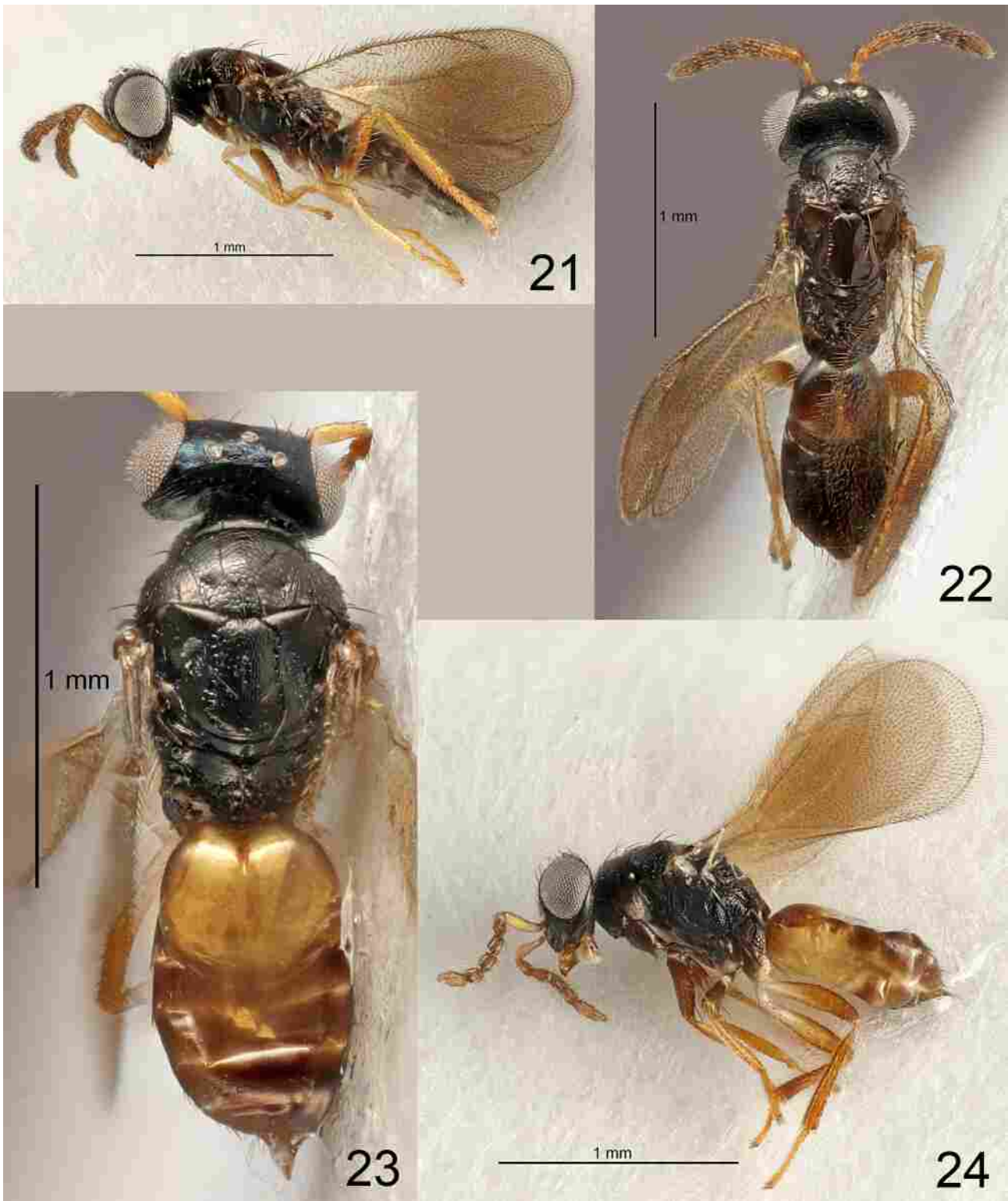
four pairs of setae, three pairs are long and strong and one pair is short and weak. Mesoscutellum, axillae, dorsellum and propodeum smooth, without reticulation; mesoscutellum with sublateral grooves not joining in posterior part; propodeal callus with nine setae. Fore wing with nine setae on dorsal surface of submarginal vein; with 17 admarginal setae; costal cell with 25+ scattered setae on ventral surface, apico-dorsal margin with 15 setae. Gaster elongate.



