

# Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) V: *Neurigona* RONDANI

[Revision der neotropischen Neurigoninae  
(Diptera: Dolichopodidae) V: *Neurigona* RONDANI]

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## Abstract

The Neotropical species of the genus *Neurigona* RONDANI (Diptera: Dolichopodidae) are revised, comprising 39 species of which 32 are described as new. Descriptions, illustrations and keys to species and species-groups are given. The following species are described as new (**spec. nov.**): *alajuela* (Costa Rica), *albatarsis* (Costa Rica), *aragua* (Venezuela), *argentifacies* (Costa Rica, Brazil), *brevitibia* (Venezuela, Peru, Brazil), *cantareira* (Brazil), *crinitarsis* (Mexico), *guanacasta* (Costa Rica), *hachaensis* (Costa Rica), *lamellata* (Costa Rica, Panama, Honduras), *latifacies* (Costa Rica), *limonensis* (Costa Rica, Venezuela), *longipalpa* (Costa Rica), *longitarsis* (Costa Rica), *maculosa* (Tobago, Panama), *magnipalpa* (Costa Rica), *micra* (Costa Rica), *montebello* (Mexico), *nervosa* (Costa Rica), *obscurata* (Mexico), *pitilla* (Costa Rica), *plumitarsis* (Costa Rica), *pressitarsis* (Venezuela), *procera* (Honduras), *pseudobanksi* (Brazil), *purulha* (Guatemala), *sirena* (Costa Rica, Panama, Venezuela, Guyana, Peru, Brazil), *starki* (Venezuela), *subnervosa* (Mexico, Guatemala), *tatumbia* (Mexico, Honduras), *tenuicauda* (Venezuela), *yacambo* (Venezuela). *Neurigona banksi* VAN DUZEE has been raised from synonymy. *Neurigona brasiliensis* (SCHINER) and *Neurigona derelicta* PARENT are regarded as nomina dubia. *Neurigona* and the closely related genus *Bickelomyia* are defined by several synapomorphies such as the ochreous-yellow body, specialised leg setation, and genitalia characters, but *Neurigona* remains paraphyletic.

## Key words

Dolichopodidae, Neurigoninae, *Neurigona*, revision, new species, Neotropical region

## Zusammenfassung

Die neotropischen Arten der Gattung *Neurigona* RONDANI (Diptera: Dolichopodidae), welche 39 Arten umfasst, werden revidiert. 32 Arten werden neu beschrieben. Beschreibungen, Abbildungen und Schlüssel für die Arten und Artengruppen werden dargestellt. Die folgenden Arten werden neu beschrieben (spec. nov.): *alajuela* (Costa Rica), *albatarsis* (Costa Rica), *aragua* (Venezuela), *argentifacies* (Costa Rica, Brazil), *brevitibia* (Venezuela, Peru, Brazil), *cantareira* (Brazil), *crinitarsis* (Mexico), *guanacasta* (Costa Rica), *hachaensis* (Costa Rica), *lamellata* (Costa Rica, Panama, Honduras), *latifacies* (Costa Rica), *limonensis* (Costa Rica, Venezuela), *longipalpa* (Costa Rica), *longitarsis* (Costa Rica), *maculosa* (Tobago, Panama), *magnipalpa* (Costa Rica), *micra* (Costa Rica), *montebello* (Mexico), *nervosa* (Costa Rica), *obscurata* (Mexico), *pitilla* (Costa Rica), *plumitarsis* (Costa Rica), *pressitarsis* (Venezuela), *procera* (Honduras), *pseudobanksi* (Brazil), *purulha* (Guatemala), *sirena* (Costa Rica, Panama, Venezuela, Guyana, Peru, Brazil), *starki* (Venezuela), *subnervosa* (Mexico, Guatemala), *tatumbia* (Mexico, Honduras), *tenuicauda* (Venezuela), *yacambo* (Venezuela). Für *Neurigona banksi* VAN DUZEE wurde die Synonymie aufgehoben. *Neurigona brasiliensis* (SCHINER) und *Neurigona derelicta* PARENT werden als nomina dubia behandelt. *Neurigona* und die nahe verwandte Gattung *Bickelomyia* werden aufgrund von Synapomorphien neu definiert, welche hauptsächlich die ockergelbe Körperfärbung, spezielle Beinbeborstung und Merkmale der Genitalien umfassen, *Neurigona* bleibt jedoch paraphyletisch.

## Stichwörter

Dolichopodidae, Neurigoninae, *Neurigona*, Revision, neue Arten, Neotropische Region

