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## Monograph

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# Revision of *Netomocera* Bouček (Hymenoptera: Chalcidoidea: Pteromalidae), excluding the Oriental species

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**Abstract.** The world species of *Netomocera* Bouček, 1954 (Hymenoptera Linnaeus, 1758: Pteromalidae Dalman, 1820), excluding those from the Oriental region, are revised. The Oriental species are excluded because their types could not be examined, the species limits could not be reliably assessed based on original descriptions and available Oriental material was scarce. Eighteen species, including 11 species described as new, are recognized: *N. africana* Hedqvist, 1971; *N. alboscapus* Hedqvist, 1971; *N. amethysta* sp. nov.; *N. celebensis* sp. nov.; *N. cyanocephala* sp. nov.; *N. desaegeri* sp. nov.; *N. formiciformis* sp. nov.; *N. gloriosa* sp. nov.; *N. irregularis* sp. nov.; *N. masneri* sp. nov.; *N. merida* sp. nov.; *N. meridionalis* sp. nov.; *N. nearctica* Yoshimoto, 1977; *N. ramakrishnai* Sureshan, 2010; *N. rufa* Hedqvist, 1971; *N. sedlaceki* Bouček, 1988; *N. setifera* Bouček, 1954; *N. virgata* sp. nov. The female brachypterous form of *N. nearctica* and the male of *N. alboscapus* are described for the first time. A key to both sexes is provided, as well as diagnoses, descriptions and illustrations for all treated species. The genus is reported for the first time in the Neotropical region. For several species, new distributional records are also given.

**Keywords.** Diparinae, parasitoid, new species, new records, taxonomy.

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## Introduction

Bouček (1954) described *Netomocera* (Hymenoptera Linnaeus, 1758: Chalcidoidea Latreille, 1817: Pteromalidae Dalman, 1820), with type species *N. setifera* Bouček, 1954, which is known to occur mainly in southeastern Europe. Since then, another ten species have been described — three Afrotropical, one Nearctic, five Oriental and one Australasian. Hedqvist (1971) provided a key to *N. setifera* and three species he described as new from the Afrotropical region (*N. africana*, *N. alboscapus* and *N. rufa*). Yoshimoto (1977) described the only Nearctic species (*N. nearctica*), while Bouček (1988) described the only Australasian species (*N. sedlaceki*). Sureshan & Narendran (1990) keyed the Oriental and African species, including their new species *N. nigra* from India. After 2010, Sureshan and other authors described several new species from India: *N. ramakrishnai* Sureshan, 2010; *N. minuta* Sureshan & Nikhil, 2015; *N. maculata* Raseena Farsana, Sureshan & Manickavasagam, 2016; *N. calicutensis* Sureshan, Raseena Farsana & Nikhil, 2018. The Oriental species, except *N. ramakrishnai*, which is found as far as Kamchatka, are excluded from the present revision because their types could not be examined and species limits could not be reliably assessed based on their original descriptions. They are keyed by Sureshan *et al.* (2018) and briefly mentioned in the present paper when discussing similarities with other species of *Netomocera*.

*Netomocera* can easily be recognized from all the other genera of Diparinae, females mainly by their usually strongly clavate flagellum with at least a slightly asymmetric clava, males by their very long, filiform antennae without a differentiated clava, and both sexes by their stout body with at most a quadrate rather than longer than broad petiole. Females can be macropterous and/or brachypterous, while males are always macropterous. In both sexes, the first gastral tergite is always large, occupying at least half of the gaster length.

Despite the description of many new species since 1954, the hosts of species of *Netomocera* remain unknown.

This paper provides diagnoses and descriptions for eighteen species of *Netomocera* from the Palaearctic, Neotropical, Australasian and Afrotropical regions, accompanied by illustrations and an identification key for both sexes. For several species, new distributional records are given.



## Material and methods

### Material

The following is a list of museum and collection abbreviations used in this taxonomic revision:

- ANIC = Australian National Insect Collection, Canberra, Australia  
 BMNH = Natural History Museum, London, United Kingdom  
 CNC = Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture and Agri-Food Canada, Ottawa, ON, Canada  
 MICO = Mitroiu Collection, “Alexandru Ioan Cuza” University of Iași, Faculty of Biology, Iași, Romania  
 NHRM = Naturhistoriska Riksmuseet/Swedish Museum of Natural History, Stockholm, Sweden  
 NMPC = Narodni Muzeum v Praze, Prague, Czech Republic  
 RMCA = Musée royal de l’Afrique central/Koninklijk Museum voor Midden-Afrika, Tervuren, Belgium  
 RMNH = Naturalis Biodiversity Center (formerly Rijksmuseum voor Natuurlijke Historie), Leiden, Netherlands  
 SAMC = Iziko Museums of South Africa, Capetown, South Africa  
 UCRC = Entomology Museum, University of California, Riverside, CA, USA  
 ZISP = Zoological Institute, St Petersburg, Russia  
 ZMUC = Natural History Museum of Denmark, Copenhagen, Denmark  
 ZSIP = Zoological Survey of India, Gangetic Plains Regional Station, Patna, Bihar, India

### Descriptive methods

For species descriptions and redescriptions, the relative measurements of the holotype (if available) are given in parentheses following the ratios in order to differentiate the primary material from other specimens and/or to allow the user to calculate other ratios than the standard ones. Sex associations are based on shared morphological attributes, which are given in the diagnosis for each species in which both sexes are described. For males, only differences from the females are given. For species diagnoses, characters that are common to both sexes are treated first, followed by characters specific to females or males, respectively.

Information on specimen labels is given *ad litteram*. Abbreviations commonly found on labels for two parks in the Democratic Republic of the Congo (D.R. Congo) are:

- P.N.A. = Parc National Albert, now Virunga National Park  
 P.N.G. = Parc National de Garamba (Garamba National Park)

Observations and descriptions were made using a Leica S8APO stereo microscope. Measurements were taken with a micrometric graduated ocular. The magnification used for each species may differ, so only ratios are comparable among species.

Images were taken mostly using a Leica DFC500 digital camera attached to a Leica M205A automated research stereo microscope. Illumination was provided by a Leica LED5000 HDI unit. The images were then processed with Zerene Stacker®. Their clarity was further enhanced using Adobe® Photoshop® 7.0. Images indicated in the text as ‘cf. Fig.’ are from a different species or sex.

### Identification

In *Netomocera*, the degree of wing development (i.e., macropterous or brachypterous females), at least in some cases (e.g., *N. setifera*, *N. ramakrishnai*), is not constant within a species, so even if at the time of the present work only one form is known, it is possible that in the future the other form will be

discovered. The colour of the mesosoma is often unreliable for species recognition because it seems highly variable in both sexes.

In order to correctly evaluate whether the clypeal margin is slightly produced or slightly emarginate, the head must be observed in an antero-ventral position (Figs 4, 68, 90, 134, 147, 160, 170). The length of the gaster includes the sometimes protruding ovipositor sheaths. In both sexes, the shape and proportions of the gaster are greatly influenced by the drying method. Air-dried specimens (especially males) tend to have a shorter gaster due to the retraction of the tergites following the first one (e.g., Figs 10, 41, 52, 157, 167). When critical-point dried or when hexamethyldisilazane is used to dry specimens, all tergites are evident, also exposing their bases, which are often lightly coloured (e.g., Figs 85, 105, 107, 116, 155); in such cases the term ‘inflated gaster’ is used. Consequently, the ratios between the length and width of the gaster, as well as the length of the first gastral tergite compared to the remaining tergites or to the gaster length, should not be used to discriminate among species.

The number and arrangement of the large dark setae on the head and mesosoma appear to be reliable characters for the identification of species. However, they should be used with care in old specimens, where some of these setae can be broken and lost. In such cases, their number and position is assessed based on their insertions, which are usually visible as large round pits among the shallow sculpture of the body surface. In the light-coloured species or specimens, it is fairly easy to trace their insertion as black dots, but this is very difficult in the dark coloured species or specimens, where only some round pits are visible and only under strong light and high magnification.

The identification key below will work better for females because they are less uniform than males, so extra caution is necessary when using the key for males, because chances of misidentifications are higher. Moreover, the number of world species of *Netomocera* will certainly prove to be higher, so the key should be used with care, especially when identifying species from poorly studied areas, such as the tropics.

### **Terminology**

Morphological terms follow Gibson (1997) for body parts and Gibson & Fusu (2016) for body sculpture.

Abbreviations used in the key and descriptions:

- fu1–10 = funicular segments 1–10
- gt1–7 = gastral tergites 1–7
- MV = marginal vein
- OOL = ocelo-ocular line
- PV = postmarginal vein
- POL = posterior ocellar line
- SV = stigmal vein

## Results

Class Insecta Linnaeus, 1758  
 Order Hymenoptera Linnaeus, 1758  
 Suborder Apocrita Latreille, 1810  
 Superfamily Chalcidoidea Latreille, 1817  
 Family Pteromalidae Dalman, 1820  
 Subfamily Diparinae Thomson, 1876

Genus *Netomocera* Bouček, 1954

*Netomocera* Bouček, 1954: 49–50 (type species: *Netomocera setifera* Bouček, 1954, by original designation and monotypy).

**Diagnosis** (with respect to other diparine genera)

**Both sexes**

Petiole transverse to quadrate, never longer than broad (Figs 8, 19, 39, 61, 72, 83, 103, 125, 138, 151, 165, 185); clypeal margin evenly curved, always without a conspicuous median tooth (Figs 4, 15, 26, 35, 44, 57, 68, 79, 90, 99, 110, 134, 147, 160, 170, 181).

**Female**

Antenna 11173, distinctly clavate, with clava moderate to large, slightly to strongly asymmetric (Figs 5, 16, 27, 36, 58, 69, 91, 100, 111, 122, 135, 148, 171, 195).

**Male**

Antenna with flagellum very long and filiform, without long outstanding setae; clava not differentiated (Figs 11, 22, 53, 64, 75, 86, 106, 117, 130, 143, 156, 161, 177, 190, 201).

## Description

**Female** (habitus: Figs 1, 12, 23, 32, 41, 54, 65, 76, 87, 96, 107, 118, 131, 144, 167, 178, 191)

**COLOUR.** Head from yellowish to black, sometimes with weak to strong blue, violet or green metallic reflections (e.g., Figs 13, 24, 33, 42, 179). Mesosoma yellowish to black, rarely with metallic reflections (e.g., Figs 18, 29, 38, 162). Metasoma with petiole similar to mesosoma and gaster, yellowish to black but ventrally usually paler (e.g., Figs 23, 32, 54, 65, 76, 96, 107, 118, 178). Body setation usually pale except for several large, symmetrically arranged dark brown setae (e.g., Figs 29, 38, 71, 113, 124, 197).

**BODY LENGTH.** 0.90–3.25 mm.

**HEAD.** Clypeal margin slightly to distinctly produced (e.g., Figs 4, 15, 35, 79, 110, 147, 170) or slightly to distinctly emarginate (e.g., Figs 44, 90, 121, 134, 194), rarely virtually straight (e.g., Fig. 57). Clypeal region virtually smooth to coriaceous. Lower face coriaceous to shallowly reticulate, piliferous punctures distinct or not (e.g., Figs 4, 15, 26, 35, 57, 68, 79, 90, 99, 110, 134, 147, 160). Upper face including vertex reticulate (e.g., Figs 14, 34, 56, 98, 146, 169) or coriaceous (e.g., Figs 67, 109); scrobes deep, reticulate (e.g., Figs 66, 97, 108, 179) or smooth (Figs 77, 168); parascrobal region with elongated (e.g., Fig. 108) or isodiametric cells (e.g., Fig. 33). Occiput virtually smooth or coriaceous-alutaceous; margin blunt (e.g., Figs 25, 89, 120, 133, 159, 180, 193) or sharply defined (e.g., Figs 14, 34, 43, 56, 67, 98, 109). Toruli with lower margins usually slightly to distinctly below lower margins of eyes (e.g., Figs 2, 24, 33, 66, 77, 88, 179), rarely above (e.g., Fig. 13); face protruding (e.g., Figs 1, 12, 167) or not (e.g., Figs 32, 54, 144) at toruli level. Funicle moderately (e.g., Figs 27, 91, 122, 171, 182) to strongly widening (e.g., Figs 5, 16, 36, 80, 100, 148) towards clava; clava more or less asymmetric. Upper face

and vertex usually with eight large setae (e.g., Figs 67, 133): one between each posterior ocellus and corresponding eye, closer to eye; two between posterior ocelli, closer to the latter than to each other; one posterior to each eye; one behind each posterior ocellus. In a few species, one or two additional pairs of setae present next to inner margins of eyes, hence the total number of head setae is 10–12 (e.g., Figs 25, 89, 120).

**MESOSOMA.** Moderately (e.g., Figs 29, 113, 137) to densely setose (e.g., Fig. 71) dorsally. Pronotal collar usually distinctly narrower than mesoscutum (e.g., Figs 18, 60, 71, 113), rarely almost as wide as mesoscutum (e.g., Figs 82, 184), with 6–10 large setae arranged in one row (e.g., Figs 93, 137, 173, 184). Mesoscutum and axillae with shallow (e.g., Figs 47, 82, 113, 137, 184) to deep (e.g., Figs 7, 18, 60) reticulation. Mesoscutum with one central pair of large setae on median lobe and each lateral lobe with one large seta above fore wing articulation (e.g., Figs 124, 137, 150, 173, 184). Scutellar disc with similar sculpture as mesoscutum; frenal line absent, but frenal area usually defined by at least slightly different sculpture, either less strong or longitudinally striate-reticulate (e.g., Figs 19, 83, 114). Scutellum with two pairs of large setae, one anteriorly, the other on the virtual frenal line, the latter setae more widely apart than the anterior setae (e.g., Figs 29, 150, 184). Mesepisternum usually densely reticulate. Mesepimeron usually mainly smooth; mesepimeral sulcus (Fig. 17) almost absent (e.g., Figs 92, 112, 123, 136, 183) to very distinct (e.g., Figs 6, 17, 46, 59). Metanotum with lateral panels and dorsellum mainly smooth except for a few fine costulae (e.g., Figs 19, 30, 39, 48, 83, 94, 114, 151, 185), rarely with more complex sculpture (Fig. 165). Propodeum mainly smooth, with intricate pattern of carinae, interspaces smooth to slightly wrinkled (e.g., Figs 8, 19, 30, 39, 72, 83, 94, 114, 138, 151, 185). Brachypterous (e.g., Figs 65, 118, 131, 167, 187), submacropterous (e.g., Fig. 178) or macropterous (e.g., Figs 1, 12, 32, 41, 54, 96). Macropterous and submacropterous forms with fore wing usually uniformly and densely setose except for small, elongate bare region similar to *linea calva* some distance beyond parastigma and basal half of marginal vein (e.g., Figs 9, 20, 62, 104, 186); occasionally fore wing extensively bare basally (Fig. 141, 199) or with bare region larger (Fig. 31); submarginal, marginal and postmarginal veins with several large setae; several long, thin admarginal setae on ventral side of wing close to marginal vein, but hard to see because of dense setation on dorsal side of wing (e.g., Fig. 84). Brachypterous form with fore and hind wings represented by stumps; fore wing with rounded or truncate apex well surpassing posterior margin of propodeum, usually with complete submarginal, reduced marginal and very short postmarginal and stigmal veins, and submarginal, marginal and postmarginal veins with several large setae (e.g., Figs 73, 126, 139, 154, 175, 188); setation similar to that of macropterous form.

**METASOMA.** Petiole either barely visible, transverse and smooth except for a few superficial longitudinal striae (e.g., Figs 39, 61, 72, 83, 103, 114, 125, 138, 151, 185, 198) or quadrate, with a few conspicuous longitudinal carinae (e.g., Figs 8, 19). Gaster (e.g., Figs 1, 23, 32, 54, 65, 76, 87, 118, 144, 178, 191) usually short-ovate to long-acuminate, with gt1 the longest and with hind margin produced or emarginate; gt2–6 short, more or less retracted; syntergum acutely pointed. Ovipositor sheaths slightly to distinctly protruding beyond apex of gaster. Cercal setae long, may surpass the apex of gaster.

**Male** (habitus: Figs 10, 21, 52, 63, 74, 85, 105, 116, 129, 142, 155, 157, 176, 189, 200)

Differs from female mainly as follows. Body length: in average smaller than for female (0.75–2.50 mm). Always macropterous (e.g., Figs 21, 52, 74, 85, 129, 142, 157, 189). Eyes smaller, hence malar space greater (e.g., Fig. 158). Toruli with lower margins usually above lower margins of eyes, rarely at same level (e.g., Fig. 158). Flagellum very long, without differentiated clava, funicular segments subequal in length to fu1, except fu10, which is longest (e.g., Figs 11, 22, 53, 64, 75, 86, 106, 117, 130, 143, 156, 177, 190, 201). Basal funicular segments sometimes slightly wider than apical segments (e.g., Figs 75, 143, 177, 190). Gaster (especially when collapsed) shorter than mesosoma, in air-dried specimens usually with only gt1 visible (e.g., Figs 10, 52, 74).

**Distribution**

Cosmopolitan.

**Hosts**

Unknown.

**Remarks**

Desjardins (2007) provided the latest revision of Diparinae, including a key to world genera. Females of *Netomocera* are prone to be confused mostly with females of *Lelaps* Walker, 1843, but differ from those mainly in the shape of the clypeal margin, without any teeth (with a small median tooth in *Lelaps*), and in the clavate antennae, with the clava being at least slightly asymmetric (e.g., Figs 16, 45, 58, 135, 148) due to the presence of a microsetation area (antennae filiform in *Lelaps*, clava symmetric, without a conspicuous microsetation area). They are also somewhat similar to females of *Chimaerolelaps* Desjardins, 2007, but those have a long petiole (at least twice as long as broad) and three pairs of large scutellar setae, while in *Netomocera* the petiole is at most quadrate (e.g., Figs 8, 19) and the scutellum has only two pairs of large setae (e.g., Figs 29, 150, 184).

Males of *Netomocera* can be confused especially with males of *Dipara* Walker, 1833 and *Lelaps*. They differ from males of both these genera in having a much shorter petiole (at most quadrate as opposed to more than twice as long as broad) and funicular segments with shorter setae (funicular segments with whorls of long setae in the mentioned genera); additionally, males of *Netomocera* differ from those of *Lelaps* in having the clypeal margin emarginate or evenly produced, without a median tooth.

**Key to world species of *Netomocera*, excluding the Oriental species****Note**

Females of *N. rufa* are unknown; males of many species are unknown.

1. Female: antenna short-clavate, clava more or less asymmetric, with large microsetation area (e.g., Figs 16, 45, 58, 135, 148); brachypterous (e.g., Figs 65, 118, 131, 167, 187) or macropterous (e.g., Figs 1, 12, 32, 41, 54, 96) ..... 2
  - Male: antenna very long, filiform (e.g., Figs 11, 53, 86, 106, 143, 177, 201); macropterous (e.g., Figs 21, 52, 74, 85, 129, 142, 157, 189) ..... 18
2. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (e.g., Figs 39, 61, 72, 83, 103, 114, 125, 138, 151, 185, 198); propodeum (e.g., Figs 30, 39, 72, 83, 94, 114, 138, 151) usually without a well-defined V-shaped area basally (except *N. setifera*, Fig. 185); mesepimeral sulcus conspicuous (e.g., Figs 46, 59) or not (e.g., Figs 92, 112, 123, 136, 183); macropterous, submacropterous or brachypterous [various biogeographic distribution] ..... 3
  - Visible part of petiole longer, usually quadrate, with a few conspicuous longitudinal carinae (Figs 8, 19); propodeum (Figs 8, 19) always with a well-defined V-shaped area basally; mesepimeral sulcus conspicuous (Figs 6, 17); macropterous [Afrotropical] ..... 17
3. Head yellowish (Figs 24, 88, 118, 132, 192); clypeal margin shallowly to conspicuously emarginate (Figs 26, 90, 121, 134, 194); occiput margin blunt (Figs 25, 120, 133, 193) or rarely abrupt (Fig. 89), but never sharply margined; mesepimeral sulcus inconspicuous, although some transverse costulae usually present (Figs 92, 123, 136, 196); usually macropterous, rarely brachypterous; fore wing always with at least some brownish spots (Figs 31, 95, 126, 128, 139, 141, 199); upper face and vertex usually with ten large setae (Figs 25, 89, 120, 193), rarely with eight setae (Fig. 133) [New World] ..... 4



- Head brown to black (e.g., Figs 33, 55, 66, 77, 108, 168), sometimes with blue-violet, green or bronze metallic reflections (e.g., Figs 42, 43, 98, 179, 180); clypeal margin usually slightly produced or straight (e.g., Figs 33, 57, 68, 79, 110, 147, 170), but rarely shallowly emarginate (Figs 44, 99); occiput margin rarely blunt (Fig. 180), usually sharply defined (e.g., Figs 34, 43, 67, 98, 109); mesepimeral sulcus conspicuous (e.g., Figs 46, 59, 101, 172) or not (e.g., Fig. 183); macropterous, submacropterous or brachypterous; fore wing hyaline or subhyaline (e.g., Figs 51, 104, 152), or with brownish spots (e.g., Figs 49, 186); upper face and vertex usually with eight large setae (e.g., Figs 56, 67), rarely with 12 setae (Fig. 169) [various biogeographic distribution] ..... 8
- 4. Macropterous, fore wing mainly brownish, except for one bare region, swollen and shining violet-blue when examined under some angles of light and with four hyaline areas covered with white setae (Fig. 31): one apically in basal cell, a U-shaped region behind bare region and two subapical spots; flagellum with basal half yellow, the rest brownish (Fig. 27); propodeum with median area almost without carinae (Fig. 30) [Neotropical] ..... *N. amethysta* sp. nov.
- Brachypterous or if macropterous fore wing with different colour pattern, never mainly brownish (Figs 95, 128, 141, 199); flagellum with different colour pattern (Figs 91, 122, 135, 195); propodeum with median area more carinate (Figs 94, 125, 138, 198) [Neotropical, Nearctic] ..... 5
- 5. Macropterous, fore wing with intricate brownish pattern of bands and spots covering more than half of wing surface (Fig. 95); propodeum with large smooth areas among carinae (Fig. 94); antenna with funicle brown and clava whitish (Fig. 91) [Neotropical] ..... *N. irregularis* sp. nov.
- Brachypterous or if macropterous fore wing with two or three brownish bands or spots separated from each other by large hyaline areas (Figs 126, 128, 139, 141, 199); propodeum with smaller smooth areas among carinae (Figs 125, 138, 198); antenna with different colour pattern (Figs 122, 135, 195) [Neotropical, Nearctic] ..... 6
- 6. Antenna with basal funicular segments and clava pale yellow (Fig. 195); fore wing with three transverse brownish bands, the first apically in basal cell, the second behind parastigma and the third behind stigma (Fig. 199); head with ten large setae on upper face and vertex (Fig. 193); macropterous [Neotropical] ..... *N. virgata* sp. nov.
- Antenna with pale areas of flagellum, if present, much more reduced (Figs 122, 135); fore wing with two transverse brownish bands, one behind MV basally and the second behind stigma or occasionally with a third spot between the second band and the apical wing margin (Figs 126, 128, 139, 141); head with eight (Fig. 133) or ten (Fig. 120) large setae on upper face and vertex; brachypterous or macropterous [Nearctic] ..... 7
- 7. Mesoscutum very shallowly reticulate (Fig. 137); scutellum medially longitudinally striate and laterally reticulate and frenal area striate-reticulate (Fig. 137); propodeum uniformly and densely reticulate except for small triangular area anteriorly; nucha large, with lateral margins parallel (Fig. 138); upper face and vertex usually with eight large setae (Fig. 133); antenna (Fig. 135) strongly clavate, fu7 width 1.7–1.9 × length; clava length 1.6–1.7 × width; head width equal to combined length of pedicel and flagellum; mesosoma length 1.7–2.0 × height; mesoscutum width 2.5–2.9 × length ..... *N. nearctica* Yoshimoto, 1977
- Mesoscutum more strongly reticulate (Fig. 124); scutellum, including frenal area, reticulate (Fig. 124); propodeum with several strong carinae, the interspaces virtually smooth; nucha smaller, with lateral margins converging posteriorly (Fig. 125); upper face and vertex usually with ten large setae (Fig. 120); antenna (Fig. 122) moderately clavate, fu7 width 1.2–1.4 × length; clava length 2.1–2.4 × width; head width slightly less than combined length of pedicel and flagellum; mesosoma length 1.5–1.6 × height; mesoscutum width 2.1–2.5 × length ..... *N. meridionalis* sp. nov.



8. Pronotal collar long,  $0.55\text{--}0.60\times$  as long as mesoscutum and wide,  $0.85\text{--}0.95\times$  as wide as mesoscutum (Figs 183–184); fore wing in macropterous and submacropterous forms with two more or less distinct brownish spots, a large one beneath MV and a smaller one a short distance beyond SV towards apical wing margin (Fig. 186); propodeum basally with densely sculptured triangular area surrounded by shallowly sculptured areas (Fig. 185); occiput margin blunt (Fig. 180) [West Palaearctic] ..... *N. setifera* Bouček, 1954
- Pronotal collar usually less long or wide (e.g., Figs 38, 47, 60, 71, 93), but if rarely as long as above then at most  $0.8\times$  as wide as mesoscutum or if as wide as above then at most  $0.45\times$  as long as mesoscutum; fore wing in macropterous form hyaline or subhyaline (e.g., Figs 40, 62, 104, 115, 152), if rarely with brownish pattern, this different from above (Fig. 49); propodeum with uniform, more or less dense sculpture (e.g., Figs 39, 48, 61, 72, 83, 103, 151); occiput margin usually sharply defined (e.g., Figs 34, 43, 67, 98, 109) [various biogeographic distribution] ..... 9
9. Scrobes deep and smooth (Figs 77, 168); occiput margin blunt (Figs 78, 169); fore wing of macropterous form with basal third extensively bare, except for several setae across basal cell (Fig. 84) [Australasian]..... 10
- Scrobes shallower and finely reticulate or reticulate-striate (e.g., Figs 66, 97, 145); occiput margin sharply defined (e.g., Figs 34, 43, 67, 98, 109); fore wing of macropterous form with basal third extensively setose, except for narrow bare region (e.g., Figs 49, 62, 104, 152) [various biogeographic distribution]..... 11
10. Head with 12 large setae (Fig. 169); toruli only slightly below lower margins of eyes (Fig. 168); antenna uniformly reddish or yellowish, moderately clavate, with clava slightly asymmetric; fu1 and fu7 moderately transverse (Fig. 171); face with piliferous punctures barely visible; mesoscutum width  $2.8\text{--}3.1\times$  length; brachypterous (Fig. 167)..... *N. sedlaceki* Bouček, 1988
- Head with eight large setae (Fig. 78); toruli distinctly below lower margins of eyes (Fig. 77); antenna with funicle gradually becoming brown towards clava, more strongly clavate, with clava conspicuously asymmetric; fu1 and fu7 more strongly transverse (Fig. 80); face with piliferous punctures more obvious; mesoscutum width about  $2.6\times$  length; macropterous (Fig. 76)..... *N. gloriosa* sp. nov.
11. Clypeal margin shallowly emarginate (Fig. 99); POL about  $4.1\times$  OOL; MV about  $5.3\times$  SV; vertex with slight dark green reflections (Fig. 98); macropterous, fore wing hyaline (Fig. 104) [Neotropical]..... *N. masneri* sp. nov.
- Clypeal margin usually produced or straight (e.g., Figs 35, 57, 110, 147) or if slightly emarginate then vertex with violet metallic reflections (Fig. 43); POL usually at most  $3.75\times$  OOL, rarely up to  $5.5\times$ ; MV usually  $3.5\text{--}5.0\times$  SV, rarely more; macropterous, submacropterous or brachypterous, fore wing sometimes with brown spots (Fig. 49) [various biogeographic distribution]..... 12
12. Mesoscutum, scutellum and axillae densely reticulate, appearing dull under setation (Fig. 60); scutoscuteellar sutures superficial, hardly visible (Fig. 60); frenal area not distinct, sculpture not different from that of rest of scutellum (Fig. 60); mesosoma with setation dense and pale brown, not conspicuous (Fig. 60); macropterous [Afrotropical] ..... *N. desaegeri* sp. nov.
- Mesoscutum, scutellum and axillae less densely reticulate, appearing shinier under setation (e.g., Figs 38, 47, 71, 113, 150); scutoscuteellar sutures deeper, more distinct (e.g., Figs 38, 47, 71, 150); frenal area distinct, sculpture at least slightly different than that of rest of scutellum (e.g., Figs 39, 48, 72, 114, 151); mesosoma with setation, if dense, whitish and conspicuous (Fig. 71); macropterous, submacropterous or brachypterous [various biogeographic distribution] ..... 13
13. Mesosoma with unusually dense and conspicuous whitish setation dorsally (Fig. 71); eye height  $2.25\text{--}2.35\times$  malar space; brachypterous, rarely submacropterous [Neotropical].....
- ..... *N. formiciformis* sp. nov.

- Mesosoma with less dense and less conspicuous setation dorsally (Figs 38, 47, 113, 150); eye height usually  $2.5\text{--}2.8\times$  malar space, rarely  $2.3\text{--}2.4\times$ ; macropterous, submacropterous or brachypterous [various biogeographic distribution]..... 14
- 14. Head with strong blue-violet reflections (Figs 42–43); clypeal margin very shallowly emarginate, almost straight (Fig. 44); macropterous, fore wing usually with two brownish regions (Figs 49–50), sometimes hyaline (Fig. 51) [Australasian].....*N. cyanocephala* sp. nov.
- Head brown or black, without metallic reflections (Figs 34, 109, 146); clypeal margin at least slightly produced (Figs 35, 110, 147); macropterous, submacropterous or brachypterous, fore wing always hyaline (Figs 40, 115, 152) [various biogeographic distribution] ..... 15
- 15. Antenna moderately clavate, fu7 width about  $1.3\times$  length (Fig. 111); head and mesosoma black (Figs 108, 113); fu7 and clava dark, contrasting with rest of funicle (Fig. 111); macropterous [Neotropical].....*N. merida* sp. nov.
- Antenna more strongly clavate, fu7 width  $1.70\text{--}1.85\times$  length (Figs 36, 148); at least mesosoma lighter (Figs 38, 150); flagellum yellowish to brown, clava occasionally darkening towards apex (Figs 36, 148); macropterous, submacropterous or brachypterous [various biogeographic distribution] ..... 16
- 16. POL about  $5.5\times$  OOL; clypeus wider than high (Fig. 35); head and mesosoma brown (Figs 33, 38); flagellum pale yellow, clava darkening towards apex (Fig. 36); macropterous [Australasian]..... *N. celebensis* sp. nov.
- POL  $3.3\text{--}3.5\times$  OOL; clypeus about as wide as high (Fig. 147); head black, mesosoma reddish-brown (Figs 145, 150); flagellum brown, gradually becoming darker towards clava (Fig. 148); macropterous, submacropterous or brachypterous [East Palaearctic, Oriental]..... *N. ramakrishnai* Sureshan, 1910
- 17. Toruli with lower margins above lower eye margins (Fig. 13); scape  $0.7\text{--}0.8\times$  as long as eye height; eye more elongate, height  $1.60\text{--}1.75\times$  length; occiput margin sharp (Fig. 14) .....*N. alboscapus* Hedqvist, 1971
- Toruli with lower margins from slightly below to about the same level as lower eye margins (Fig. 2); scape from very slightly shorter to as long as eye height; eye less elongate, height  $1.35\text{--}1.50\times$  length; occiput margin blunt (Fig. 3)..... *N. africana* Hedqvist, 1971
- 18. Visible part of petiole short-transverse and smooth or almost smooth, with at most some superficial longitudinal striae (cf. Figs 39, 61, 72, 83, 103, 114, 125, 138, 151, 185, 198) or if rarely quadrate then without distinct longitudinal rugae (Fig. 165) [various biogeographic distribution] ..... 19
- Visible part of petiole longer, usually quadrate and with more or less regular and strong longitudinal carinae (cf. Figs 8, 19) [Afrotropical]..... 31
- 19. Clypeal margin slightly to conspicuously emarginate (cf. Figs 99, 121, 134, 194) [New World] .. 20
- Clypeal margin virtually straight or slightly to conspicuously produced (Fig. 160; cf. Figs 57, 68, 79, 110, 147, 170, 181) [various biogeographic distribution] ..... 23
- 20. Fore wing without brownish spots (cf. Fig. 104); body colour mainly dark brown (Fig. 105) [Neotropical].....*N. masneri* sp. nov.
- Fore wing with at least one brownish spot behind basal end of MV, usually with two or three (Figs 129, 142, 200; cf. Figs 128, 141, 199); body colour usually lighter, mainly yellowish to brownish (Figs 129, 142, 200) [Neotropical, Nearctic]..... 21
- 21. Basal cell densely setose apically (cf. Fig. 199); head usually yellowish (Fig. 200); funicle with fu1 and fu10 (occasionally also fu9) usually at least slightly lighter than intermediate funiculars (Fig. 201) [Neotropical].....*N. virgata* sp. nov.

- Basal cell mainly bare apically (cf. Figs 128, 141), with at most some scattered setae (Fig. 142); head usually brownish (Figs 129, 142); funicle of uniform colour or sometimes fu1 lighter (Figs 130, 143 [Nearctic])..... 22
22. MV 4.0–4.2 × SV; fu1 length 1.3–1.5 × width; scutellum with at least a small shiny area with superficial sculpture in posterior third to half, usually including central part of frenal area, the latter at least laterally striate in large specimens (cf. Fig. 137) ..... *N. nearctica* Yoshimoto, 1977
- MV 5.0–5.5 × SV; fu1 length 1.7–2.5 × width; scutellum uniformly reticulate, cells isodiametric to slightly elongated (cf. Fig. 124)..... *N. meridionalis* sp. nov.
23. Pronotal collar long, 0.55–0.80 × as long as mesoscutum and wide, 0.80–0.95 × as wide as mesoscutum (Figs 162, 164, 189; cf. Fig. 184) ..... 24
- Pronotal collar either shorter or/and narrower (cf. Figs 47, 60, 71, 82, 113, 150, 173) ..... 25
24. Head and mesosoma black, without metallic reflections (Fig. 189) or head distinctly greenish and mesosoma brownish, the latter without metallic reflections; MV 3.0–3.2 × SV [West Palaearctic] ..... *N. setifera* Bouček, 1954
- Head orange and mesosoma dark brown, without metallic reflections (Figs 157, 158) or both orange with distinct greenish metallic reflections dorsally (Figs 159, 162); MV 2.7–2.9 × SV [Afrotropical]..... *N. rufa* Hedqvist, 1971
25. Mesosoma dorsally with dense reticulation, alveolae deep (cf. Fig. 60); mesepimeral sulcus well impressed (cf. Fig. 59) [Afrotropical]..... *N. desaegeri* sp. nov.
- Mesosoma dorsally with less dense reticulation, alveolae shallower (cf. Figs 47, 71, 82, 113, 150, 173); mesepimeral sulcus sometimes shallow (cf. Figs 112, 149) [various biogeographic distribution]..... 26
26. Scrobes deep and smooth (cf. Figs 77, 168); occiput margin blunt (cf. Figs 78, 169) [Australasian] ..... 27
- Scrobes shallower and reticulate (cf. Figs 66, 108, 145); occiput margin sharply defined (cf. Figs 43, 67, 109, 146) [various biogeographic distribution] ..... 28
27. Funicular segments thick and short, fu1 wider than pedicel, length 1.6–2.0 × width (Fig. 177); body length 0.8–1.2 mm ..... *N. sedlaceki* Bouček, 1988
- Funicular segments slender and longer, fu1 not wider than pedicel, length 2.0–2.1 × width (Fig. 86); body length 1.2–1.5 mm ..... *N. gloriosa* sp. nov.
28. Mesosoma usually at least partially reddish (Fig. 155); head without violet reflections on vertex (cf. Fig. 146) [Oriental, East Palaearctic] ..... *N. ramakrishnai* Sureshan, 2010
- Mesosoma uniformly dark brown to black (Figs 52, 74, 116); head sometimes with violet reflections on vertex (cf. Fig. 43) [Australasian or Neotropical] ..... 29
29. Head with more or less conspicuous violet reflections on vertex (cf. Fig. 43) [Australasian]..... *N. cyanocephala* sp. nov.
- Head without any violet reflections on vertex (cf. Figs 67, 109) [Neotropical]..... 30
30. Fu1 length 2.4–2.6 × width; length of pedicel plus flagellum 2.40–2.75 × head width; MV 3.2–4.1 × SV ..... *N. merida* sp. nov.
- Fu1 length 1.9–2.2 × width; length of pedicel plus flagellum 2.8–3.0 × head width; MV about 4.5 × SV ..... *N. formiciformis* sp. nov.
31. Toruli with lower margins distinctly above lower margins of eyes..... *N. alboscapus* Hedqvist, 1971
- Toruli with lower margins at about same level as lower margins of eyes ..... *N. africana* Hedqvist, 1971

## **Descriptive taxonomy**

### *Netomocera africana* Hedqvist, 1971

Figs 1–11

*Netomocera africana* Hedqvist, 1971: 238 (holotype (♀) in BMNH, examined).

#### **Diagnosis**

##### **Both sexes**

Macropterous (Figs 1, 10). Mesepimeral sulcus conspicuous (Fig. 6). Propodeum with a well-defined V-shaped area basally (Fig. 8). Visible part of petiole quadrate, with a few conspicuous longitudinal carinae (Fig. 8).

##### **Female**

Occiput margin blunt (Fig. 3). Eye height  $1.35\text{--}1.50 \times$  length. Toruli with lower margins from slightly below to about same level as lower margins of eyes (Fig. 2). Scape from very slightly shorter than to as long as eye height.

##### **Male**

Toruli with lower margins at about same level as lower margins of eyes.

#### **Material examined**

##### **Holotype**

SOUTH AFRICA • ♀; “Holotype”; “Port St. John, Pondoland. 6-25. Feb. 1924”; “S. Africa. R. E. Turner. Brit. Mus. 1924-136”; “HOLOTYPUS *Netomocera africana* sp. n., K-J Hedqvist det. 1971”; “B.M. TYPE HYM. 5.2256”; BMNH 5.2256.

##### **Paratypes**

SOUTH AFRICA • 1 ♀; “Paratype”; “Port St. John, Pondoland. 6-25. Feb. 1924”; “S. Africa. R. E. Turner. Brit. Mus. 1924-136”; “PARATYPUS *Netomocera africana* sp. n., K-J Hedqvist det. 1971”; BMNH • 1 ♂; same data as for preceding; BMNH • 2 ♀♀; same data as for preceding; “Dec. 1923”; BMNH.

##### **Other material**

SOUTH AFRICA • 2 ♀♀; “Port St. John, Pondoland. 6-25. Feb. 1924”; “S. Africa. R. E. Turner. Brit. Mus. 1924-136”; NMPC • 1 ♂; same collecting data as for paratypes; BMNH • 3 ♂♂; same collecting data as for preceding; NMPC • 2 ♂♂; “Port St. John, Pondoland. June 12-30. 1923”; “S. Africa. R. E. Turner. Brit. Mus. 1923-363”; NMPC • 1 ♂; “South Africa, TVL., Entabeni Forest Res., Soutpansberg, 23.00S 30.16E. 3-7.xi.1980, G. L. Prinsloo”; “National Coll. Of Insects Pretoria, S. Afr.”; NMPC.

#### **Description**

##### **Female** (habitus: Fig. 1)

COLOUR. Head (Figs 2–4) black. Mandibles reddish-brown. Antenna (Fig. 5) with scape mainly whitish, light brown apically; pedicel light brown; funicle with fu1–3 yellowish, fu4–7 and clava dark brown. Mesosoma (Figs 6–8) dorsally black, dark brown laterally. Legs with fore and mid coxae brown, hind coxa mainly whitish but brownish dorsally; fore and mid trochanters, trochantelli and femora brown, hind trochanter and trochantellus whitish, hind femur brown except apices whitish; tibiae yellowish-brown, apices lighter; tarsi whitish, pretarsi brown. Fore and hind wings slightly and uniformly infumate;

venation brown; setation brown. Metasoma with petiole dark brown (Fig. 8); gaster mainly dark brown, sometimes paler between gt2 and syntergum. Body setation, including large, symmetrically arranged setae, mainly brown, except with whitish setae on mesoscutal lateral lobes (Fig. 7).

**BODY LENGTH.** 2.5–3.2 mm.

**HEAD.** Clypeus finely coriaceous (Fig. 4); apical margin very slightly produced. Lower face with shallow piliferous punctures among reticulation. Upper face reticulate, with reticulation becoming denser towards vertex; scrobes moderately deep, smooth; parascrobal area with elongate cells (Fig. 2). Occiput alutaceous; margin blunt (Fig. 3). Toruli with lower margins from slightly below to about same level as lower margins of eyes (Fig. 2). Antenna (Fig. 5) with funicle strongly widening towards clava, with clava conspicuously asymmetric. Upper face and vertex with eight large setae. Head in dorsal view with width about twice length in dorsal view and in frontal view about  $1.2 \times$  height. POL about  $3.1 \times$  OOL. Eye height  $1.5 \times$  length, about  $3.3 \times$  malar space and about  $1.1 \times$  scape length. Head width about  $0.9 \times$  length of pedicel plus flagellum. Fu1 length about  $2.1 \times$  width; fu7 width about  $1.9 \times$  length; clava length about  $2.1 \times$  width.