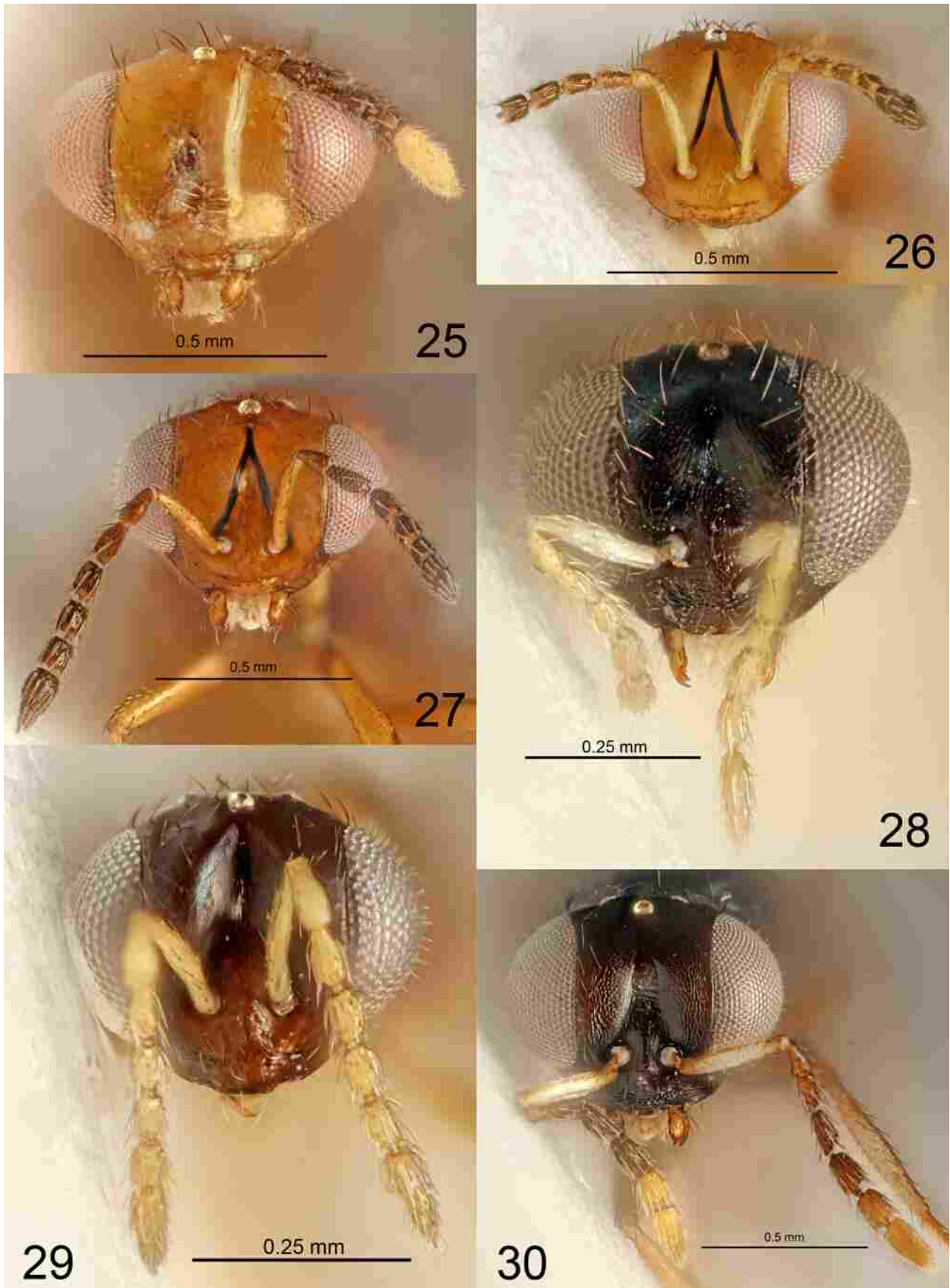
FIGURES 17–20. *Diglyphomorphyia* spp. nov., males; 17–18. *D. carinifer*; 17 body in lateral view, holotype; 18 body in dorsal view, paratype; 19–20. *D. pedunculata*; 19 body in dorsal view, paratype; 20 body in lateral view, paratype.