## Introduction

This is the fifth and final part of a revision of the Neotropical Neurigoninae, and deals with the large genus *Neurigona* of the tribe Neurigonini. The preceding parts of this revision treated the tribe Coeloglutini (NAGLIS, 2001) comprising the genera *Coeloglutus* ALDRICH, *Neotonnoiria* ROBINSON, and *Paracoeloglutus* NAGLIS, the tribe Dactylomyiini (NAGLIS, 2002a) including the genera *Argentinia* PARENT, *Dactylomyia* ALDRICH, *Macroductylomyia* NAGLIS and *Systemoides* NAGLIS, and the tribe Neurigonini with the genera *Bickelomyia* NAGLIS (NAGLIS, 2002b) and *Viridigona* NAGLIS (NAGLIS, 2003). For a general introduction see NAGLIS (2001). The large genus *Neurigona* RONDANI has a worldwide distribution and contains about 150 species including the new ones described here. The genus forms a heterogeneous assemblage of species with neurigonine-like characters, and so the definition of monophyletic groups within the Neotropical fauna was necessary, based on a phylogenetic analysis. In the Neotropical region, the genus *Neurigona* included 17 described species (ROBINSON 1970, 1975). In the preceding parts of this revision, the following taxonomic changes were made which impacted upon the genus *Neurigona*: *Neurigona maculipennis* VAN DUZEE was transferred to *Neotonnoiria* (NAGLIS 2001); *Neurigona bicolor* VAN DUZEE, *Neurigona coruscans* PARENT, and *Neurigona decora* ALDRICH were transferred to *Dactylomyia* (NAGLIS 2002a); *Neurigona thoracica* VAN DUZEE and *Neurigona viridis* VAN DUZEE were transferred to *Viridigona* (NAGLIS 2003); *Neurigona cinereicollis* VAN DER WULP and *Neurigona lamprostethus* PHILIPPI were treated as nomina dubia (NAGLIS 2003). It should be noted that the genera and species outside the Neotropics, especially the Nearctic species, could not be taken into consideration within this revision.

## Material and methods

This revision is based on material belonging to the following institutions: The American Museum of Natural History, New York (AMNH); The Natural History Museum, London (BMNH); California Academy of Sciences, San Francisco (CAS); Biosystematics Research Institute, Agriculture Canada, Ottawa (CNC); Deutsches Entomologisches Institut, Eberswalde (DEI); Essig Museum of Entomology, University of California, Berkeley (EMEC); Instituto Nacional de Biodiversidad, Costa Rica (INBio); Instituto Nacional de Pesquisas da Amazonia, Manaus (INPA); Museum of Comparative Zoology, Harvard University, Massachusetts (MCZ); Museu del Instituto de Zoologia Agricola, Maracay (MIZA); Martin-Luther-Universität, Halle a. S. (MLUH); Zoological Museum, University of Helsinki, Helsinki (MZHF); Museum of Zoology, Lund University, Lund (MZLU); Museu de Zoologia, Universidade de São Paulo, São Paulo (MZSP); Swedish Museum of Natural History, Stockholm (NHRS), Naturhistorisches Museum, Vienna (NMW); Staatliches Museum für Tierkunde, Dresden (SMTD); Texas A&M University, College Station, Texas (TAMU); National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM); The James Entomological Collection, Washington State University, Pullman (WSU); Museum für Naturkunde der Humboldt-Universität, Berlin (ZMHB).

The original label text of all the specimens examined is given, and multiple labels are separated by a slash (/). The following measurements are used and are in millimetres: body length is measured from the base of the antennae to the tip of the sixth or seventh abdominal segment; thorax length from the prothorax to the posterior border of the postnotum; abdomen length from the base of segment 1 to the tip of segment 7; wing length from the wing base to the wing apex. The following ratios are used: ratio of length of ocellar setae to

vertical setae; ratio of narrowest distance between eyes on face to distance between ocellar setae; ratio of length of arista to length of first flagellomere; ratio of length of lateral scutellar setae to medians; ratio of podomeres of femur, tibia, tarsomere 1/2/3/4/5; ratio of length of crossvein dm-cu to distance between  $R_{4+5}$  and M at wing apex = RMx ratio; ratio of length of crossvein dm-cu to distal section of CuA = CuAx ratio (according to BICKEL, 1998). The morphological terminology follows mainly McALPINE (1981) and the hypopygial terminology BICKEL (1998), which refers to the position prior to deflection and rotation of the hypopygium; this means that dorsal is below and ventral above in the illustrations. Common features are listed in the generic and species-group diagnoses and are not usually repeated in the species descriptions. Females have not usually been associated with the appropriate males as they usually lack clear diagnostic features for accurate identification.

The following abbreviations are used: MSSC = male secondary sexual character(s); I = prothoracic leg; II = mesothoracic leg; III = metathoracic leg; ac = acrostichal setae; ad = anterodorsal; av = anteroventral; C = coxa; dc = dorsocentral setae; DSur = dorsal surstylar lobe; dv = dorsoventral; F = femur; hm = postpronotal setae; LEp = lateral epandrial lobe; MEp = median epandrial lobe; np = notopleural setae; pa = postalar setae; pd = posterodorsal; pm = presutural supra-alar setae; ppl = proepisternal setae; pv = posteroventral; sa = postsutural supra-alar setae; sr = presutural intra-alar setae; T = tibia; t = tarsus;  $t_1$ - $t_5$  = tarsomeres 1 to 5; VSur = ventral surstylar lobe.

## Systematic account

### Key to genera of Neotropical Neurigonini

The following key includes all the Neotropical genera of the tribe Neurigonini. Keys to the genera and species of the tribes Coeloglutini and Dactylomyiini are provided in NAGLIS (2001, 2002a).