**MESOSOMA.** Pronotal collar conspicuously narrower than mesoscutum, with six–eight large setae (Fig. 7). Mesonotum moderately setose dorsally (Fig. 7). Mesoscutum and axillae with dense reticulation. Scutellar disc similarly sculptured as mesoscutum and longitudinally striate-reticulate on frenal area (Fig. 7). Mesepisternum transversely striate-reticulate. Mesepimeron very superficially wrinkled; mesepimeral sulcus well developed (Fig. 6). Propodeum with intricate pattern of carinae forming a V-shaped area anteriorly and two large, smooth areas posterior and lateral to it; interspaces smooth to slightly wrinkled (Fig. 8). Macropterous; fore wing (Fig. 9) uniformly and densely setose except for small, elongate bare region. Mesosoma length  $1.5 \times$  width and about  $1.7 \times$  height. Pronotal collar about  $0.5 \times$  as long as mesoscutum and about  $0.9 \times$  as wide as mesoscutum. Mesoscutum width  $2.9 \times$  length. Scutellum length about equal to width. Propodeum length about  $0.5 \times$  scutellum length. Fore wing length about  $2.5 \times$  width; MV about  $5 \times$  SV and  $3.3 \times$  PV.

**METASOMA.** Petiole (Fig. 8) large, visible part quadrate, with several longitudinal costulae. Gaster (Fig. 1) acuminate, length about  $2.5 \times$  width; gt1 longest, length about equal to width, with hind margin broadly emarginate; gt2–5 short, transverse; gt6 wider than long, triangular; syntergum acutely pointed. Ovipositor sheaths conspicuously protruding beyond apex of gaster (Fig. 1). Cercal setae almost reaching gaster apex.

**Male** (habitus: Fig. 10)

Differs from female mainly as follows. Body length: 2.25–2.50 mm. Antenna (Fig. 11) with scape yellowish-brown; pedicel brown; flagellum dark brown. Coxae brown. Fu1 length about  $3.1 \times$  width; combined length of pedicel plus flagellum about  $2.1 \times$  head width. Propodeum more densely sculptured, with V-shaped area less conspicuous and smooth posterior areas indistinct. Petiole with visible part transverse. Gaster (when not inflated) much shorter than mesosoma, with only gt1 visible.

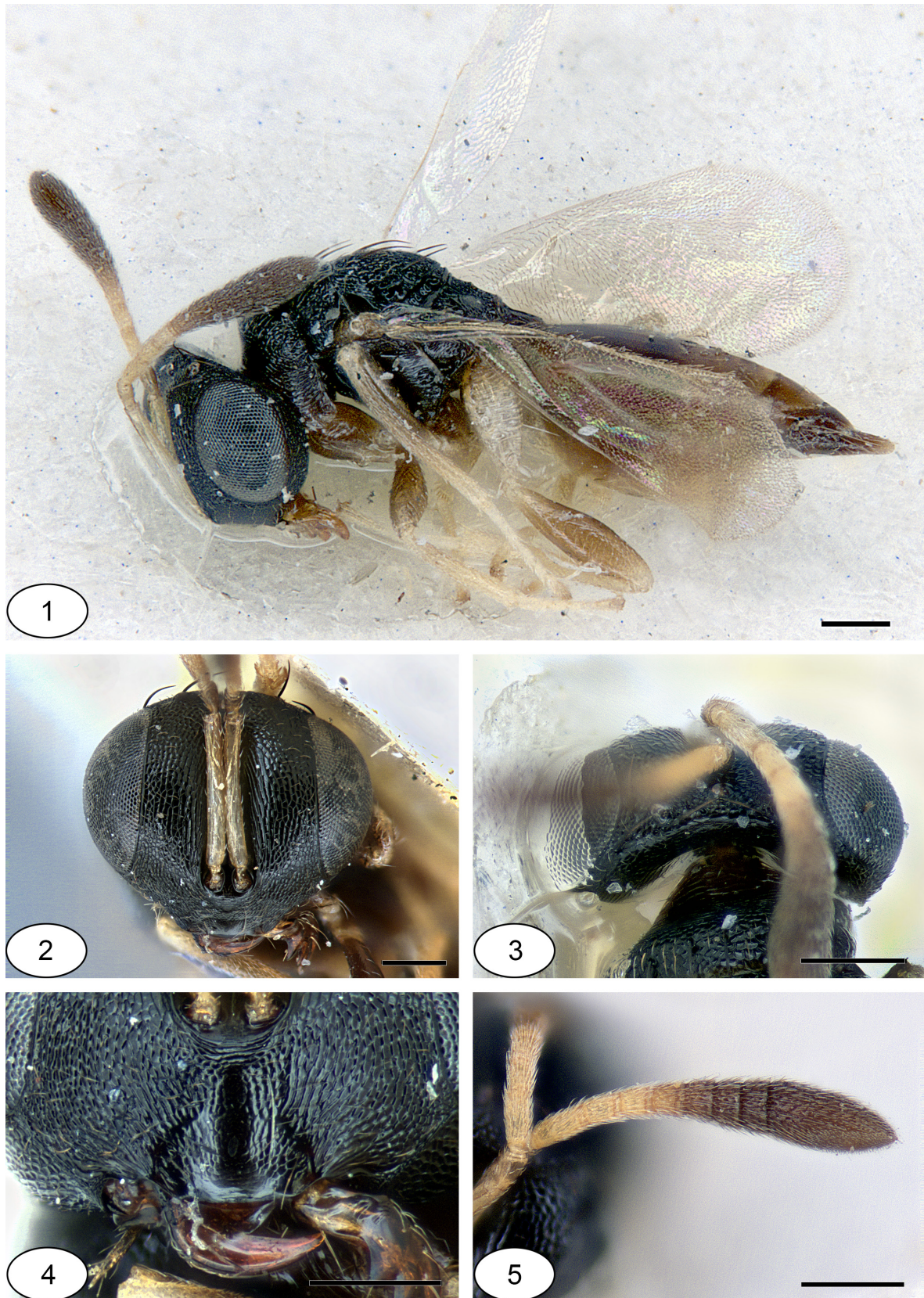
**Distribution**

South Africa.

**Remarks**

This species, together with *N. alboscapus*, *N. nigra* and *N. maculata* (the latter two very similar to each other and not treated here), belong to a small group of species with Afrotropical and Oriental

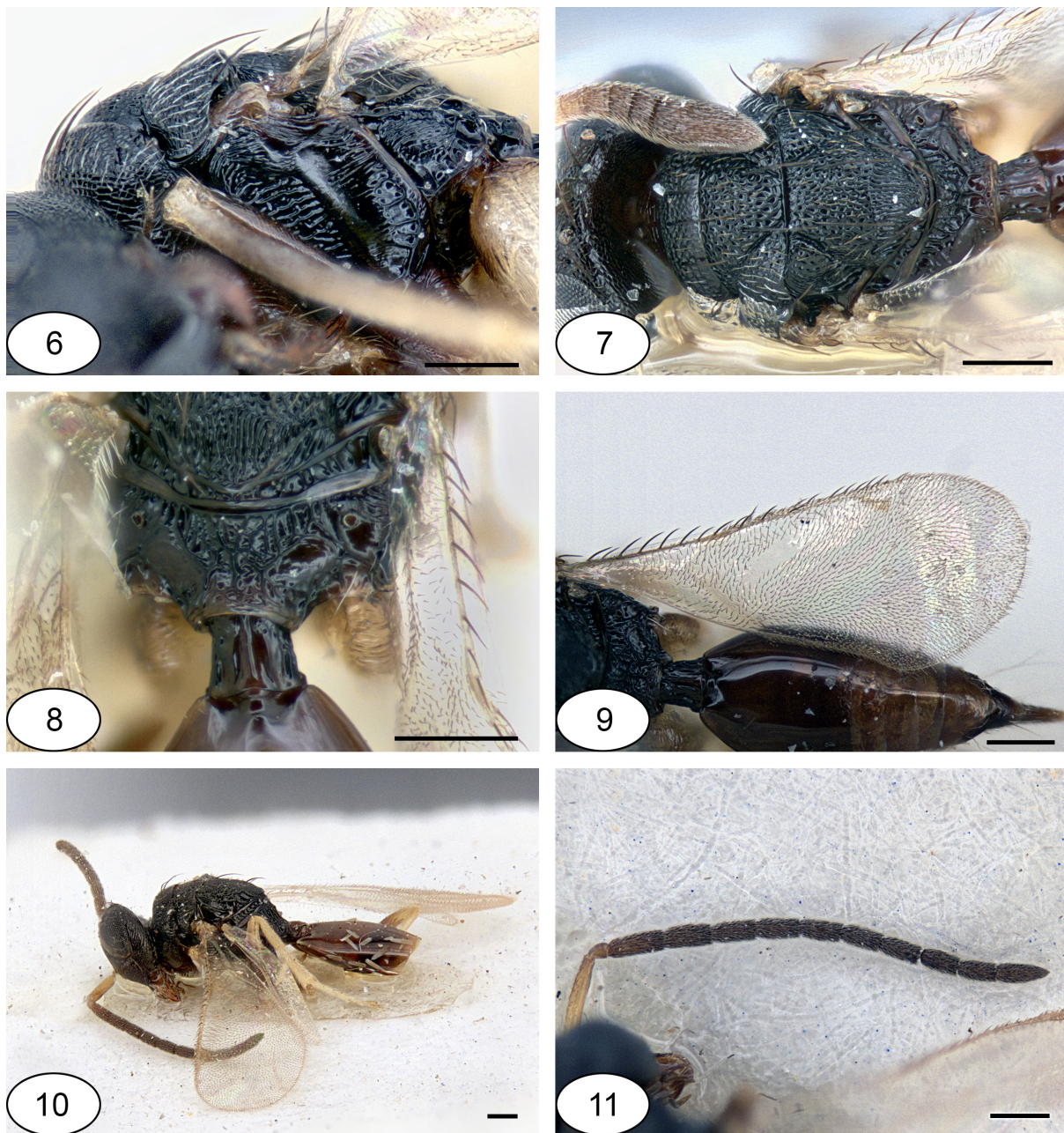




**Figs 1–5.** *Netomocera africana* Hedqvist, 1971. 1. Paratype, ♀, habitus, lateral view. 2. ♀, head, frontal view. 3. Paratype, ♀, head, dorsal view. 4. ♀, lower face. 5. Paratype, ♀, antenna. Scale bars: 0.2 mm.



distributions, which are easily recognized by the well-developed petiole and a V-shaped area on the propodeum, which is more distinct in females (Fig. 8). *Netomocera africana* differs from both *N. nigra* and *N. maculata* in having the face only slightly protruding at the level of the toruli (Fig. 1); mesoscutum and scutellum (except frenum) strongly reticulate, appearing dull (Fig. 7); scape about as long as eye height (Fig. 2); fore wing hyaline (Fig. 9); mesosoma uniformly dark brown (Fig. 1); clava brown (Fig. 5). For differences between *N. africana* and *N. alboscapus*, see the key.



**Figs 6–11.** *Netomocera africana* Hedqvist, 1971. **6.** ♀, mesosoma, lateral view. **7.** Paratype, ♀, mesosoma, dorsal view. **8.** Paratype, ♀, propodeum, dorsal view. **9.** Paratype, ♀, fore wing. **10.** Paratype, ♂, habitus, lateral view. **11.** Paratype, ♂, antenna. Scale bars: 0.2 mm.

*Netomocera alboscopus* Hedqvist, 1971

Figs 12–22

*Netomocera alboscopus* Hedqvist, 1971: 238 (holotype (♀) in NHRM, examined).

**Diagnosis**

**Both sexes**

Macropterous (Figs 12, 21). Toruli with lower margins above lower margins of eyes (Fig. 13). Mesepimeral sulcus conspicuous (Fig. 17). Propodeum with well-defined V-shaped area basally (Fig. 19). Visible part of petiole quadrate, with a few conspicuous longitudinal carinae (Fig. 19).

**Female**

Occiput margin sharp (Fig. 14). Eye height  $1.60\text{--}1.75 \times$  length. Scape  $0.7\text{--}0.8 \times$  as long as eye height.

**Material examined**

**Holotype**

D.R. CONGO • ♀; “Congo”; “Holotypus *Netomocera alboscopus* sp. n. ♀, K-J Hedqvist det. 1971”; “NHRM-HEVA000002236”; NHRM 000002236.

**Other material**

CAMEROON • 1 ♀; “Cameroun, Mbalmayo, VII.93. Maudsley”; “♀ *Netomocera magna* sp. n., det. Z. Bouček 1993”; NMPC.

D.R. CONGO • 1 ♀; “Congo belge: Kivu, Rutshuru (riv. Fuku), 1250 m. 5.VII.1935, G. F. de Witte: 1621”; RMCA • 1 ♀; same data as for preceding; “1285 m., 12.VII.1935”; RMCA • 1 ♀; same data as for preceding; “1285 m., 6.VII.1935”; RMCA • 1 ♀; “Congo Belge: P.N.A., 26-28-VIII-1953, P. Vanschuytbroeck & V. Hendrickx 4999-5005”; “Secteur Tshiaberimu, Riv. Mbulikerere, affl. dr. Talia N, 2720 m”; RMCA • 1 ♀; “Congo belge: Uele Monga, 450 m. 18-IV- au 8-V-1935, G. F. de Witte: 1338”; RMCA • 1 ♂; “Congo Belge: P.N.A., 3-IX-1952, P. Vanschuytbroeck & J. Kekenbosch 931-33”; RMCA • 1 ♂; same data as for preceding; “7-15-VII-1955, P. Vanschuytbroeck 13274-309”; RMCA.

GABON • 1 ♀; “Gabon, Province de l’Ogooue-Maritime, Réserve des Monts Doudou, 25.2 km 304° NW Doussala, 2°13.63’ S, 10° 23.67’ E, 660m”; “17.iii.2000, S. van Noort, Sweep, GA00-S126, Coastal Lowland Rainforest, undergrowth, low canopy in forest”; “SAM-HYM-P0023814”; SAMC P0023814.

IVORY COAST • 1 ♂; “Ivory Coast, Bouaké – rice field, III 1980, P. Cochereau”; NMPC.

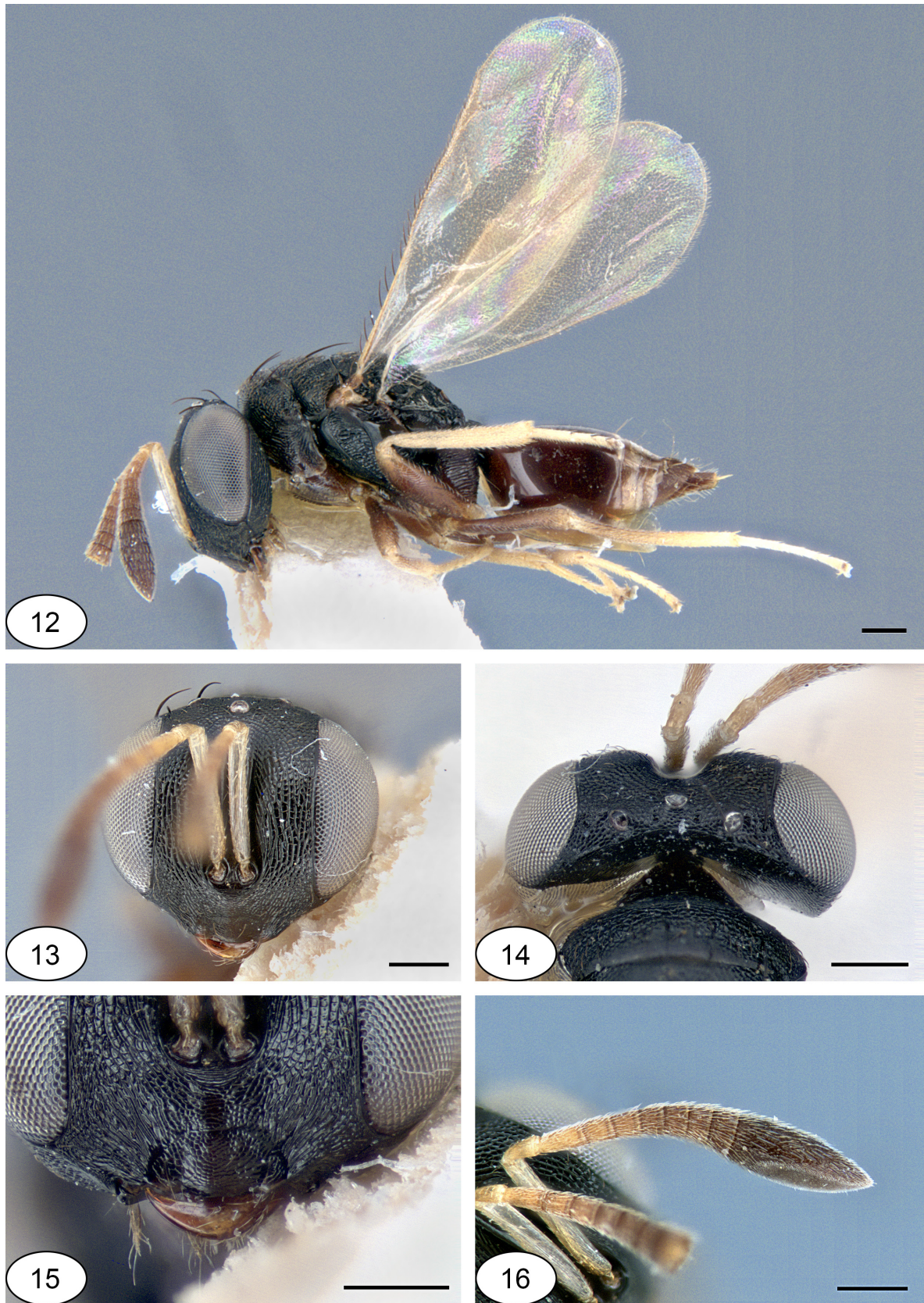
ZIMBABWE • 1 ♂; “Rhodesia, Salisbury, A. Watsham /WF124, (ii)75”; NMPC • 1 ♂; same data as for preceding; “WF99, xii.74”; NMPC.

**Description**

**Female** (habitus: Fig. 12)

COLOUR. Head (Figs 13–15) black. Mandibles reddish-brown. Antenna (Fig. 16) with scape whitish to yellowish-brown; pedicel light brown to yellowish-brown; funicle light brown to yellowish-brown basally and increasingly darker towards dark brown to black clava. Mesosoma (Figs 17–19) black. Legs with coxae dark brown; fore and mid trochanters and trochantelli brown, hind trochanter and trochantellus light brown to yellowish-brown; femora brown, apical apices lighter; tibiae yellowish-brown except fore and hind tibiae basally darker; tarsi whitish to yellowish-brown, pretarsi brown. Fore and hind wings slightly and uniformly infumate; venation brown; setation brown. Metasoma





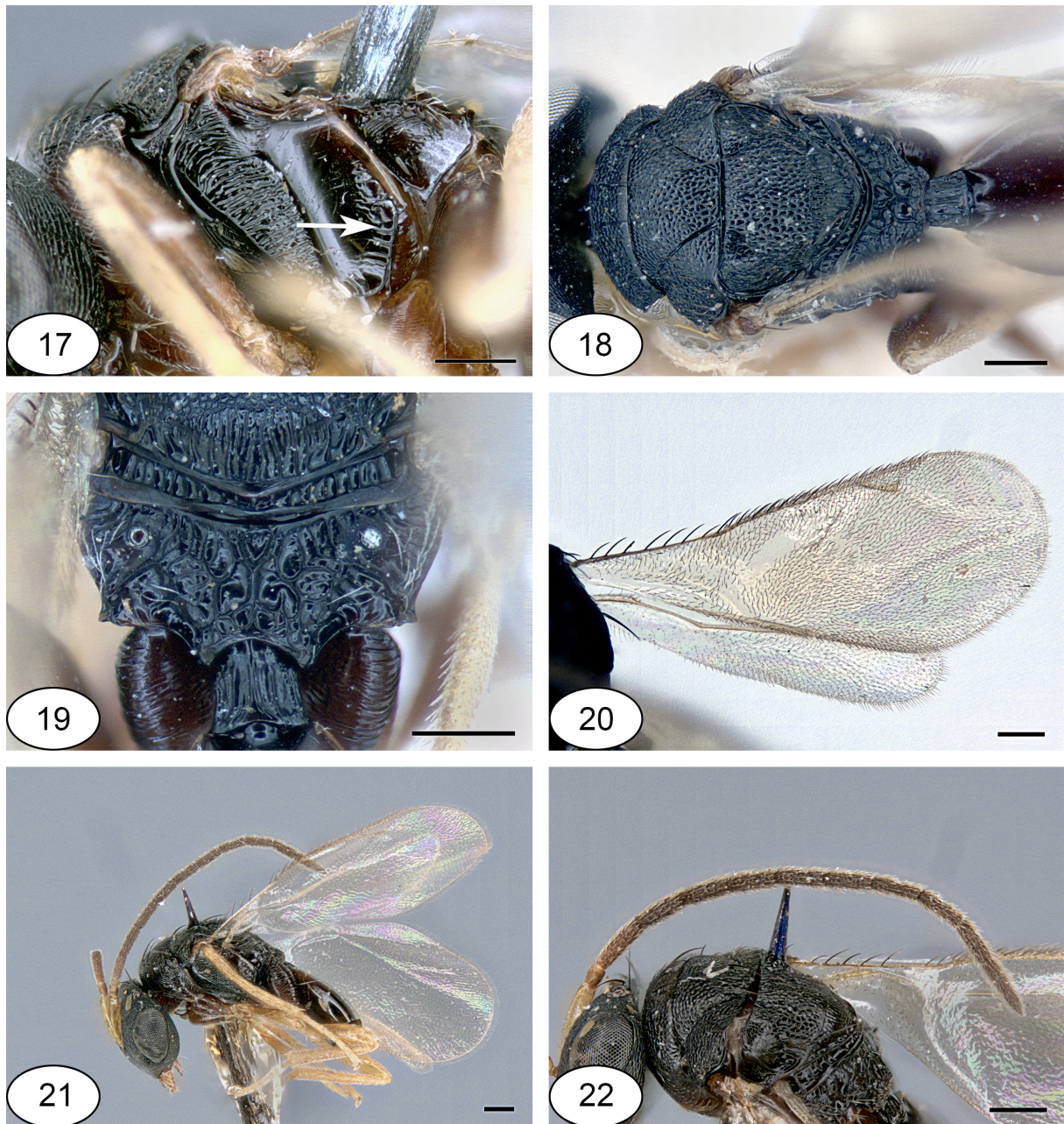
**Figs 12–16.** *Netomocera alboscopus* Hedqvist, 1971, holotype, ♀. **12.** Habitus, lateral view. **13.** Head, frontal view. **14.** Head, dorsal view. **15.** Lower face. **16.** Antenna. Scale bars: 0.2 mm.



with petiole black (Fig. 19); gaster dark brown to black. Body setation, including large, symmetrically arranged setae, dark brown.

BODY LENGTH. 2.75–3.25 mm.

HEAD. Clypeus finely coriaceous (Fig. 15); apical margin very slightly produced. Lower face with shallow piliferous punctures among reticulation. Upper face reticulate, with reticulation becoming



**Figs 17–22.** *Netomocera alboscapus* Hedqvist, 1971. **17.** ♀, D.R. Congo, mesosoma, lateral view (mesepimeral sulcus indicated). **18.** Holotype, ♀, mesosoma, dorsal view. **19.** Holotype, ♀, propodeum, dorsal view. **20.** Holotype, ♀, fore and hind wings. **21.** ♂, D.R. Congo, habitus, lateral view. **22.** ♂, D.R. Congo, antenna. Scale bars: 0.2 mm.

denser towards vertex; scrobes moderately deep, smooth; parascrobal area with elongated cells (Fig. 13). Occiput alutaceous; margin sharp (Fig. 14). Toruli with lower margins above lower margins of eyes (Fig. 13). Antenna (Fig. 16) with funicle strongly widening towards clava, with clava conspicuously asymmetric. Upper face and vertex with eight large setae. Head in dorsal view with width  $2.0\text{--}2.2 \times$  length (85:38) and in frontal view about  $1.1 \times$  height (85:75). POL about  $2.5 \times$  OOL (23:9). Eye height about  $1.6 \times$  length (55:35), about  $4.6 \times$  malar space (55:12) and about  $1.4 \times$  as long as scape (55:40). Head width  $0.80\text{--}0.85 \times$  length of pedicel plus flagellum (85:100). Fu1 length  $1.7\text{--}2.4 \times$  width (12:5); fu7 width  $1.7\text{--}2.3 \times$  length (11.0:6.5); clava length  $2.8\text{--}3.1 \times$  width (40:13).

**MESOSOMA.** Pronotal collar conspicuously narrower than mesoscutum, with six–eight large setae (Fig. 18). Mesonotum moderately setose dorsally (Fig. 18). Mesoscutum and axillae with dense reticulation (Fig. 18). Scutellar disc similarly sculptured as mesoscutum and longitudinally striate-reticulate on frenal area (Fig. 18). Mesepisternum transversely striate-reticulate. Mesepimeron mainly smooth; mesepimeral sulcus well developed (Fig. 17). Propodeum with intricate pattern of carinae forming a V-shaped area anteriorly, the rest with irregular carinae; interspaces smooth to slightly wrinkled (Fig. 19). Macropterous; fore wing (Fig. 20) uniformly and densely setose except for small, elongate bare region. Mesosoma length  $1.4 \times$  width (100:73) and about  $1.8 \times$  height (100:55). Pronotal collar about  $0.3 \times$  as long as mesoscutum (10:30) and about  $0.8 \times$  as wide as mesoscutum (61:73). Mesoscutum width  $2.3\text{--}2.4 \times$  length (73:30). Scutellum length subequal to width (40:42). Propodeum length about  $0.5 \times$  scutellum length (20:40). Fore wing length  $2.4\text{--}2.8 \times$  width (195:70); MV  $3.4\text{--}3.9 \times$  SV (55:14) and  $1.9\text{--}2.3 \times$  PV (55:24).

**METASOMA.** Petiole (Fig. 19) large, visible part quadrate, with several longitudinal costulae. Gaster (Fig. 12) ovate, length twice width (100:50); gt1 longest, width about  $0.9 \times$  length (50:58), with hind margin broadly emarginate; gt2–5 short, transverse; gt6 wider than long, triangular; syntergum acutely pointed. Ovipositor sheaths conspicuously protruding beyond apex of gaster. Cercal setae almost reaching gaster apex.

#### **Male** (habitus: Fig. 21)

Differs from female mainly as follows. Body length: 1.5–2.0 mm. Antenna (Fig. 22) with flagellum dark brown. Fu1 length about  $2.7 \times$  width; combined length of pedicel plus flagellum about  $2.5 \times$  head width. Gaster (when not inflated) much shorter than mesosoma, with only gt1 visible.

#### **Distribution**

D.R. Congo; Cameroon, Gabon, Ivory Coast, Zimbabwe (new records).

#### **Remarks**

See *N. africana*. *Netomocera alboscapus* may be only a variant of *N. africana* with larger eyes than the latter species, but more material is needed to clarify this.

#### *Netomocera amethysta* sp. nov.

[urn:lsid:zoobank.org:act:B0B76349-1A0A-44B3-A948-45BFA1F90AD0](https://doi.org/10.21203/rs.3.rs-1111111/v1)

Figs 23–31

#### **Diagnosis**

##### **Female**

Macropterous (Fig. 23). Head yellowish (Figs 24–25). Fore wing (Fig. 31) mainly brownish except for one bare region, swollen and shining violet-blue when examined under some angles of light, and with four hyaline areas covered with white setae: one apically in basal cell, a U-shaped region behind bare



region and two subapical spots. Basal half of flagellum yellow, the rest brownish (Fig. 27). Clypeal margin shallowly emarginate (Fig. 26). Upper face and vertex with ten large setae (Fig. 25). Occiput margin blunt (Fig. 25). Mesepimeral sulcus inconspicuous. Propodeum with median area almost without carinae, without a well-defined V-shaped area basally (Fig. 30). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 29).

### **Etymology**

The name of the species (noun in apposition) refers to the characteristic blue-violet colour of the fore wing bare region, similar to the colour of amethyst quartz.

### **Material examined**

#### **Holotype**

DOMINICAN REPUBLIC • ♀; “Pedernales, Sierra de Bahoruco, «Las Abejas», 1300m, 17-19.I.1989, L. Masner, cloud forest”; on triangular card, left antenna with fu7 and clava missing; CNC.

### **Description**

#### **Female** (habitus: Fig. 23)

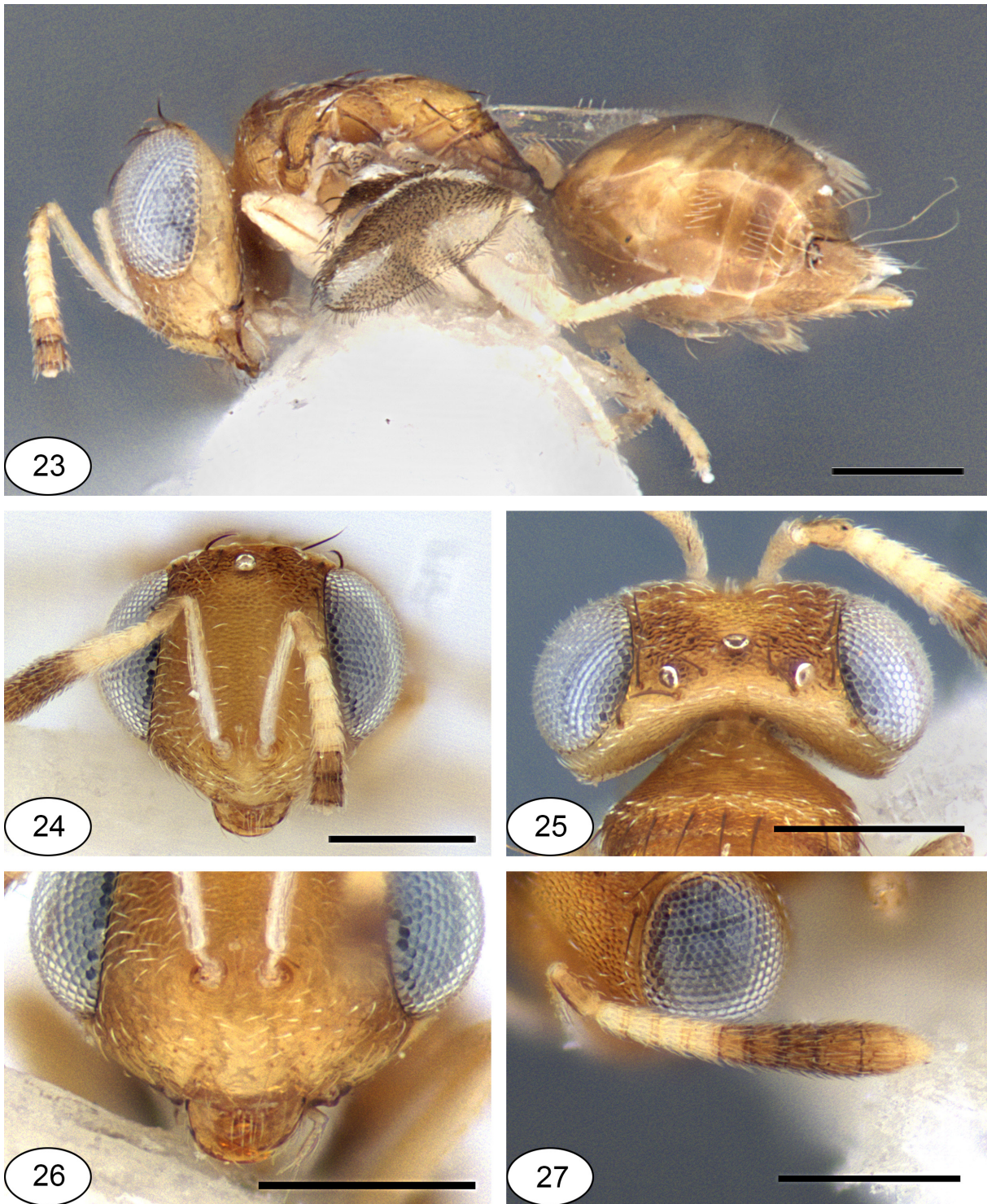
**COLOUR.** Head (Figs 24–26) mainly orange-yellow, except vertex and genae below eyes brownish. Mandibles orange, teeth reddish-brown. Antenna (Fig. 27) with scape pale yellow; pedicel dorsally brown, ventrally yellowish; anellus brown; fu1–4 yellow, fu5–7 brown; clava mostly brown, becoming lighter towards yellowish apex. Mesosoma (Figs 28–30) dorsally mainly orange, darker on pronotal collar, axillae and propodeum; laterally orange except darker over lower posterior half of mesopleuron and entire metapleuron. Legs with fore coxa whitish, mid and hind coxae brownish; femora mainly whitish but becoming brownish apically; tibiae and tarsi light brown. Fore wing (Fig. 31) mainly brownish except for one bare region, swollen and shining violet-blue when examined under some angles of light, and four hyaline areas covered with white setae: one apically in basal cell, a U-shaped region behind bare region and two subapical spots; venation brown. Hind wing hyaline. Metasoma (Fig. 23) with petiole dark brown; gaster mainly uniformly brown, with a few lighter spots dorsally. Body setation whitish except for several large, symmetrically arranged dark brown setae.

**BODY LENGTH.** 1.25 mm.

**HEAD.** Clypeus almost smooth; apical margin very slightly emarginated (Fig. 26). Lower face with shallow piliferous punctures among reticulation. Upper face, including shallow scrobes and adjacent areas, and vertex becoming densely punctulate-reticulate (Figs 24–25). Occiput reticulate-imbricate; margin abrupt, but not sharply defined (Fig. 25). Toruli with lower margins slightly below lower margins of eyes (Fig. 24). Antenna (Fig. 27) with funicle gradually widening towards clava, with clava very slightly asymmetric. Upper face and vertex with ten large setae. Head in dorsal view with width  $3.15 \times$  length (60:19) and in frontal view about  $1.2 \times$  height (60:50). POL about  $4 \times$  OOL (18.0:4.5). Eye height about  $1.4 \times$  length (34:25), about  $2.6 \times$  malar space (34:13) and about  $1.2 \times$  scape length (34:29). Head width  $0.95 \times$  length of pedicel plus flagellum (60:63). Fu1 quadrate (5:5); fu7 width  $1.5 \times$  length (7.5:5.0); clava length  $2.5 \times$  width (20:8).

**MESOSOMA.** Pronotal collar narrower than mesoscutum, with ten large setae (Fig. 29). Mesonotum moderately setose dorsally (Fig. 29). Mesoscutum and axillae with dense punctulate reticulation (Fig. 29). Scutellar disc densely punctulate-reticulate anteriorly and becoming longitudinally striate-reticulate posteriorly; frenal area coriaceous (Figs 29–30). Upper mesepisternum smooth; lower mesepisternum reticulate. Mesepimeron mainly smooth, becoming shallowly punctulate ventrally and posteriorly; mesepimeral sulcus mostly inconspicuous (Fig. 28). Propodeum mainly smooth to slightly wrinkled, except for straight median carina and incomplete plicae (Fig. 30). Macropterous; fore wing (Fig. 31) with





**Figs 23–27.** *Netomocera amethysta* sp. nov., holotype, ♀. **23.** Habitus, lateral view. **24.** Head, frontal view. **25.** Head, dorsal view. **26.** Lower face. **27.** Antenna. Scale bars: 0.2 mm.



basal cell uniformly setose; bare region reaching about middle of marginal vein; setae on infusate areas darker, longer and thicker than those on hyaline areas; setae below parastigma forming a large patch of conspicuously thicker and longer setation than that on other areas of wing. Mesosoma length about  $1.4 \times$  width (68:47) and about  $1.5 \times$  height (47:46). Pronotal collar  $0.2 \times$  as long as mesoscutum (4:20) and about  $0.8 \times$  as wide as mesoscutum (29:28). Mesoscutum width  $2.35 \times$  length (47:20). Scutellum length subequal to width (24:26). Propodeum length about  $0.5 \times$  scutellum length (15:29). Fore wing length  $2.5 \times$  width (120:48); MV  $7 \times$  SV (35:5) and about  $4.7 \times$  PV (35.0:7.5).

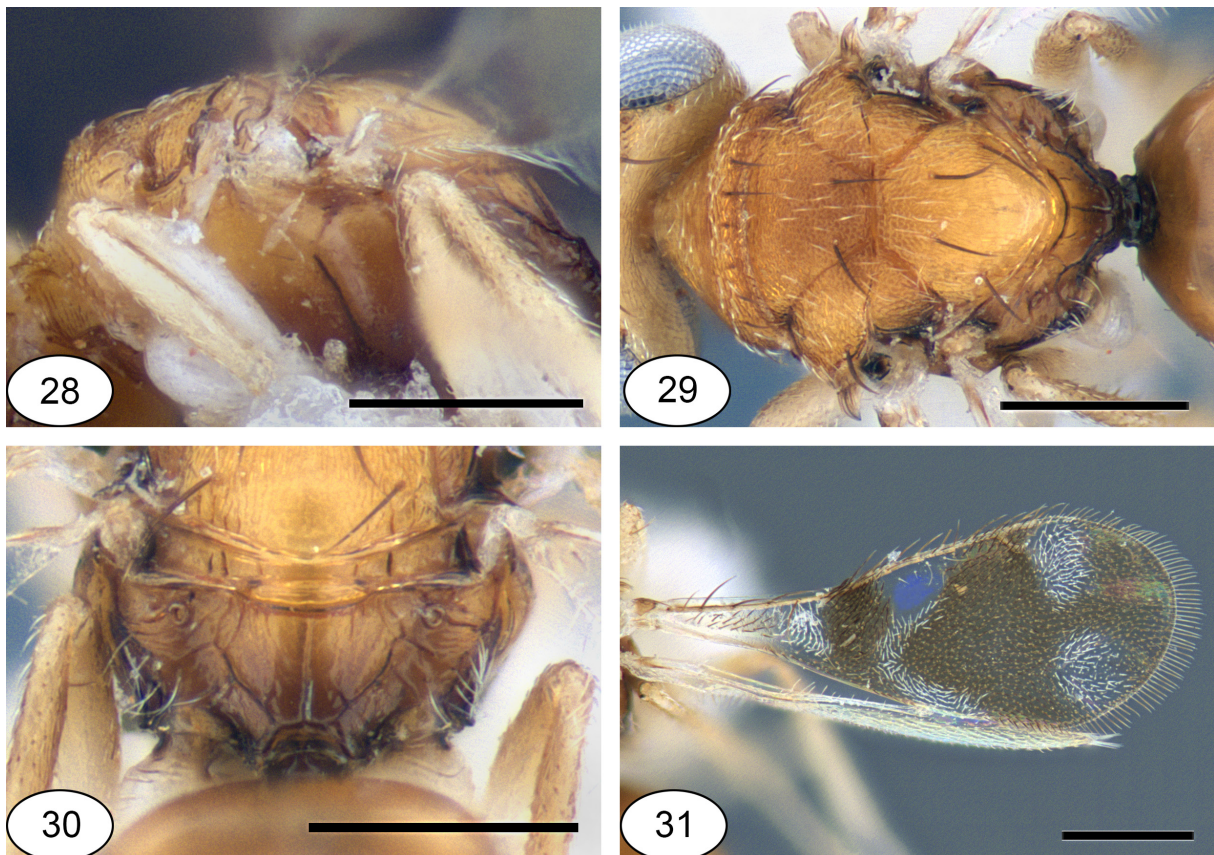
**METASOMA.** Petiole (Fig. 29) barely visible, transverse, smooth. Gaster (Fig. 23) ovate, length about  $1.5 \times$  width (75:51); gt1 longest, width about  $1.3 \times$  length (51:40), with posterior margin slightly produced; gt2–5 short; syntergum acutely pointed. Ovipositor sheaths not protruding beyond apex of gaster. Cercal setae surpassing apex of gaster.

#### Male

Unknown.

#### Distribution

Dominican Republic.



**Figs 28–31.** *Netomocera amethysta* sp. nov., holotype, ♀. **28.** Mesosoma, lateral view. **29.** Mesosoma, dorsal view. **30.** Propodeum, dorsal view. **31.** Fore and hind wings. Scale bars: 0.2 mm.