Colour. Head dark brown to black. Antennae with scape yellowish-brown, pedicel pale brown, and flagellum dark brown. Mesoscutum, mesoscutellum, dorsellum and propodeum yellowish-brown. Fore leg with coxa and trochanter white, femur pale brown, tibia and tarsus yellowish-brown; mid and hind legs yellowish-brown. Wings

infumate, fore wing with part below stigmal vein slightly darker. Petiole yellowish-brown. Gaster with Gt_1 pale brown, remaining tergites dark brown.

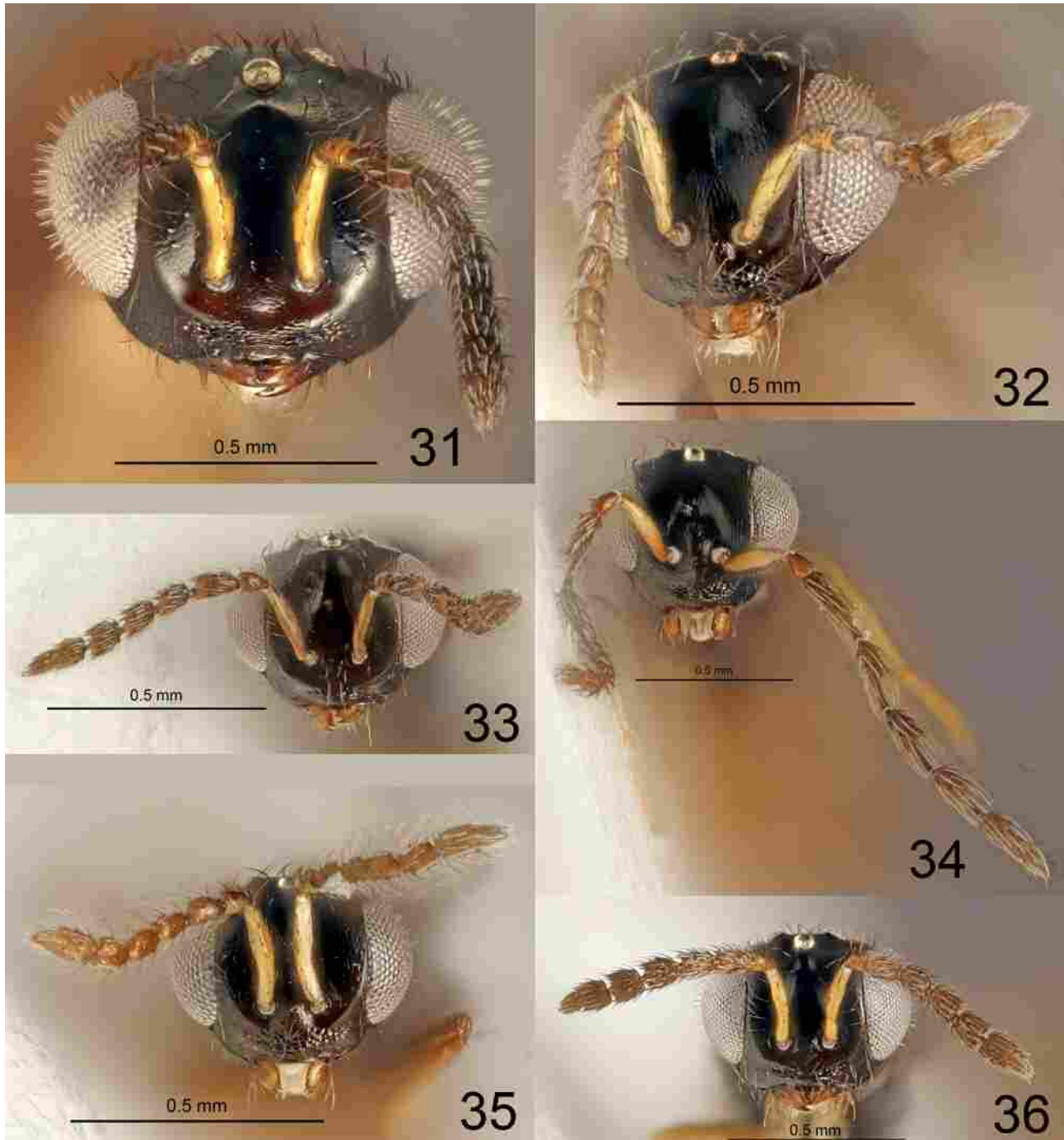


FIGURES 21–24. *Diglyphomorphyia* spp. nov., males; 21–22. *D. pilosa*; 21 body in lateral view, paratype; 22 body in dorsal view, paratype; 23–24. *D. costulata*; 23 body in dorsal view, paratype; 24 body in lateral view, paratype.



FIGURES 25–30. *Diglyphomorphyia* spp. nov., head in frontal view, females; 25 *D. albiclava*, paratype; 26 *D. albicoxa*, paratype; 27 *D. cristata*, holotype; 28 *D. metallica*, holotype; 29 *D. parva*, paratype; 30 *D. pedunculata*, paratype.

Relative measurements. **Head:** length in dorsal view 27; length in frontal view 39; width 55; POL 10.5; OOL 8; mouth width 21; malar space 11; eye height 26; lateral ocellus maximum width 5; scape length 20.5; scape width 5; pedicel length 