1. Thorax strongly elongated; abdomen about as long as thorax and dorsoventrally flattened; vertex excavated dorsally between vertical seta and ocellar tubercle; male  $It_5$  with a ventral comb of short blunt spines; arista subapical; hypopygium partially hidden under segment 5 or 6, surstylus fused into a single lobe ..... **Coeloglutini**
- Thorax not elongated; abdomen usually longer than thorax and cylindrical; vertex not excavated; male fore tarsomeres not or differently modified; arista usually dorsal; hypopygium external; surstylus divided into dorsal and ventral lobes ..... **2**
2. Thorax entirely metallic green; wing vein M S-shaped, joining costa distinctly anterior of apex close to vein  $R_{4+5}$ , with the distance between both veins at wing margin at most half length of crossvein dm-cu; legs bare of major setae; male hypopygium usually yellow; female oviscapt with terga 9+10 blunt and rounded, and with cercus free from terga 9+10 and rounded ..... **Dactylomyiini**
- Thorax metallic green or ochreous-yellow; wing vein M straight or bent, joining costa at apex or posterior of apex, with the distance between  $R_{4+5}$  and M at costa usually more than half length of crossvein dm-cu; legs usually with major setae on IIT and/or IIIT; male hypopygium varying in colour; female oviscapt with terga 9+10 elongated and tapering, and with cercus fused with terga 9+10 and digitiform **Neurigonini ... 3**
3. Male abdominal segment 5 with a long sickle-shaped ventral projection covering the whole ventral border of the hypopygium; hypopygium large and at base remarkably projecting above dorsum of abdomen; male IIC with a ventral lobe bearing long sinuate or flattened setae; male  $It_{4+5}$  broadened and pennate bilaterally; aedeagus divided into

- two arms with a multi-furcate tip; ventral postcranium in both sexes bearing long setae which are several times as long as postocular setae ..... *Bickelomyia*
- Male abdominal segment 5 with or without ventral projection, if present then not sickle-shaped and only partially covering the ventral border of the hypopygium; hypopygium at base not projecting above dorsum of abdomen; male IIC unmodified; male  $It_{4+5}$  rarely pennate; aedeagus usually present as a single arm with a pointed tip; ventral postcranium with setae which are not several times as long as postocular setae ..... **4**
  - 4.** Thorax entirely metallic green; abdomen metallic bronze-green with segments 1 and 2 often yellow; IIT usually with only 1–2 ad setae;  $It_1$  devoid of major setae; proboscis without a pair of long ventral hairs; male  $It_4$  usually dorsoventrally flattened, with ventral pile; male cercus often elongated and with modified setation ..... *Viridigona*
  - Thorax mainly ochreous-yellow, metallic green at most on mesonotal depression and scutellum, or sometimes dark brown, with or without dense pruinosity; abdomen ochreous-yellow, usually with dark tergal bands; IIT usually with ad, pd and ventral setae;  $It_1$  usually with a strong posterior seta basally and additional strong setae; proboscis with a pair of long sinuous ventral hairs; male fore tarsomeres not or otherwise modified; male cercus short and rounded, with short setae ..... *Neurigona*

**Genus *Neurigona* RONDANI**

*Neurigona* RONDANI, 1856 – RONDANI (1856: 142).

*Saucropus* LOEW, 1857 – LOEW (1857: 41). Unjustified new name for *Neurigona*.

*Neurogona*, *Neurogonia*, *Neurogonus*, *Neurongonia*, auct. (errors).

**Type species:** *Musca quadrifasciata* FABRICIUS, 1781: 448 (by original designation).

**Diagnosis**

**Head:** Eyes usually contiguous or sometimes separated on face in males, always separated in females; face and clypeus entirely covered with dense white, grey or ochreous pruinosity; frons and occiput metallic green with grey or ochreous pruinosity; palp with apical setae, sometimes enlarged; antenna yellow, first flagellomere sometimes infuscated; scape short and bare; pedicel short and rounded, with a circlet of short setae, sometimes slightly projecting into first flagellomere on median and on lateral side; first flagellomere short and rounded, about as long as wide or shorter; arista dorsal, with short pubescence; dorsal postcranium flat or slightly concave; postocular setae uniseriate and yellow with upper 2–4 setae black and uppermost seta distinctly longer than succeeding setae; pairs of long verticals, long ocellars, long postverticals, and tiny postocellars present; ventral postcranium with yellow setae; proboscis with a pair of long sinuous pale basoventral setae.

**Thorax:** Mesonotum ochreous-yellow, sometimes dark brown and often with dense greyish pruinosity (Palearctic species), mesonotal depression and dorsum of scutellum usually metallic green, blue-violet or dark brown; posterior third of mesonotum flattened; ac in 2 rows, sometimes reduced or absent; dc usually comprising 6–7 strong setae decreasing in size anteriorly, anterior setae sometimes reduced or lost, posteriormost 2 pairs bordering mesonotal depression; a field of irregular setulae present anteriorly of dc and anterolaterally of mesonotum; 1 pa, 2 sa, 1–2 sr, 2 np, 1 hm, and 1 pm present; median scutellar setae long, laterals present as tiny setulae or hairs; proepisternum with 1 strong pale seta and some hairs above; anepimeron usually with a black triangular spot below wing base.