**Remarks**

This is one of the most remarkable species of the genus due to its unusual coloration and setal pattern of the fore wing (Fig. 31). It is also unusual in having ten large setae on the head (Fig. 25) instead of eight as in most other species and ten large setae on the pronotum rather than six–eight. The propodeum is also unusually without carinae, except for a median carina and plicae (Fig. 30). All of these characters indicate that the new species may belong to a different genus, but at present I prefer to keep it in *Netomocera*, at least until more Neotropical material is examined.

*Netomocera celebensis* sp. nov.

[urn:lsid:zoobank.org:act:C7F1B2F4-E1BC-46C7-B659-EA2A5EA7BDC6](https://zoobank.org/urn:lsid:zoobank.org:act:C7F1B2F4-E1BC-46C7-B659-EA2A5EA7BDC6)

Figs 32–40

**Diagnosis****Female**

Head and mesosoma brown (Figs 33–34, 37–38). Flagellum yellowish, clava darkening towards apex (Fig. 36). Macropterous (Fig. 32); fore wing subhyaline (Fig. 40). Clypeus wider than high; margin produced (Fig. 35). Scrobes shallow and reticulate. Upper face and vertex with eight large setae. Occiput margin sharply defined (Fig. 34). Eye height about  $2.5 \times$  malar space. POL about  $5.5 \times$  OOL. Antenna strongly clavate (Fig. 36). Pronotal collar not unusually long or wide (Fig. 38). Mesoscutum, scutellum and axillae with shallow reticulation (Fig. 38); scutoscutellar sutures deep, distinct (Fig. 38); frenal area distinct, i.e., sculpture at least slightly different than rest of scutellum (Fig. 39). Setation of mesonotum not unusually dense and conspicuous (Fig. 38). Mesepimeral sulcus conspicuous (Fig. 37). Propodeum without a well-defined V-shaped area basally (Fig. 39). Fore wing with basal third extensively setose except for narrow bare region (Fig. 40); MV about  $5.3 \times$  SV. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 39).

**Etymology**

The name of the species (noun in the genitive case) refers to the collecting place, Celebes, being an older name of Sulawesi.

**Material examined****Holotype**

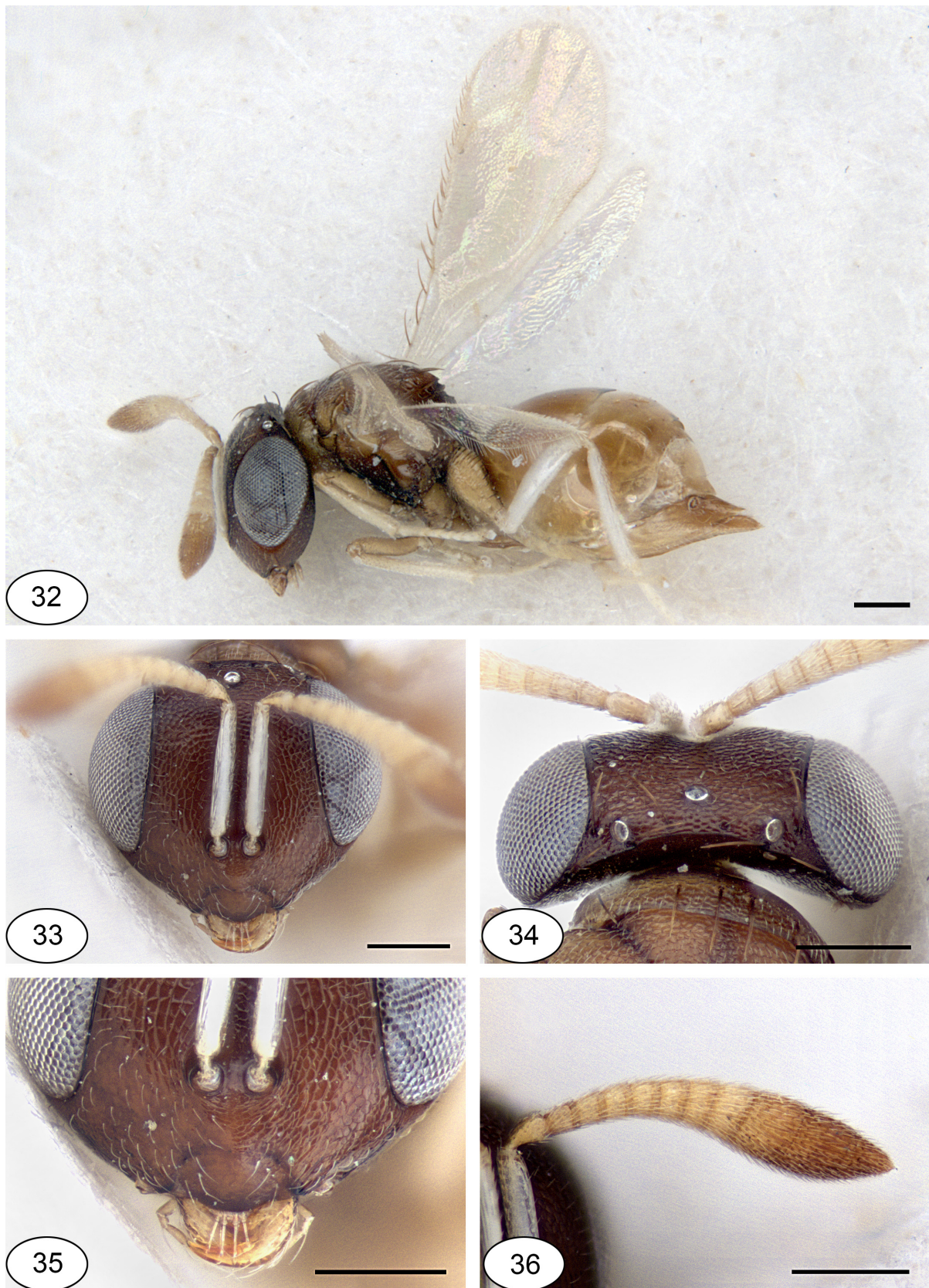
INDONESIA • ♀; “Sulawesi, Dumoga-Bone NP, Mogogonipa, vi.1985 AD Austin”; entire, on rectangular card; BMNH.

**Description****Female** (habitus: Fig. 32)

COLOUR. Head (Figs 33–35) brown. Mandibles light brown, teeth darker. Antenna (Fig. 36) with scape whitish, pedicel pale yellow except brownish dorsally, funicle pale yellow and clava brown. Mesosoma (Figs 37–39) reddish-brown, but sutures, metanotum, propodeum and mesepisternum darker. Legs with coxae light brown, fore and mid trochanters, trochantelli and femora light brown, hind trochanter, trochantellus and femur whitish, tibiae and tarsi whitish, pretarsi brown. Fore wing (Fig. 40) slightly and uniformly infumate; venation light brown; setation brown. Hind wing hyaline. Metasoma with petiole dark brown (Fig. 39); gaster mainly brown, ventrally paler. Body setation whitish except for several large, symmetrically arranged, dark brown setae.

BODY LENGTH. 2.3 mm.



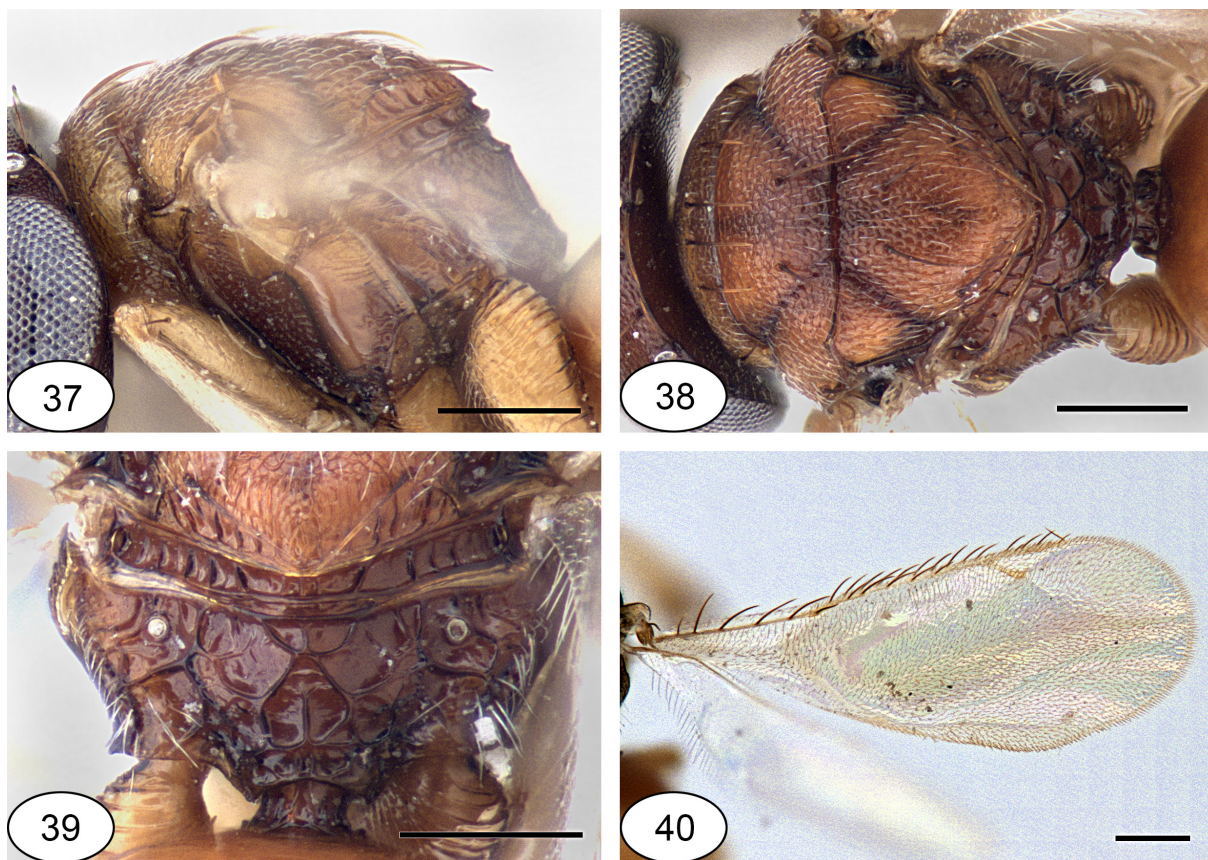


**Figs 32–36.** *Netomocera celebensis* sp. nov. 32. Holotype, ♀, habitus, lateral view. 33. Head, frontal view. 34. Head, dorsal view. 35. Lower face. 36. Antenna. Scale bars: 0.2 mm.



**HEAD.** Clypeal almost smooth; apical margin slightly produced (Fig. 35). Lower face with shallow piliferous punctures among reticulation. Upper face, including shallow scrobes and adjacent areas, reticulate, with reticulation becoming denser towards vertex. Occiput smooth; margin sharply defined (Fig. 34). Toruli with lower margins slightly below lower margins of eyes (Fig. 33). Antenna with flagellum strongly widening towards clava; clava conspicuously asymmetric (Fig. 36). Upper face and vertex with eight large setae. Head in dorsal view with width about  $2.2 \times$  length (49:22) and in frontal view about  $1.1 \times$  height (49:43). POL about  $5.5 \times$  OOL (16.5:3.0). Eye height  $1.4 \times$  length (28:20), about  $2.5 \times$  malar space (28:11) and about  $1.3 \times$  scape length (28:22). Head width subequal to length of pedicel plus flagellum (49:47). Fu1 length about  $1.2 \times$  width (3.5:3.0); fu7 width  $1.75 \times$  length (7:4); clava length about  $2.2 \times$  width (19.0:8.5).

**MESOSOMA.** Pronotal collar narrower than mesoscutum, with six large setae (Fig. 38). Mesonotum moderately setose dorsally (Fig. 38). Mesoscutum and axillae with shallow reticulation (Fig. 38). Scutellum on anterior part with shallow reticulation and longitudinally striate-reticulate on frenal area (Figs 38–39). Mesepisternum densely reticulate. Mesepimeron mainly smooth, except for shallow striation dorsally; mesepimeral sulcus conspicuous (Fig. 37). Propodeum with intricate pattern of carinae, interspaces large, smooth to slightly wrinkled (Fig. 39). Macropterous; fore wing (Fig. 40) uniformly and densely setose except for small, elongate bare region. Mesosoma length  $1.25 \times$  width (50:40) and about  $1.4 \times$  height (50:35). Pronotal collar about  $0.3 \times$  as long as mesoscutum (4.5:14.0) and about  $0.8 \times$  as wide as mesoscutum (32:40). Mesoscutum width  $2.85 \times$  length (40:14). Scutellum length



**Figs 37–40.** *Netomocera celebensis* sp. nov., holotype, ♀. **37.** Mesosoma, lateral view. **38.** Mesosoma, dorsal view. **39.** Propodeum, dorsal view. **40.** Fore wing. Scale bars: 0.2 mm.

about  $0.9 \times$  width (21:23). Propodeum length about  $0.6 \times$  scutellum length (13:21). Fore wing length about  $2.6 \times$  width (103:40); MV about  $5.3 \times$  SV (32:6) and about  $2.1 \times$  PV (32:15).

**METASOMA.** Petiole (Fig. 39) very short, transverse, with a few longitudinal costulae. Gaster (Fig. 32) ovate, length about  $1.9 \times$  width (75:39); gt1 longest, width  $1.3 \times$  length (39:30), with hind margin slightly produced; gt2–6 short; syntergum acutely pointed. Ovipositor sheaths slightly protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

#### **Male**

Unknown.

#### **Distribution**

Indonesia (Sulawesi).

#### **Remarks**

The only known female of this species most closely resembles females of *N. ramakrishnai*, from which it differs mainly in the colouration of the head and antenna, the wider than high clypeus and the longer POL.

*Netomocera cyanocephala* sp. nov.

[urn:lsid:zoobank.org:act:2D81D3A2-C148-4606-BA4F-1560395FA013](https://zoobank.org/act:2D81D3A2-C148-4606-BA4F-1560395FA013)

Figs 41–53

#### **Diagnosis**

##### **Both sexes**

Head with strong blue-violet reflections (Figs 42–43). Macropterous (Figs 41, 52). Clypeal margin very shallowly emarginate, almost straight (Fig. 44). Scrobes shallow and finely reticulate. Upper face and vertex with eight large setae. Pronotal collar not unusually long or wide (Fig. 47). Mesepimeral sulcus conspicuous (Fig. 46). Propodeum without well-defined V-shaped area basally (Fig. 48). Fore wing with basal third extensively setose except for narrow bare region (Figs 49–51). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 48).

##### **Female**

Fore wing usually with two brownish regions (Figs 49–50), sometimes hyaline (Fig. 51). Occiput margin sharply defined (Fig. 43). Eye height  $2.6$ – $2.7 \times$  malar space. POL  $2.90$ – $3.75 \times$  OOL. Mesoscutum, scutellum and axillae with shallow reticulation (Fig. 47); scutoscutellar sutures deep, distinct; frenal area distinct, i.e., sculpture at least slightly different than on rest of scutellum (Fig. 47). Setation of mesonotum not unusually dense and conspicuous (Fig. 47). MV  $4$ – $5 \times$  SV.

##### **Male**

Mesosoma uniformly dark brown to black (Fig. 52).

#### **Etymology**

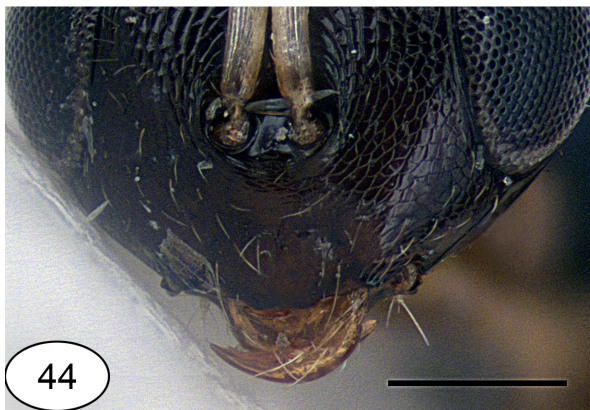
The name of the species (adjective) refers to the distinct bluish colouration of the head.

#### **Material examined**

##### **Holotype**

PAPUA NEW GUINEA • ♀; “PAPUA N. GUINEA, Mt. Hagen 1600 m, 17.XII.82. Bouček”; entire, on rectangular card; BMNH.





**Figs 41–45.** *Netomocera cyanocephala* sp. nov., holotype, ♀. **41.** Habitus, lateral view. **42.** Head, frontal view. **43.** Head, dorsal view. **44.** Lower face. **45.** Antenna. Scale bars: 0.2 mm.

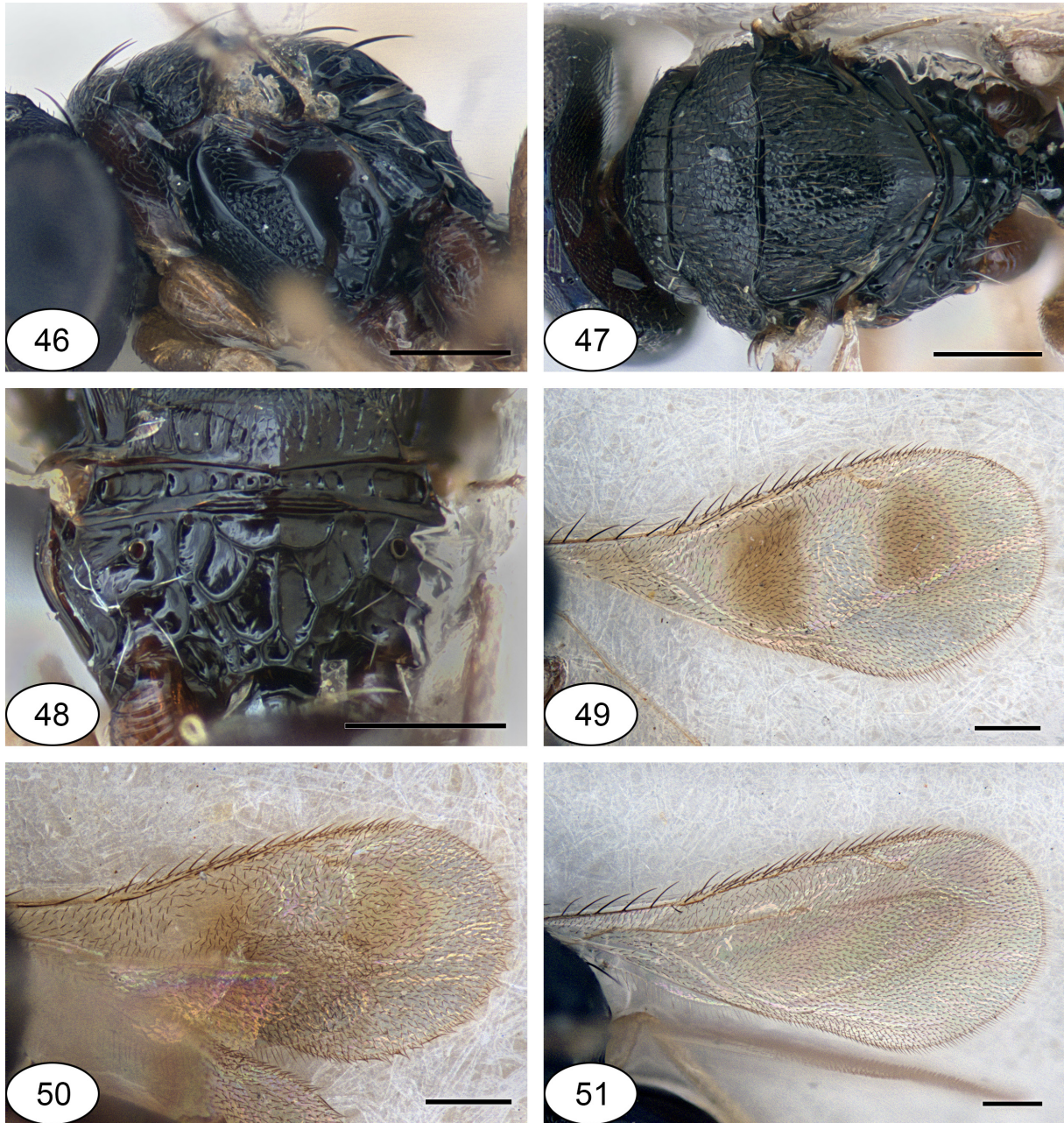


**Allotype**

PAPUA NEW GUINEA • ♂; same data as for holotype; BMNH.

**Additional paratypes**

PAPUA NEW GUINEA • 1 ♀; same data as for holotype; “Netomocera”; BMNH • 4 ♂♂; same data as for holotype; BMNH • 2 ♂♂; same data as for holotype; “15.XII.82”; BMNH • 1 ♀; “PAPUA N. GUINEA, Lae, 16.xii.82. Bouček”; BMNH.



**Figs 46–51.** *Netomocera cyanocephala* sp. nov. **46.** Holotype, ♀, mesosoma, lateral view. **47.** Holotype, ♀, mesosoma, dorsal view. **48.** Holotype, ♀, propodeum, dorsal view. **49.** Holotype, ♀, fore wing. **50.** Paratype, ♀, fore wing. **51.** Paratype, ♀, fore wing. Scale bars: 0.2 mm.



## Description

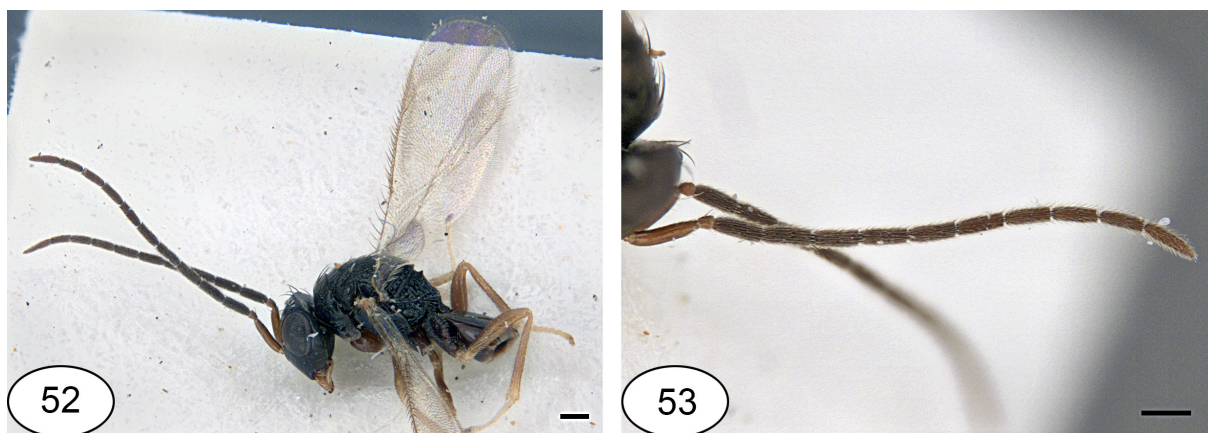
### Female (habitus: Fig. 41)

COLOUR. Head (Figs 42–43) black, with conspicuous blue-violet reflections on upper face and vertex. Mandibles brown. Antenna (Fig. 45) with scape whitish except brownish apically; pedicel and flagellum brown. Mesosoma (Figs 46–48) blackish except for dark reddish-brown pronotal panels and neck. Legs with fore coxa usually reddish-brown, mid and hind coxae darker, occasionally all coxae dark brown; femora and tibiae yellowish to brown, occasionally hind femur lighter than fore or mid femora; tarsi pale yellow to dark yellow, pretarsi brown. Fore wing (Figs 49–51) hyaline or with two large brownish regions, one behind marginal vein, the other behind stigma, of variable intensity; venation brown; setation brown. Hind wing hyaline. Metasoma (Fig. 41) with petiole black; gaster mainly dark brown. Body setation light brown except for several large, symmetrically arranged dark brown setae.

BODY LENGTH. 1.80–2.25 mm.

HEAD. Clypeus virtually smooth; apical margin very slightly emarginate, almost straight (Fig. 44). Lower face coriaceous to shallowly reticulate, with piliferous punctures more or less distinct. Upper face reticulate and vertex shallowly reticulate to coriaceous (Fig. 43); scrobes shallow, reticulate; parascrobal region with elongate cells (Fig. 42). Occiput alutaceous; margin sharply defined (Fig. 43). Toruli with lower margins from about level with to slightly above lower margins of eyes (Fig. 42). Antenna (Fig. 45) with funicle strongly widening towards clava, with clava conspicuously asymmetric. Upper face and vertex with eight large setae. Head in dorsal view with width about  $2.3 \times$  length (47.5:20.5) and in frontal view  $1.20\text{--}1.25 \times$  height (47.5:40.0). POL  $2.90\text{--}3.75 \times$  OOL (15:4). Eye height about  $1.4 \times$  length (26:18),  $2.6\text{--}2.7 \times$  malar space (26:10) and about  $1.1 \times$  scape length (26:23). Head width  $0.9\text{--}1.0 \times$  length of pedicel plus flagellum (47.5:47.0). Fu1 length about  $1.4\text{--}2.0 \times$  width (5.0:3.5); fu7 width  $1.2\text{--}1.4 \times$  length (6:5); clava length about  $2.3\text{--}2.7 \times$  width (19:8).

MESOSOMA. Pronotal collar narrower than mesoscutum, with six large setae (Fig. 47). Mesonotum moderately setose dorsally (Fig. 47). Pronotal collar dorsally, mesoscutum and axillae shiny, shallowly reticulate, with origins of setae sometimes visible as small punctures (Fig. 47). Scutellum reticulate, except for coriaceous and more or less longitudinally striate frenal area (Fig. 47). Upper mesepisternum mainly smooth; lower mesepisternum mainly punctulate-reticulate, occasionally transversally striate (Fig. 46). Mesepimeron mainly smooth; mesepimeral sulcus conspicuous (Fig. 46). Propodeum with intricate pattern of carinae, interspaces mainly smooth (Fig. 48). Macropterous; fore wing uniformly and



**Figs 52–53.** *Netomocera cyanocephala* sp. nov., allotype, ♂. **52.** Habitus, lateral view. **53.** Antenna. Scale bars: 0.2 mm.

densely setose except for small, elongate bare region (Figs 49–51). Mesosoma length  $1.25\text{--}1.30 \times$  width (50:40) and  $1.35\text{--}1.50 \times$  height (50:37). Pronotal collar  $0.3\text{--}0.4 \times$  as long as mesoscutum (5:13) and about  $0.8 \times$  as wide as mesoscutum (31:40). Mesoscutum width  $2.95\text{--}3.10 \times$  length (40:13). Scutellum length about  $0.9\text{--}1.0 \times$  width (22:24). Propodeum length about  $0.6 \times$  scutellum length (13:22). Fore wing length about  $2.4 \times$  width (112:47); MV about  $4\text{--}5 \times$  SV (33:7) and about  $2.0\text{--}2.6 \times$  PV (33:15).

**METASOMA.** Petiole barely visible, transverse, smooth except for a few superficial longitudinal striae (Fig. 48). Gaster ovate, length about  $1.8\text{--}2.0 \times$  width (55:30); gt1 longest, width  $0.85\text{--}0.90 \times$  length (30:35), with hind margin produced; gt2–5 almost not visible, retracted; gt6 broadly triangular; syntergum acutely pointed. Ovipositor sheaths slightly protruding beyond apex of gaster (Fig. 41). Cercal setae surpassing apex of gaster.

#### **Male** (habitus: Fig. 52)

Differs from female mainly as follows. Body length: 1.0–1.8 mm. Head sometimes with weak to indistinct bluish reflections. Mesosoma and part of gaster in very small specimens orange-brown. Scape reddish-brown to brown. Fore wing always without brown spots (Fig. 52). Toruli with lower margins above lower margins of eyes. Antenna (Fig. 53) with full length about  $2.0\text{--}3.1 \times$  width; combined length of pedicel plus flagellum about  $2.3\text{--}2.6 \times$  head width. Gaster, when not inflated, much shorter than mesosoma, with only gt1 visible (Fig. 52).

#### **Distribution**

Papua New Guinea.

#### **Remarks**

The variability of the fore wing colouration of females is remarkable (Figs 49–51) and seems to be correlated with leg pigmentation because females with brownish spots on the wings also have darker legs, whereas females with hyaline wings have lighter legs. Due to the following reasons I decided to treat the two different forms of females as a single species, although future molecular studies may prove differently: (1) no additional characters were found to separate them; (2) there is a variation in the colour intensity of the brownish spots; (3) they seem to be sympatric; (4) their respective males are indistinguishable. *Netomocera cyanocephala* sp. nov. seems closest to *N. ramakrishnai*, at least the females being separated mainly by body colour and antennal structure.

*Netomocera desaegeri* sp. nov.

[urn:lsid:zoobank.org:act:E5F91D00-8C88-4849-9CD5-9863ABAC04DF](https://doi.org/10.3897/ejt.568.4849-9CD5-9863ABAC04DF)

Figs 54–64

#### **Diagnosis**

##### **Both sexes**

Macropterous; fore wing slightly to conspicuously and uniformly infumate (Fig. 62). Clypeal margin straight to very slightly produced (Fig. 57). Scrobes shallow and finely reticulate. Upper face and vertex with eight large setae (Fig. 56). Occiput margin sharply defined (Fig. 56). Pronotal collar not unusually long or wide (Fig. 60). Mesoscutum, scutellum and axillae densely reticulate, appearing dull under setation (Fig. 60); scutoscutellar sutures superficial, hardly visible (Fig. 60); frenal area not distinct, i.e., sculpture not different than on rest of scutellum (Fig. 60). Mesepimeral sulcus conspicuous (Fig. 59). Propodeum (Fig. 61) with uniform, more or less dense sculpture, without a well-defined V-shaped area basally. Fore wing with basal third extensively setose except for narrow bare region (Fig. 62). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 61).

**Female**

Head dark brown to black, occasionally slightly bluish or bluish-green (Figs 55–56). POL 4.2–5.3 × OOL. Setation of mesonotum dense and pale brown, not conspicuous (Fig. 60). MV 3.5–4.5 × SV.

**Etymology**

The species is named (noun in the genitive case) for Henri De Saeger, who organized the expedition to Belgian Congo during which thousands of specimens of Pteromalidae were collected.

**Material examined****Holotype**

TOGO • ♀; “Togo: Région des Plateaux: main road between Agbanon and Agoté, at creek Tomezuitoe, Creek bank at teak-forest (*Tectona grandis*), shady cocoa plantation, 7°15'53" N 0°47'51" E, 360 m a.s.l., 15.4.2008, swept, eclector; v. Tschirnhaus (Tg1878)”; entire, on rectangular card; BMNH.

**Allotype**

TOGO • ♂; same data as for holotype; BMNH.

**Additional paratypes**

D.R. CONGO • 1 ♀; “Congo Belge P.N.G., Miss. H. de Saeger, Aka, 14-V-1952, H. de Saeger. 3450”; RMCA • 1 ♀; “Congo Belge P.N.G., Miss. H. de Saeger, Ndelele/K.117, 27.III-1952, H. de Saeger. 3267”; RMCA • 1 ♀; “Congo Belge P.N.G., Miss. H. de Saeger, II/fd/17, 2-VII-1951, Réc. H. de Saeger. 2032”; RMCA • 1 ♀; “Congo Belge P.N.A, Nyasheke (Volc. Nyamuragira), 1820m. 14/26-VI-1935, G.F. de Witte: 1493”; RMCA • 1 ♂; “Congo Belge P.N.G., Miss. H. de Saeger, Makpe/8, 5-XI-1951, Réc. H. de Saeger. 2718”; RMCA • 1 ♀; “Congo Belge P.N.A., 7-15-VII-1955, P. Vanschuytbroeck, 13274-309”; RMCA • 1 ♂; “Congo Belge P.N.G., Miss. H. de Saeger, Pp.K.72, 27-VIII-1951, Réc. H. de Saeger. 2338”; RMCA.

GABON • 2 ♀♀; “GABON: 17 Km N. of Libreville, XII. 1987, J. Noyes”; “♀ *Netomocera*, det. Z. Bouček 1997”; NMPC.

GAMBIA • 1 ♀; “Gambia, Abuko, 5/11 1981, K.-J.Hedqvist”; “Standing over *Netomocera alboscopus* in Hedqvist coll., BMNH(E) 2011-27”; BMNH.

KENYA • 1 ♂; “KENYA, Nairobi, iii.1982”; “Brit. Mus. 1982-347”; NMPC.

MALAWI • 1 ♀; “Coll. Mus. Tervuren, Malawi: Chisasira (Chinteche), 3-20.I.1978, R. Jocqué”; RMCA.

SOUTH AFRICA • 1 ♀; “S. Africa, R. E. Turner. Brit. Mus. 1924-235”; “Port St. John, Pondoland. 16-28.iv.1924”; NMPC • 1 ♂; “S. Africa, R. E. Turner. Brit. Mus. 1923-363”; “Port St. John, Pondoland. June 12-30.1923”; NMPC.

TANZANIA • 1 ♀; “Africa or. Katona”; “Arusha-Ju 1905. XII”; “Arusha-9”; “*Netomocera*”; NMPC • 1 ♀; “Mto-ja-Kifarú”; “Africa or. Katona”; “no frenal groove” [Bouček’s handwriting]; NMPC.

TOGO • 1 ♂; same data as for holotype; MICO.

UGANDA • 1 ♀; “Uganda, Entebbe, Oct.-Nov. 1972”; “♀ *Netomocera*, Det. Z. Bouček, 1991”; NMPC.

ZIMBABWE • 1 ♀; “RHODESIA, Salisbury, A. Watsham /WF.193, viii.75”; “505.R”; BMNH • 1 ♀; “RHODESIA, Salisbury, A. Watsham/WF.224, (i)76”; BMNH • 1 ♀; “RHODESIA, Salisbury, A. Watsham /WF.218, (xii)75”; BMNH • 1 ♀; “RHODESIA, Salisbury, A. Watsham/WF.205, (x)75”; BMNH.



BMNH • 2 ♀♀; “RHODESIA: Chishawasha, Nr. Salisbury”; “XII. 1978, A. Watsham”; NMPC • 1 ♂; “RHODESIA, Mazoe, i.75, A. Watsham”; NMPC.

#### **Other material**

SOUTH AFRICA • 1 ♀; “Zululand, Eshowe, 1-22.iv.1925”; “S. Africa, R. E. Turner. Brit. Mus. 1925-175”; NMPC.

#### **Description**

##### **Female** (habitus: Fig. 54)

**COLOUR.** Head (Figs 55–56) black, occasionally dark brown or with slight bluish or bluish-green reflections. Mandibles reddish-brown. Antenna (Fig. 58) with scape whitish to yellowish, extreme apices usually darker; pedicel yellowish-brown but dorsally darker; flagellum light brown to brown, usually gradually darkening towards dark brown clava. Mesosoma (Figs 59–61) dark brown to black. Legs with coxae yellowish-brown to dark brown; fore and mid trochanters and trochantelli yellowish-brown to brown, hind trochanter and trochantellus yellowish to yellowish-brown; femora yellowish-brown to brown, hind femur progressively lighter apically; tibiae yellowish, fore and hind tibiae basally usually darker; tarsi yellowish, pretarsi brown. Fore wing (Fig. 62) slightly to conspicuously and uniformly infumate; venation light brown; setation light brown. Metasoma (Fig. 54) with petiole black; gaster brown to almost black. Body setation light to dark brown except several large, symmetrically arranged reddish-brown setae.

**BODY LENGTH.** 1.50–2.75 mm.

**HEAD.** Clypeus finely coriaceous; apical margin straight to very slightly produced (Fig. 57). Lower face with shallow piliferous punctures among reticulation. Upper face reticulate, with reticulation becoming denser towards vertex (Fig. 56); scrobes shallow, reticulate except smooth near toruli; parascrobal area with elongate cells (Fig. 55). Occiput alutaceous; margin sharply defined (Fig. 56). Toruli with lower margins from slightly below to about level with lower margins of eyes (Fig. 55). Antenna with flagellum strongly widening towards clava; clava conspicuously asymmetric (Fig. 58). Upper face and vertex with eight large setae (Fig. 56). Head in dorsal view with width  $2.15\text{--}2.40 \times$  length (70:31) and in frontal view  $1.1\text{--}1.2 \times$  height (70:60). POL  $4.2\text{--}5.3 \times$  OOL (24.0:4.5). Eye height about  $1.4\text{--}1.5 \times$  length (41:28),  $2.4\text{--}2.9 \times$  malar space (41:14) and about  $1.1\text{--}1.3 \times$  scape length (41:32). Head width  $0.9\text{--}1.1 \times$  length of pedicel plus flagellum (70:69). Fu1 length  $1.25\text{--}1.50 \times$  width (7:5); fu7 width  $1.6\text{--}2.0 \times$  length (9:5); clava length  $2.0\text{--}2.4 \times$  width (24:10).

**MESOSOMA.** Pronotal collar conspicuously narrower than mesoscutum, with eight large setae (Fig. 60). Mesonotum moderately setose dorsally (Fig. 60). Mesoscutum and axillae with dense reticulation, dull (Fig. 60). Scutellar disc similarly sculptured as mesoscutum, cells somewhat elongate and smaller on frenal area (Figs 60–61). Upper mesepisternum partly smooth, partly striate-reticulate, lower mesepisternum reticulate (Fig. 59). Mesepimeron mainly smooth; mesepimeral sulcus conspicuous (Fig. 59). Propodeum with intricate pattern of carinae forming a raised tooth anteriorly, interspaces smooth to slightly wrinkled (Fig. 61). Macropterous; fore wing uniformly and densely setose except for small, elongate bare region (Fig. 62). Mesosoma length  $1.25\text{--}1.30 \times$  width (75:60) and  $1.40\text{--}1.45 \times$  height (75:55). Pronotal collar about  $0.3\text{--}0.4 \times$  as long as mesoscutum (6:22) and about  $0.8 \times$  as wide as mesoscutum (49:60). Mesoscutum width  $2.5\text{--}3.0 \times$  length (60:22). Scutellum length about  $0.9 \times$  width (32:35). Propodeum length about  $0.6\text{--}0.7 \times$  scutellum length (20:32). Fore wing length  $2.4\text{--}2.5 \times$  width (140:55); MV  $3.5\text{--}4.5 \times$  SV (39:11) and  $2.2\text{--}3.3 \times$  PV (39:18).

**METASOMA.** Petiole very short, transverse, virtually smooth (Fig. 61). Gaster ovate-acuminate, length  $1.5\text{--}2.0 \times$  width (92:50) (Fig. 54); gt1 longest, from slightly longer than to slightly shorter than wide (50:50),



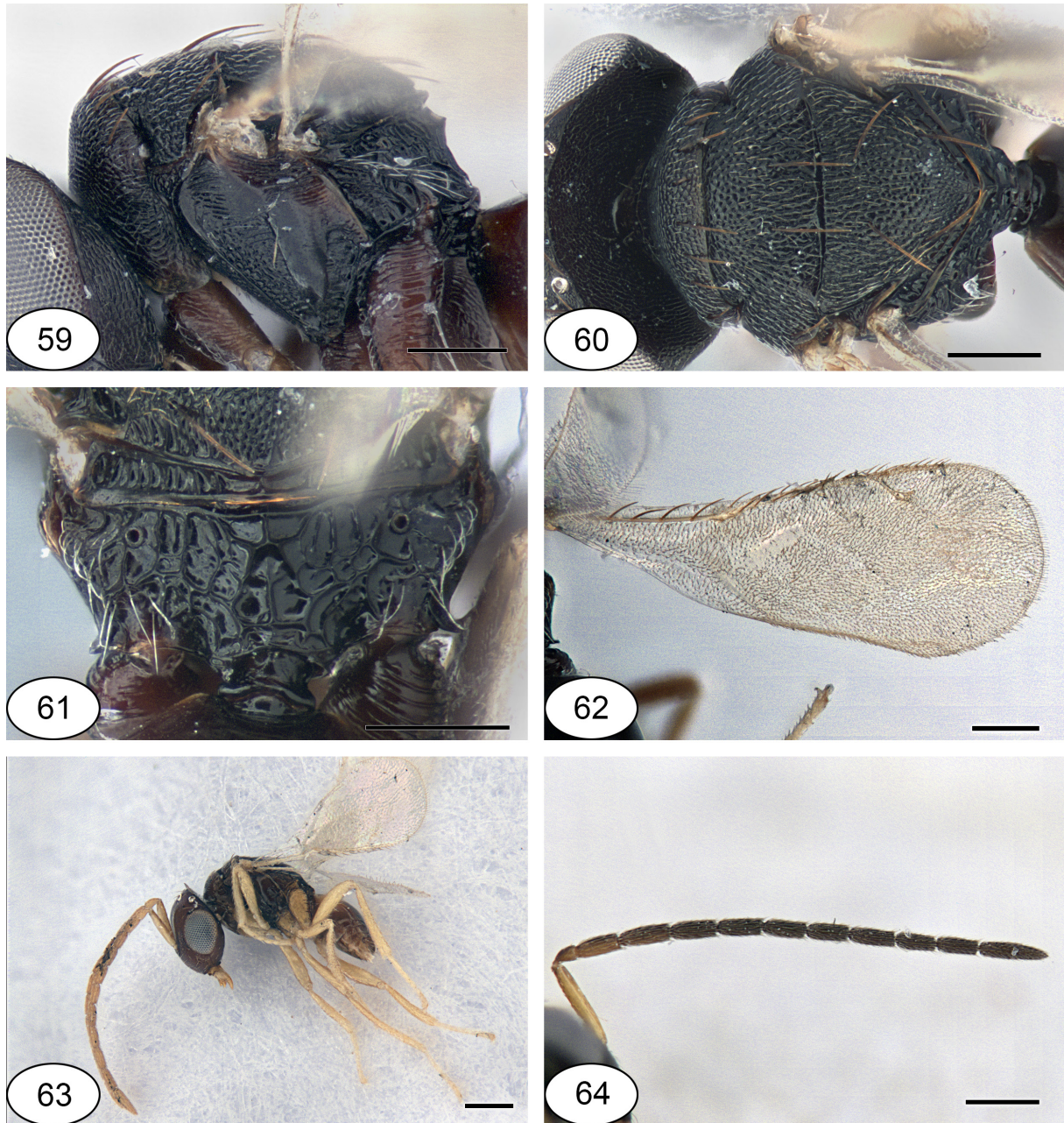
**Figs 54–58.** *Netomocera desaegeri* sp. nov., holotype, ♀. **54.** Habitus, lateral view. **55.** Head, frontal view. **56.** Head, dorsal view. **57.** Lower face. **58.** Antenna. Scale bars: 0.2 mm.



with hind margin slightly produced curved posteriorly; gt2–5 very short, transverse, sometimes almost completely retracted under gt1; gt6 much wider than long, semicircular; syntergum acutely pointed. Ovipositor sheaths conspicuously protruding beyond apex of gaster. Cercal setae almost reaching gaster apex.