8.5; pedicel width in dorsal view 4.2; pedicel+flagellum length 65; F1 length 12; F2 length 11; F3 length 9.5; F4 length 8.5; antennal clava length 14.5; F1 width 5.5; F2 width 6; F3 width 7; F4 width 7; antennal clava width 7.5. **Mesosoma:** length 84; width 48; midlobe of mesoscutum length 28; mesoscutellum length 30; mesoscutellum width 25.5; dorsellum length 2.5; propodeum length 19; mid tarsus length 28; mid tarsus T4 length 6.5; hind tarsus length 30; hind tarsus T4 length 7; fore wing length 120; fore wing width 67; costal cell length 46; costal cell width 4; marginal vein length 46; postmarginal vein length 20; stigmal vein length 17. **Gaster:** length 102; width 51; Gt₁ length 34; Gt₇ length 8; Gt₇ width 10.



FIGURES 31–36. *Diglyphomorphyia* spp. nov., head in frontal view; **31** *D. pilosa*, female holotype; **32** *D. costulata*, female paratype; **33** *D. carinifer*, male paratype; **34** *D. pedunculata*, male paratype; **35** *D. costulata*, male paratype; **36** *D. pilosa*, male paratype.

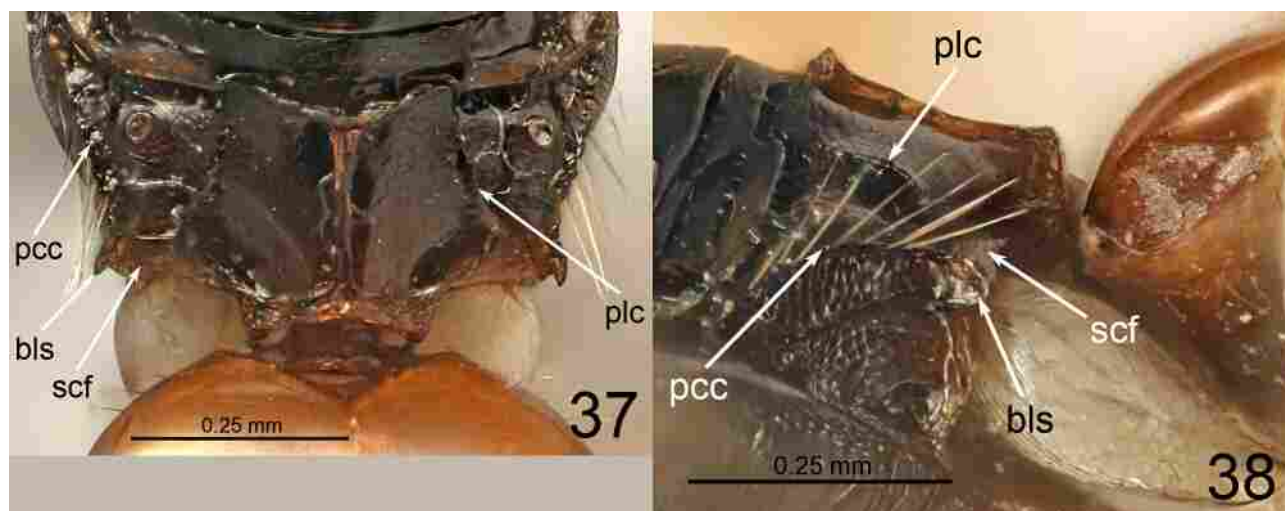
Male. Length 1.7–2.0mm. Mesosoma, pedicel, gaster, mid and hind coxae dark brown. Fore wing with ten setae along apico-dorsal margin of costal cell. Otherwise as in female.