**Legs:** All legs yellow and elongate; IC with strong apical and 2 strong anterolateral setae; male fore tarsomeres sometimes modified: broadened, compressed, white in colour, or with specialised setation (MSSC); IIT usually with strong ad, pd and ventral setae;  $It_1$  with a

strong posterior seta basally or a pair of short setae in this position, and often with 1–2 strong dorsal and sometimes with strong ventral setae; IIIC with a strong lateral seta; IIIT usually with strong dorsal setae, and sometimes with additional strong ad setae. **Wing:** Hyaline, with yellowish or brownish tinge, sometimes with distinct brown infuscation; vein  $R_{4+5}$  curved posteriad distally and joining wing margin anteriorly of apex; vein M various: beyond crossvein dm-cu with a weak flexion and more or less subparallel with  $R_{4+5}$ , joining wing margin at apex (Neotropical species), or strongly curved and converging towards  $R_{4+5}$  joining wing margin distinctly anteriorly of apex (species outside the Neotropics); crossvein dm-cu about 1.0–2.0 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.4–0.7 times as long as distal section of CuA; A distinct and almost reaching wing margin.

**Male abdomen:** Elongate, ochreous-yellow, terga 2–4 usually with a dark brown dorsal band or spot; terga with long marginal setae; segment 5 usually with a ventral cuticular projection, segment 4 sometimes with a ventral process; hypopygium usually dark brown, semi-pedunculate (segment 7 forming a short peduncle attached to sternum 8). Hypopygium: epandrium globular or pyriform, hypandrium basally fused to epandrium and distal 1/3 to 1/2 free; aedeagus present as a single arm; epandrial lobes present and bearing long setae; surstylus divided into dorsal (DSur) and ventral (VSur) lobes, both lobes with various shapes and with diagnostic distal projections and appendages; cercus short and rounded, with a median internal digitiform projection and sometimes with a lateral extension; hypopygial foramen positioned left dorsolateral.

**Female:** Similar to male, but eyes always separated on face; oviscapt as characteristic for all Neurigonini: terga 9+10 narrow and elongated, as long as cercus; cercus basally fused with terga 9+10, narrow and digitiform, with fine setae (see BICKEL 1998, Fig. 2c).

### Remarks

*Neurigona* is worldwide in distribution and is known from all biogeographic regions, except the Afrotropical region (GRICHANOV 2000). The genus is paraphyletic and traditionally contains most of the neurigonine-like species. During the present revision, 6 species or one third of all the described Neotropical species formerly included in *Neurigona* had to be transferred to other genera (see Introduction). The synapomorphies of *Neurigona* are discussed below under Phylogenetic Analysis. In NAGLIS (2003) a differential diagnosis was provided for *Neurigona* and *Viridigona*. *Bickelomyia* is closely related to *Neurigona* but is separated by several strong male autapomorphies (NAGLIS 2002b) and is probably derived from *Neurigona*.

### List of Neotropical species and species groups of *Neurigona*

#### *brevitibia* group

- brevitibia* **spec. nov.** (Venezuela, Peru, Brazil)
- cantareira* **spec. nov.** (Brazil)

#### *tenuicauda* group

- alajucla* **spec. nov.** (Costa Rica)
- limonensis* **spec. nov.** (Costa Rica, Venezuela)
- plumitarsis* **spec. nov.** (Costa Rica)
- pressitarsis* **spec. nov.** (Venezuela)
- starki* **spec. nov.** (Venezuela)
- tenuicauda* **spec. nov.** (Venezuela)

#### *orbicularis* group

- grossicauda* VAN DUZEE (Guyana, Peru)
- guanacasta* **spec. nov.** (Costa Rica)
- orbicularis* BECKER (Paraguay)
- pitilla* **spec. nov.** (Costa Rica)
- yacambo* **spec. nov.** (Venezuela)

#### *magnipalpa* group

- aragua* **spec. nov.** (Venezuela)
- longipalpa* **spec. nov.** (Costa Rica)
- longitarsis* **spec. nov.** (Costa Rica)
- magnipalpa* **spec. nov.** (Costa Rica)

**banksi group**

- albitarsis* **spec. nov.** (Costa Rica)
- banksi* VAN DUZEE (Costa Rica, Panama, Venezuela, Guyana, Ecuador, Peru, Bolivia, Brazil)
- maculosa* **spec. nov.** (Tobago, Panama).
- pseudobanksi* **spec. nov.** (Brazil).

**americana group**

- americana* PARENT (Costa Rica).
- argentifacies* **spec. nov.** (Costa Rica, Brazil)
- crinitarsis* **spec. nov.** (Mexico).
- hachaensis* **spec. nov.** (Costa Rica).
- lamellata* **spec. nov.** (Costa Rica, Panama, Honduras).
- montebello* **spec. nov.** (Mexico)

- nervosa* **spec. nov.** (Costa Rica)
- obscurata* **spec. nov.** (Mexico)
- procera* **spec. nov.** (Honduras)
- purulha* **spec. nov.** (Guatemala)
- subnervosa* **spec. nov.** (Mexico, Guatemala)
- signifera* ALDRICH (St. Vincent, Dominica)
- tatumbia* **spec. nov.** (Mexico, Honduras)

**unplaced species of *Neurigona***

- fuscicosta* ROBINSON (Dominica)
- latifacies* **spec. nov.** (Costa Rica)
- melini* FREY (Peru)
- micra* **spec. nov.** (Costa Rica)
- sirena* **spec. nov.** (Costa Rica, Panama, Venezuela, Guyana, Peru, Brazil)

**Nomina dubia**

*brasiliensis* (SCHINER, 1868) (*Saucropus*) (Brazil). 2 female syntypes examined: Novara R., Rio de Janeiro / brasiliensis, Alte Sammlung / [red label:] Type / Gen. Prep. No. SN2000–6, Feb. 2000, St. NAGLIS. [NMW].