**Male** (habitus: Fig. 63)

Differs from female mainly as follows. Body length: 0.90–1.75 mm. Antenna with flagellum yellowish-brown to dark brown. Fu1 length  $2.0\text{--}2.8 \times$  width; combined length of pedicel plus flagellum  $2.3\text{--}2.4 \times$



**Figs 59–64.** *Netomocera desaegeri* sp. nov. **59.** Holotype, ♀, mesosoma, lateral view. **60.** Holotype, ♀, mesosoma, dorsal view. **61.** Holotype, ♀, propodeum, dorsal view. **62.** Holotype, ♀, fore wing. **63.** Allotype, ♂, habitus, lateral view. **64.** Paratype, ♂, Kenya, antenna. Scale bars: 0.2 mm.

as wide as head. Eye height about  $2.10\text{--}2.35 \times$  malar space. POL  $2.7\text{--}3.6 \times$  OOL. Occipital margin blunt in small specimens. Mesosoma sculpture shallower. Propodeum without a tooth anteriorly. Gaster, when not inflated, much shorter than mesosoma, with only *gt1* visible.

### Distribution

D.R. Congo, Gabon, Gambia, Kenya, Malawi, South Africa, Tanzania, Togo, Uganda, Zimbabwe.

### Remarks

The species can be recognized mainly by the dull dorsal surface of the mesonotum, without any differentiated frenal area (Fig. 60). One female from South Africa (NMPC), excluded from the type series, has both fore wings abruptly shortened beyond the parastigma, as if cut off (no trace of shortened venation), and the hind wings also shortened and very narrow. I do not include these character states in the description because this seems to be an exceptional case.

*Netomocera formiciformis* sp. nov.

[urn:lsid:zoobank.org:act:1DE3095C-E08F-4D64-AB86-A527E8ECBB1B](https://zoobank.org/act:1DE3095C-E08F-4D64-AB86-A527E8ECBB1B)

Figs 65–75

### Diagnosis

#### Both sexes

Head black, occasionally with very slight bluish metallic reflections (Figs 66–67). Clypeal margin produced (Fig. 68). Scrobes shallow and reticulate (Fig. 66). Upper face and vertex with eight large setae (Fig. 67). Occiput margin sharply defined (Fig. 67). Pronotal collar not unusually long or wide (Fig. 71). Mesepimeral sulcus conspicuous. Propodeum without a well-defined V-shaped area basally (Fig. 72). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 72).

#### Female

Brachypterous, rarely submacropterous (Figs 65, 73). Eye height  $2.25\text{--}2.35 \times$  malar space. POL about  $3 \times$  OOL. Mesoscutum, scutellum and axillae with shallow punctulate reticulation (Fig. 71); scutoscutellar sutures deep, distinct; frenal area distinct, i.e., sculpture at least slightly different than on rest of scutellum (Fig. 71). Mesosoma with unusually dense and conspicuous whitish setation dorsally (Fig. 71).

#### Male

Antenna with full length  $1.9\text{--}2.2 \times$  width; length of pedicel plus flagellum  $2.8\text{--}3.0 \times$  head width. MV about  $4.5 \times$  SV.

### Etymology

The species name (adjective) refers to the female habitus, which is somewhat similar to that of an ant.

### Material examined

#### Holotype

GUATEMALA • ♀; “GUATEMALA, Fraijanes, Finca San Antonio, 1800 m, VII.87, J. Mauger”; entire, on triangular card; CNC.

#### Allotype

GUATEMALA • ♂; “GUATEMALA Sacatepequez, Volcan Agua 1700 m, above Antigua Guatemala, Nov 23 1986 sweep, Sharkey”; CNC.



### **Additional paratypes**

GUATEMALA • 1 ♀; “GUATEMALA, Fraijanes, Finca San Antonio, 1800 m, XII.1986, J. P. Mauger”; CNC • 1 ♂; “GUATEMALA: Sierra de Minas, 5 mi. N.E. San Lorenzo, 10.VI.1986, J. M. Campbell”; CNC.

MEXICO • 3 ♀♀; “MEXICO: Oaxaca; 6.1 Km S Suchixtepec 2150 m, 26.VII.1992, R. Anderson oak-alder-pine forest”; CNC • 1 ♀; “MEX. Dgo. 9000’, El Salto, 10 mi W., 10 June 1964, W. R. M. Mason”; CNC.

### **Description**

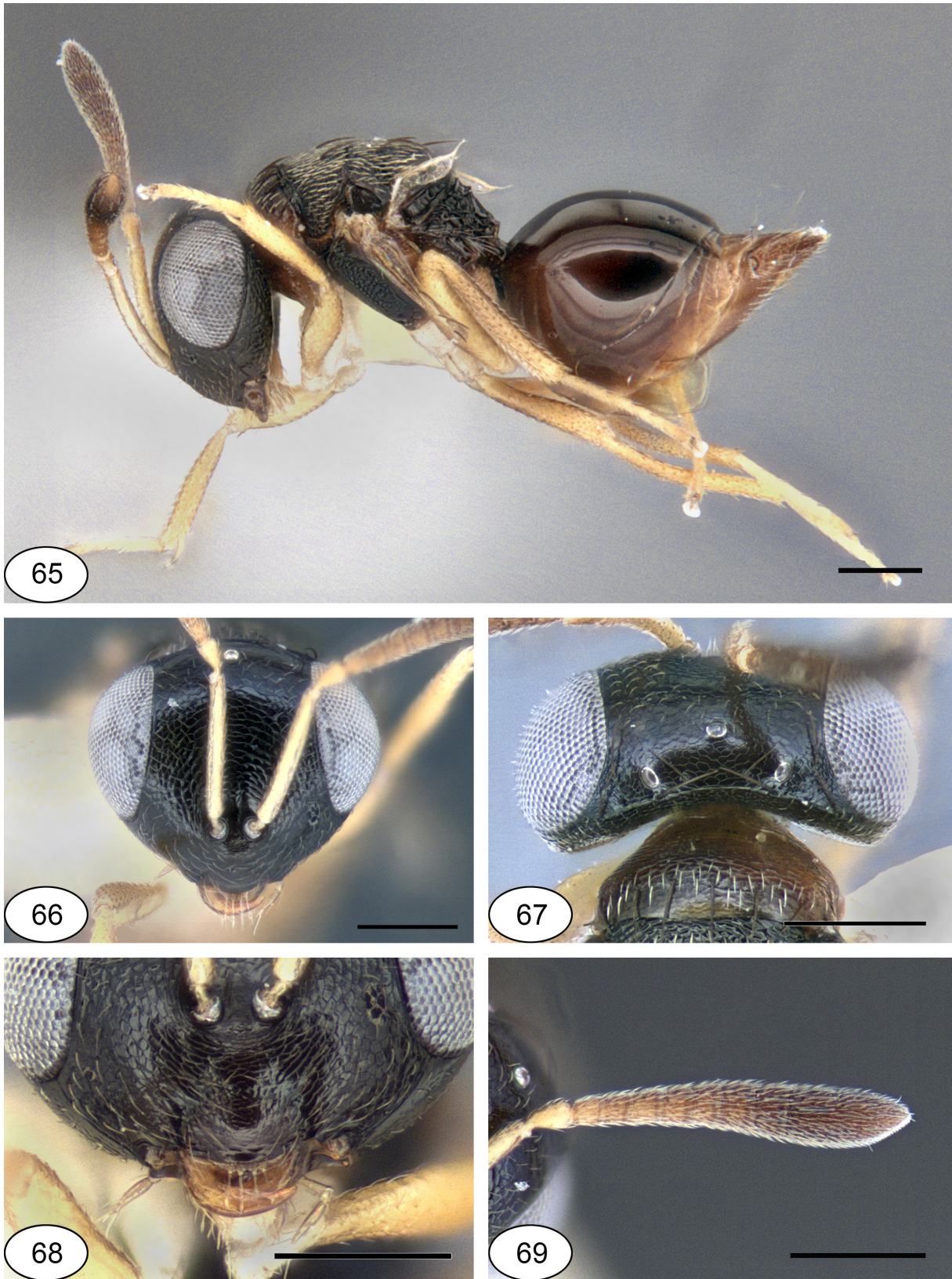
#### **Female** (habitus: Fig. 65)

**COLOUR.** Head (Figs 66–67) black, with very slight bluish metallic reflections. Mandibles brown, teeth reddish-brown. Antenna (Fig. 69) with scape pale yellowish-brown, pedicel light brown, flagellum brown basally but gradually becoming dark brown towards clava. Mesosoma (Figs 70–72) black, pronotal collar occasionally dark brown. Legs with coxae whitish, hind coxae more or less brownish basally; trochanters whitish to light brown; femora, tibiae and tarsi yellowish-brown, pretarsi darker. Wings subhyaline, venation brown; setation brown. Metasoma (Fig. 65) with petiole black; gaster mostly dark brown to black, apical tergites lighter. Body setation (Fig. 71) whitish except for several large, symmetrically arranged dark brown setae.

**BODY LENGTH.** 1.5–1.9 mm.

**HEAD.** Clypeus finely coriaceous; apical margin produced (Fig. 68). Lower face shallowly reticulate. Upper face reticulate and vertex shallowly reticulate to coriaceous (Fig. 67); scrobes shallow, reticulate; parascrobal region mostly with isodiametric cells (Fig. 66). Occiput finely reticulate; margin sharply defined (Fig. 67). Toruli with lower margins below lower margins of eyes (Fig. 66). Antenna with flagellum moderately widening towards clava; clava conspicuously asymmetric (Fig. 69). Upper face and vertex with eight large setae (Fig. 67). Head in dorsal view with width  $2.1\text{--}2.3 \times$  length (73:35) and in frontal view  $1.1\text{--}1.2 \times$  height (73:62). POL about  $3 \times$  OOL (21:7). Eye height about  $1.3 \times$  length (40:30),  $2.25\text{--}2.35 \times$  malar space (40:17) and  $1.1\text{--}1.2 \times$  scape length (40:37). Head width  $0.9\text{--}1.0 \times$  length of pedicel plus flagellum (73:75). Fu1 length  $1.0\text{--}1.2 \times$  width (6:5); fu7 width  $1.5\text{--}1.8 \times$  length (10.0:6.5); clava length  $2.1\text{--}2.2 \times$  width (23.0:10.5).

**MESOSOMA.** Pronotal collar narrower than mesoscutum, with six large setae (Fig. 71). Mesonotum moderately setose dorsally except for bare frenal area (Figs 71–72). Mesoscutum and axillae densely but superficially punctulate-reticulate, but sculpture difficult to see because of dense setation (Fig. 71). Scutellum, including frenal area, punctulate-reticulate, cells isodiametric (Fig. 71). Mesepisternum mainly reticulate (Fig. 70). Mesepimeron smooth; mesepimeral sulcus conspicuous. Propodeum with a pattern of several strong carinae, interspaces virtually smooth (Fig. 72). Submacropterous or brachypterous. Submacropterous form with fore wing uniformly and densely setose except for small, elongate bare region. Brachypterous form (Fig. 65) with fore and hind wings reduced and represented by stumps (Fig. 73); fore wing longer than its maximum width, well surpassing posterior margin of propodeum, truncate apically, with setation visible beyond basal cell and with complete submarginal vein, incomplete marginal vein and virtually absent postmarginal and stigmal veins. Mesosoma length about  $1.3 \times$  width (75:59) and  $1.4\text{--}1.5 \times$  height (75:55). Pronotal collar  $0.4\text{--}0.5 \times$  as long as mesoscutum (9:22) and about  $0.7 \times$  as wide as mesoscutum (44:59). Mesoscutum width  $2.7\text{--}3.4 \times$  length (59:22). Scutellum length about  $0.9 \times$  width (30:33). Propodeum length about  $0.7 \times$  scutellum length (20:30). Fore wing length of submacropterous form about  $2.8 \times$  width; MV about  $4.3 \times$  SV; PV about  $1.3 \times$  SV. Fore wing length of brachypterous form  $3.6\text{--}4.0 \times$  width (50:14).



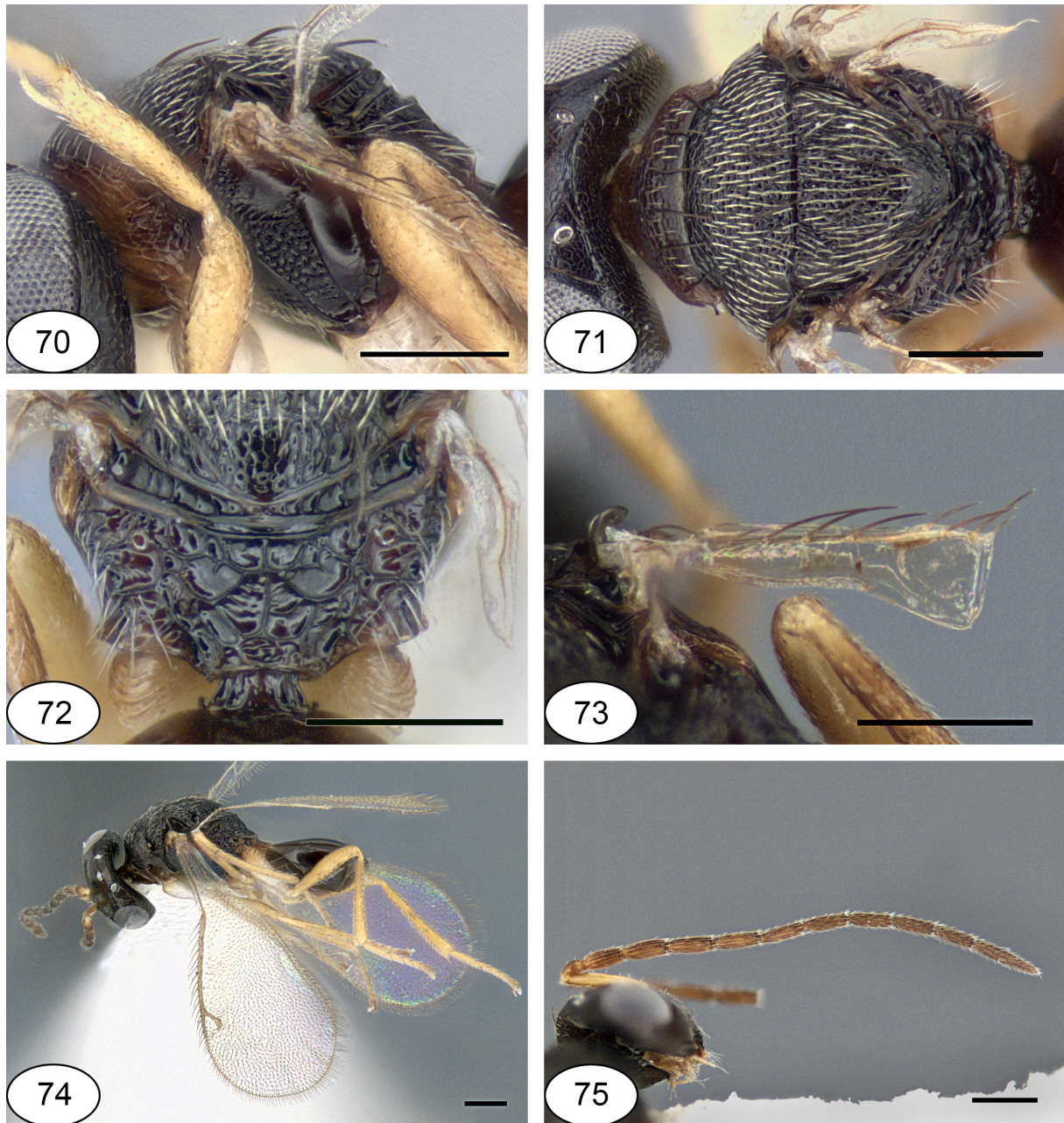
**Figs 65–69.** *Netomocera formiciformis* sp. nov., holotype, ♀. **65.** Habitus, lateral view. **66.** Head, frontal view. **67.** Head, dorsal view. **68.** Lower face. **69.** Antenna. Scale bars: 0.2 mm.



**METASOMA.** Petiole very short, transverse, with a few longitudinal costulae (Fig. 72). Gaster ovate, length 1.6–1.7 × width (95:60) (Fig. 65); gt1 long, width about 0.9 × length (60:65), with posterior margin produced; gt2–6 very short, retracted; syntergum acutely pointed. Ovipositor sheaths protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

**Male** (habitus: Fig. 74)

Differs from female mainly as follows. Body length: 1.2–1.6 mm. Scape yellowish-brown, pedicel brown, flagellum uniformly brown. Setation on mesosoma less dense. Petiole longer. Antenna (Fig. 75)



**Figs 70–75.** *Netomocera formiciformis* sp. nov. **70.** Holotype, ♀, mesosoma, lateral view. **71.** Holotype, ♀, mesosoma, dorsal view. **72.** Holotype, ♀, propodeum, dorsal view. **73.** Holotype, ♀, fore wing. **74.** Allotype, ♂, habitus, lateral view. **75.** Allotype, ♂, antenna. Scale bars: 0.2 mm.



with fu1 length  $1.9\text{--}2.2 \times$  width; length of pedicel plus flagellum  $2.8\text{--}3.0 \times$  as long as head width. Fore wing length about  $2.4 \times$  width. MV about  $4.5 \times$  SV. Gaster length  $1.4\text{--}1.6 \times$  width, gt1 occupying virtually all gaster length (gaster collapsed) or about half of gaster length (gaster inflated).

### Distribution

Guatemala, Mexico.

### Remarks

Females can easily be separated from those of all other species by the dense whitish setation dorsally on the mesonotum (Fig. 71). Males seem similar to those of *N. merida* sp. nov. (see the key).

### *Netomocera gloriosa* sp. nov.

[urn:lsid:zoobank.org:act:62A7C0FC-8601-4000-918B-43694FACA24B](https://zoobank.org/act:62A7C0FC-8601-4000-918B-43694FACA24B)

Figs 76–86

### Diagnosis

#### Both sexes

Head black (Figs 77–78, 85). Macropterous; fore wing subhyaline (Figs 84–85). Clypeal margin slightly produced (Fig. 79). Scrobes deep and smooth (Fig. 77). Upper face and vertex with eight large setae (Fig. 78). Occiput margin blunt (Fig. 78). Pronotal collar wide but not long (Fig. 82). Mesepimeral sulcus shallow. Propodeum (Fig. 83) without a well-defined V-shaped area basally. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 83).

#### Female

Toruli distinctly below lower margins of eyes (Fig. 77). Face with conspicuous piliferous punctures. Antenna with funicle gradually becoming brown towards clava; flagellum strongly clavate; clava conspicuously asymmetric; fu1 and fu7 strongly transverse (Fig. 80). Mesoscutum width about  $2.6 \times$  length. Fore wing with basal third extensively bare, except for several setae across basal cell (Fig. 84).

#### Male

Body length 1.2–1.5 mm. Mesosoma dorsally with reticulation not dense, alveolae shallow (cf. Fig. 82). Funicular segments slender and long, fu1 not wider than pedicel, length  $2.0\text{--}2.1 \times$  width (Fig. 86).

### Etymology

The name of the species (adjective) indicates the locality where the type material was collected (Mount Glorious).

### Material examined

#### Holotype

AUSTRALIA • ♀; “AUST.: Qld. 630m. Mt. Glorious S.F., Feb. 28–March 9, 84, L. Masner, MT”; “Dry sclerophyl Eucalyptus for.”; “Netomocera, det. R. A. Burks”; left flagellum missing, left fore wing glued aside, on triangular card; CNC.

#### Allotype

AUSTRALIA • ♂; “AUST.: Qld. 630m. Mt. Glorious S.F., Feb. 28–March 9, 84, L. Masner, MT”; CNC.

#### Additional paratype

AUSTRALIA • 1 ♂; same data as for allotype; CNC.

## Description

### Female (habitus: Fig. 76)

COLOUR. Head (Figs 77–78) black. Mandibles reddish, teeth reddish-brown. Antenna (Fig. 80) with scape and pedicel light yellowish-brown; flagellum yellowish-brown basally, gradually becoming dark brown towards clava; clava yellowish ventrally. Mesosoma (Figs 81–83) reddish-brown. Legs reddish-yellow. Wings (Fig. 84) subhyaline, venation and setation brown. Metasoma (Fig. 76) with petiole and gaster reddish-brown. Body setation pale except for several large, symmetrically arranged dark brown setae.

BODY LENGTH. 1.5 mm.

HEAD. Clypeus virtually smooth; apical margin slightly produced (Fig. 79). Lower face reticulate, piliferous punctures distinct. Upper face, including vertex, with shallow reticulation (Fig. 78); scrobes deep, smooth and shiny; parascrobal region extensively striate-reticulate (Fig. 77). Occiput coriaceous-alutaceous; margin blunt (Fig. 78). Toruli with lower margins distinctly below lower margins of eyes (Fig. 77). Antenna with flagellum strongly widening towards clava; clava conspicuously asymmetric (Fig. 80). Upper face and vertex with eight large setae. Head in dorsal view with width about twice length (76:38) and in frontal view about  $1.2 \times$  height (76:64). POL about  $3.8 \times$  OOL (23:6). Eye height about  $1.4 \times$  length (45:32), about  $3.2 \times$  malar space (45:14) and about  $1.5 \times$  scape length (45:30). Head width about  $1.2 \times$  length of pedicel plus flagellum (76:62). Fu1 length about  $0.7 \times$  width (3.5:5.0); fu7 width about  $1.6 \times$  length (10.5:6.5); clava length about  $1.9 \times$  width (21:11).

MESOSOMA. Pronotal collar slightly narrower than mesoscutum, with eight large setae (Fig. 82). Mesonotum moderately setose dorsally (Fig. 82). Mesoscutum and axillae with extremely fine reticulation, appearing almost smooth (Fig. 82). Scutellar disc as mesoscutum, but longitudinally striate on frenal area (Figs 82–83). Mesepisternum mainly reticulate, less conspicuously so dorsally (Fig. 81). Mesepimeron smooth; mesepimeral sulcus shallow. Propodeum mainly smooth, with intricate pattern of carinae, interspaces smooth to finely wrinkled (Fig. 83). Macropterous; fore wing extensively bare on basal third, except for several setae across basal cell (Fig. 84). Mesosoma length about  $1.2 \times$  width (75:62) and about  $1.3 \times$  height (62:48). Pronotal collar  $0.45 \times$  as long as mesoscutum (11:24) and about  $0.9 \times$  as wide as mesoscutum (55:62). Mesoscutum width about  $2.6 \times$  length (62:24). Scutellum length  $0.85 \times$  width (30:35). Propodeum length about half scutellum length (15:30). Fore wing length  $2.25 \times$  width (135:60); MV  $4 \times$  SV (40:10) and about  $3.6 \times$  SV (40:11).

METASOMA. Petiole barely visible, transverse, smooth except for a few superficial longitudinal striae (Fig. 83). Gaster ovate, length about  $1.4 \times$  width (82:60) (Fig. 76); gt1 long, length about  $0.9 \times$  width (55:60), with hind margin straight to slightly produced; gt2–6 short; syntergum acutely pointed. Ovipositor sheaths slightly protruding beyond apex of gaster. Cercal setae surpassing apex of gaster.

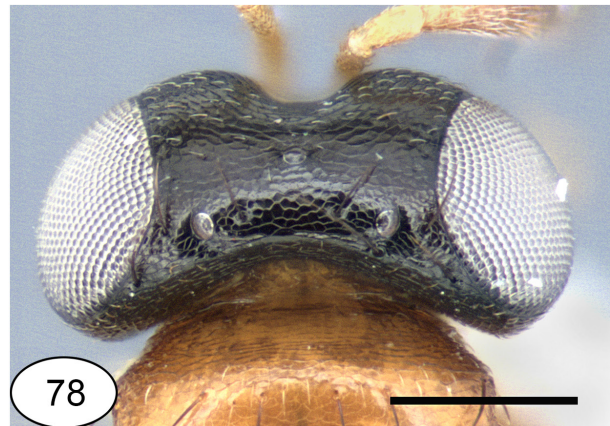
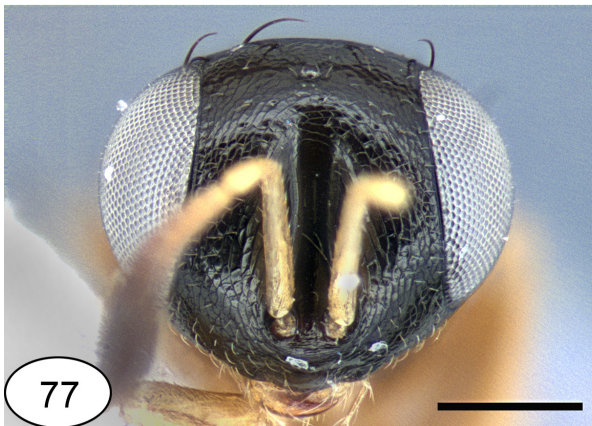
### Male (habitus: Fig. 85)

Differs from female mainly as follows. Body length: 1.2–1.5 mm. Flagellum uniformly dark brown or fu1 sometimes paler (Fig. 86). Mesosoma dorsally yellowish to dark brown but in the latter case pronotal collar, metanotum and propodeum lighter; gaster dorsally yellowish, with darker margins to uniformly brown. Fu1 length  $2.0$ – $2.1 \times$  width, remaining funicular segments subequal in length to fu1; combined length of pedicel plus flagellum  $2.4$ – $2.6 \times$  head width. Fore wing more setose on basal third, with small to medium bare region. Gaster (inflated) as long as or shorter than mesosoma, length  $1.5$ – $1.7 \times$  width.

## Distribution

Australia.



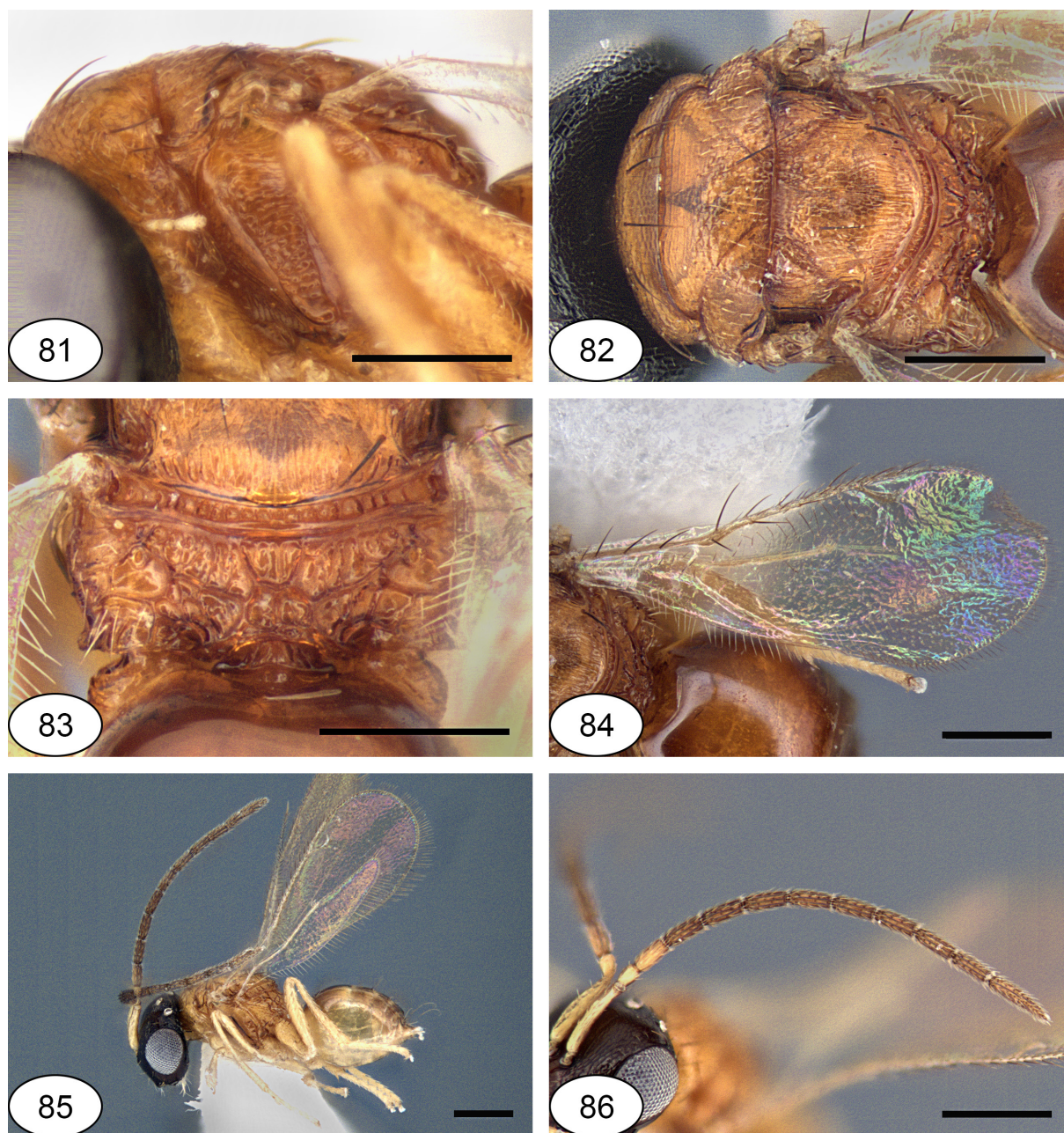


**Figs 76–80.** *Netomocera gloriosa* sp. nov., holotype, ♀. **76.** Habitus, lateral view. **77.** Head, frontal view. **78.** Head, dorsal view. **79.** Lower face. **80.** Antenna. Scale bars: 0.2 mm.



### Remarks

Both sexes are similar to those of *N. sedlaceki*. This could be the macropterous form of the latter species, but differences in body setation, and the shape and colour of the antenna indicate it is a different species.



**Figs 81–86.** *Netomocera gloriosa* sp. nov. **81.** Holotype, ♀, mesosoma, lateral view. **82.** Holotype, ♀, mesosoma, dorsal view. **83.** Holotype, ♀, propodeum, dorsal view. **84.** Holotype, ♀, fore wing. **85.** Allotype, ♂, habitus, lateral view. **86.** Allotype, ♂, antenna. Scale bars: 0.2 mm.



*Netomocera irregularis* sp. nov.[urn:lsid:zoobank.org:act:EE9C7948-B25F-40BC-AEC4-3CE24A8C72AF](https://doi.org/10.21203/rs.3.rs-10000000/v1)

Figs 87–95

**Diagnosis****Female**

Head yellowish (Figs 88–89). Antenna (Fig. 91) with funicle brown and clava whitish. Macropterous; fore wing (Fig. 95) with intricate pattern of brownish bands and spots covering more than half of wing surface. Clypeal margin shallowly emarginate (Fig. 90). Upper face and vertex with ten large setae (Fig. 89). Occiput margin abrupt, but not sharply margined (Fig. 89). Mesepimeral sulcus inconspicuous, although some transverse costulae present (Fig. 92). Propodeum (Fig. 94) without a well-defined V-shaped area basally, with large smooth areas among carinae. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture.

**Etymology**

The name of the species (adjective) indicates the intricate brownish pattern of the fore wing of the female.

**Material examined****Holotype**

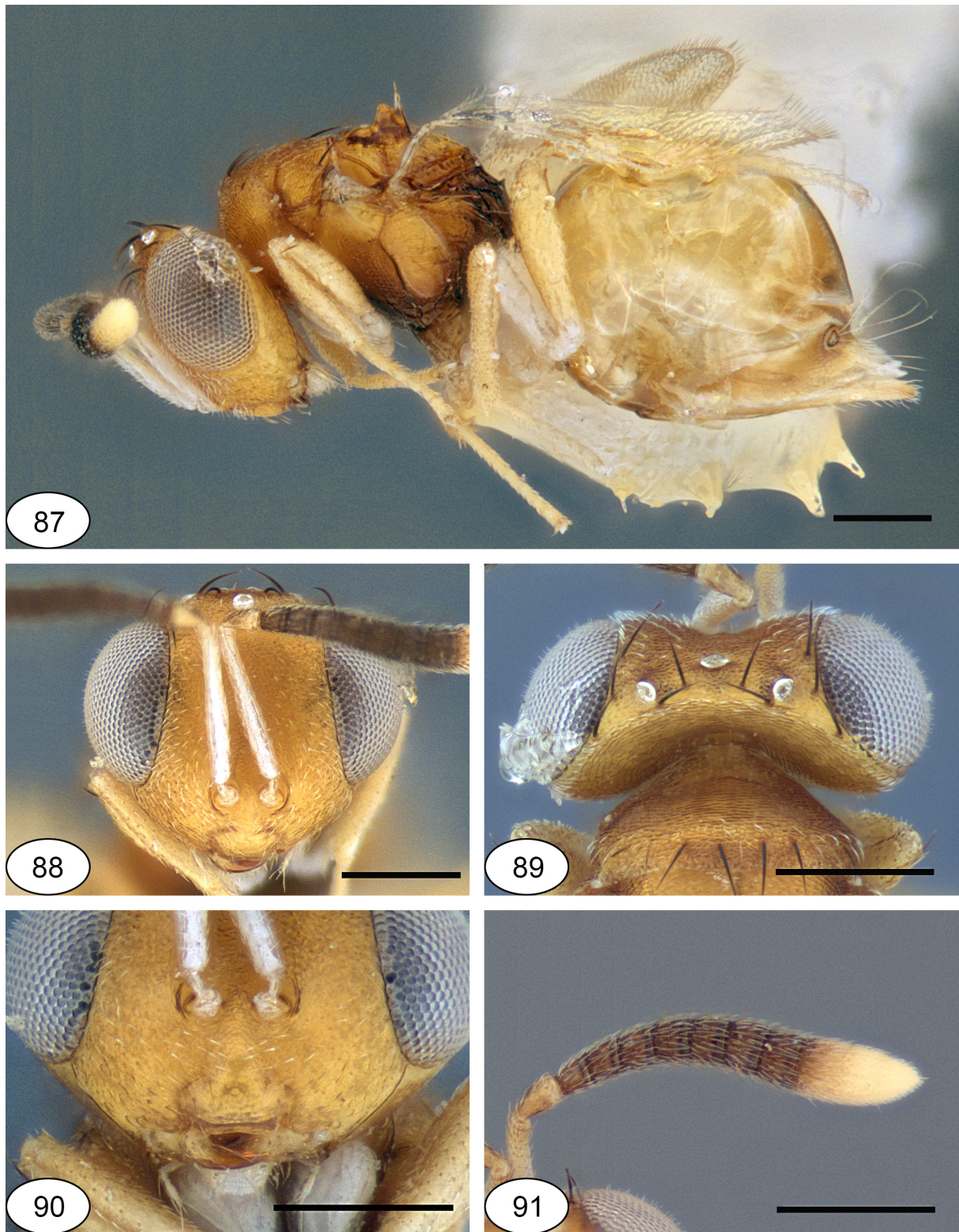
DOMINICAN REPUBLIC • ♀; “DOMINICAN REPUBLIC: Barahona, 7 km NW Paraiso, 200 m, 27.XI.1991, L. Masner & S. Peck, rainforest remnant”; entire, on triangular card, left fore wing glued aside; CNC.

**Description****Female** (habitus: Fig. 87)

COLOUR. Head (Figs 88–89) mainly orange-yellow. Mandibles yellowish, teeth reddish-brown. Antenna (Fig. 91) with scape whitish; pedicel dorsally brown, ventrally yellowish; anellus yellowish; flagellum dark brown except clava yellowish. Mesosoma (Figs 92–94) dorsally mainly orange, brown on pronotal collar, axillae and propodeum; laterally orange except ventral edges of mesopleuron and metapleuron darker. Legs with fore and hind coxae bright white, mid coxa brown, rest of legs orange-yellow, except brown tarsal pretarsi. Fore wing (Fig. 95) with intricate pattern of brownish bands and spots; venation brown; setation brown. Hind wing hyaline. Metasoma (Fig. 87) with petiole dark brown. Gaster mainly orange-yellow, but brownish both basally and apically. Body setation brownish.

BODY LENGTH. 1.6 mm.

HEAD. Clypeus almost smooth; apical margin very slightly emarginated (Fig. 90); gena almost smooth (Fig. 90). Lower face reticulate, without distinct piliferous punctures. Upper face, including shallow scrobes and adjacent areas, and vertex gradually becoming densely punctulate-reticulate (Fig. 89). Occiput alutaceous; margin abrupt, but not sharply defined (Fig. 89). Toruli with lower margins below lower margins of eyes (Fig. 88). Antenna moderately clavate, with clava slightly asymmetric (Fig. 91). Upper face and vertex with ten large setae (Fig. 89). Head in dorsal view with width about  $2.3 \times$  length (70:30) and in frontal view about  $1.2 \times$  height (70:60). POL about  $3.2 \times$  OOL (19:6). Eye height  $1.3 \times$  length (37:29), about  $2.5 \times$  malar space (37:15) and subequal to scape length (37:36). Head width equal to length of pedicel plus flagellum (70:70). Fu1 length equal to width (6:6); fu7 width  $1.7 \times$  length (10:6); clava length  $2.2 \times$  width (22:10).



**Figs 87–91.** *Netomocera irregularis* sp. nov., holotype, ♀. **87.** Habitus, lateral view. **88.** Head, frontal view. **89.** Head, dorsal view. **90.** Lower face. **91.** Antenna. Scale bars: 0.2 mm.