Relative measurements. **Head:** length in dorsal view 22; length in frontal view 33; width 45; POL 8; OOL 5; mouth width 18; malar space 7.5; eye height 23; scape length 17; scape width 4; pedicel+flagellum length 52; F1 length 8.5; F2 length 8.5; F3 length 8.5; F4 length 7.5; antennal clava length 13; F1 width 5; F2 width 6; F3 width 6.5; F4 width 6.5; antennal clava width 6.5. **Mesosoma:** length 67; width 39; midlobe of mesoscutum length 25; mesoscutellum length 23.5; mesoscutellum width 20; dorsellum length 3; propodeum length 15. **Gaster:** length 65; width 35; Gt₁ length 28.

Distribution. Costa Rica.

Etymology. From the Latin *pilosa* = hairy, referring to the hairy costal cell.

Material. Holotype female: COSTA RICA, Puntarenas, Estación Altamira, Sendero a Casa Coca, 9°02'N, 83°00'W, 1450–1700m, 7.ii–5.iii.2002, C. Hansson & Parataxonomos (MZLU). Paratypes (2♂, NHMUK): 1♂ COSTA RICA, Puntarenas, San Vito, Las Cruces, Wilson Botanico, 8°46'N, 82°57'W, 1150–1300m, 18–22.iii.1990, J.S. Noyes; 1♂ from same locality as previous but collected 15–16.ii.2012.



FIGURES 37–38. *Diglyphomorphomyia pedunculata* sp. nov., propodeum, female holotype; **37** dorsal view; **38** lateral view. Abbreviations: **bls** = blunt spine at apex of propodeal callus carina; **pcc** = propodeal callus carina; **plc** = plica; **scf** = supracoxal flange.

Discussion

Diglyphomorphomyia shares several morphological features with *Elachertus* and allied genera. These Eulophinae genera are characterized by: antenna with four funiculars and two clavomeres in both sexes, and males without branches (rami) on the funiculars; ventral margin of clypeus smoothly rounded without indentations; notauli narrow, distinct and complete; mesoscutellum with sublateral grooves and with two pairs of setae; propodeum with a strong and complete median carina that has the most anterior part expanded to form a semicircular or triangular cup, or a lamina. The phylogenetic relationships between these genera remain to be investigated. Morphological data are not sufficient for such analyses, more data (i.e. molecular data) are necessary for this task.

The Neotropical species of *Diglyphomorphomyia* agree with the type species of this genus, and also with other congeneric species, for most features except for one character. Old World species of *Diglyphomorphomyia* have deep punctures or foveae on mesoscutum and mesoscutellum (Bouček 1988), while Neotropical species lack such punctures/foveae. However, the diagnostic features, listed under the genus diagnosis above, shared between Old World and New World species are so many, and unique to this group, that creating a new genus for the Neotropical species for the lack of one feature is not a parsimonious solution. Therefore, the Neotropical species treated here are best placed in *Diglyphomorphomyia*.

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