*derelecta* PARENT, 1928 (Costa Rica). Female holotype examined: Farm La Caja, 8 km westl. S. José, 15.4.–20.6. 1924 / [underside of label:] Costa Rica, Eing. Nr. 59.1925 / [red label:] Kotype / O. PARENT determ. 1927 / Mus. Hamburg / *Neurogona derelecta* Par. [handwritten] / [red label:] Holotypus / Coll. DEI Eberswalde / Gen. Prep., No. SN2000–9, Mar. 2000, St. NAGLIS. [DEI].

**Remarks**

The types of *N. signifera* could not be found and must be treated as lost (see remarks under the species description). *N. brasiliensis* and *N. derelecta* (both examined) were described from females only and cannot be accurately interpreted due to the lack of clear diagnostic characters in that sex. Therefore I propose to treat them as nomina dubia.

**Key to Neotropical species and species-groups of *Neurigona* (males)**

Neotropical species of *Neurigona* are often very similar in external characters, and therefore clearing and examination of their genitalia is usually necessary. For accurate identification, the genitalia drawings should always be used in addition to the key descriptions since they show important diagnostic features.

1. Ac absent; dorsum of mesonotum with dense short setulae on anterior 2/3 including anterior part of mesonotal depression; dc consisting of 3 pairs of strong setae and 0–2 reduced setulae anterior; VSur with short curved apical tip; abdominal segment 5 without ventral projection (Fig. 1a) (*brevitibia* group) ..... **2**
  - Ac present in two rows; dorsum of mesonotum with short setulae on anterior 1/3, mesonotal depression bare; dc usually consisting of 6–7 pairs; other features various ..... **3**
2. Only 3 pairs of strong dc present; VSur with a spine-like apical seta (Fig. 1b); LEp not projecting above ventral border of hypopygium; IIT shorter than IIF (Fig. 1a) ..... *brevitibia* **spec. nov.**
  - 3 pairs of strong dc present and 2 reduced setulae anterior; VSur with two leaf-like apical setae (Fig. 2); LEp projecting above ventral border of hypopygium; IIT about as long as IIF ..... *cantareira* **spec. nov.**



3. Abdominal segment 5 narrow and pedunculate, without ventral projection (Fig. 3a); epandrium ventrally convex and tube-shaped and strongly compressed basolaterally (*tenuicauda* group) ..... 4
  - Abdominal segment 5 usually not pedunculate but with small or distinct ventral cuticular projection (Fig. 18a, 23a), but if ventral projection not distinct then IIIT with strong ad setae in addition to dorsal setae; epandrium ventrally not distinctly convex or tube-shaped ..... 9
4. Fore tarsomeres modified: flattened, pennate, or white in colour ..... 5
  - Fore tarsomeres unmodified ..... 7
5.  $It_5$  white;  $It_4$  black and pennate bilaterally (Fig. 6a); sternum 8 and hypopygium bright yellow, only DSur dark brown;  $It_{2+3}$  very thin and flattened, hypopygium (Fig. 6b) ..... *starki* spec. nov.
  - $It_5$  not white;  $It_4$  various; sternum 8 and hypopygium brown;  $It_{2+3}$  not modified ..... 6
6.  $It_{4+5}$  broadened and pennate bilaterally (Fig. 7a); hypopygium (Fig. 7b) ..... *plumitarsis* spec. nov.
  - $It_4$  unmodified,  $It_5$  compressed (Fig. 5a); hypopygium (Fig. 5b) *pressitarsis* spec. nov.
7. VSur apically stout (Fig. 8); DSur apically broad and rectangular; IIT without pd setae ..... *alajuela* spec. nov.
  - VSur apically pointed; DSur apically tapering; IIT with or without pd setae ..... 8
8. Eyes touching on face; IIT with pd setae; VSur apically sinuate (Fig. 4); DSur apically pointed ..... *limonensis* spec. nov.
  - Eyes not touching on face; IIT without pd setae; VSur apically straight (Fig. 3b); DSur apically rounded ..... *tenuicauda* spec. nov.
9. VSur apically stout and rounded, without long and tapering apical projections, if short projections present then hook-shaped and IIIT with 1–2 ad setae in addition to the dorsal setae ..... 10
  - VSur apically with 1–2 long and tapering apical projections (Fig. 18a, 23a); IIIT usually without ad setae in addition to the dorsal setae ..... 17
10. IIIT without ad setae in addition to dorsal setae; surstyli dark brown to black ..... 11
  - IIIT with 1–2 strong ad setae in addition to dorsal setae; surstyli ochreous-yellow; first flagellomere small and about as wide as pedicel; hypandrium with a pair of lateral arms (*orbicularis* group) ..... 13
11. Eyes distinctly separated on face, distance between eyes greater than distance between ocellar setae; IIT with 3 strong pd setae; hypandrium strongly upcurved and projecting distally (Fig. 39) ..... *latifacies* spec. nov.
  - Eyes touching or almost touching on face; IIT with 2 pd setae ..... 12
12. Fore tarsomeres with a row of dense long ventral hairs (Fig. 37a); IIT with small ad and pd setae which are not longer than diameter of tibia; VSur strongly projecting beyond ventral border of epandrium (Fig. 37b); wing length less than 3 mm ..... *micra* spec. nov.
  - Fore tarsomeres unmodified; IIT with ad and pd setae which are distinctly longer than diameter of tibia; VSur not projecting beyond ventral border of epandrium (Fig. 38); wing length more than 3 mm ..... *sirena* spec. nov.
13. IIIT with a strong yellow dorsal seta at 1/2, and with an ad seta at 1/4; eyes distinctly separated on face, face with greyish-white pruinosity; VSur straight with a roundish flattened apex (Fig. 9); DSur with a long cup-shaped projection .... *orbicularis* BECKER
  - IIIT without yellow dorsal seta; other features various ..... 14
14. Eyes touching on face; IIIT with 1 strong ad seta at 1/4; VSur bifurcate, with a small subapical and a strong flattened apical seta (Fig. 12) ..... *yacambo* spec. nov.