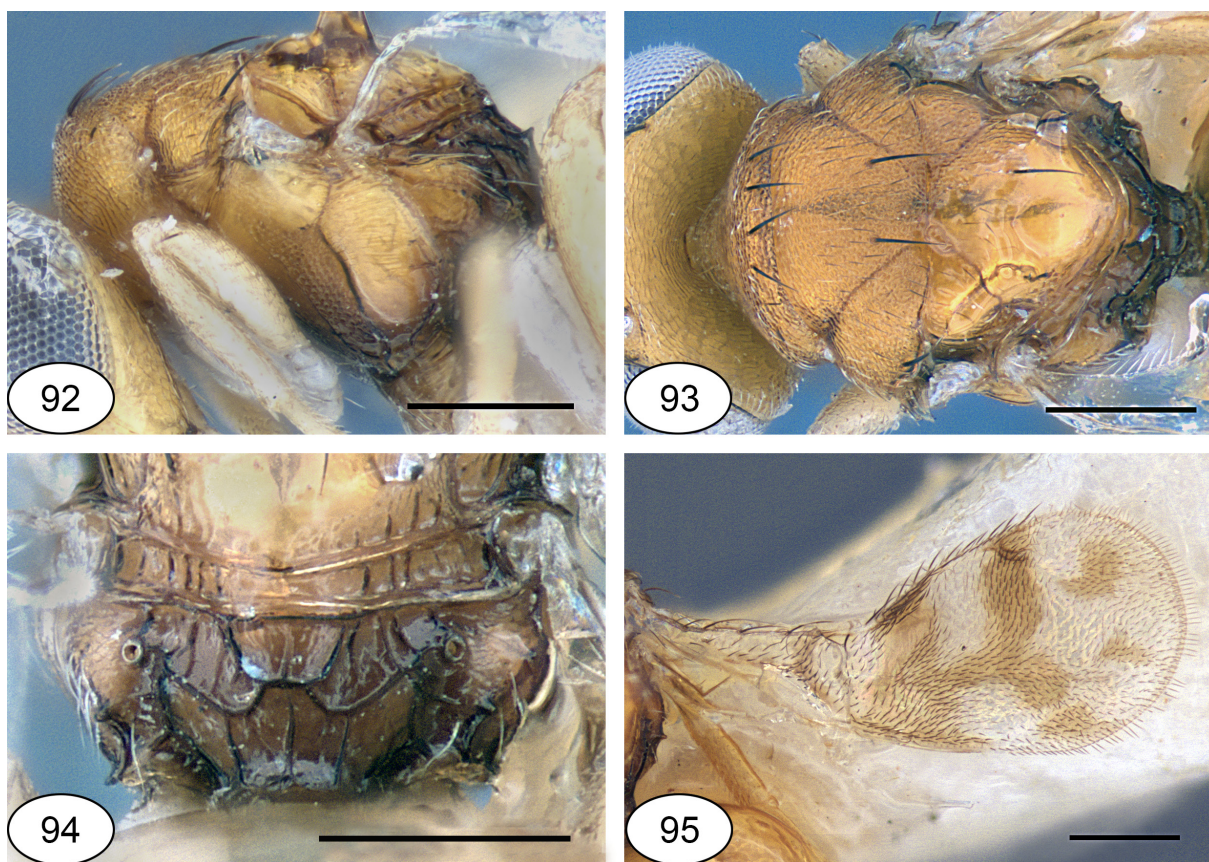


**MESOSOMA.** Pronotal collar narrower than mesoscutum, with six large setae (Fig. 93). Mesonotum moderately setose dorsally (Fig. 93). Mesoscutum and axillae with dense punctulate reticulation (Fig. 93). Scutellum as for mesoscutum, except for smoother frenal area (Fig. 93). Upper mesepisternum smooth; lower mesepisternum reticulate (Fig. 92). Mesepimeron mainly smooth, becoming shallowly striate posteriorly; mesepimeral sulcus inconspicuous, although with some transverse costulae (Fig. 92). Propodeum mainly smooth, with large smooth areas among carinae (Fig. 94). Macropterous; fore wing (Fig. 95) with basal cell mostly setose, setae denser apically; bare region reaching about middle of marginal vein; setae on infuscate areas darker and longer than those on hyaline areas; setae below parastigma normal, not forming a large patch of conspicuously thicker and longer setation than on other areas. Mesosoma length about  $1.3 \times$  width (80:60) and  $1.6 \times$  height (80:50). Pronotal collar about  $0.2 \times$  as long as mesoscutum (5:28) and about  $0.8 \times$  as wide as mesoscutum (46:60). Mesoscutum width about  $2.1 \times$  length (60:28). Scutellum length  $1.1 \times$  width (33:30). Propodeum length about  $0.6 \times$  scutellum length (20:33). Fore wing length about  $2.3 \times$  width (125:55); MV about  $5.4 \times$  SV (43:8), SV equal to PV.

**METASOMA.** Petiole barely visible, transverse, with several longitudinal costulae. Gaster ovate, length  $1.75 \times$  width (105:60) (Fig. 87); gt1 longest, width about  $1.9 \times$  length (60:32), with hind margin medially slightly produced; gt2–4 wider than long; gt5 strongly transverse; syntergum acutely pointed. Ovipositor sheaths slightly protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

#### Male

Unknown.



**Figs 92–95.** *Netomocera irregularis* sp. nov., holotype, ♀. **92.** Mesosoma, lateral view. **93.** Mesosoma, dorsal view. **94.** Propodeum, dorsal view. **95.** Fore wing. Scale bars: 0.2 mm.

### Distribution

Dominican Republic.

### Remarks

The only known female is somewhat similar to that of *N. amethysta* sp. nov., but constitutes one of the most unique-looking species of *Netomocera* because of its unique, intricate brownish fore wing colour pattern (Fig. 95).

*Netomocera masneri* sp. nov.

[urn:lsid:zoobank.org:act:62FFFD78-A37E-4341-9DD6-A9A0B8968B3E](https://doi.org/10.3896/eb.62FFFD78-A37E-4341-9DD6-A9A0B8968B3E)

Figs 96–106

### Diagnosis

#### Both sexes

Macropterous; fore wing subhyaline (Fig. 104). Clypeal margin shallowly emarginate (Fig. 99). Scrobes reticulate (Fig. 97). Upper face and vertex with eight large setae. Occiput margin sharply defined (Fig. 98). Pronotal collar not unusually long or wide (Fig. 102). Mesoscutum, scutellum and axillae with dense punctulate reticulation (Fig. 102); scutoscutellar sutures distinct (Fig. 102); frenal area distinct, i.e., sculpture different than on rest of scutellum (Fig. 102). Mesepimeral sulcus conspicuous (Fig. 101). Propodeum (Fig. 103) without a well-defined V-shaped area basally. Fore wing with basal third extensively setose except for narrow bare region (Fig. 104). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 103).

#### Female

Vertex with slight dark green reflections (Fig. 98); POL about  $4.1 \times$  OOL. MV about  $5.3 \times$  SV.

#### Male

Body colour mainly dark brown (Fig. 105).

### Etymology

The new species is dedicated to Dr. Lubomir Masner, world expert on Platygastridae (Hymenoptera), who collected most of the specimens of the new species (noun in the genitive case).

### Material examined

#### Holotype

ECUADOR • ♀; “ECUADOR, Napo Prov., El Chaco 2000m, 11.II 1983, M. Sharkey, L. Masner”; right antenna with fu7 and clava missing, on triangular card; CNC.

#### Allotype

ECUADOR • ♂; same data as for holotype; CNC.

#### Additional paratypes

ECUADOR • 3 ♂♂; same data as for holotype; CNC • 3 ♂♂; “ECUADOR: Napo, 5 Km S. Baeza 1700m, Feb. 13 1983, Masner & Sharkey”; CNC • 1 ♂; “ECUADOR: Pichincha, 16 Km. s.e. Santo Domingo Tinalandia, 680 m., 15-30.VI.1975, S&J Peck”; CNC.



## Description

### Female (habitus: Fig. 96)

COLOUR. Head (Figs 97–98) black, with faint dark green reflections mainly on vertex. Mandibles brown, teeth reddish-brown. Antenna (Fig. 100) with scape, pedicel, anellus and basal funicular segments light brown; apical funicular segments (mostly fu6 and fu7) and clava dark brown. Mesosoma (Figs 101–103) black. Legs light brown except mid coxa and basal part of hind coxa darker. Fore wing (Fig. 104) subhyaline; venation brown; setation brown. Hind wing hyaline. Metasoma with petiole black (Fig. 103). Gaster (Fig. 96) with gt1, syntergum and ovipositor sheaths dark brown, remaining tergites lighter. Body setation including large, symmetrically arranged, setae dark brown.

BODY LENGTH. 1.9 mm.

HEAD. Clypeus mostly coriaceous; apical margin slightly emarginate (Fig. 99); lower face and genae mostly coriaceous (Fig. 99). Scrobes and adjacent areas reticulate, cells elongate (Fig. 97). Vertex reticulate (Fig. 98). Occiput reticulate-striate; margin sharply defined (Fig. 98). Toruli with lower margins about level with lower margins of eyes (Fig. 97). Antenna with flagellum strongly clavate; clava conspicuously asymmetric (Fig. 100). Vertex with eight large setae. Head in dorsal view with width  $2.25 \times$  length (90:40) and in frontal view about  $1.1 \times$  height (90:79). POL about  $4.1 \times$  OOL (29:7). Eye height  $1.4 \times$  length (51:37),  $2.55 \times$  malar space (51:20) and about  $1.2 \times$  scape length (51:43). Head width equal to length of pedicel plus flagellum (90:90). Fu1 length about  $1.2 \times$  width (7:6); fu7 width  $1.4 \times$  length (11:8); clava length about  $2.3 \times$  width (30:13).

MESOSOMA. Pronotal collar narrower than mesoscutum, with six large setae (Fig. 102). Mesonotum moderately setose dorsally (Fig. 102). Mesoscutum and axillae with dense punctulate reticulation (Fig. 102). Scutellum densely punctulate reticulate, frenal area with shallower reticulation (Fig. 102). Upper mesepisternum alutaceous; lower mesepisternum reticulate (Fig. 101). Mesepimeron virtually smooth, with only short costulae and impressions near posterior margin; mesepimeral sulcus conspicuous (Fig. 101). Propodeum with intricate pattern of carinae, the interspaces shiny but wrinkled (Fig. 103). Macropterous; fore wing uniformly and densely setose except for small, elongate bare region (Fig. 104). Mesosoma length about  $1.4 \times$  width (103:72) and  $1.45 \times$  height (103:71). Pronotal collar  $0.4 \times$  as long as mesoscutum (10:25) and  $0.75 \times$  as wide as mesoscutum (54:72). Mesoscutum width about  $2.9 \times$  length (72:25). Scutellum length  $0.95 \times$  width (40:42). Propodeum length about  $0.6 \times$  scutellum length (23:40). Fore wing length about  $2.5 \times$  width (190:75); MV about  $5.3 \times$  SV (64:12) and  $3.2 \times$  PV (64:20).

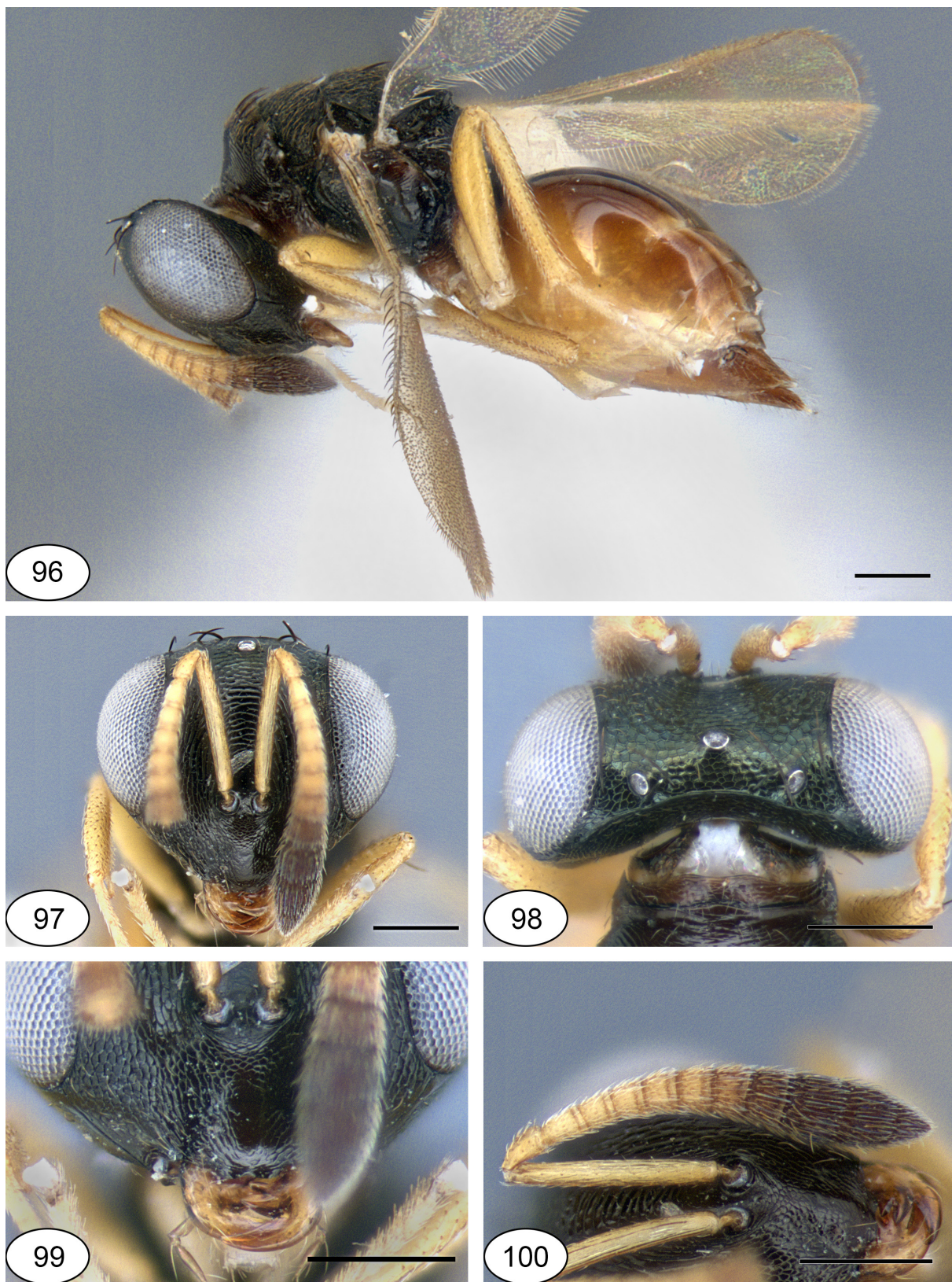
METASOMA. Petiole transverse, mainly smooth, except for some irregular costulae (Fig. 103). Gaster ovate, length about  $1.6 \times$  width (130:80) (Fig. 96); gt1 longest, width about  $1.1 \times$  length (80:70), with hind margin produced; gt2–6 progressively shorter, transverse; syntergum acutely pointed. Ovipositor sheaths slightly protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

### Male (habitus: Fig. 105)

Differs from female mainly as follows. Body length: 1.1–1.3 mm. Body colour brown to dark brown (Fig. 105). Vertex without any metallic reflections. Flagellum brown, basal segments usually slightly lighter (Fig. 106). Fore wing less infumate. Legs paler, mainly yellow, mid and hind coxae light brown. Gaster with gt1 and syntergum brown, remaining tergites with basal half lighter. Fu1 length about  $2.8 \times$  width; length of pedicel plus flagellum  $2.7$ – $2.9 \times$  as long as head width. Mesepimeral sulcus from barely visible to conspicuous. Fore wing length about  $2.3 \times$  width. MV about  $4.7 \times$  as long as SV. Petiole quadrate. Gaster (inflated) length about  $1.4 \times$  width, gt1 occupying less than half length of gaster.

## Distribution

Ecuador.

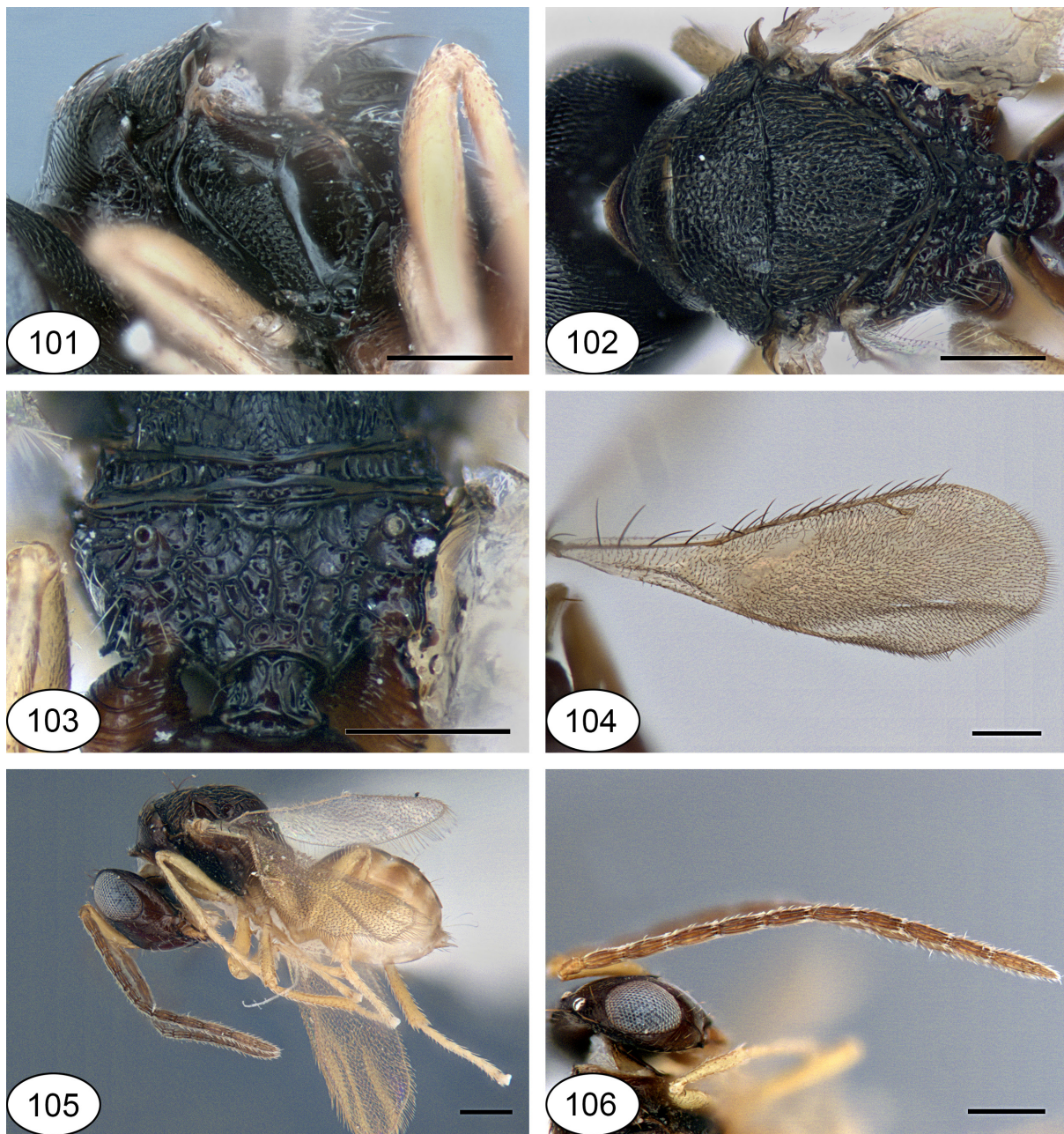


**Figs 96–100.** *Netomocera masneri* sp. nov., holotype, ♀. **96.** Habitus, lateral view. **97.** Head, frontal view. **98.** Head, dorsal view. **99.** Lower face. **100.** Antenna. Scale bars: 0.2 mm.



**Remarks**

Specimens of this species are superficially similar to those of *N. merida* sp. nov., from which they can be separated by the shape of the clypeal margin, which is slightly emarginate in *N. masneri* sp. nov. (Fig. 99) and produced in *N. merida* sp. nov. (Fig. 110). Individuals of the former species are also overall more strongly sculptured, the head of females has distinct metallic reflections (Fig. 98) and the first gastral tergite is longer.



**Figs 101–106.** *Netmocera masneri* sp. nov. **101.** Holotype, ♀, mesosoma, lateral view. **102.** Holotype, ♀, mesosoma, dorsal view. **103.** Holotype, ♀, propodeum, dorsal view. **104.** Holotype, ♀, fore wing. **105.** Allotype, ♂, habitus, lateral view. **106.** Allotype, ♂, antenna. Scale bars: 0.2 mm.

*Netomocera merida* sp. nov.

[urn:lsid:zoobank.org:act:99558136-D5EB-4847-963B-3BE6E1ED90AE](https://doi.org/10.3897/ejt.568.99558136-D5EB-4847-963B-3BE6E1ED90AE)

Figs 107–117

### Diagnosis

#### Both sexes

Macropterous (Figs 107, 116). Head and mesosoma black (Figs 108–109, 116). Fore wing subhyaline (Figs 115–116). Clypeal margin produced (Fig. 110). Scrobes shallow and reticulate (Fig. 108). Upper face and vertex with eight large setae. Occiput margin sharply defined (Fig. 109). Pronotal collar not unusually long or wide (Fig. 113). Mesoscutum, scutellum and axillae with shallow reticulation; scutoscutellar sutures deep, distinct; frenal area distinct, i.e., sculpture at least slightly different than on rest of scutellum (Fig. 113). Mesepimeral sulcus conspicuous (Fig. 112). Propodeum without a well-defined V-shaped area basally (Fig. 114). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 114).

#### Female

Antenna with both fu7 and clava dark, contrasting with other funicular segments (Fig. 111). Eye height about  $2.8 \times$  malar space. Antenna moderately clavate (Fig. 111), fu7 width about  $1.3 \times$  length. Setation of mesonotum not unusually dense or conspicuous (Fig. 113). Fore wing with basal third extensively setose except for narrow bare region (Fig. 115). MV about  $4.3 \times$  SV.

#### Male

Head without any violet reflections on vertex. Mesosoma uniformly dark brown to black (Fig. 116). Fu1 length  $2.4\text{--}2.6 \times$  width; length of pedicel plus flagellum  $2.40\text{--}2.75 \times$  head width. MV  $3.2\text{--}4.1 \times$  SV.

### Etymology

The name of the species (noun in apposition) indicates the name of the Venezuelan state where the holotype was collected.

### Material examined

#### Holotype

VENEZUELA • ♀; “Venezuela: Merida – Sta. Rosa. 2000m.”; “15.v-15.vi.1981, Briceno & Suarez”; “Brit. Mus. 1982-347”; left fore wing glued near specimen, on rectangular card; BMNH.

#### Allotype

VENEZUELA • ♂; “Venezuela: Merida, Tabay La Mucuy, 1900m, 18.VI-2.VIII.1989, S. & J. Peck, FIT, streamside meadow”; CNC.

#### Additional paratypes

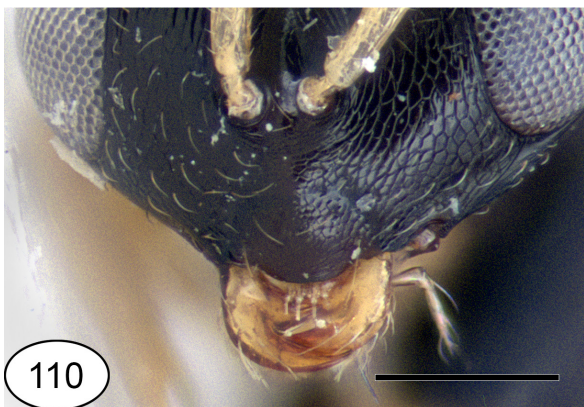
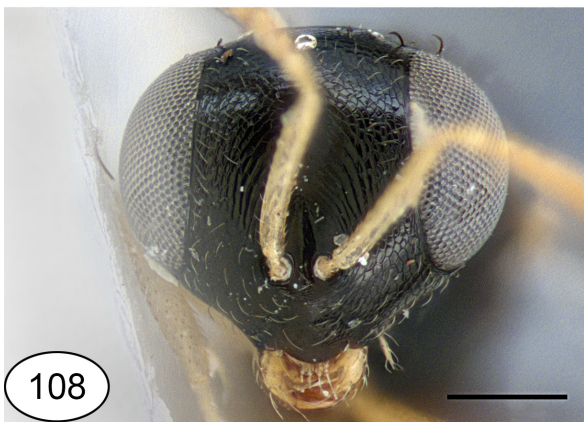
VENEZUELA • 2 ♂♂; “Venezuela: Miranda, Guatopo NP Aqua Blanca, 35 km N Altigracia 400m, 3-10.VI.1987, S. & J. Peck”; CNC.

### Description

#### Female (habitus: Fig. 107)

COLOUR. Head (Figs 108–109) black. Mandibles yellowish-brown, teeth darker. Antenna (Fig. 111) with scape, pedicel, anellus and fu1–5 yellowish-brown; fu6 slightly darker; fu7 and clava dark brown. Mesosoma (Figs 112–113) dorsally black, laterally dark brown. All legs yellowish-brown, except darker basal half of coxae and tarsal pretarsi. Fore wing (Fig. 115) subhyaline; venation light brown; setation brown. Hind wing hyaline. Metasoma with petiole black (Fig. 114). Gaster (Fig. 107) brown, ventrally paler. Body setation including large, symmetrically arranged setae dark brown.



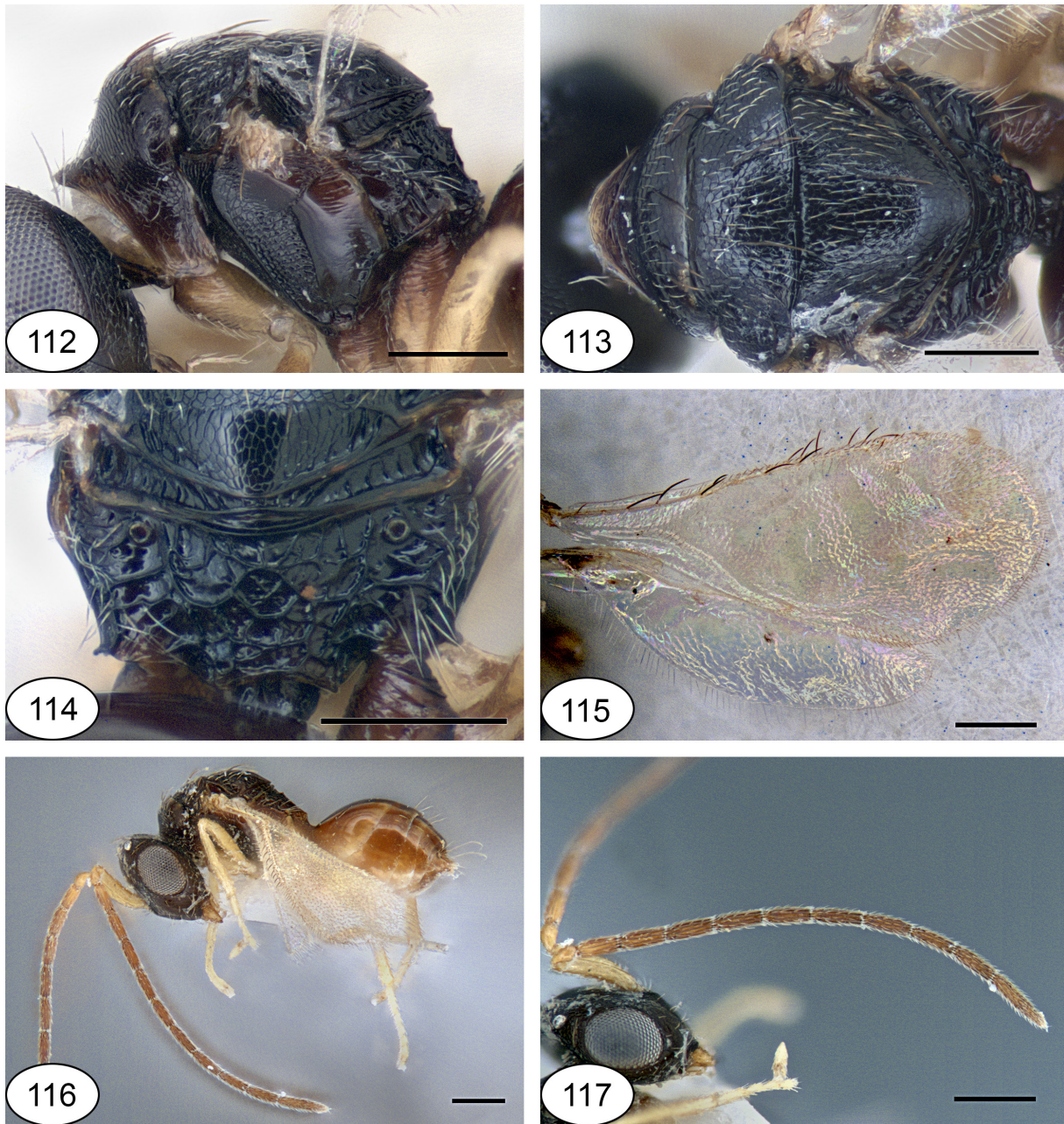


**Figs 107–111.** *Netomocera merida* sp. nov., holotype, ♀. **107.** Habitus, lateral view. **108.** Head, frontal view. **109.** Head, dorsal view. **110.** Lower face. **111.** Antenna. Scale bars: 0.2 mm.



BODY LENGTH. 2.25 mm.

HEAD. Clypeus coriaceous; apical margin produced (Fig. 110). Lower face, gena and vertex mostly coriaceous (Fig. 109). Scrobal depression and areas between scrobes and eyes reticulate, cells elongate (Fig. 108). Occiput reticulate-striate; margin sharply defined (Fig. 109). Toruli with lower margins about level with lower margins of eyes (Fig. 108). Antenna moderately clavate, with clava conspicuously asymmetric (Fig. 111). Upper face and vertex with eight large setae. Head in dorsal view with width  $2.2 \times$  length (83:37) and in frontal view  $1.15 \times$  height (83:72). POL about  $3.4 \times$  OOL (24:7). Eye height



**Figs 112–117.** *Netomocera merida* sp. nov. **112.** Holotype, ♀, mesosoma, lateral view. **113.** Holotype, ♀, mesosoma, dorsal view. **114.** Holotype, ♀, propodeum, dorsal view. **115.** Holotype, ♀, fore and hind wings. **116.** Allotype, ♂, habitus, lateral view. **117.** Allotype, ♂, antenna. Scale bars: 0.2 mm.



about  $1.4 \times$  length (48:35), about  $2.8 \times$  malar space (48:17) and  $1.2 \times$  scape length (48:40). Head width subequal to length of pedicel plus flagellum (83:85). Fu1 length  $1.4 \times$  width (7:5); fu7 width about  $1.3 \times$  length (10.5:8.0); clava length  $2.45 \times$  width (27:11).

**MESOSOMA.** Pronotal collar narrower than mesoscutum, with six large setae (Fig. 113). Mesonotum moderately setose dorsally (Fig. 113). Mesoscutum and axillae coriaceous to very shallowly reticulate (Fig. 113). Scutellum shallowly reticulate except frenal area coriaceous (Figs 113–114). Upper mesepisternum alutaceous to coriaceous; lower mesepisternum reticulate (Fig. 112). Mesepimeron virtually smooth, with only short costulae and impressions near posterior margin; mesepimeral sulcus conspicuous (Fig. 112). Propodeum with intricate pattern of carinae, interspaces shiny but slightly wrinkled (Fig. 114). Macropterous; fore wing uniformly and densely setose except for small, elongate bare region (Fig. 115). Mesosoma length about  $1.4 \times$  width (94:66) and about  $1.4 \times$  height (94:65). Pronotal collar about  $0.3 \times$  as long as mesoscutum (8:23) and about  $0.8 \times$  as wide as mesoscutum (51:66). Mesoscutum width about  $2.9 \times$  length (66:23). Scutellum length  $0.95 \times$  width (38:40). Propodeum length about  $0.5 \times$  scutellum length (20:38). Fore wing length about  $2.6 \times$  width (160:62); MV about  $4.3 \times$  SV (52:12) and about  $2.7 \times$  PV (52:19).

**METASOMA.** Petiole transverse, mainly smooth, except for some irregular costulae (Fig. 114). Gaster ovate, length  $1.65 \times$  width (132:80) (Fig. 107); gt1 longest, width about  $1.6 \times$  length (80:50), with hind margin very slightly produced; gt2–6 progressively shorter, transverse; syntergum acutely pointed. Ovipositor sheaths very slightly protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

**Male** (habitus: Fig. 116)

Differs from female mainly as follows. Body length: 1.2–1.3 mm. Flagellum brown except basal segments slightly lighter (Fig. 117). Mesosoma and metasoma brown to dark brown (Fig. 116). Coxae lighter basally. Fu1 length  $2.4$ – $2.6 \times$  width; length of pedicel plus flagellum  $2.40$ – $2.75 \times$  as long as head width. Fore wing length  $2.5 \times$  width. MV  $3.2$ – $4.1 \times$  as long as SV and  $2.1$ – $2.5 \times$  PV. Gaster (inflated) length about  $1.3 \times$  width, gt1 occupying about half of gaster length.

**Distribution**

Venezuela.

**Remarks**

See *N. masneri* sp. nov. Also similar to *N. celebensis* sp. nov. and *N. ramakrishanai*; from both these species the females of *N. merida* sp. nov. differ mainly in having a less strongly clavate antenna with both fu7 and the clava dark, contrasting with the other funicular segments (Fig. 111), and a darker mesosoma (Figs 112–114). The males seem most similar to those of *N. formiciformis* sp. nov. (see the key).

*Netomocera meridionalis* sp. nov.

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Figs 118–130

**Diagnosis**

**Both sexes**

Clypeal margin shallowly emarginate (Fig. 121). Upper face and vertex with ten large setae (Fig. 120). Occiput margin blunt (Fig. 120). Scutellum, including frenal area, reticulate, with elongate cells (Fig. 124). Propodeum (Fig. 125) without a well-defined V-shaped area basally, with small smooth areas

among carinae; nucha small, with lateral margins converging posteriorly. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 125).

### Female

Head yellowish (Figs 119–120). Flagellum mainly brown (Fig. 122). Macropterous (Fig. 127) or brachypterous (Fig. 118); fore wing with two transverse brownish bands, one behind basal part of marginal vein and the second behind stigma (Figs 126, 128). Head width slightly less than combined length of pedicel and flagellum. Antenna (Fig. 122) moderately clavate, fu7 width 1.2–1.4 × length; clava length 2.1–2.4 × width. Mesosoma length 1.5–1.6 × height. Mesoscutum strongly reticulate (Fig. 124), width 2.1–2.5 × length. Mesepimeral sulcus mostly inconspicuous (Fig. 123).

### Male

Head usually brownish (Fig. 129). Funicle uniform in colour except sometimes fu1 lighter (Fig. 130). Fore wing with at least one brownish band behind basal part of marginal vein (Fig. 129); apical part of basal cell mainly bare (cf. Fig. 128). Fu1 length 1.7–2.5 × width. Scutellum uniformly reticulate, cells isodiametric to slightly elongate (cf. Fig. 124). MV 5.0–5.5 × SV.

### Etymology

The name of the species (adjective) refers to its southern distribution in North America.

### Material examined

#### Holotype

UNITED STATES OF AMERICA – **Florida** • ♀; “FLA: Monroe Co, Big Pine Key, S1, T67S, R29E, 1.VIII.-18.XI.85, S&J Peck, Cactus Hammock, malaise & FIT, forest”; entire, on triangular card; CNC.

#### Allotype

UNITED STATES OF AMERICA – **Florida** • ♂; same data as for holotype; “1.VIII.-17.XI.85”; CNC.

#### Additional paratypes

UNITED STATES OF AMERICA – **Florida** • 1 ♀; “FLA: Dade Co, Chekika St. Rec Area, 50 km SW Miami, [?]2.VIII.85 S&J Peck”; “Grossman Hammock For. malaise-FIT”; “*Netomocera nearctica* Yoshim. Det. Z. Bouček 1991”; BMNH • 2 ♀♀; “FLA: Dade Co., Everglades NP, Long Pine Key, pinelands, 8.VI-26.VIII.86, S&J Peck 3 mal FITs”; CNC • 1 ♂; “USA, Florida: Gainesville, 28.8.76. Z. Bouček”; “*Netomocera nearctica* Yoshim. ♂”; BMNH • 1 ♀; “USA, Florida: Cedar Key, 29.8.76. Z. Bouček”; “*Netomocera nearctica* Ish.”; BMNH • 1 ♀; “FL: Highlands Co., Archbold Biol. Stn., 19.IV.1989, J.R. Vockeroth”; “PT on shore of Lake Annie”; “*Netomocera nearctica* Yoshim. Det. Z. Bouček 1993”; CNC • 1 ♀; “FLA. Levy Co., Manatee Sprs. State Park, 3-5.VI.1978, N.F. Johnson”; “pan trap in hardwood forest”; CNC • 1 ♀; “USA FL: Monroe Co., Sugar Loaf Key, Kitchings NW1/4, SE1/2, S25, R27E, T66S, 3.v-3.viii.85, FIT, S&J Peck hammock for.”; “*Netomocera nearctica* Yoshim. Det. Z. Bouček 1993”; CNC • 6 ♂♂; same data as for preceding; “26.II-6.VI.1985, S&J Peck FIT malaise”; CNC • 1 ♂; same data as for preceding; “14.XI.-85-26.II.-86”; CNC • 1 ♂; same data as for preceding; “22.VIII-16.XI.-85”; CNC • 1 ♂; same data as for preceding; “24.II-4.VI.86”; CNC • 3 ♂♂; same data as for preceding; “5.VIII-19.XI.1985”; CNC • 3 ♀♀, 4 ♂♂; “FLA: Monroe Co., Sugar Loaf Key, SE 1/4 S23, 29.VIII-14.XII.86, S.&J. Peck”; “*Netomocera* Det. Z. Bouček 1989”; CNC • 2 ♂♂; “FLA: Monroe Co., Big Torch Key, SW1/4, Sec 12, 4.VIII.-19.IX.85, S&J Peck hammock forest, malaise & FIT”; CNC • 2 ♂♂; same data as for preceding; “19.XI.85-26.II.86”; CNC • 5 ♂♂; “Fla Archer, 11.VI.86, S. Peck”; CNC • 3 ♀♀; “FLA: Alachua Co, Archer, 9-11.IV.86, G.A.P. Gibson, P.T.”; CNC • 2 ♀♀; “FLA: Monroe Co; Big Pine Key; S1, T67S, R29E, 1.VIII.-17.XI.85, S&J Peck, Cactus Hammock, malaise & FIT, forest”; CNC • 1 ♀; “FLA: Monroe Co, Big Pine Key, Watsons



Hammock, S&J Peck, 23.II-3.VI.86, hardwood hammock, malaise FIT”; CNC • 1 ♀; same data as for preceding; “3.V/27.VII.86”; CNC • 1 ♀, 1 ♂; “FLA: Monroe Co., Big Pine Key, Watson’s Hammock”; “31.VIII-9.XII.86, S.&J. Peck”; “*Netomocera nearctica*, det. C. Desjardins”; CNC • 4 ♀♀, 2 ♂♂; same data as for preceding; “28.VIII.86”; CNC • 1 ♀; “FL, Big Pine Key, Watson’s Hammock, July 1981, S.B. Peck Mal. trap”; CNC. – **Georgia** • 1 ♀, 1 ♂; “USA GA: McIntosh Co., Sapelo Is., FIT, 9-21. ix.87, coastal savannah, BRD team”; CNC. – **Missouri** • 1 ♀; “USA: MO, Wayne Co., Williamsville, VII.1987, J. Becker MT”; CNC • 2 ♂♂; same data as for preceding; “VIII.1987”; CNC. – **Texas** • 1 ♀; “USA: Texas: Tyler Co., Kirby St. Forest, F.I.T., 30.iii-27.iv.2003 E. Riley”; “Univ. Calif. Riverside Ent. Res. Museum, UCRC ENT 135892”; UCRC 135892.

#### Other material

MEXICO • 1 ♀; “Mexico, Yucatan, Chichen Itza, 27.VII.84 G. Gordth”; “Univ. Calif. Riverside, Ent. Res. Museum, UCRC ENT 494314”; UCRC 494314.