- Eyes separated on face, distance between eyes at least twice the diameter of adjacent facets; IIIT with 2 strong ad setae at 1/4 and 2/3 ..... **15**
- 15.** VSur apically hook-shaped and downcurved, bearing a straight thin apical seta (Fig. 13); IIT with 3 pd setae ..... *pitilla spec. nov.*
- VSur apically not hook-shaped, but with a stout triangular or rectangular tip ..... **16**
- 16.** VSur with a rectangular tip (Fig. 10); gonocoxites equal in length; IIT with 3 pd setae; IIt<sub>1</sub> with distinct ad seta; face with grey pruinosity ..... *grossicauda* VAN DUZEE
- VSur with a triangular tip (Fig. 11); gonocoxites unequal in length (left arm distinctly longer than right arm); IIT with 2 pd setae; IIt<sub>1</sub> without distinct ad seta; face with ochreous pruinosity ..... *guanacasta spec. nov.*
- 17.** It<sub>3+4</sub> white, It<sub>5</sub> black and pennate bilaterally (Fig. 35a); IIT strongly flattened dorsoventrally with 2 short ad setae; first flagellomere small, about as wide as pedicel; hypopygium (Fig. 35b) ..... *melini* FREY
- It unmodified or otherwise modified; IIT usually not flattened ..... **18**
- 18.** First flagellomere very small, about as wide as pedicel; pedicel truncate against first flagellomere; VSur with a single long downcurved apical projection; DSur folded, with a hair-like serrate distal rim; abdominal segment 5 with a long ventral projection; wings infuscated (*magnipalpa* group) ..... **19**
- First flagellomere distinctly wider than pedicel; pedicel usually slightly projecting into first flagellomere; VSur usually with 2 apical projections; DSur usually not folded; other features various ..... **22**
- 19.** Palp enlarged and at least as long as proboscis (Fig. 14a, 15a), silvery-white and bare ..... **20**
- Palp shorter than proboscis and hairy ..... **21**
- 20.** Palp roundish, about as long as wide (Fig. 14a); IIIT dark brown with 4-5 dorsal setae; IIIF with a brown longitudinal stripe; hypandrium upcurved; VSur with a straight apical projection (Fig. 14b) ..... *magnipalpa spec. nov.*
- Palp elliptic, about twice as long as wide (Fig. 15a); IIIT yellow with 2 dorsal setae; IIIF entirely yellow; hypandrium not upcurved; VSur with a curved apical projection (Fig. 15b) ..... *longipalpa spec. nov.*
- 21.** It<sub>1</sub> 1.4 times as long as IT; It<sub>2</sub> flattened and 6 times as long as It<sub>3</sub> (Fig. 16a); DSur tapering (Fig. 16b) ..... *longitarsis spec. nov.*
- It<sub>1</sub> as long as IT; It<sub>2</sub> not flattened and 2 times as long as It<sub>3</sub>; DSur apically U-shaped (Fig. 17) ..... *aragua spec. nov.*
- 22.** Abdominal segment 5 with a long filiform ventral projection (sometimes hidden under segment 4); wing with a brown infuscation along costa and R<sub>4+5</sub>; IIIT with 3 strong dorsal setae on basal half; hypopygium (Fig. 36) ..... *fuscicosta* ROBINSON
- Abdominal segment 5 with an ovate or triangular projection; wing without distinct infuscation, or if infuscation present then usually not as above ..... **23**
- 23.** Abdominal segment 5 distinctly wider than segment 4 (Fig. 18a); median projection of VSur straight and longer than lateral projection; DSur with a serrate rim (*banksi* group) ..... **24**
- Abdominal segment 5 as wide as segment 4 (Fig. 23a); median projection of VSur downcurved and not longer than lateral projection; DSur without serrate rim (*americana* group) ..... **27**
- 24.** It<sub>5</sub> white with white vestiture; IIIT with 3 strong dorsal setae on basal half; hypopygium (Fig. 20) ..... *albitarsis spec. nov.*