#### Description

##### Female (habitus: Figs 118, 127)

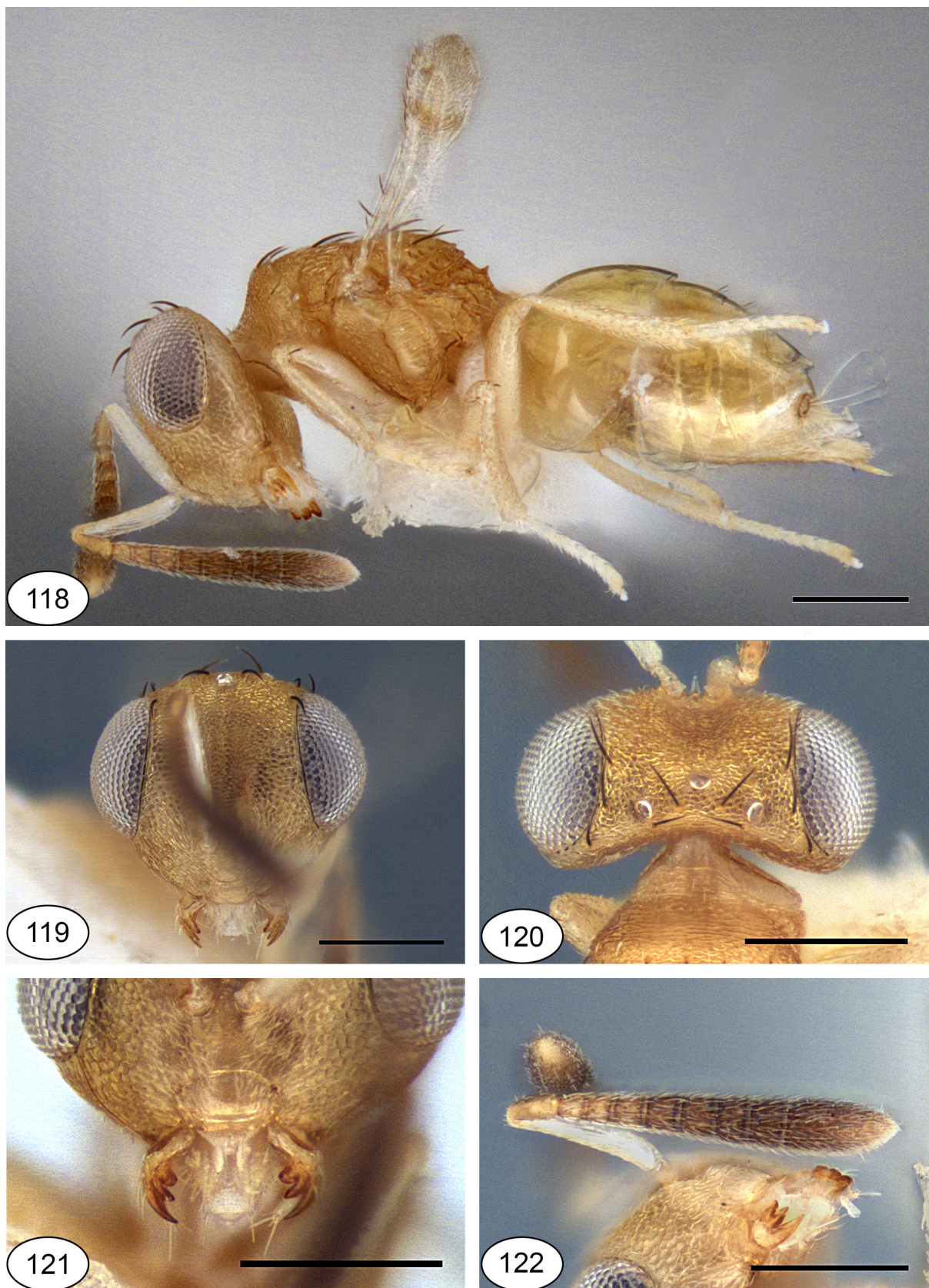
COLOUR. Head (Figs 119–120) yellow to yellowish-brown. Mandibles as head, except teeth reddish-brown. Antenna (Fig. 122) with scape whitish-yellow to yellowish-brown; pedicel yellowish-brown to light brown; flagellum brown to dark brown, basally usually slightly lighter. Mesosoma (Figs 123–125) as head, with one small black spot near each fore wing base. Legs with coxae whitish or rarely middle coxa pale yellow; trochanters and trochantelli whitish; femora, tibiae and tarsi light yellowish-brown, pretarsi dark brown. Fore wing with two brownish bands, one behind basal part of marginal vein and second behind stigma, in macropterous form (Fig. 128) the second band converging towards the first and in brachypterous form (Fig. 126) the two bands joined posteriorly or not; fore wing setation brown. Hind wing hyaline. Metasoma with petiole as mesosoma (Fig. 125). Gaster (Fig. 118) yellow to yellowish-brown, with cercal region, tip of ovipositor sheaths and usually part of several tergites darker. Body setation whitish except for large, symmetrically arranged, black setae.

BODY LENGTH. 1.00–1.75 mm.

HEAD. Clypeus almost smooth; apical margin slightly emarginated (Fig. 121). Lower face shallowly reticulate. Upper face reticulate, with reticulation becoming denser towards vertex (Fig. 120). Scrobal depression densely reticulate (Fig. 119). Occiput finely reticulate; margin blunt (Fig. 120). Toruli with lower margin below lower margins of eyes (Fig. 119). Antenna moderately clavate, with clava conspicuously asymmetric (Fig. 122). Upper face and vertex with ten large setae (Fig. 120). Head in dorsal view with width  $2.10\text{--}2.25 \times$  length (57:27) and in frontal view  $1.1\text{--}1.2 \times$  height (57:50). POL about  $2.10\text{--}2.45 \times$  OOL (15:7). Eye height about  $1.3 \times$  length (29:23),  $1.8\text{--}2.2 \times$  malar space (29:14) and  $0.9\text{--}1.0 \times$  scape length (29:30). Head width  $0.85\text{--}0.90 \times$  length of pedicel plus flagellum (57:64). Fu1 length  $1.0\text{--}1.5 \times$  width (4:4); fu7 width  $1.2\text{--}1.4 \times$  length (7.5:6.0); clava length  $2.1\text{--}2.4 \times$  width (19:8).

MESOSOMA. Pronotal collar narrower than mesoscutum, with six or seven large setae (Fig. 124). Mesonotum moderately setose dorsally (Fig. 124). Mesoscutum and axillae densely reticulate, dull (Fig. 124). Scutellum, including frenal area, reticulate, cells isodiametric to elongate (Fig. 124). Mesepisternum reticulate (Fig. 123). Lower mesepimeron smooth, upper mesepimeron transversally striate; mesepimeral sulcus as a rugose area (Fig. 123). Propodeum with a pattern of several strong carinae, interspaces virtually smooth or slightly wrinkled; nucha small, with lateral margins converging posteriorly (Fig. 125). Macropterous or brachypterous. Macropterous form (Fig. 127) with fore wing extensively bare in basal half, but basal cell with a few scattered setae on apical third and with a large bare region behind marginal vein (Fig. 128). Brachypterous form (Fig. 118) with fore and hind wings reduced and represented by

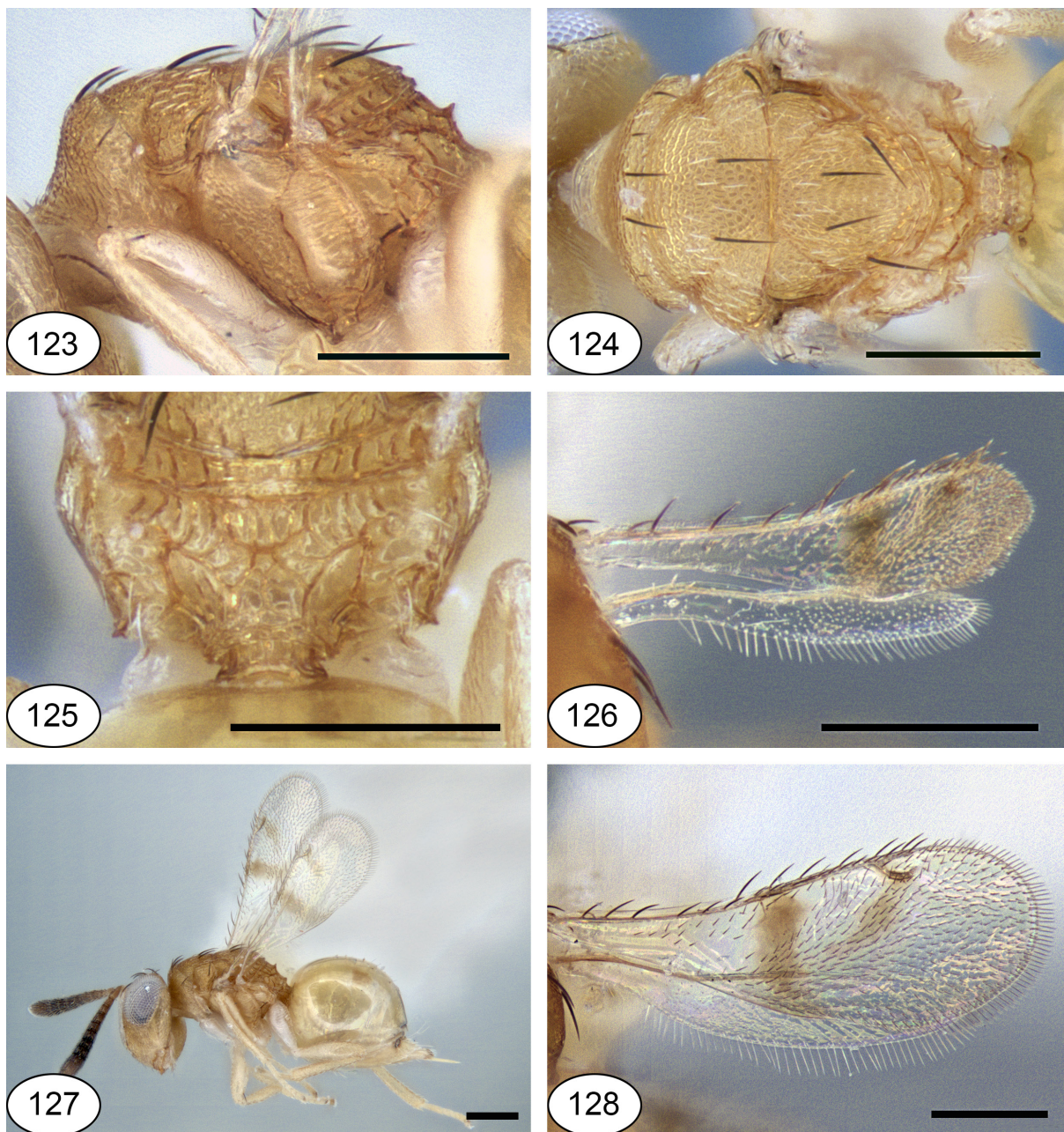




**Figs 118–122.** *Netomocera meridionalis* sp. nov., holotype, ♀. **118.** Habitus, lateral view. **119.** Head, frontal view. **120.** Head, dorsal view. **121.** Lower face. **122.** Antenna. Scale bars: 0.2 mm.



stumps; fore wing longer than its maximum width, well surpassing posterior margin of propodeum, usually rounded or acute apically and with complete submarginal vein, reduced marginal vein and very short postmarginal and stigmal veins; basal cell bare; bare region behind marginal vein large (Fig. 126). Mesosoma length  $1.45\text{--}1.50\times$  width (65:42) and  $1.5\text{--}1.6\times$  height (65:41). Pronotal collar about  $0.2\times$  as long as mesoscutum (3.5:20.0) and about  $0.8\times$  as wide as mesoscutum (35:42). Mesoscutum width  $2.1\text{--}2.5\times$  length (42:20). Scutellum length about  $0.9\times$  width (22:24). Propodeum length about  $0.6\times$



**Figs 123–128.** *Netomocera meridionalis* sp. nov. **123.** Holotype, ♀, mesosoma, lateral view. **124.** Holotype, ♀, mesosoma, dorsal view. **125.** Holotype, ♀, propodeum, dorsal view. **126.** Holotype, ♀, fore and hind wings. **127.** Paratype, ♀, habitus, lateral view. **128.** Paratype, ♀, fore and hind wings. Scale bars: 0.2 mm.



scutellum length (13:22). Fore wing length of macropterous form  $2.7\text{--}3.1 \times$  width; MV  $3.8\text{--}4.7 \times$  SV; PV equal to slightly shorter than SV. Fore wing length of brachypterous form  $3.8\text{--}4.7 \times$  width (57:15).

**METASOMA.** Petiole very short, transverse, with a few longitudinal costulae (Fig. 125). Gaster ovate, length  $1.7\text{--}1.8 \times$  width (85:48) (Fig. 118); gt1 longest, width  $1.1\text{--}1.3 \times$  length (48:37), with hind margin slightly produced; gt2–6 short; syntergum acutely pointed. Ovipositor sheaths protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

**Male** (habitus: Fig. 129)

Differs from female mainly as follows. Body length: 0.75–1.60 mm. Head and mesosoma brown, except propodeum lighter (Fig. 129). Flagellum light brown to brown, slightly to conspicuously darker than scape and pedicel (Fig. 130). Fore wing with only first brownish band visible and this usually less distinct (Fig. 129). Gaster yellowish-brown, usually becoming darker towards tip, occasionally only tip dark (Fig. 129). Fu1 length  $1.7\text{--}2.5 \times$  width; length of pedicel plus flagellum  $2.10\text{--}2.15 \times$  as long as head width. Fore wing length  $2.40\text{--}2.85 \times$  width, row of admarginal setae sometimes longer. MV  $5.0\text{--}5.5 \times$  as long as SV and  $5.0\text{--}6.2 \times$  PV. Gaster (inflated) length  $1.3\text{--}1.4 \times$  width, gt1 occupying about one-third of gaster length.

**Distribution**

Mexico, USA.

**Remarks**

The only specimen from Mexico is not included in the type series because of its darker pedicel and legs, especially the hind tibia, which is dark brown. Females, and especially males, of this species are very similar to those of *N. nearctica* (see the key for main differences). *Netomocera meridionalis* sp. nov. seems confined to Florida and neighbouring states, except for three specimens collected in Missouri. Its area of distribution seems to be shared to a certain degree with *N. nearctica* (mostly Missouri, Georgia and Texas), the records of *N. nearctica* in Florida being very rare (see below). As for *N. nearctica*, this species has both brachypterous and macropterous females; the ratio of brachypterous versus macropterous females among the analyzed specimens was 28:6, without obvious intermediate forms and thus opposite of the situation found in *N. nearctica*, where the macropterous form seems dominant.



**Figs 129–130.** *Netomocera meridionalis* sp. nov., allotype, ♂. **129.** Habitus, lateral view. **130.** Antenna. Scale bars: 0.2 mm.



*Netomocera nearctica* Yoshimoto, 1977

Figs 131–143

*Netomocera nearctica* Yoshimoto, 1977: 1044 (holotype (♀) in CNC, not examined).

**Diagnosis****Both sexes**

Clypeal margin emarginate (Fig. 134). Upper face and vertex with eight large setae (Fig. 133). Occiput margin blunt (Fig. 133). Scutellum medially longitudinally striate and laterally reticulate, with elongate cells, frenal area striate-reticulate (Fig. 137). Propodeum (Fig. 138) without a well-defined V-shaped area basally, with small smooth areas among carinae; nucha large, with lateral margins parallel. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 138).

**Female**

Head yellowish (Figs 132–133). Flagellum mainly brown (Fig. 135). Macropterous (Fig. 140) or brachypterous (Fig. 131); fore wing with two transverse brownish bands, one behind basal part of marginal vein and second behind stigma, occasionally with a third spot between second band and apical wing margin (Figs 139, 141). Head width equal to combined length of pedicel and flagellum. Antenna (Fig. 135) strongly clavate, fu7 width  $1.7\text{--}1.9 \times$  length; clava length  $1.6\text{--}1.7 \times$  width. Mesosoma length  $1.7\text{--}2.0 \times$  height. Mesoscutum very shallowly reticulate (Fig. 137), width  $2.5\text{--}2.9 \times$  length. Mesepimeral sulcus inconspicuous (Fig. 136).

**Male**

Head brownish (Fig. 142). Funicle of uniform colour or sometimes fu1 lighter (Fig. 143). Fore wing usually with at least one brownish band behind basal part of marginal vein (Fig. 142); apical part of basal cell mainly bare, with at most some scattered setae (Fig. 142). Fu1 length  $1.3\text{--}1.5 \times$  width. Scutellum with at least a small shiny area with superficial sculpture on posterior third to half, usually including central part of frenal area, the latter at least laterally striate in large specimens (cf. Fig. 137). MV  $4.0\text{--}4.2 \times$  SV.

**Material examined**

CANADA • 1 ♀, 1 ♂; “ONT.: Chatterton, 13 mi N. Belleville. Meadow, 26.V.1976, Coll. C. D. Dondale”; “*Netomocera nearctica* Yosh., det Z. Bouček 1993”; BMNH • 1 ♀; same data as for preceding; “Top B35. 14.VIII.1967”; BMNH • 1 ♀; same data as for preceding; “Top E50 1.IX.1969”; BMNH • 1 ♂; “ONT: 5 km N.W. Almonte, 22.VII.86 G. Gibson”; CNC • 1 ♂; “ONT: 3 km N. Almonte, 17-24.VI.1986, Denis & Dumouchel, Malaise trap”; CNC • 2 ♀♀; “PQ. Upper Rigaud, IX.1979 PT, M. Sharkey”; BMNH.

UNITED STATES OF AMERICA – **Arizona** • 1 ♀; “USA: AZ, Cochise Co., 12 km S Sierra Vista Ramsey Cyn, 1700m, 17.V.1987, B.V. Brown, MT”; CNC. – **California** • 1 ♀; “Ca: Tulare Co., Ash. Mtn. Pwr. Sta, 10-VII-1983, J.A. Halstead”; CNC • 1 ♀; “CA: Tulare Co., Ash. Mtn. 10.VII.83 flume, J.A. Halstead”; BMNH • 3 ♂♂; “CAL. Riverside Co., Menifee Vly (hills on W end) 33°9' N. 117°13' W. 1800' el., 17-22-X-1981, John D. Pinto”; CNC • 1 ♀; “Cal. San Bernardino Co., 29 Palms 8.v.84, J. Huber”, “*Netomocera* Det. Z Bouček 1991”; CNC • 1 ♀; “Calif, Los Angeles Co., Frazier park near Gorman”; “18-VI-1981, J.B. Wulley”; “*Netomocera* Det. Z Bouček 1991”; CNC. – **Louisiana** • 1 ♂; “LA, Iberville Parish, 4.X.1980, 8020, Masner & Bowen”; “Drying pools along Atchafalaya River”; “♂ *Netomocera nearctica* Yosh. det. Z Bouček 1993”; CNC. – **Florida** • 1 ♀; “FL: Levy Co., 5 km SW Archer, 1.V-13.VIII.1987; FIT, Turkey oak shrubs, BRC Hym. team”; CNC. – **Georgia** • 1 ♀; “USA: GA, McIntosh Co., Sapelo Island, 18.VII-11.IX.1987, BRC Hym. team, FIT, live oak forest”; CNC • 1 ♂; “GA. Forsyth, 5.V-14.V.1971, Malaise Trap, F.T. Naumann”; “Lelaps det. C.M. Yoshimoto”;

“Netomocera”; CNC • 1 ♂; same data as for preceding; “5-10.VI.1971”; “Netomocera nearctica Yshm Det. C.M. Yoshimoto”; CNC • 3 ♂♂; “GA: McIntosh Co., Sapelo Island, 18.VII.1987, Live Oak Forest, BRC Hym. team”; CNC. – **Mississippi** • 1 ♂; “MS, Issaquena Co., 2.X.1980, 8019, Masner & Bowen”; CNC. – **Missouri** • 12 ♂♂; “USA: MO, Wayne Co., Williamsville, 10-26.xi.1987, J. Becker MT”; CNC • 2 ♀♀; same data as for preceding; “VII.1987”; CNC • 1 ♂; same data as for preceding; “X.1987”; CNC. – **Nebraska** • 1 ♂; “Nebraska, Chadron, 14.VIII.80, J. Pinto”; CNC. – **Pennsylvania** • 1 ♂; “Pittsburg Pa”; “Aug. 11 1937”; “Carn. Mus. Acc./2032”; “Coll. [...] 34, Wallace”; “Netomocera det. Burks”; BMNH. – **South Carolina** • 2 ♂♂; “SC: Oconee Co., Clemson 250m, 20.V-5.VI.1987; FIT, Oak woodland-shore, BRC Hym. team”; CNC. – **Texas** • 1 ♀; “USA Texas Jeff Davis Co., Davis Mtns. St. Pk., Limpia Crk. 4800’, 18.VII.82 G.A.P. Gibson”; CNC • 1 ♂; “TX, Big Bend N.P., 19.VII.1977, lowland desert spring, L. Masner”; “♂ Netomocera nearctica Yoshim. Det. Z. Bouček 1991”; BMNH • 1 ♂; “TEX. Brewster Co., Big Bend Natl. Pk, Cotton wood Cpga 2300’ 13-14.VIII.1982 G. Gibson”; “♂ Netomocera Det. Z Bouček 1989”; CNC • 2 ♀♀; “USA Texas Brewster Co, Big Bend National Park, 5.3 mi. W Panther Jct., 3900’ 10-14.VII.82, G.A.P. Gibson”; “Netomocera sp. det. C. Desjardins”; CNC • 1 ♂; “USA: TX: Cameron Co., Ranch Viejo (Omito), 11 mi N Brownsville, 20-28.V.1995, Denis Gumz YPT”; “Netomocera det. R.A. Burks 2004”; CNC. – **Virginia** • 1 ♂; “VA: Shenandoah N.P., Big Meadow 1300m, 5.V-5.VI.1987, MT, Natural meadow, BRC Hym. team”; CNC.

## Description

### Female (habitus: Figs 131, 140)

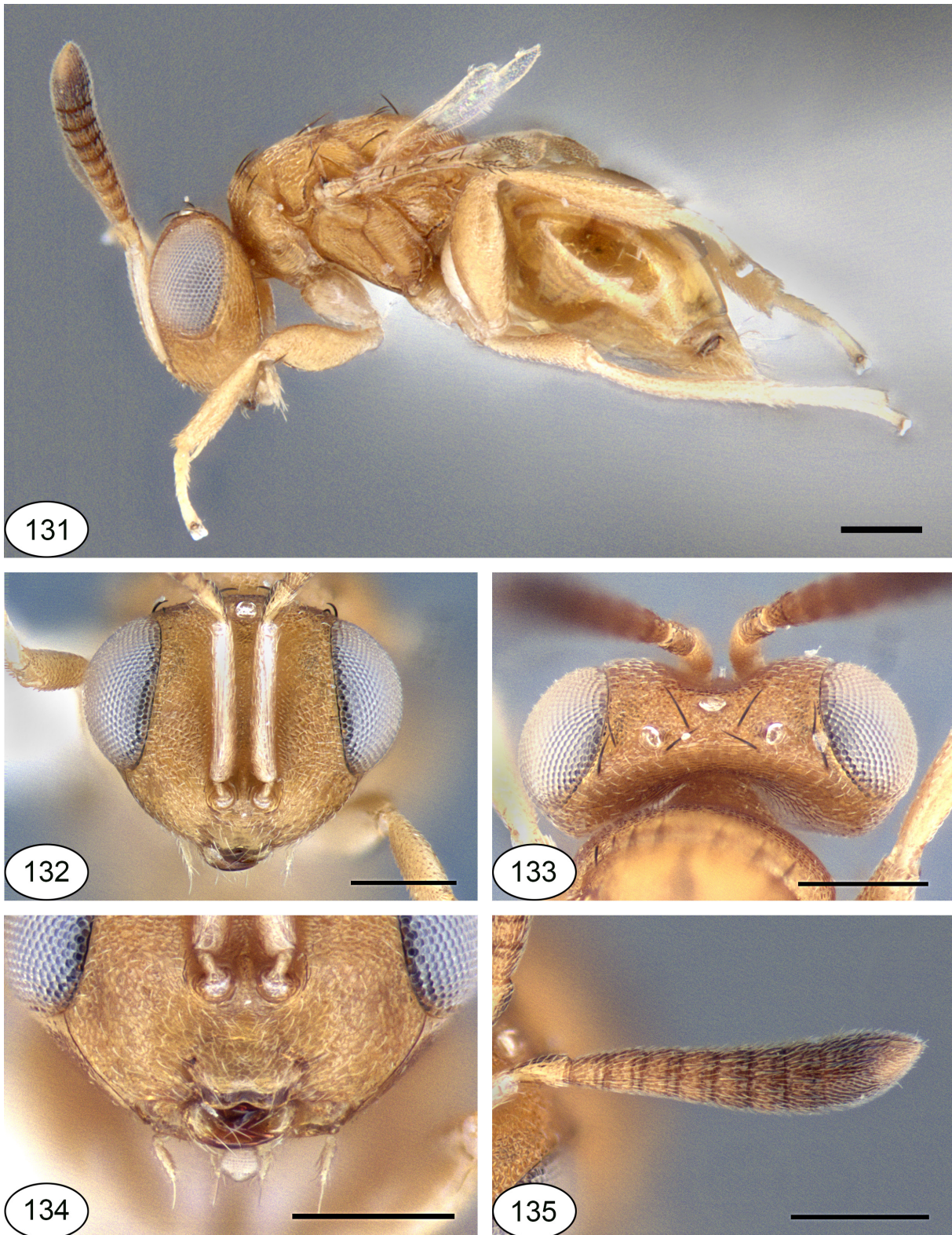
**COLOUR.** Head (Figs 132–133) yellowish-brown to orange brown. Mandibles as head, except reddish-brown teeth. Antenna (Fig. 135) with scape and pedicel as head; flagellum as pedicel or slightly darker basally, progressively getting brown to dark brown towards clava. Mesosoma (Figs 136–138) yellowish-brown to orange brown, sutures occasionally darker, with small black spot near each fore wing base. Legs with fore and hind coxae whitish to yellowish-brown, occasionally darker basally, mid coxa as mesosoma; trochanters whitish to yellowish-brown; femora, tibiae and tarsi yellowish-brown, pretarsi dark brown. Fore wing (Figs 139, 141) with brownish spots: macropterous form with two brownish bands, one behind basal part of marginal vein and second behind stigma converging towards first, plus a somewhat paler roundish spot between second band and apical margin of wing (Fig. 141); brachypterous form with two bands broadly joined posteriorly, third spot absent when wing very short (Fig. 139); setation brown. Hind wing hyaline. Metasoma with petiole (Fig. 138) and gaster (Fig. 131) mainly yellowish-brown to orange-brown, with cercal region, tip of ovipositor sheaths and usually part of several tergites darker. Body setation whitish except large, symmetrically arranged, black setae.

**BODY LENGTH.** 1.2–2.0 mm.

**HEAD.** Clypeus finely coriaceous; apical margin slightly emarginate (Fig. 134). Lower face shallowly reticulate. Upper face reticulate, with reticulation becoming denser towards vertex (Fig. 133). Scrobes densely reticulate (Fig. 132). Occiput mainly finely coriaceous to alutaceous; margin blunt (Fig. 133). Toruli with lower margins below lower margins of eyes (Fig. 132). Antenna with flagellum strongly clavate; clava conspicuously asymmetric (Fig. 135). Upper face and vertex with eight large setae (Fig. 133). Head in dorsal view with width  $2.0\text{--}2.1 \times$  length and in frontal view  $1.2\text{--}1.3 \times$  height. POL  $2.10\text{--}2.75 \times$  OOL. Eye height  $1.3\text{--}1.4 \times$  length,  $1.85\text{--}2.00 \times$  malar space and about equal to scape length. Head width equal to length of pedicel plus flagellum. Fu1 length  $1.0\text{--}1.2 \times$  width; fu7 width  $1.7\text{--}1.9 \times$  length; clava length  $1.6\text{--}1.7 \times$  width.

**MESOSOMA.** Pronotal collar narrower than mesoscutum, with six large setae (Fig. 137). Mesonotum moderately setose (Fig. 137). Dorsal side of mesoscutum and axillae very shallowly reticulate, shiny (Fig. 137). Scutellar disc medially longitudinally striate and laterally reticulate, with elongate cells; frenal area striate (Figs 137–138). Mesepisternum coriaceous (Fig. 136). Mesepimeron transversally

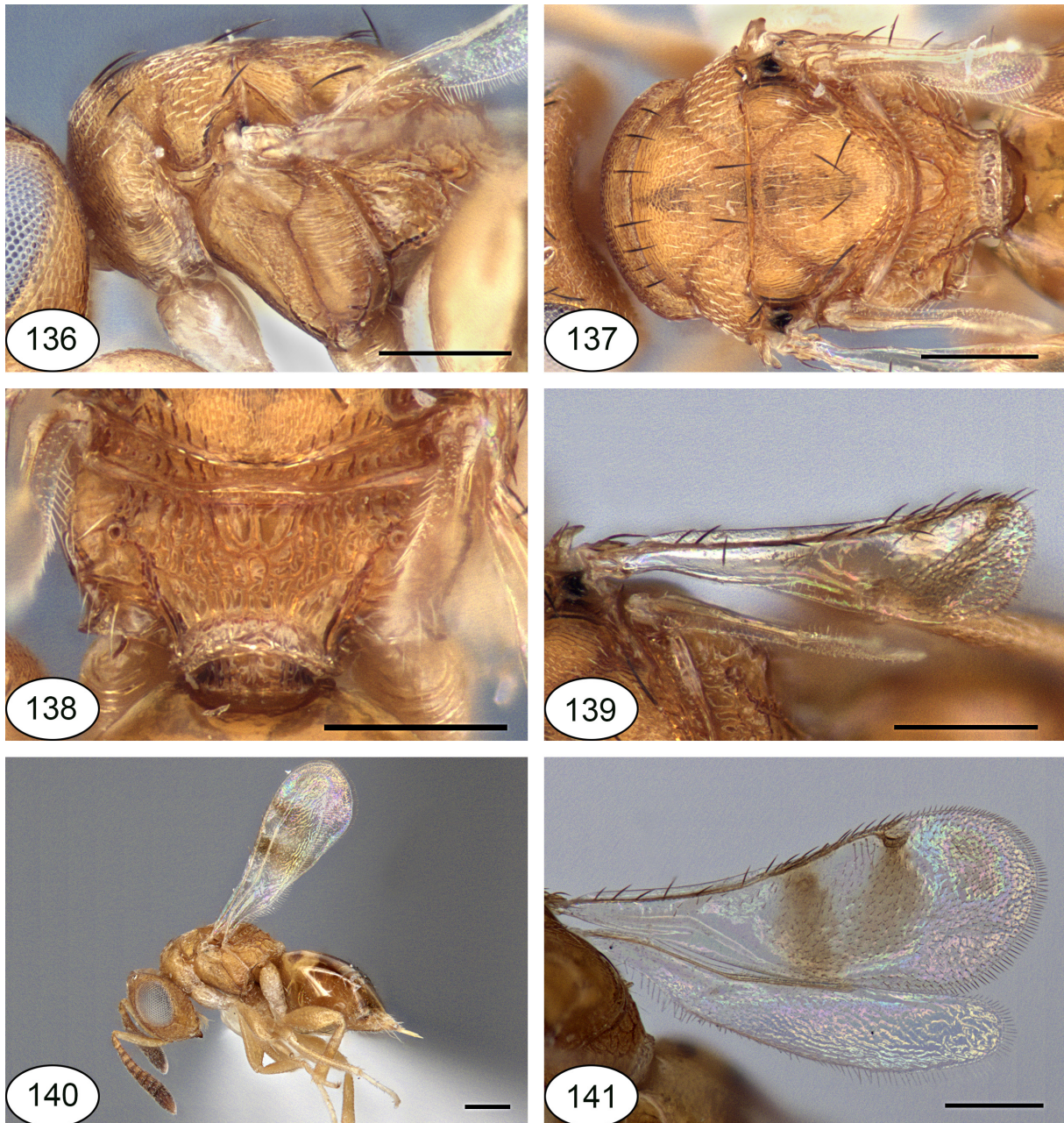




**Figs 131–135.** *Netomocera nearctica* Yoshimoto, 1977, ♀, Missouri (USA). **131.** Habitus, lateral view. **132.** Head, frontal view. **133.** Head, dorsal view. **134.** Lower face. **135.** Antenna. Scale bars: 0.2 mm.



striate; mesepimeral sulcus virtually absent (Fig. 136). Propodeum strongly reticulate, except for almost smooth callus and small area anteriorly; nucha large, with lateral margins parallel (Fig. 138). Macropterous (Fig. 140) or brachypterous (Fig. 131). Macropterous form with fore wing extensively bare on basal half; basal cell with a few scattered setae on apical third; bare region behind marginal vein large (Fig. 141). Brachypterous form with fore and hind wings reduced and represented by stumps; fore wing with rounded or truncate apex well surpassing posterior margin of propodeum, with basal cell bare, large bare region behind marginal vein, and complete submarginal vein, reduced marginal vein and very



**Figs 136–141.** *Netomocera nearctica* Yoshimoto, 1977. **136.** ♀, Missouri (USA), mesosoma, lateral view. **137.** ♀, Missouri (USA), mesosoma, dorsal view. **138.** ♀, Missouri (USA), propodeum, dorsal view. **139.** ♀, Missouri (USA), fore and hind wings. **140.** ♀, California (USA), habitus, lateral view. **141.** ♀, California (USA), fore and hind wings. Scale bars: 0.2 mm.



short postmarginal and stigmal veins (Fig. 139). Mesosoma length  $1.4\text{--}1.5 \times$  width and  $1.7\text{--}2.0 \times$  height. Pronotal collar  $0.25\text{--}0.30 \times$  as long as mesoscutum and  $0.8\text{--}0.9 \times$  as wide as mesoscutum. Mesoscutum width  $2.5\text{--}2.9 \times$  length. Scutellum length  $0.9\text{--}1.0 \times$  width. Propodeum length about  $0.6 \times$  scutellum length. Fore wing length of macropterous form  $2.9\text{--}3.0 \times$  width; MV  $4\text{--}5 \times$  SV; PV slightly shorter than SV. Fore wing length of brachypterous form about  $3.6 \times$  width.

**METASOMA.** Petiole very short, transverse, with a few longitudinal costulae (Fig. 138). Gaster ovate, about  $1.3\text{--}1.7 \times$  width (Fig. 131); gt1 longest, width  $1.2\text{--}1.3 \times$  length, with hind margin produced; gt2–6 short; syntergum acutely pointed. Ovipositor sheaths slightly protruding beyond apex of gaster. Cercal setae surpassing apex of gaster.

**Male** (habitus: Fig. 142)

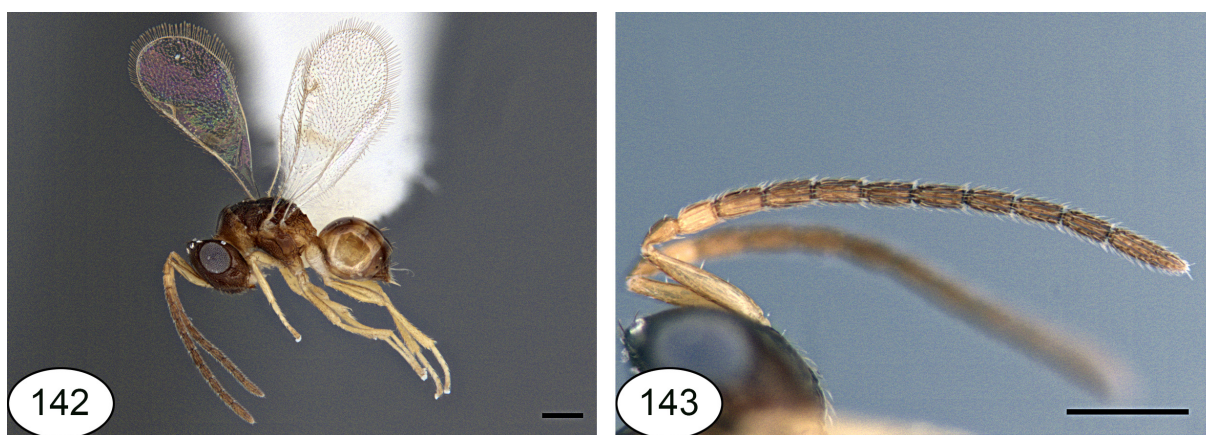
Differs from female mainly as follows. Body length: 1.0–1.5 mm. Body orange brown (rarely) to blackish-brown, pronotum and propodeum usually lighter (Fig. 142). Scape and pedicel orange-brown to brown, flagellum brown to blackish, sometimes lighter ventrally (Fig. 143). Scutellum with at least a small shiny area with superficial sculpture on posterior third to half, usually including central part of frenal area, the latter at least laterally striate in large specimens. Fore wing with second infusate band reduced to a small spot behind stigma, third spot absent (Fig. 142) and rarely all markings inconspicuous. Fu1 length  $1.3\text{--}1.5 \times$  width; length of pedicel plus flagellum  $1.7\text{--}2.1 \times$  as long as head width. Fore wing length  $2.4\text{--}2.8 \times$  width, row of admarginal setae sometimes longer. MV  $4.0\text{--}4.2 \times$  as long as SV and  $6.0\text{--}6.3 \times$  PV. Gaster (inflated) length about  $1.6\text{--}1.8 \times$  width, gt1 occupying about half or slightly less than half of gaster length.

**Distribution**

Canada; USA (new record).

**Remarks**

The species was described by Yoshimoto (1977) based on a brachypterous female from Canada. Analyzing the Nearctic material above, it was found that a macropterous form (Fig. 140) also occurs, which apparently is more frequent than the brachypterous form because the ratio of brachypterous to macropterous females examined was 4:13. The shortened wings can vary in length, with the apical part being rounded or truncate (Fig. 139) and the apical-most, third spot being visible or absent. Yoshimoto (1977: 1044) stated “[vertex] with six prominent black setae and 2 others on each side of upper margin



**Figs 142–143.** *Netomocera nearctica* Yoshimoto, 1977, ♂, South Carolina (USA). **142.** Habitus, lateral view. **143.** Antenna. Scale bars: 0.2 mm.

of eyes”. This seems to be true for all examined females, except a brachypterous one from Florida, which has one additional seta near the inner margin of each eye, as in *N. meridionalis* sp. nov. Regarding the setae on the pronotum, in a few cases an additional seta was observed, the total number of setae being seven instead of six. For additional differences between *N. nearctica* and *N. meridionalis* sp. nov., see the latter species.

I also examined one female from Missouri, USA and one from Ontario, Canada (CNC) that are brachypterous and have the head black, as well as several males from North America that are darker than the usual males of *N. nearctica*. These specimens may represent a distinct species, but more are necessary before a decision can be made.

*Netomocera ramakrishnai* Sureshan, 2010

Figs 144–156

*N. ramakrishnai* Sureshan, 2010: 1310 (holotype (♀) in ZSIP, not examined).

**Diagnosis**

**Both sexes**

Clypeus about as wide as high; apical margin produced (Fig. 147). Scrobes shallow and reticulate. Upper face and vertex with eight large setae. Occiput margin sharply defined (Fig. 146). Pronotal collar not unusually long or wide (Fig. 150). Mesoscutum, scutellum and axillae with shallow reticulation (Fig. 150); scutoscutellar sutures deep, distinct (Fig. 150); frenal area distinct, i.e., sculpture at least slightly different than on rest of scutellum (Figs 150–151). Setation of mesonotum not unusually dense or conspicuous (Fig. 150). Mesepimeral sulcus conspicuous (Fig. 149). Propodeum without a well-defined V-shaped area basally (Fig. 151). Fore wing with basal third extensively setose except for narrow bare region (Figs 152, 154). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 151).

**Female**

Head black, mesosoma reddish-brown (Figs 145, 150). Flagellum brown, gradually becoming darker towards clava (Fig. 148). Macropterous, submacropterous or brachypterous (Figs 144, 153); fore wing subhyaline (Figs 152, 154). Eye height 2.3–2.4 × malar space. POL 3.3–3.5 × OOL. Antenna strongly clavate (Fig. 148). MV 4–5 × SV.

**Male**

Mesosoma usually at least partially reddish (Fig. 155). Head without violet reflections on vertex (cf. Fig. 146).

**Material examined**

INDIA • 1 ♀; “INDIA Madras, Nilgiri, 22.XI.72, 1600 m, Coonoor, Besuchet Löbi Mussard”; “Netomocera”; BMNH.

JAPAN • 1 ♀; “Honshu I., Ibaraki, Tsukuba Mountain, 36°13.186' N, 140°06.444' E, 25 September 1999, S.A. Belokobylskij”; ZIN • 2 ♀♀, 3 ♂♂; “Iwate, Iwaizumi Hitsufori, 770 m, 11–17 August 1991, A. Smetana (J47)”; CNC • 1 ♀, 1 ♂; “Tochigi, Nishinasuno, 500 m, 10 August 1989, M.J. Sharkey, sweep”; CNC • 1 ♂; “Aichi, Toyone Misawa, 750 m, 15–17 July 1992, K. Yamagishi”; CNC • 3 ♂♂; “Iwate, Kawai, Yoshibezawa, 1050 m, 12–17 August 1991, A. Smetana (J50)”; CNC • 2 ♂♂; “Tochigi, Kuriyama, Nikkosawa, 1465 m, 20–22 August 1991, A. Smetana”; CNC • 1 ♂; “Kibune, Kyoto, 6



August 1980, C.M. Yoshimoto”; CNC • 1 ♂; “Aichi Pref., Mt Sanageyama, 25–31 July 1989, A. Takano, Malaise trap”; CNC.

RUSSIA • 2 ♀♀; “Kamchatka Terr., Kronotsky Natural Reserve, 90 km S Lazo, forest margin near thermal pool Kipelye, 55°08.165' N, 160°05.832' E, 20 July 2013, E.V. Tselikh et D.V. Rachin”; ZIN • 1 ♀; “Sakhalin Prov., Sakhalin I., 17 km S Nevelsk, forest margin, 46°35.244' N, 141°50.071' E, 17 July 2011, E.V. Tselikh et D.V. Rachin”; ZIN.

TAIWAN • 2 ♀♀; “Taiwan, Shan-Lin Chi (Nanton Helen), 1600 m, 16 May 1990, L. Lesage”; CNC.