- $It_5$  unmodified ..... 25
- 25. Wing with a conspicuous brown apical maculation (Fig. 19a); hypopygium (Fig. 19b) ..... *maculosa* **spec. nov.**
- Wing without brown apical maculation, sometimes slightly infuscated ..... 26
- 26. Cercus basally covered with a dark brown triangular extension, without digitiform apical lobe (Fig. 18b); lateral projection of VS<sub>ur</sub> apically leaf-shaped and pointed; DS<sub>ur</sub> without incision ..... *banksi* VAN DUZEE
- Cercus basally not covered with an extension, but with a digitiform apical lobe (Fig. 21); lateral projection of VS<sub>ur</sub> apically shaped like a parallelogram; DS<sub>ur</sub> with a strong incision ..... *pseudobanksi* **spec. nov.**
- 27. Fore tarsomeres with dense erect ventral hairs which are about twice as long as diameter of tarsomeres (Fig. 26a); II<sub>t1</sub> with 2 strong ad, and 2 strong av setae; lateral projection of VS<sub>ur</sub> with a stout blossom-like apex (Fig. 26b) ..... *crinitarsis* **spec. nov.**
- Fore tarsomeres sometimes with dense ventral hairs which are not longer than diameter of tarsomeres; II<sub>t1</sub> usually with only 1–2 ad setae ..... 28
- 28. Eyes distinctly separated on face; face and clypeus silvery-white; dorsum of mesonotum largely metallic blue-violet on the area from mesonotal depression to mesonotal suture and laterad of dc rows; DS<sub>ur</sub> cloud-shaped (Fig. 28) ..... *argentifacies* **spec. nov.**
- Eyes contiguous on face or almost so, other features various ..... 29
- 29. Thorax largely dark brown with faint metallic blue-green reflections, ochreous-yellow only laterad of dc rows; VS<sub>ur</sub> with hook-shaped lateral projection (Fig. 33), median projection only half as long as lateral ..... *obscurata* **spec. nov.**
- Thorax ochreous-yellow, dark brown at most on mesonotal depression and scutellum ..... 30
- 30. Proximal section of vein M at least as long as distal section or longer (measured from crossvein r-m) (Fig. 24a); vein M with a distinct bend; posterior wing margin with a distinct lobe at junction with vein CuA; IIT with only 1–2 small ad setae; IIIT with small dorsal setae ..... 31
- Proximal section of vein M shorter than distal section; vein M various; posterior wing margin usually without distinct lobe at vein CuA; other features various ..... 32
- 31. DS<sub>ur</sub> apically triangular, with a seta-like projection (Fig. 24b); IIT with 1 small ad seta; proximal section of vein M longer than distal section ..... *nervosa* **spec. nov.**
- DS<sub>ur</sub> apically bifurcate, without seta-like projection (Fig. 27); IIT with 2 small ad setae; proximal section of vein M subequal to distal section ... *subnervosa* **spec. nov.**
- 32. Dc consisting of 3 pairs of strong setae and 1–2 smaller setae anterior that are restricted posterior of mesonotal suture; IIIT with a strong ad seta at 1/5 in addition to dorsal setae; DS<sub>ur</sub> with a triangular apex and a hook-shaped projection (Fig. 25) ..... *signifera* ALDRICH
- Dc consisting of 6 strong setae decreasing in size anterior and extending anterior of mesonotal suture; IIIT usually without ad seta in addition to dorsal setae ..... 33
- 33. Large species with wing length more than 5 mm; abdominal segment 4 with a ventral extension ..... 34
- Smaller species with wing length less than 5 mm; abdominal segment 4 without ventral extension ..... 35
- 34. Fore tarsomeres with dense apically-curved ventral hairs (Fig. 30a); DS<sub>ur</sub> with an ovate projection (Fig. 30b) ..... *procera* **spec. nov.**

- Fore tarsomeres with straight ventral hairs; DSur with a long blade-like projection (Fig. 31) ..... *purulha* **spec. nov.**
- 35.** Cercus with a laterally projecting concave lamella; DSur with a tapering projection with a triangular lobe (Fig. 32) ..... *lamellata* **spec. nov.**
- Cercus without laterally projecting concave lamella ..... **36**
- 36.** DSur with a seta-like process ..... **37**
- DSur without a seta-like process ..... **38**
- 37.** Median projection of VSUR flattened and acute (Fig. 23b); apex of DSur straight ..... *hachaensis* **spec. nov.**
- Median projection of VSUR not flattened and stout (Fig. 22); apex of DSur upcurved ..... *americana* **PARENT**
- 38.** DSur with an anchor-like apical appendage with a serrate rim (Fig. 29); VSUR with two distal projections, lateral one with a flattened leaf-like apex ... *montebello* **spec. nov.**
- DSur tapering and rounded apically (Fig. 34); VSUR with a single slender projection with a hook-shaped apex ..... *tatumbia* **spec. nov.**

**General remarks on the definition of species and species-groups**

The definition of species and species-groups is mainly based on genitalic characters. In Neotropical species of *Neurigona*, the distinction of these characters are sometimes weak and the determination of variations or good species is sometimes difficult. In this work, a more conservative approach is followed, and in cases of doubt infraspecific variation is presumed. The genitalia drawings show the left lateral view of the preparations, but it must be borne in mind that the shape of diagnostic features such as the apical appendages on the surstyli depends on the exact angle of view.