## Description

**Female** (habitus: Figs 144, 153)

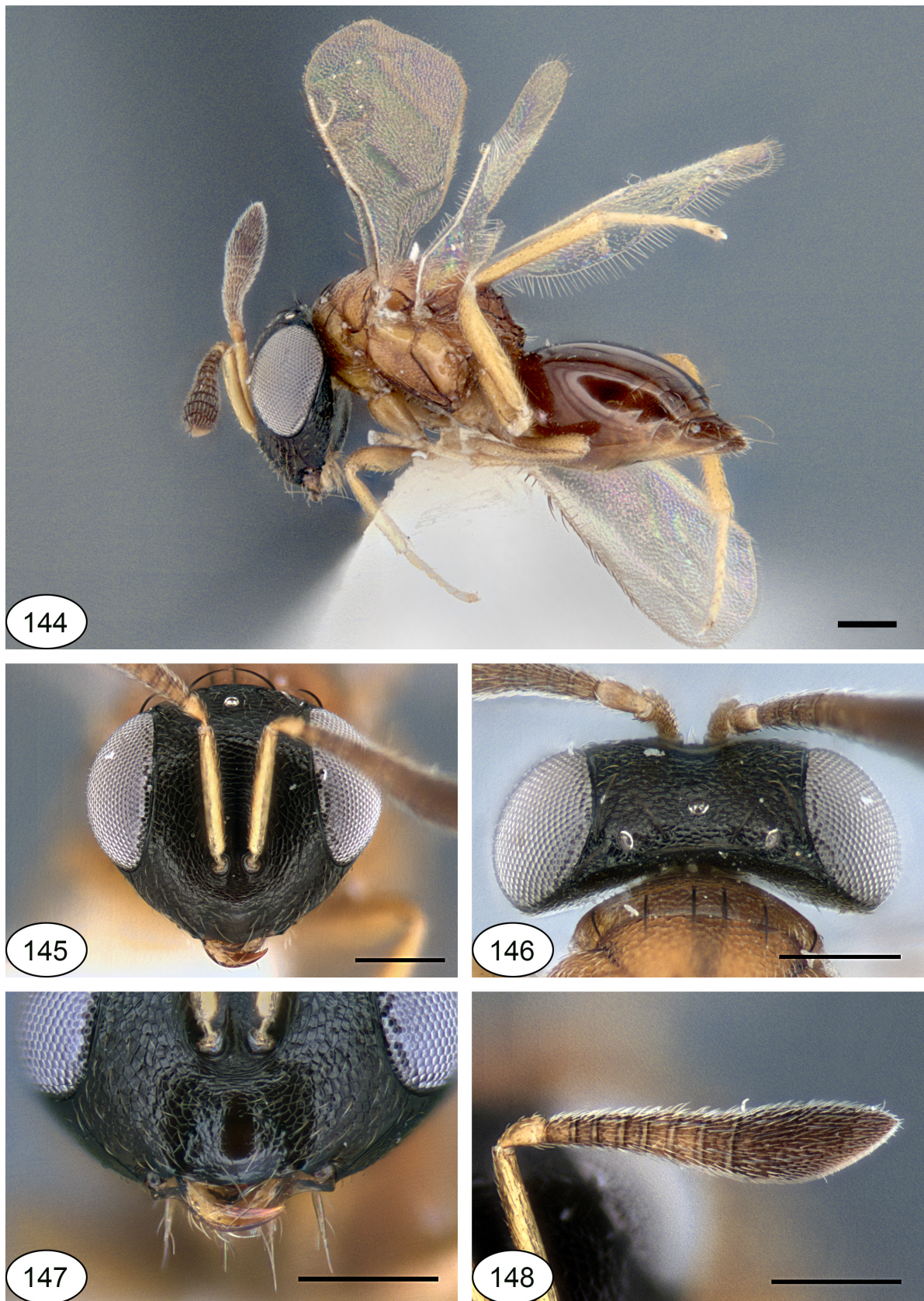
**COLOUR.** Head (Figs 145–146) black. Mandibles reddish-yellow, teeth darker. Antenna (Fig. 148) with scape and pedicel reddish-yellow, pedicel sometimes darker dorsally; flagellum brown, gradually becoming darker towards clava. Mesosoma (Figs 149–151) dorsally reddish-brown, occasionally dark brown. Mesepisternum and sometimes mesepimeron brown to dark brown. Legs reddish-yellow. Fore wing evenly and slightly to moderately infuscate; setation brown (Figs 152, 154). Hind wing hyaline. Metasoma with petiole reddish-brown (Fig. 151); gaster (Fig. 144) dorsally dark brown to black, ventrally pale. Body setation pale except for several large, symmetrically arranged dark brown setae.

**BODY LENGTH.** 1.6–2.4 mm.

**HEAD.** Clypeus virtually smooth; apical margin slightly produced (Fig. 147). Lower face coriaceous to shallowly reticulate, piliferous punctures not distinct. Upper face including vertex reticulate (Fig. 146). Scrobes deep, reticulate; parascrobal region with elongate cells (Fig. 145). Occiput coriaceous-alutaceous; margin sharply defined (Fig. 146). Toruli with lower margins below lower margins of eyes (Fig. 145). Antenna with flagellum strongly clavate; clava conspicuously asymmetric (Fig. 148). Upper face and vertex with eight large setae. Head width about  $2.3 \times$  length in dorsal view and  $1.1\text{--}1.2 \times$  height in frontal view. POL  $3.3\text{--}3.5 \times$  OOL. Eye height  $1.4\text{--}1.5 \times$  length,  $2.3\text{--}2.4 \times$  malar space and  $1.1\text{--}1.2 \times$  scape length. Head width subequal to length of pedicel plus flagellum.  $Fu_1$  length  $1.0\text{--}1.3 \times$  width;  $Fu_7$  width  $1.70\text{--}1.85 \times$  length; clava length  $1.8\text{--}2.0 \times$  width.

**MESOSOMA.** Pronotal collar narrower than mesoscutum, with six large setae (Fig. 150). Mesonotum moderately setose (Fig. 150). Mesoscutum and axillae with fine punctulate reticulation (Fig. 150). Scutellar disc with similar sculpture as mesoscutum and longitudinally striate-reticulate on frenal area (Figs 150–151). Mesepisternum densely reticulate (Fig. 149). Mesepimeron mainly smooth, except for shallow striation on upper part dorsally; mesepimeral sulcus conspicuous (Fig. 149). Propodeum mainly smooth, with intricate pattern of carinae, interspaces smooth to slightly wrinkled (Fig. 151). Brachypterous (Fig. 153), submacropterous or macropterous (Fig. 144). Macropterous and submacropterous forms with fore wing uniformly and densely setose except for small, elongate bare region (Fig. 152). Brachypterous form with fore and hind wings reduced and represented by stumps; fore wing with rounded or truncate apex well surpassing posterior margin of propodeum; setation similar to that of macropterous form; fore wing with complete submarginal vein, reduced marginal vein and very short postmarginal and stigmal veins (Fig. 154). Mesosoma length about  $1.3 \times$  width and  $1.1\text{--}1.2 \times$  height. Pronotal collar  $0.4\text{--}0.6 \times$  as long as mesoscutum and about  $0.8 \times$  as wide as mesoscutum. Mesoscutum width  $2.9\text{--}3.1 \times$  length. Scutellum about as long as broad. Propodeum length  $0.6\text{--}0.7 \times$  scutellum length. Fore wing length of macropterous form  $2.2\text{--}2.3 \times$  width; MV  $4\text{--}5 \times$  SV and  $2.0\text{--}2.6 \times$  PV. Fore wing length of brachypterous form  $2.6\text{--}3.0 \times$  width.





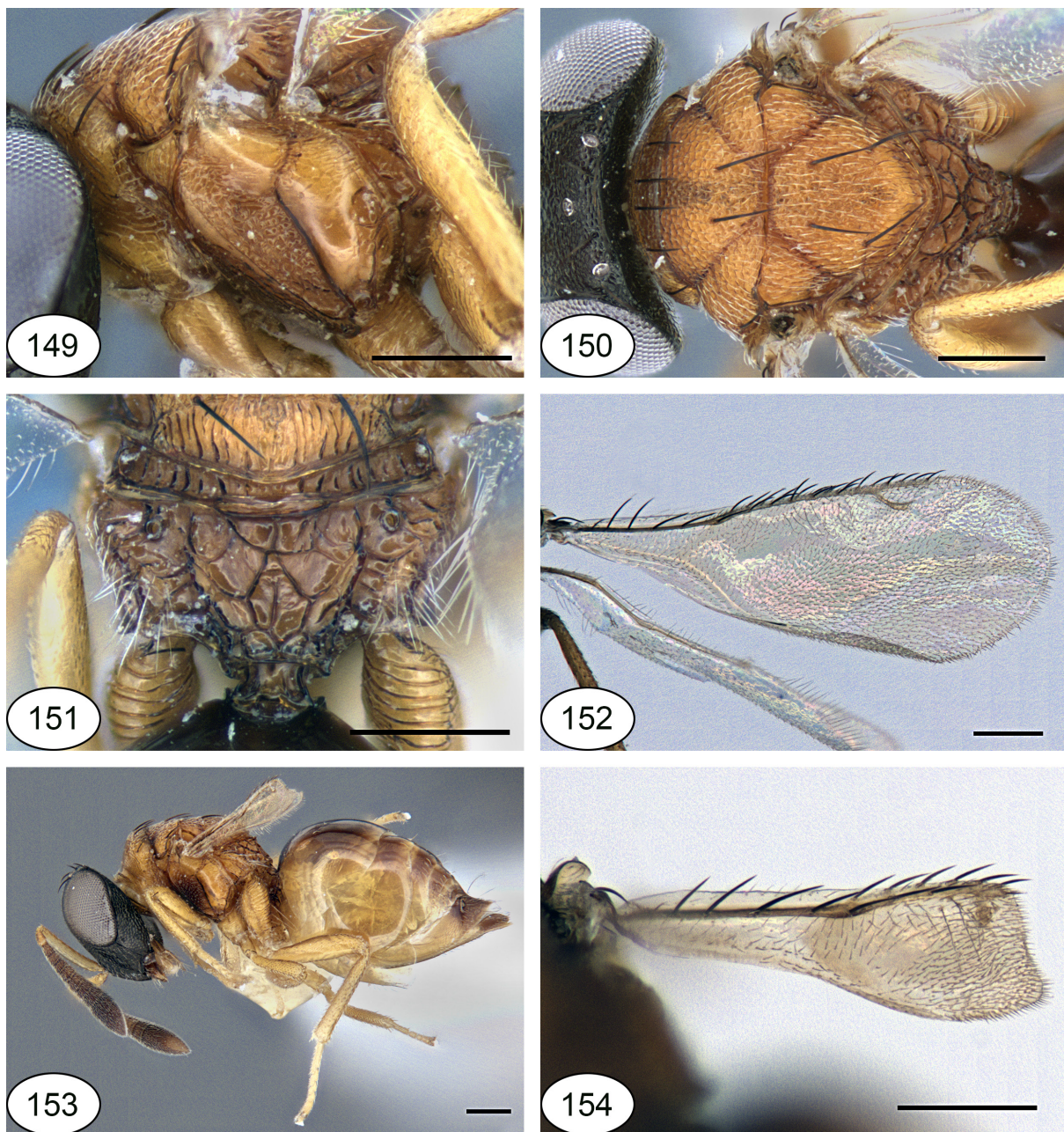
**Figs 144–148.** *Netomocera ramakrishnai* Sureshan, 2010, ♀, Taiwan. **144.** Habitus, lateral view. **145.** Head, frontal view. **146.** Head, dorsal view. **147.** Lower face. **148.** Antenna. Scale bars: 0.2 mm.



**METASOMA.** Petiole barely visible, transverse, smooth except for a few superficial longitudinal striae (Fig. 151). Gaster ovate, length 1.6–1.8 × width (Fig. 144); gt1 longest, length 1.4–1.5 × width, with hind margin produced; gt2–6 short; syntergum acutely pointed. Ovipositor sheaths slightly to distinctly protruding beyond apex of gaster. Cercal setae surpassing apex of gaster.

**Male** (habitus: Fig. 155)

Differs from female mainly as follows. Body length: 1.0–2.3 mm. Flagellum uniformly brown to dark brown (Fig. 156). Mesoscutum, scutellum and axillae dark brown; mesopleuron more extensively brown



**Figs 149–154.** *Netomocera ramakrishnai* Sureshan, 2010. **149.** ♀, Taiwan, mesosoma, lateral view. **150.** ♀, Taiwan, mesosoma, dorsal view. **151.** ♀, Taiwan, propodeum, dorsal view. **152.** ♀, Taiwan, fore wing. **153.** ♀, Japan, habitus, lateral view. **154.** ♀, Japan, fore wing. Scale bars: 0.2 mm.



(Fig. 155). Fu1 length  $2.0\text{--}2.7\times$  width; combined length of pedicel plus flagellum  $2.7\text{--}3.0\times$  head width. Gaster (when not inflated) much shorter than mesosoma, with only gt1 visible.

### Distribution

India, Japan, Russia, Taiwan.

### Remarks

See Tselikh & Mitroiu (2014) for general comments regarding the identity of the brachypterous and submacropterous specimens collected in East Asia and identified as *N. ramakrishnai*. Based on their original description, and taking into consideration the high intraspecific variability encountered in other species of the genus, *N. ramakrishnai* seems very similar to *N. calicutensis* and *N. minuta* (the latter two not treated here).

### *Netomocera rufa* Hedqvist, 1971

Figs 157–166

*Netomocera rufa* Hedqvist, 1971: 241 (holotype (♂) in BMNH, examined).

### Diagnosis

#### Male

Head orange and mesosoma dark brown, without metallic reflections (Figs 157–158), or both head and mesosoma orange with distinct greenish metallic reflections dorsally (Figs 159, 162). Clypeal margin slightly produced (Fig. 160). Pronotal collar long,  $0.75\text{--}0.80\times$  as long as mesoscutum and wide, about  $0.8\times$  as wide as mesoscutum (Figs 162–164). MV  $2.7\text{--}2.9\times$  SV. Visible part of petiole transverse to quadrate, without distinct longitudinal rugae (Fig. 165).

### Material examined

#### Holotype

SOUTH AFRICA • ♂; “Holotype”; “Port St. John, Pondoland. July 10-31.1923.”; “S. Africa. R. E. Turner. Brit. Mus. 1923-398”; “HOLOTYPUS *Netomocera rufa* sp. n. ♂, K-J Hedqvist det. 1971”; “B.M. TYPE HYM. 5.2257”; BMNH 5.2257.



**Figs 155–156.** *Netomocera ramakrishnai* Sureshan, 2010, ♂, Japan. **155.** Habitus, lateral view. **156.** Antenna. Scale bars: 0.2 mm.



**Other material**

SOUTH AFRICA • 1 ♂; “Port St. John, Pondoland. Dec. 1923”; “S. Africa. R. E. Turner. Brit. Mus. 1924-54”; NMPC.

ZIMBABWE • 1 ♂; “Rhodesia, Mazoe (i)75, A. Watsham”; “78”; NMPC.

**Description**

**Male** (habitus: Figs 157, 162)

COLOUR. Head (Figs 158–159) orange, occasionally gradually darker towards vertex, which then has distinct blue-green metallic reflections. Mandibles orange, teeth reddish-brown. Antenna (Fig. 161) with scape orange, pedicel and flagellum brown. Mesosoma (Figs 162–165) usually reddish-brown with pronotum lighter, but occasionally mesosoma dorsally, except reddish-brown propodeum, with distinct green reflections. Legs light brown, except hind coxa usually lighter. Wings (Fig. 166) hyaline, venation light brown; setation brown. Metasoma with petiole reddish-brown (Fig. 165). Gaster (Figs 157, 162) dark brown to black. Body setation light brown except for several large, symmetrically arranged, dark brown setae.

BODY LENGTH. 1.1–2.0 mm.

HEAD. Clypeus almost smooth; apical margin slightly produced (Fig. 160). Upper face including shallow scrobes and adjacent areas weakly reticulate, with reticulation becoming denser towards vertex (Fig. 159). Occiput smooth; margin blunt (Fig. 159). Toruli with lower margins slightly above or level with lower margins of eyes (Fig. 158). Upper face and vertex with eight large setae. Head in dorsal view with width  $2.0\text{--}2.2 \times$  length and in frontal view about  $1.2 \times$  height. POL  $1.5\text{--}1.6 \times$  OOL. Eye height  $1.3\text{--}1.4 \times$  length,  $1.4\text{--}1.7 \times$  malar space and  $0.75\text{--}0.80 \times$  scape length. Flagellum very long, without differentiated clava (Fig. 161); combined length of pedicel plus flagellum about  $2.4 \times$  head width. Fu1 length  $1.7\text{--}2.3 \times$  width; fu10 length  $3.3\text{--}3.8 \times$  width.

MESOSOMA. Pronotal collar narrower than mesoscutum, with four large setae (Figs 162, 164). Mesonotum moderately setose (Fig. 164). Mesoscutum and axillae with dense but superficial reticulation (Figs 162, 164). Scutellar disc densely but superficially reticulate and irregularly longitudinally striate on frenal area (Figs 162, 164). Mesepisternum densely reticulate, with several costulae posteriorly (Fig. 163). Mesepimeron mainly striate; mesepimeral sulcus conspicuous (Fig. 163). Propodeum mainly smooth, with intricate pattern of carinae (Fig. 163). Macropterous; fore wing uniformly and densely setose except for small, elongate bare region (Fig. 166). Mesosoma length  $1.4\text{--}1.5 \times$  width, width about  $1.1 \times$  height. Pronotal collar  $0.75\text{--}0.80 \times$  as long as mesoscutum and about  $0.8 \times$  as wide as mesoscutum. Mesoscutum width  $2.60\text{--}2.75 \times$  length. Scutellum length about  $1.1 \times$  width. Propodeum length  $0.6\text{--}0.7 \times$  scutellum length. Fore wing length  $2.3\text{--}2.4 \times$  width; MV  $2.7\text{--}2.9 \times$  SV and  $2.7\text{--}3.6 \times$  PV.

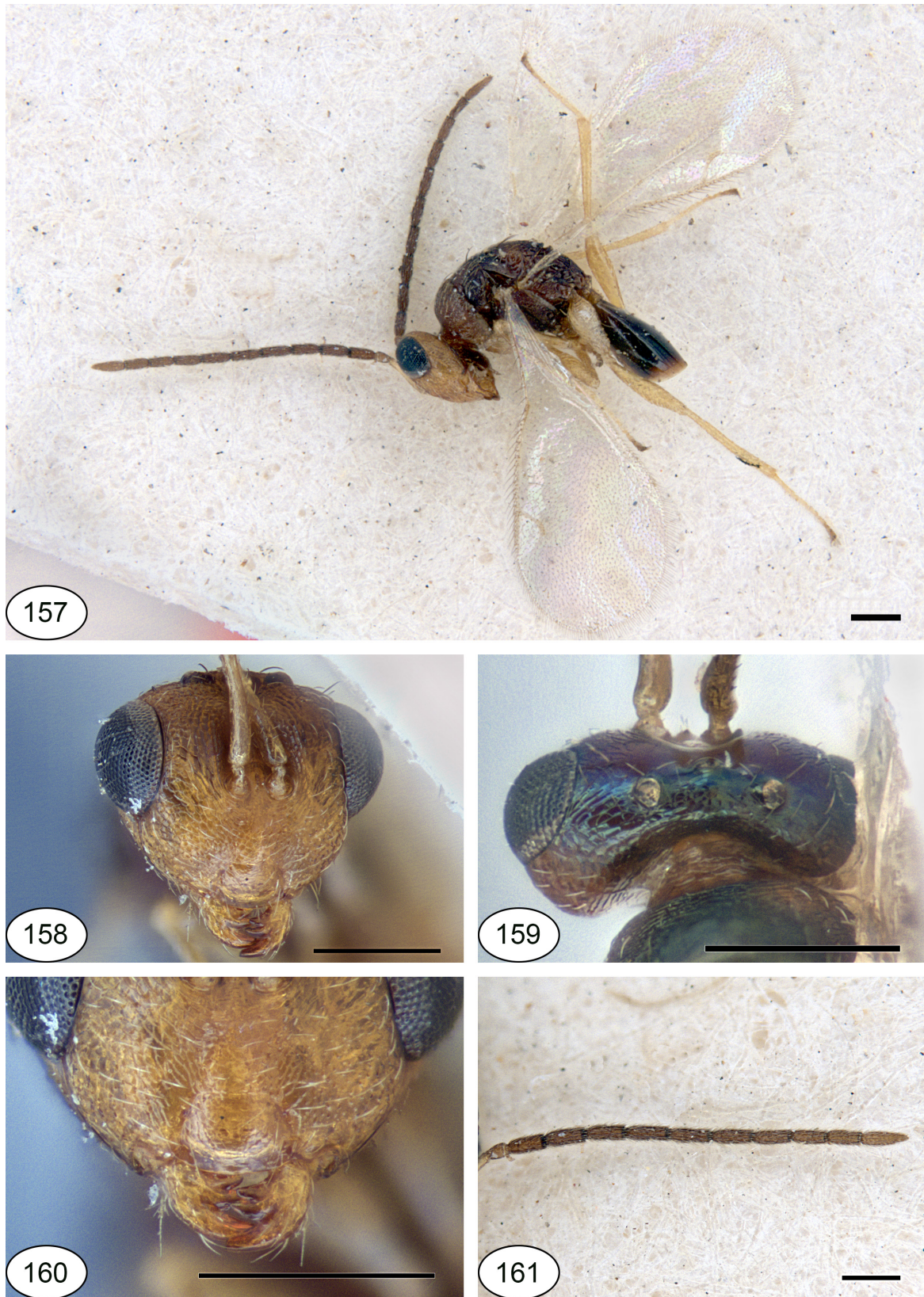
METASOMA. Petiole short, quadrate to slightly transverse, mainly rugose (Fig. 165). Gaster ovate, length about  $1.2\text{--}1.5 \times$  width; gt1 large, covering all other tergites, with hind margin straight (Fig. 162).

**Female**

Unknown.

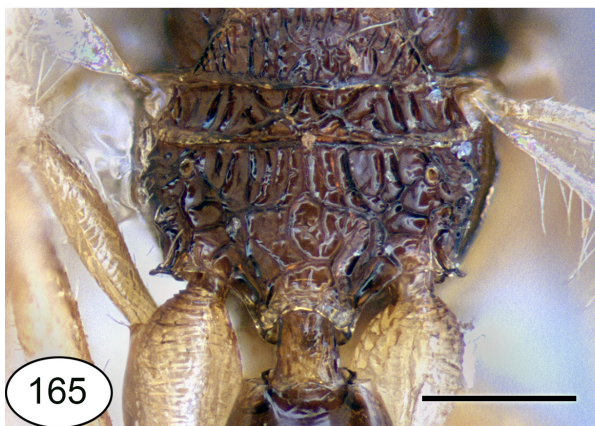
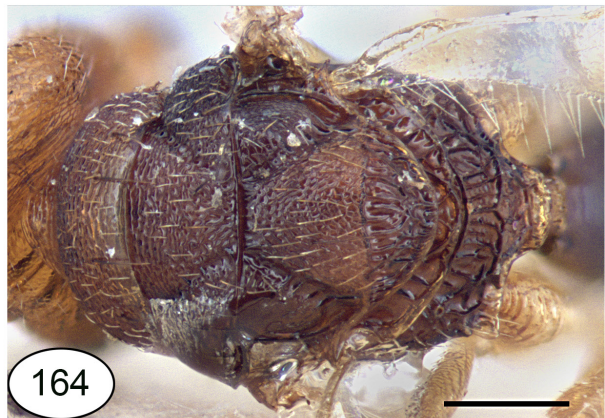
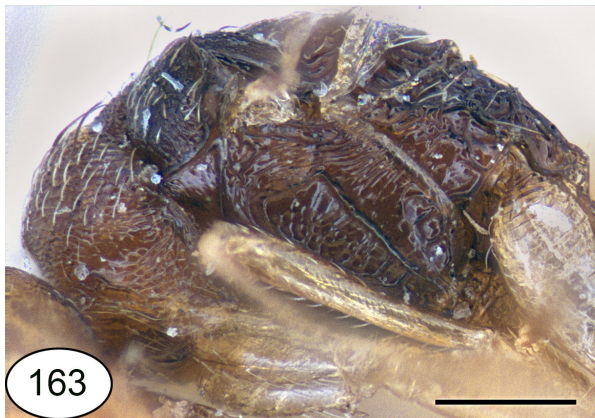
**Distribution**

South Africa; Zimbabwe (new record).



**Figs 157–161.** *Netomocera rufa* Hedqvist, 1971. **157.** Holotype, ♂, habitus, lateral view. **158.** Holotype, ♂, head, frontal view. **159.** ♂, Zimbabwe, head, dorsal view. **160.** Holotype, ♂, lower face. **161.** Holotype, ♂, antenna. Scale bars: 0.2 mm.





**Figs 162–166.** *Netomocera rufa* Hedqvist, 1971. **162.** ♂, Zimbabwe, habitus, dorsal view. **163.** Holotype, ♂, mesosoma, lateral view. **164.** Holotype, ♂, mesosoma, dorsal view. **165.** Holotype, ♂, propodeum, dorsal view. **166.** Holotype, ♂, fore wing. Scale bars: 0.2 mm.



## Remarks

Previously known only from the male holotype. Presumably, females also have a large pronotal collar, making them similar to females of *N. setifera*.

### *Netomocera sedlaceki* Bouček, 1988

Figs 167–177

*Netomocera sedlaceki* Bouček, 1988: 336 (holotype (♀) in ANIC, not examined).

## Diagnosis

### Both sexes

Head black (Figs 168–169, 176). Clypeal margin slightly produced (Fig. 170). Scrobes deep and smooth (Fig. 168). Upper face and vertex with 12 large setae (Fig. 169). Occiput margin blunt (Fig. 169). Pronotal collar wide but not long (Fig. 173). Mesepimeral sulcus shallow (Fig. 172). Propodeum (Fig. 174) without a well-defined V-shaped area basally. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Figs 174).

### Female

Brachypterous (Fig. 167). Toruli only slightly below lower margins of eyes (Fig. 168). Face with piliferous punctures barely visible. Antenna uniformly reddish or yellowish, moderately clavate, with clava slightly asymmetric; fu1 and fu7 moderately transverse (Fig. 171). Mesoscutum width 2.8–3.1 × length.

### Male

Body length 0.8–1.2 mm. Mesosoma dorsally with reticulation not dense, alveolae shallow (cf. Fig. 173). Funicular segments thick and short, fu1 wider than pedicel, length 1.6–2.0 × width (Fig. 177).

## Material examined

### Paratypes

AUSTRALIA – Queensland • 1 ♀; “Brisbane – Brookfield, QNSLD. 14. I. 83. Bouček”; “Paratype”; “♀ *Netomocera sedlaceki* sp. n. det. Z. Bouček 1983”; BMNH • 1 ♀; same data as for preceding; “18. I. 83”; BMNH • 4 ♂♂; “AUSTRALIA: Qld., Cooloola, vi. 1980”; “J.S. Noyes, B.M. 1981-299”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; “SE. QUEENSLAND: Mt. Tamborine, 21.xii.76. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; same data as for preceding; “3/3.1984. Masner”; BMNH • 1 ♂; “SE. QUEENSLAND: 40km W. of Warwick, 31.x.76. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 2 ♂♂; “QLD: Brookfield Nr Brisbane, xii.1982. Bouček”; “Paratype”; “♂ *Netomocera sedlaceki* sp. n. det. Z. Bouček 1984”; BMNH • 1 ♂; “AUSTRALIA: Qld., Capalaba, 8.vi.1980”; “J.S. Noyes, B.M. 1981-299”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; “AUSTRALIA: Qld., Mt Tibrogargan, 5.vi.1980”; “J.S. Noyes, B.M. 1981-299”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 3 ♂♂; “Rockhampton: Mt. Archer, QUEENSLD., 4.xii.76. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; “QNSLD, Brisbane: Acacia Ridge, 15.i.77. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; “Acacia Ridge, Brisbane S. E. Q., 15.i.77. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; “S. QUEENSLAND: Mt. Tamborine, X. 1977. Galloway”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; “QUEENSLAND: Mt. Ossa nr. Mackay, 28.xi.76. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH • 1 ♂; “Conway Range, nr. Proserpine, QLD., 2.xii.76. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH.



– **Australian Capital Territory** • 1 ♂; “AUSTRALIA, A.C.T.: Ainslie, 8.ii.77. Bouček”; “Paratype”; “PARATYPE ♂ *Netomocera sedlaceki* sp. n. Bouček det. 1987”; BMNH.

### Description

#### Female (habitus: Fig. 167)

COLOUR. Head (Figs 168–169) black. Mandibles yellow, teeth reddish-yellow. Antenna (Fig. 171) yellowish or reddish-yellow. Mesosoma (Figs 172–174) reddish-brown. Legs reddish-yellow. Wing stumps (Fig. 175) subhyaline, venation brown, setation brown. Metasoma with petiole reddish-brown (Fig. 174); gaster (Fig. 167) mostly dark reddish-brown, ventrally paler. Body setation pale except for several large, symmetrically arranged, dark brown setae.

BODY LENGTH. 0.9–1.5 mm.

HEAD. Clypeus virtually smooth; apical margin slightly produced (Fig. 170). Lower face reticulate, piliferous punctures mostly indistinct. Upper face including vertex reticulate (Fig. 169). Scrobes deep, smooth and shiny; parascrobal region extensively striate-reticulate (Fig. 168). Occiput coriaceous-alutaceous; margin blunt (Fig. 169). Toruli with lower margins slightly below lower margins of eyes (Fig. 168). Antenna moderately clavate, with clava slightly asymmetric (Fig. 171). Upper face and vertex with 12 large setae. Head in dorsal view with width  $2.1\text{--}2.2 \times$  length and in frontal view about  $1.2 \times$  height. POL  $3.5\text{--}3.7 \times$  OOL. Eye height about  $1.3 \times$  length,  $2.75\text{--}3.10 \times$  malar space and about  $1.4 \times$  scape length. Head width about  $1.2 \times$  length of pedicel plus flagellum. Fu1 length  $0.9\text{--}1.0 \times$  width; fu7 width  $1.1\text{--}1.4 \times$  length; clava length  $1.8\text{--}2.2 \times$  width.

MESOSOMA. Pronotal collar slightly narrower than mesoscutum, with eight large setae (Fig. 173). Mesonotum moderately setose (Fig. 173). Mesoscutum and axillae with fine reticulation (Fig. 173). Scutellar disc with similar sculpture as mesoscutum and longitudinally striate on frenal area (Figs 173–174). Mesepisternum mainly reticulate, less conspicuously so dorsally (Fig. 172). Mesepimeron smooth; mesepimeral sulcus shallow (Fig. 172). Propodeum mainly smooth, with intricate pattern of carinae, interspaces smooth (Fig. 174). Brachypterous; fore and hind wings reduced and represented by stumps (Fig. 167); fore wing with truncate apex well surpassing posterior margin of propodeum; basal cell mostly bare, rest of the wing setose; fore wing with complete submarginal vein, reduced marginal vein and indistinct postmarginal and stigmal veins (Fig. 175). Mesosoma length about  $1.3 \times$  width and about  $1.1 \times$  height. Pronotal collar about  $0.4 \times$  as long as mesoscutum and about  $0.9 \times$  as wide as mesoscutum. Mesoscutum width  $2.8\text{--}3.1 \times$  length. Scutellum length  $0.8\text{--}0.9 \times$  width. Propodeum length about half scutellum length. Fore wing length  $3.0\text{--}3.1 \times$  width.

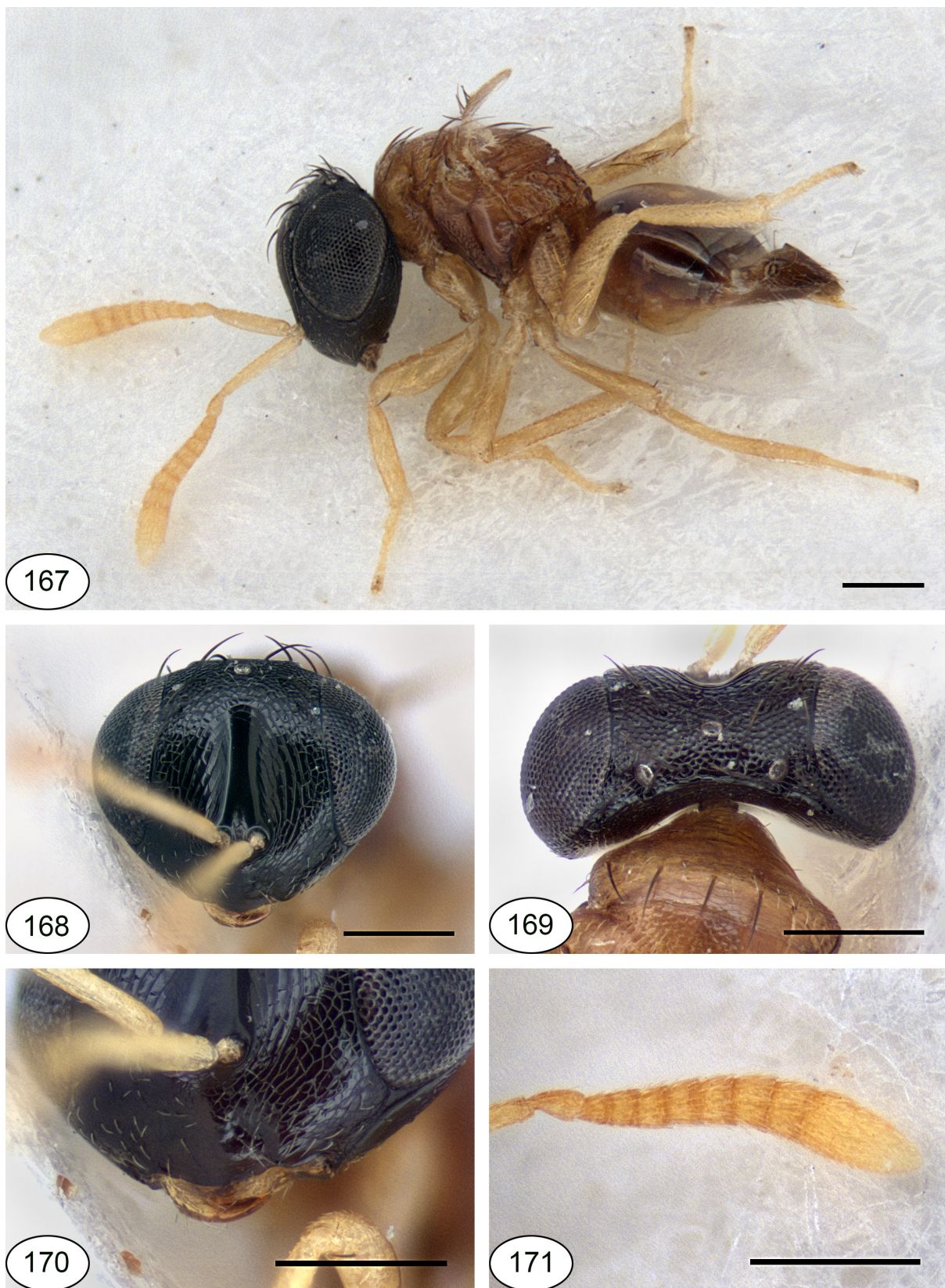
METASOMA. Petiole barely visible, transverse, smooth except for a few superficial longitudinal striae (Fig. 174). Gaster ovate, length about  $1.5 \times$  width (Fig. 167); gt1 longest, length about  $0.9 \times$  width, with hind margin straight to slightly produced; gt2–6 short; syntergum acutely pointed. Ovipositor sheaths slightly protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

#### Male (habitus: Fig. 176)

Differs from female mainly as follows. Body length: 0.8–1.2 mm. Flagellum uniformly dark brown (Fig. 177). Mesosoma dorsally dark brown except metanotum and propodeum reddish; lateral panel of pronotum, mesepimeron and metapleuron reddish (Fig. 176). Fu1 length  $1.6\text{--}2.0 \times$  width; combined length of pedicel plus flagellum about  $2.4 \times$  head width. Macropterous, fore wing length about  $2.5 \times$  width; MV about  $3.4 \times$  SV; PV about  $1.2 \times$  SV. Gaster (when not inflated) much shorter than mesosoma, usually with only gt1 visible.

### Distribution

Australia.

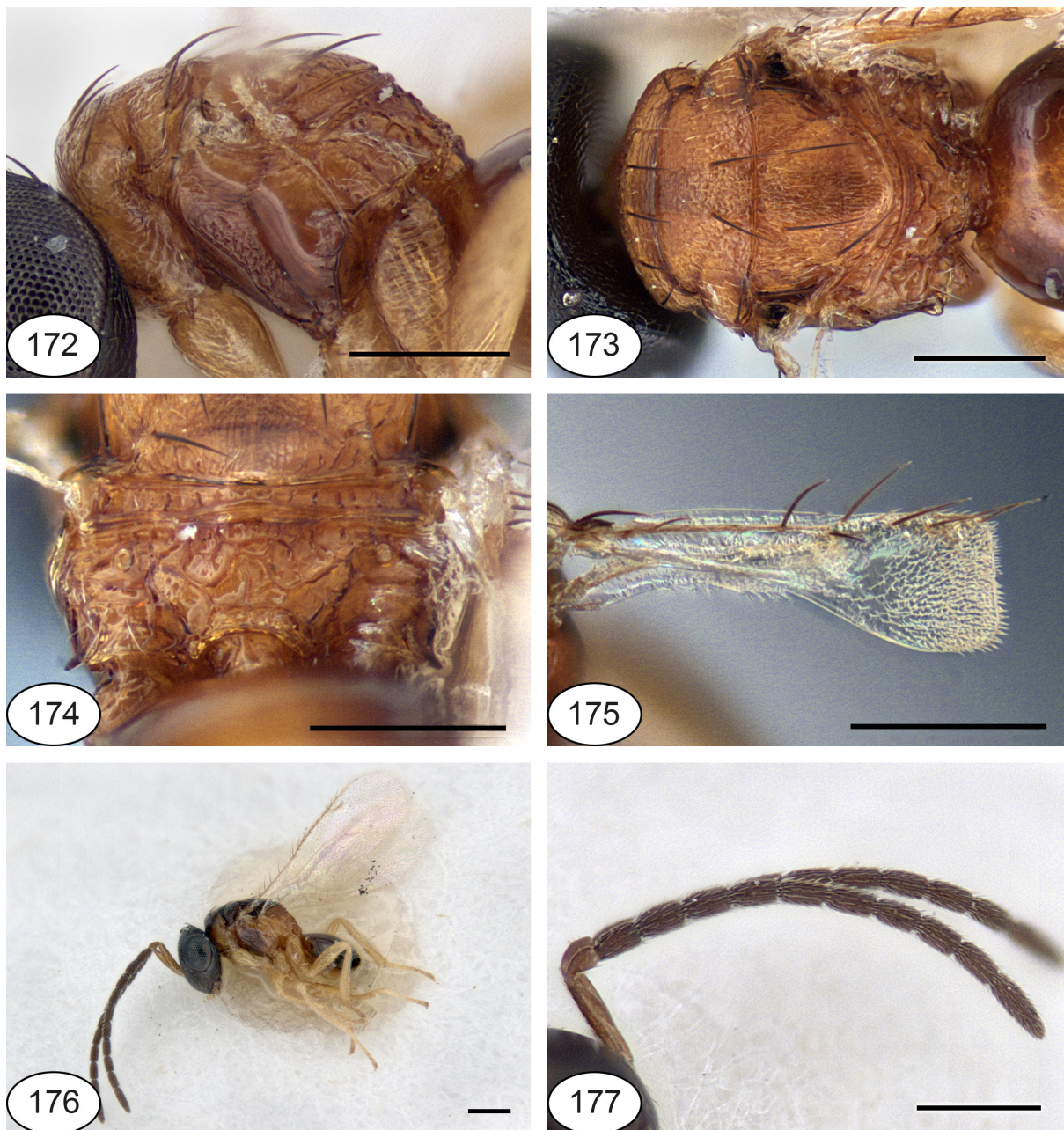


**Figs 167–171.** *Netomocera sedlaceki* Bouček, 1988, paratype, ♀, (BMNH). **167.** Habitus, lateral view. **168.** Head, frontal view. **169.** Head, dorsal view. **170.** Lower face. **171.** Antenna. Scale bars: 0.2 mm.



**Remarks**

The colour of the mesosoma and gaster varies the most in males. The majority of the observed specimens have most of the mesosoma dorsally and the gaster dark brown, except for the propodeum, which seems to be always orange (Fig. 176). A few other specimens have the entire mesosoma and most of the gaster bright orange, except its tip, which is brownish.



**Figs 172–177.** *Netomocera sedlaceki* Bouček, 1988. **172.** Paratype, ♀, mesosoma, lateral view. **173.** Paratype, ♀, mesosoma, dorsal view. **174.** Paratype, ♀, propodeum, dorsal view. **175.** Paratype, ♀, fore and hind wings. **176.** Paratype, ♂, habitus, lateral view. **177.** Paratype, ♂, antenna. Scale bars: 0.2 mm.

*Netomocera setifera* Bouček, 1954  
Figs 178–190

*Netomocera setifera* Bouček, 1954: 50 (holotype (♀) in NMPC, examined).

**Diagnosis**

**Both sexes**

Clypeal margin slightly produced (Fig. 181). Occiput margin blunt (Fig. 180). Upper face and vertex with eight large setae. Pronotal collar long, 0.55–0.60 × as long as mesoscutum and wide, 0.85–0.95 × as wide as mesoscutum (Figs 183–184). Mesepimeral sulcus inconspicuous (Fig. 183). Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 185).

**Female**

Head usually with green or bronze metallic reflections (Figs 179–180). Macropterous, submacropterous (Fig. 178) or brachypterous (Fig. 187); fore wing in macropterous form with two more or less distinct brownish spots, a large one behind marginal vein and a smaller one a short distance beyond stigma vein towards apical margin (Fig. 186). Propodeum (Fig. 185) with a well-defined, densely sculptured V-shaped area basally surrounded by shallowly sculptured areas.

**Male**

Head and mesosoma both black, without metallic reflections (Fig. 189); or head distinctly greenish and mesosoma brownish, the latter without metallic reflections. MV 3.0–3.2 × SV.

**Material examined**

**Holotype**

CZECH REPUBLIC • ♀; “*Netomocera setifera* Bčk. ♀ Det. Z. Bouček 1954”; “Holotypus”; “Mus. Nat. Paragae Inv. 3001”; “Mor. mer.: Pouzdřany step, 3.VI.41. Hoffer.”; NMPC.

**Other material**

BULGARIA • 1 ♂; “Varvara, BULGARIA, Kocourek. 8.70”; “♂ *Netomocera setifera* Bčk., Z. Bouček det. 1973”; BMNH • 1 ♂; “BULGARIA: Kavarna, slope by sea border, 24-25.viii.2012, 43°25'09" N, 28°21'22" E, YPT, Leg. Fusu L. & Ploscaru B.”; MICO • 1 ♂; same collection data as for preceding, “22-27.viii.2012, 2 Malaise tr.”; MICO.

CROATIA • 1 ♂; “YUGOSL., Dalm. Isl. Mljet N.P., 7.IX.1980 Bouček”; “♂ *Netomocera setifera* Bčk., det. Z. Bouček 1970”; BMNH • 1 ♂; “YUGOSL: CR. GORA: Durmitor: Vrdo, 25.6.87 Bouček”; “♂ *setifera*”; BMNH.

CZECH REPUBLIC • 1 ♀; “Moravia centr., Mohelno, 10/7/63. Hoffer”; “*Netomocera setifera* Bčk. ♀”; “BMNH(E) 199 5-489”; BMNH • 1 ♂; “ČSR., Mohelno, 7.7.1963, A. Hoffer”; “♂ *Netom. setifera*”; BMNH • 1 ♂; “Hlavence u Brandýsa /L. Bohemia, vi.1959. Martínek”; “♂ *Netomocera setifera* Bčk., det. Z. Bouček 1970”; BMNH.

FRANCE • 1 ♂; “FRANCE, Var: St. Tropez, 16.VI.80 Bouček”; “♂ *Netomocera setifera* Bčk., det. Z. Bouček 1980”; BMNH • 1 ♂; “SE. France, Château-Arnoux, 10.8.72. Bouček”; “♂ *Netomocera setifera* Bčk., det. Z. Bouček 1980”; BMNH • 1 ♂; “France, Aveyron: La Pezade, 27.7.78, M. de V. Graham”; “♂ *Netomocera setifera* Bčk., det. Z. Bouček 1980”; BMNH • 2 ♂♂; “La Blaqueserie, (2) 3/8/78”; “BMNH(E) 199 5-489”; “♂ *Netomocera setifera* Bčk.”; BMNH • 2 ♂♂; “France, M.J. Gijswijt”; “Dentelles de Montmirail, 29 IV 1987”; “♂ *Netomocera setifera* Bouček, M.J. Gijswijt det. 2001”; RMNH • 1 ♂; “FRANCE, Dépt Aveyron, M.J. Gijswijt”; “La Pezade (Causse), 16 VI 1982”; “♂



*Netomocera setifera* Bčk., Gijswijt det. 1999"; RMNH • 2 ♂♂; "FRANCE, Dept. Drôme, M.J. Gijswijt"; "Veau, 4 VIII 1973"; "Remounted 1989, M.J. Gijswijt"; "♂ *Netomocera setifera* Bčk., Gijswijt det. 1999"; RMNH • 1 ♂; "FRANCE, Drôme, M.J. Gijswijt"; "Condorcet, 7 km NE Nyons, 11 IX 1987"; "♂ *Netomocera setifera* Bčk., det. Z. Bouček, 1990"; RMNH.

GREECE • 7 ♂♂; "GREECE, Korfu: Nissaki, 6.9.87 JS Noyes"; "♂ *Netom. setifera* Bčk., det. Z. Bouček 1997"; BMNH • 1 ♂; "HELLAS, Makedonia, J.P. Duffels"; "18 km SE of KÓZANI, 3-VII-1975"; "♂ *Netomocera setifera* Bčk., det. Z. Bouček, 1990"; RMNH.

ITALY • 2 ♂♂; "ITALIA - Abr. Prov. l' Aquila, M.J. Gijswijt"; "Gran Sasso d'Italia, S.E. slope, 1400 m, 17.vi.1993"; "♂ *Netomocera setifera* Bčk., Gijswijt det. 1999"; RMNH.

MOLDAVIA • 2 ♂♂; "MOLDAV. SSR, KOTOVSKOJE, 12.VII.1961, Bouček & Talitzki"; "♂ *Netomocera setifera* Bčk., det. Z. Bouček 1970"; BMNH.

ROMANIA • 1 ♀, 4 ♂♂; "RO: MH, Gura Văii, Valea Oglănicului, xeroph. veg. on dry slope, 17-18. VII.09, OP & LF, sweep, 232 m /44°39'22.8" N, 22°34'18.8" E"; MICO • 1 ♂; "RN Valea lui David (IS), vegetatie de stepa, 14.V.1999, Leg. IP"; "Netomocera setifera Bčk. ♂, Det. M. Mitroiu"; MICO • 2 ♂♂; same data as for preceding; "9.V.1999"; "Netomocera setifera Bčk. ♂, Det. M. Mitroiu"; MICO • 1 ♂; same data as for preceding; "28.V.1999, Leg. LF"; "Netomocera setifera Bčk. ♂, Det. M. Mitroiu"; MICO • 3 ♂♂; same data as for preceding; "2.V.2005"; "Netomocera setifera Bčk. ♂, Det. M. Mitroiu"; MICO.

SLOVAKIA • 1 ♂; "Slovakia or. Král. Chlumec, 20.5.58 Bouček"; "♂ *Netomocera setifera* Bčk., det. Z. Bouček 1970"; BMNH • 1 ♂; "Slovakia or.: Baba u Ladmovcu, 23.6.52 Kocourek"; "♂ *Netomocera setifera* Bčk., det. Z. Bouček 1970"; BMNH • 1 ♂; "Královský Chimec"; "Slovakia mer., 20.V.58, Bouček"; "Netomocera setifera Bčk ♂, Zd. Bouček det. 1965"; "EX COLL. J.C. ROSKAM, Museum Leiden 2004"; RMNH.

## Description

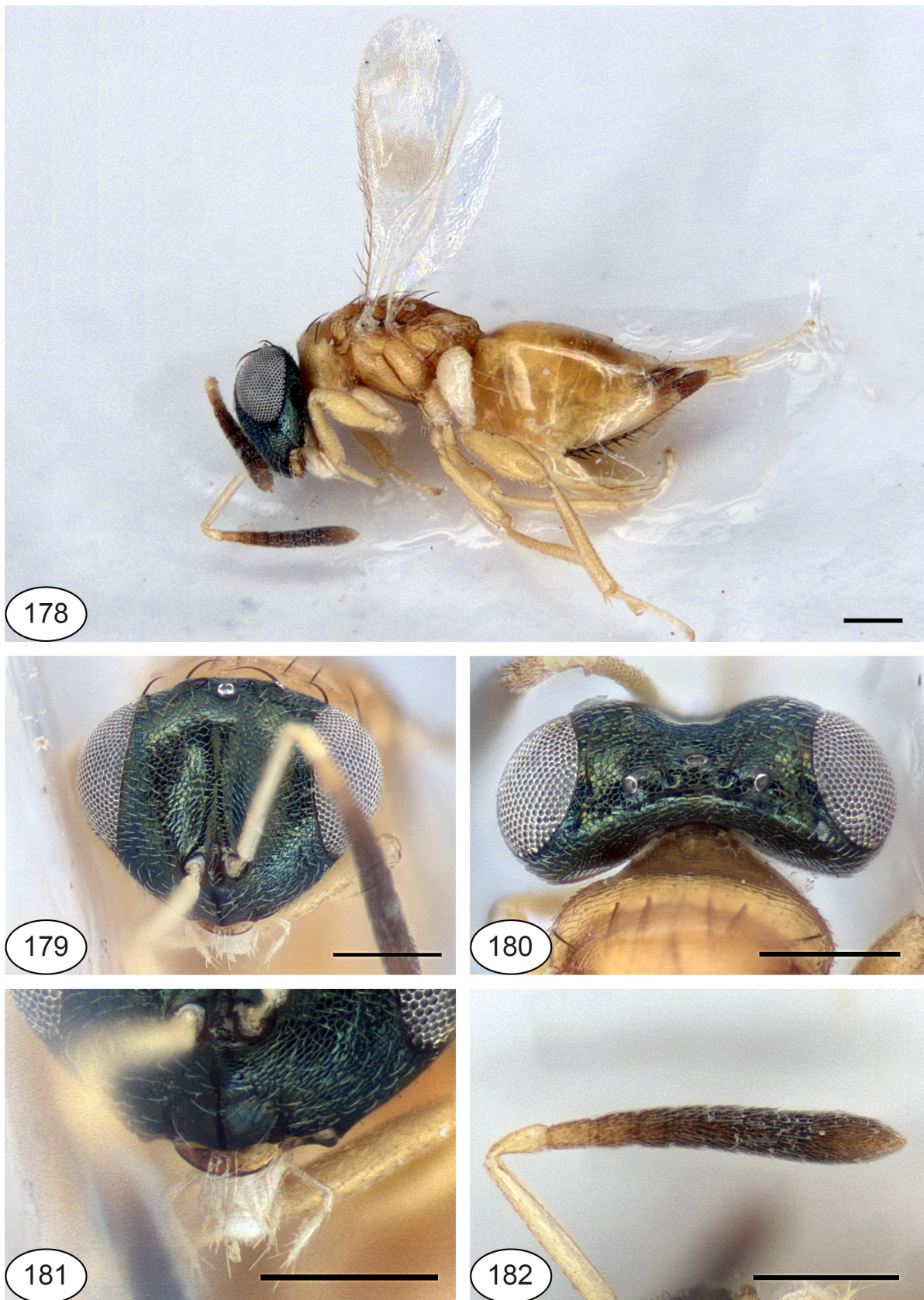
### Female (habitus: Figs 178, 187)

COLOUR. Head (Figs 179–180) usually with more or less distinct dark green to bronze reflections. Mandibles reddish-yellow, teeth darker. Antenna (Fig. 182) with scape pale yellow to reddish-brown; pedicel pale yellow to brown; funicle uniformly brown or basally paler; clava, especially ventrally, slightly paler than funicle. Mesosoma (Fig. 183–185) reddish-yellow to reddish-brown. Legs reddish-yellow, except for brownish tips, or hind coxa lighter. Fore wing (Fig. 186) of macropterous and submacropterous forms usually with two large brownish spots, a larger one in middle of wing below marginal vein and a smaller one in apical quarter, the latter sometimes appearing divided into two smaller spots; setation brown. Metasoma with petiole as mesosoma (Fig. 185); gaster (Figs 178, 187) reddish-yellow to reddish-brown in basal half and light brown to dark brown in apical half; gt1 usually with two darker spots anterolaterally. Body setation pale except for several large, symmetrically arranged, dark brown setae.

BODY LENGTH. 1.6–2.1 mm.

HEAD. Clypeus virtually smooth; apical margin slightly produced (Fig. 181). Lower face below toruli striate-reticulate, piliferous punctures mostly indistinct. Upper face including vertex densely but finely reticulate, piliferous punctures slightly visible (Fig. 180). Scrobes deep, reticulate; parascrobal region mostly without elongate cells (Fig. 179). Occiput coriaceous-alutaceous; margin blunt (Fig. 180). Toruli with lower margins below lower margins of eyes (Fig. 179). Antenna moderately clavate, with clava conspicuously asymmetric (Fig. 182). Upper face and vertex with eight large setae. Head width about 2.2 × length in dorsal view and 1.15–1.30 × height in frontal view. POL 2.2–2.3 × OOL. Eye height 1.3–



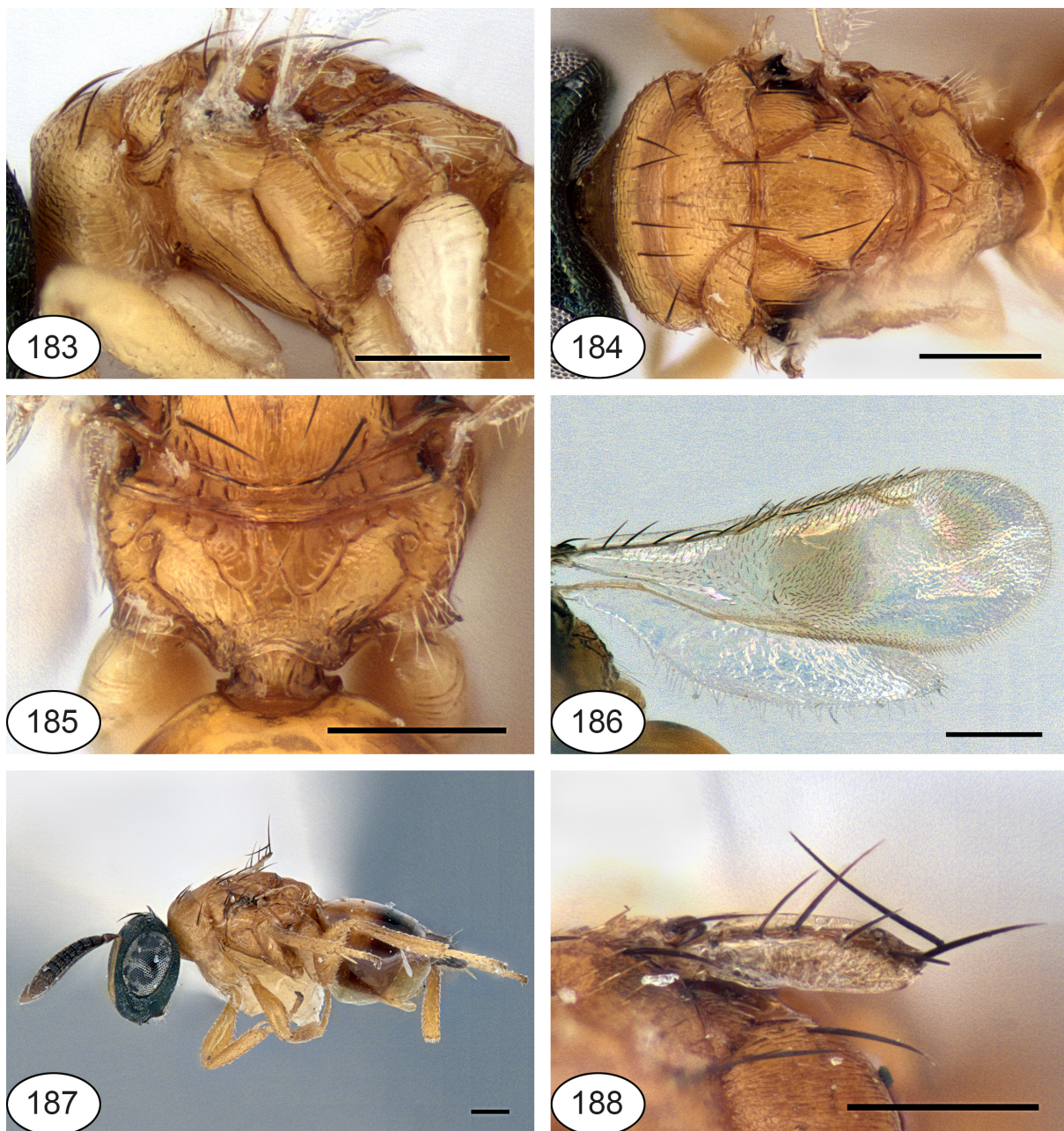


**Figs 178–182.** *Netomocera setifera* Bouček, 1954, ♀, Romania. **178.** Habitus, lateral view. **179.** Head, frontal view. **180.** Head, dorsal view. **181.** Lower face. **182.** Antenna. Scale bars: 0.2 mm.



1.4 × length, 2.2–2.3 × malar space and 1.0–1.2 × scape length. Head width 1.0–1.1 × length of pedicel plus flagellum. Fu1 length 1.3–1.8 × width; fu7 width 1.1–1.5 × length; clava length 1.8–2.0 × width.

MESOSOMA. Moderately setose dorsally (Fig. 184). Pronotal collar virtually as wide as or slightly narrower than mesoscutum, with six large setae (Fig. 184). Mesoscutum and axillae with extremely fine reticulation, appearing almost smooth (Fig. 184). Scutellar disc with sculpture as mesoscutum and longitudinally striate-reticulate on frenal area (Figs 184–185). Mesepisternum mainly weakly reticulate,



**Figs 183–188.** *Netomocera setifera* Bouček, 1954. **183.** ♀, Romania, mesosoma, lateral view. **184.** ♀, Romania, mesosoma, dorsal view. **185.** ♀, Romania, propodeum, dorsal view. **186.** ♀, Romania, fore and hind wings. **187.** ♀, Czech Republic, habitus, lateral view. **188.** ♀, Czech Republic, fore wing. Scale bars: 0.2 mm.



almost smooth dorsally (Fig. 183). Mesepimeron smooth; mesepimeral sulcus indistinct (Fig. 183). Propodeum mainly smooth, with intricate pattern of carinae defining a central V-shaped area, interspaces smooth to slightly wrinkled (Fig. 185). Macropterous, submacropterous (Fig. 178) or brachypterous (Fig. 187). Macropterous and submacropterous forms with fore wing uniformly and densely setose except for moderately large, elongate bare region some distance behind parastigma and basal half of marginal vein (Fig. 186). Brachypterous form with fore and hind wings reduced and represented by stumps, venation vestigial; fore wing with rounded apex not reaching posterior margin of propodeum; setation absent except in apical third (Fig. 188). Mesosoma length  $1.3\text{--}1.5 \times$  width and  $1.4\text{--}1.7 \times$  height. Pronotal collar  $0.55\text{--}0.60 \times$  as long as mesoscutum and  $0.85\text{--}0.95 \times$  as wide as mesoscutum. Mesoscutum width  $2.6\text{--}3.0 \times$  length. Scutellum length about  $0.9 \times$  width. Propodeum length about  $0.7 \times$  scutellum length. Fore wing length of macropterous form about  $2.5 \times$  width; MV  $3.0\text{--}3.2 \times$  SV and  $2.7\text{--}3.0 \times$  PV. Fore wing length of brachypterous form  $3.75 \times$  width.

**METASOMA.** Petiole barely visible, transverse, smooth except for a few superficial longitudinal striae (Fig. 185). Gaster ovate, length  $1.7\text{--}1.8 \times$  width (Figs 178, 187); gt1 longest, length  $0.80\text{--}1.15 \times$  width, with hind margin straight to slightly emarginate; gt2–6 short; syntergum acutely pointed. Ovipositor sheaths distinctly protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

**Male** (habitus: Fig. 189)

Differs from female mainly as follows. Body length: 1.0–1.8 mm. Head sometimes without distinct metallic reflections (Fig. 189). Flagellum uniformly dark brown to black (Fig. 190). Mesosoma usually dark brown to black (Fig. 189), occasionally with reddish pronotal collar, propodeum and pleura. Gaster dark brown to black (Fig. 189) or with basal half lighter, light brown to reddish-brown. Propodeum more uniformly sculptured, mostly without a well-defined V-shaped area. Fu1 length  $1.7\text{--}2.0 \times$  width, other funicular segments subequal in length to fu1; combined length of pedicel plus flagellum  $2.0\text{--}2.5 \times$  head width. Gaster (inflated) shorter than mesosoma, length  $1.5\text{--}1.6 \times$  width.

**Distribution**

China, Croatia, Czech Republic, Moldavia, Montenegro, Romania, Serbia, Slovakia (Noyes 2018); Bulgaria, France, Greece, Italy (new records).



**Figs 189–190.** *Netomocera setifera* Bouček, 1988, ♂, Romania. **189.** Habitus, lateral view. **190.** Antenna. Scale bars: 0.2 mm.



**Remarks**

Females of *Netomocera setifera* are distinct from those of all other species with a reduced petiole in having a well defined V-shaped area on the propodeum (Fig. 185). Together with males, they display mesosomal colour variation, which can range from yellowish to brown. Except for *N. rufa*, both sexes are also unique in having a long and wide pronotal collar (Figs 183–184).

*Netomocera virgata* sp. nov.

[urn:lsid:zoobank.org:act:C667D5E0-900C-4E7B-A6B6-2830822F1ECD](https://zoobank.org/urn:lsid:zoobank.org:act:C667D5E0-900C-4E7B-A6B6-2830822F1ECD)

Figs 191–201

**Diagnosis****Both sexes**

Head yellowish (Figs 192–193, 200). Macropterous. Clypeal margin shallowly emarginate (Fig. 194). Upper face and vertex with ten large setae (Fig. 193). Occiput margin blunt (Fig. 193). Mesepimeral sulcus inconspicuous (Fig. 196). Propodeum (Fig. 198) without a well-defined V-shaped area basally, with small smooth areas among carinae. Visible part of petiole very short, distinctly transverse, with more or less obliterate sculpture (Fig. 198).

**Female**

Antenna (Fig. 195) with basal funicular segments and clava pale yellow. Fore wing with three transverse brownish bands, the first apically within basal cell, the second behind parastigma and the third behind stigma (Fig. 199).

**Male**

Body yellowish to brownish (Fig. 200). Fu1 and fu10 (and occasionally fu9) usually at least slightly lighter than intermediate funiculars (Fig. 201). Fore wing with at least one brownish spot behind basal end of marginal vein and usually with one or two more spots (Fig. 200); apical basal cell densely setose apically (cf. Fig. 199).

**Etymology**

The name of the species (adjective) refers to the brownish stripes on the fore wing.

**Material examined****Holotype**

VENEZUELA • ♀; “VENEZUELA: Miranda, 28 km N Altagracia 700 m, Guatopo NP. El Lucero, 31.V-7.VI.1987 FIT, ravine, S. & J. Peck”; entire, on triangular card; CNC.

**Allotype**

VENEZUELA • ♂; same data as for holotype; CNC.

**Additional paratypes**

BAHAMAS • 1 ♂; “Bahamas, San Salvador Is., 8-13.XII.1980, B. Bowen”; CNC.

BRAZIL • 3 ♀♀; “BRAZIL: Nova Teutonia. 27°11' S.52°23' W”, “18.iii.1937. Fritz Plaumann. B.M.1937-424,656,748”; BMNH • 1 ♀; “Brasilien Nova Teutonia, 27°11' S, 52°23' W, Fritz Plaumann, VIII-1935”; BMNH • 1 ♂; “Nova Teutonia, 27°11' S, 52°23' W. BRAZIL, 300-500 m. 3.VII.61, Fritz Plaumann”; CNC • 1 ♀; “Chapeco, Santa Catarina, BRAZIL VIII.60, F. Plaumann”; CNC • 1 ♂; “BRAZIL, Mato Grosso, 12°31' S, 55°37' W, X.1974, M. Alvarenga”; CNC.

COSTA RICA • 2 ♀♀; “COSTA RICA: Guan. Pr., Guanacaste Cons. Area, Cacao Field Station, 1100–1200 m, 4.V.1995 R. B. Andreson, berlese leaf lit., montane hrdwd-cld for.”; CNC • 1 ♂; “COSTA RICA, Heredia, 1400 m, 10°17' N, 84°10' W, J. Helava”; “30.V.1973, Montane rain forest”; CNC • 1 ♂; “COSTA RICA, Her, Pto. Viejo 50 m, Rain Forest, Feb. 80. Mason”; CNC • 1 ♂; “Costa Rica, San José, 800–825 m”; “9°45' W, 84°23' N, Cerro Tufares, J. Helva, 27-V-73”; CNC • 13 ♂♂; “COSTA RICA, B. Carrillo N.P., 84°07' W, 10°10' N, 10.IV.85; 500 m. H. Goulet-L. Masner”; CNC • 5 ♂♂; “CR: Cartago, 550 m, Turrialba, CATIE, 4.IX.1986 s.s. Reventazon gorge, L. Masner”; CNC • 1 ♂; “CR: Puntarenas, Manuel Antonio N.P., 23–28.VIII.1986 ss costal rainforest, L. Masner”; CNC.

PANAMA • 1 ♀; “Museum Leiden, M. PANAMA, Level 1, Barro Colorado Isl., 9°30' N–79°51' W. 25–31.VII.1978, H. Holda, at light”; “BE.68011”; RMNH • 1 ♂; “PANAMA, Chiriqui Prov., 15 km. N.W. Hato del Volcan, 1200 m., 24–31.V.1977, Peck & Howden”; “Lelaps, Det. C. M. Yoshimoto”; “Netomocera ♂, Det. Z. Bouček 1989”; CNC.

VENEZUELA • 2 ♀♀; same data as for holotype; CNC • 1 ♀; “VENEZUELA: Miranda, Guatopo NP Aqua Blanca 35 km N Altigracia 400 m, 3–10.VI.1987, S. & J. Peck”; CNC • 1 ♂; “VENEZUELA: Miranda, Guatopo Nat. Park, Machanilla 50 km N Altigracia, 7.VI.1987, S. & J. Peck”; CNC • 2 ♂♂; “VENEZUELA: Aragua Rancho Grande N.P., 18.VIII–3.IX.1992, L. Masner maxinet cloud for. 1100 m”; CNC • 1 ♂; “VENEZUELA: Bolivar, 20 km NW Guri, 16–28.XII.1987, B. Gill”; CNC.

#### Other material

BRAZIL • 1 ♂; “BRAZIL, Rio de Janeiro, R. J. Repressa Rio Grande, II. 1976, M. Alvarenga”; “new gen, det. C. M. Yoshimoto”; “♂ Netomocera (?) nearctica Yoshm., Det. Z. Bouček 1989”; CNC.

#### Description

##### Female (habitus: Fig. 191)

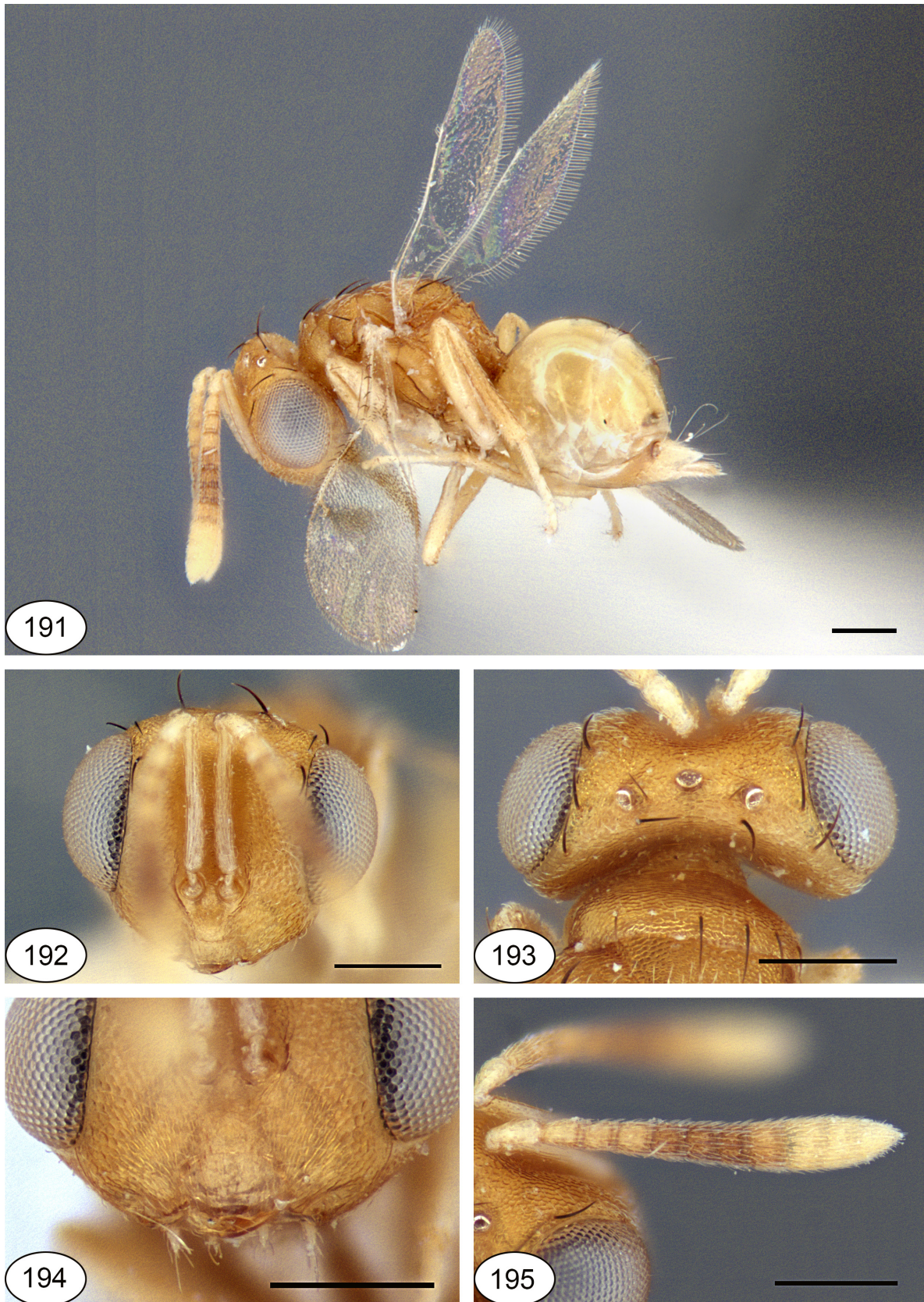
COLOUR. Head (Fig. 192–193) brownish-yellow. Mandibles light brown. Antenna (Fig. 195) with scape whitish; pedicel pale yellow; fu1–3 brownish-yellow, fu4–6 brown, fu7 brownish-yellow; clava pale yellow. Mesosoma (Figs 196–198) as head, with one small black spot near each fore wing base. Legs with fore and hind coxae whitish, middle coxa brownish-yellow; trochanters and trochantelli as respective coxa; femora pale yellow; tibiae light brown; tarsi pale yellow, pretarsi dark brown. Fore wing (Fig. 199) with three brownish bands, the first apically within basal cell, the second behind parastigma and the third behind stigma, converging towards the second; setation brown. Hind wing hyaline. Metasoma with petiole as mesosoma (Fig. 198). Gaster (Fig. 191) yellowish, with cercal region and apical part of gt3 darker. Body setation whitish except large, symmetrically arranged, black setae.

BODY LENGTH. 1.5–3.0 mm.

HEAD. Clypeus almost smooth; apical margin shallowly emarginate medially (Fig. 194). Lower face shallowly reticulate. Upper face reticulate, with reticulation becoming denser towards vertex (Fig. 193). Scrobal depression densely reticulate. Occiput finely reticulate; margin blunt (Fig. 193). Toruli with lower margins slightly below lower margins of eyes (Fig. 192). Antenna moderately clavate, with clava slightly asymmetric (Fig. 195). Upper face and vertex with ten large setae (Fig. 193). Head in dorsal view with width 2.1–2.4 × length (75:35) and in frontal view 1.10–1.25 × height (75:60). POL 2.10–2.45 × OOL (21:10). Eye height 1.3–1.4 × length (38:30), 2.5–2.7 × malar space (38:14) and 0.90–1.05 × scape length (38:36). Head width 0.9–1.0 × length of pedicel plus flagellum (75:85). Fu1 length 1.3–1.5 × width (8:6); fu7 width 1.4–1.6 × length (10:7); clava length 2.0–2.4 × width (24:10).

MESOSOMA. Pronotal collar narrower than mesoscutum, with six large setae (Fig. 197). Mesonotum moderately setose (Fig. 197). Mesoscutum and axillae densely reticulate, dull (Fig. 197). Scutellum,

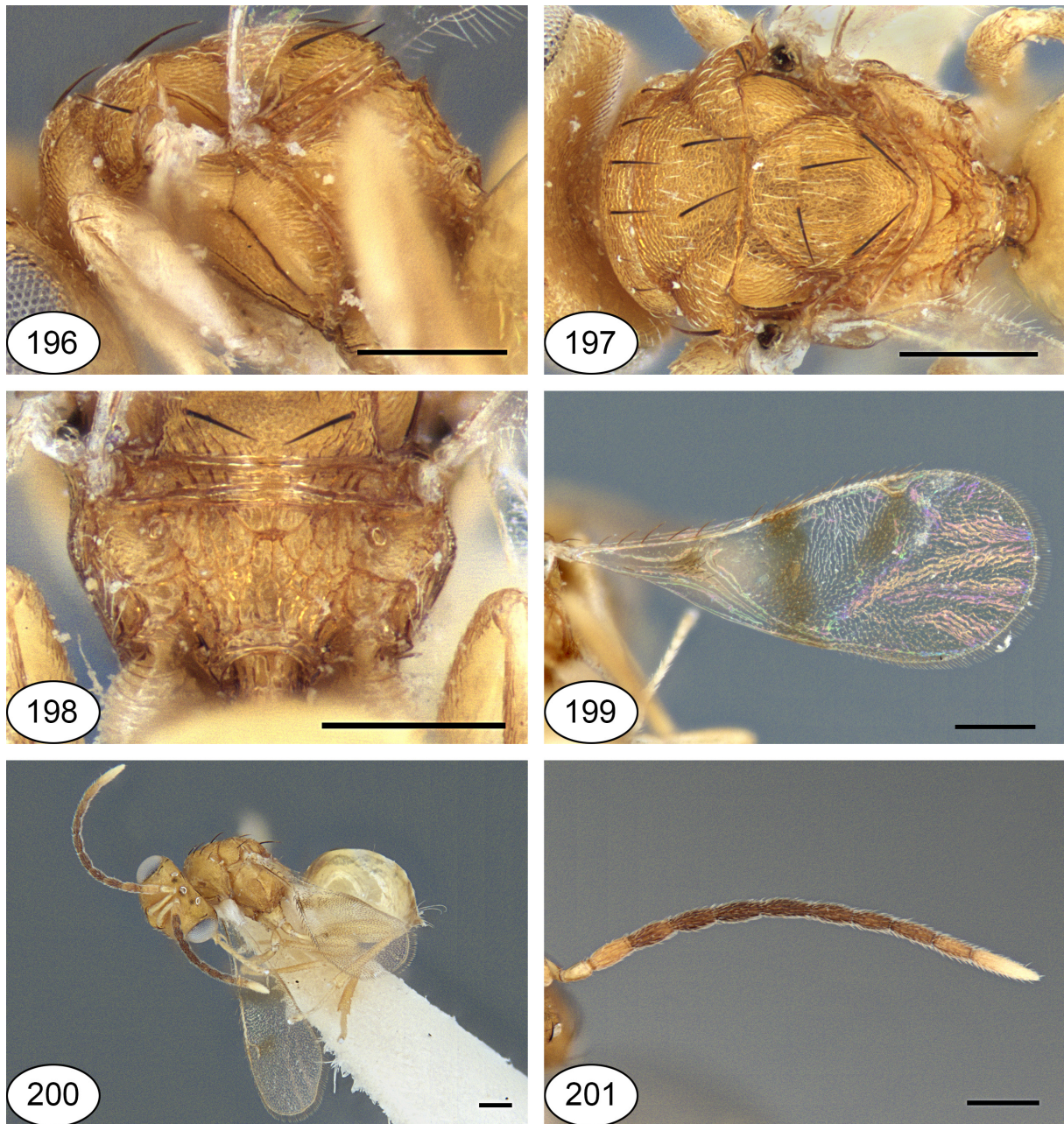




**Figs 191–195.** *Netomocera virgata* sp. nov., holotype, ♀. **191.** Habitus, lateral view. **192.** Head, frontal view. **193.** Head, dorsal view. **194.** Lower face. **195.** Antenna. Scale bars: 0.2 mm.



including frenal area, reticulate, cells isodiametric to elongate (Figs 197–198). Mesepisternum reticulate (Fig. 196). Lower mesepimeron smooth, upper mesepimeron transversally striate; mesepimeral sulcus indistinct (Fig. 196). Propodeum with dense pattern of carinae, interspaces wrinkled; nucha with lateral margins converging posteriorly (Fig. 198). Macropterous. Fore wing extensively bare in basal half, basal cell with a large patch of setae in apical third and with moderately large bare region (Fig. 199). Mesosoma length  $1.3\text{--}1.4 \times$  width (80:58) and  $1.45\text{--}1.80 \times$  height (80:55). Pronotal collar about  $0.3 \times$  as long as mesoscutum (8:23) and about  $0.8 \times$  as wide as mesoscutum (47:58). Mesoscutum width  $2.5\text{--}3.1 \times$  length (58:23). Scutellum length  $0.9\text{--}1.0 \times$  width (31:31). Propodeum length about  $0.6 \times$  scutellum



**Figs 196–201.** *Netomocera virgata* sp. nov. **196.** Holotype, ♀, mesosoma, lateral view. **197.** Holotype, ♀, mesosoma, dorsal view. **198.** Holotype, ♀, propodeum, dorsal view. **199.** Holotype, ♀, fore wing. **200.** Allotype, ♂, habitus, lateral view. **201.** Allotype, ♂, antenna. Scale bars: 0.2 mm.



length (20:31). Fore wing length  $2.5\text{--}2.6 \times$  width (155:60); MV  $5.7\text{--}6.7 \times$  SV (40:6); PV from equal to slightly longer than SV.

**METASOMA.** Petiole very short, transverse, with a few longitudinal costulae (Fig. 198). Gaster short-ovate, length  $1.6\text{--}2.0 \times$  width (95:60) (Fig. 191); gt1 longest, width  $1.1\text{--}1.3 \times$  length (60:45), with hind margin slightly produced; gt2–3 short but visible, gt4–6 almost completely retracted; syntergum acutely pointed. Ovipositor sheaths protruding beyond apex of gaster. Cercal setae not surpassing apex of gaster.

**Male** (Habitus: fig. 200)

Differs from female mainly as follows. Body length: 1.25–2.25 mm. Fore wing without brown spot on basal cell and one behind stigma greatly reduced to absent (Fig. 200). Flagellum usually with fu1 and fu10 distinctly lighter than the rest, yellowish to light brown (Fig. 201). Fu1 length  $1.7\text{--}2.3 \times$  width; length of pedicel plus flagellum  $2.10\text{--}2.25 \times$  as long as head width. Gaster (inflated) length  $1.3\text{--}1.7 \times$  width, gt1 occupying about one third to one half of gaster length.

**Distribution**

Bahamas, Brazil, Costa Rica, Panama, Venezuela.

**Remarks**

*Netomocera virgata* sp. nov. is similar to *N. nearctica* and *N. meridionalis* sp. nov.; the female differs from both species mainly in having a different fore wing colour pattern (Fig. 199) and a different colour of the antennae (Fig. 195). In males, fu1 and fu10 are usually at least slightly lighter than fu2–fu9 (Fig. 201), but sometimes only fu1, fu10, or none are different in colour. One male from Brazil (CNC) is excluded from the type series because it has only three setae apically in the basal cell; in other respects it is closer to *N. virgata* sp. nov. than to *N. nearctica* or *N. meridionalis* sp. nov.

**Discussion**

With the description of several new species from the Neotropical region in this paper, *Netomocera* now has a cosmopolitan distribution. The highest number of species appears to be confined to tropical and other warm regions, but their biology remains unknown. Bouček (1954) stated that their hosts probably belong to steppe or wood-steppe fauna; indeed the available information shows that *N. setifera* is frequently collected in such habitats, but this is not the case for other species.

Specimens of *Netomocera* are rather rare in museum collections, confirming the fact that they are rarely collected in the field, especially females, which are probably more active at soil level, as confirmed by the yellow pan trap captures; this is certainly true for the brachypterous forms, which occur in one third of the analyzed species. This hypothesis may also be supported by the non-metallic colour of both sexes and the brownish clouds or bands found on the fore wings of several species, which could enhance their camouflage.

*Netomocera* is unique among the Diparinae in that females have an asymmetric clava, although this feature is less conspicuous in several of the new species, mainly from the Neotropical region. According to Desjardins (2007: 70) “*Netomocera* is resolved in different positions in different analyses, usually as sister-group to either *Lelaps* or *Dipara*, although there is little evidence in the phylogenetic analysis to support this”. The general morphology of *Netomocera* seems to indicate a closer relationship with *Lelaps*, the discovery of several species whose females have an almost symmetric clava diminishing the gap between the two genera.

Sex associations may prove very difficult in *Netomocera* because males are more uniform in their morphology and colouration as compared with females. Whenever possible, it is thus recommended

to use DNA barcoding for this purpose. Although a considerable amount of material has been studied, the new species described in this paper probably represent only part of the true diversity of the genus worldwide. More collecting effort is thus needed, especially in South-East Asia and the Neotropical region.

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