**The *brevitibia* group**

**Diagnosis.** Ac absent; dc consisting of 3 strong setae and 0–3 shorter setulae anteriorad which are restricted posteriorad of mesonotal suture; dorsum of mesonotum covered with dense setulae including anterior part of mesonotal depression (in both sexes); only 1 short sr present; IIT with 2 ad, 2 pd, 1 av, and 2 pv setae; IIT<sub>1</sub> with a strong ad seta; VSUR with a short curved apical tip bearing 1–2 flattened setae; abdominal segment 5 without ventral projection.

*Neurigona brevitibia* **spec. nov.**

(Fig. 1a–b)

**Material: Holotype** male: VENEZUELA: Venezuela, T. F. Amaz., Cerro de la Neblina, Basecamp, 140 m, 0°50'N, 66°10'W, 10–20 February 1985 / Malaise trap, in rainforest, P. J. & P. M. SPANGLER, R. A. FAITOUTE, W. E. STEINER colrs. [USNM]. **Paratypes:** VENEZUELA: 1 male: Venezuela, T. F. Amazonas, Puerto Ayacucho (40 km S), El Tobogan, Cano Coromoto, 24 January 1989, malaise, Collected by P J SPANGLER & R A FAITOUTE & C B BARR. [USNM]. PERU: 1 male: Avispas, Madre de Dios, Peru, 20–30.IX.1962, L. Pena, 400 m. 1 male: same data but 1–15.X.1962. [CNC]. BRAZIL: 1 male: Brazil, Amazonas, Manaus, R. Ducke, 30.XI.1981, J. A. RAFAEL. 1 female: Manaus, 11.VI.1976, P. A. LUNA. [INPA]

**Description**

**Male.** Length: holotype: body 4.3, wing 3.9; thorax 1.6, abdomen 2.0; paratypes: body 4.0–4.5. Male habitus (Fig. 1a). **Head:** Ocellars 1.3 times as long as verticals; postverticals 0.5 times as long as verticals; postoculars pale yellow, uppermost 2–3 setae black; eyes contiguous on face; face and clypeus with dense greyish pruinosity; palp pale yellow, with 2 pale apical setae and black hairs; pedicel slightly projecting into first flagellomere on median and lateral side; first flagellomere yellow, apical half brown, about as long as wide; arista about 10 times as long as first flagellomere.

**Thorax:** Mesonotum ochreous-yellow; mesonotal depression and dorsum of scutellum metallic green with blue and violet reflections; ac absent; dc consisting of 3 strong setae decreasing in size anteriorly; dorsum of mesonotum including mesonotal depression covered with dense short setulae; additional strong setae include: 1 pa, 2 sa (anterior smaller), 1 small sr, 2 np, 1 hm, and 1 pm. Lateral scutellar setae 1/6 as long as medians. **Legs:** Yellow, covered with dense black hairs; IIT shorter than IIF, with a pair of strong ad/pd setae at 1/6 and 2/3, with 2–3 strong ventral, and 3 apical setae; IIT<sub>1</sub> with a strong posterior seta basally, and with a strong dorsal seta at 1/2; IIIT with 5 strong dorsal setae, slightly increasing in size distally. Relative podomere ratios: I: 44, 42, 33/24/13/9/6; II: 52, 45, 59/24/18/9/7; III: 55, 82, 22/29/17/12/6. **Wing:** Hyaline, with a brownish infuscation, especially in anterior part; M with a weak flexion and subparallel with R<sub>4+5</sub>; RMx ratio = 1.3, CuAx ratio = 0.5; lower calypter pale yellow with brown rim and a fan of brown setae; halter stem yellow, knob infuscated.

**Abdomen:** Ochreous-yellow; terga 2–4 with a dark brown band; sternum 8 dark brown; segment 5 without ventral projection; epandrium and surstyli dark brown; cercus ochreous with pale setae. Hypopygium (Fig. 1b): epandrium pyriform, tapering distally; hypandrium long and pointed; MEp short and narrow, with a median seta; LEp broad and triangular with several setae on apical half; VSur narrow and rectangular, with an apical incision and forming two pointed tips, with median setae; DSur triangular; cercus with a median internal projection covered by the surstyli.

**Female:** Similar to male except as noted: eyes separated on face; face with dense ochreous pruinosity; distance between eyes equal to the distance between ocellar setae.

**Distribution:** Venezuela, Peru, Brazil.

**Etymology:** The name refers to the shortened male middle tibia.

**Remarks:** The absence of ac setae, the reduction of dc setae, and the presence of dense setulae on dorsum of mesonotum in both sexes are distinctive characters of the *N. brevitibia*. The tendency to reduction of the dc setae has evolved several times in other Neurigoninae genera and is also present in other *Neurigona* species such as *N. signifera*.

### *Neurigona cantareira* spec. nov.

(Fig. 2)

**Material:** Holotype male: BRAZIL: Est. São Paulo, S. Cantareira, Chapadao, Barretto col., 9–[1?]945. [MZSP].

#### **Description**

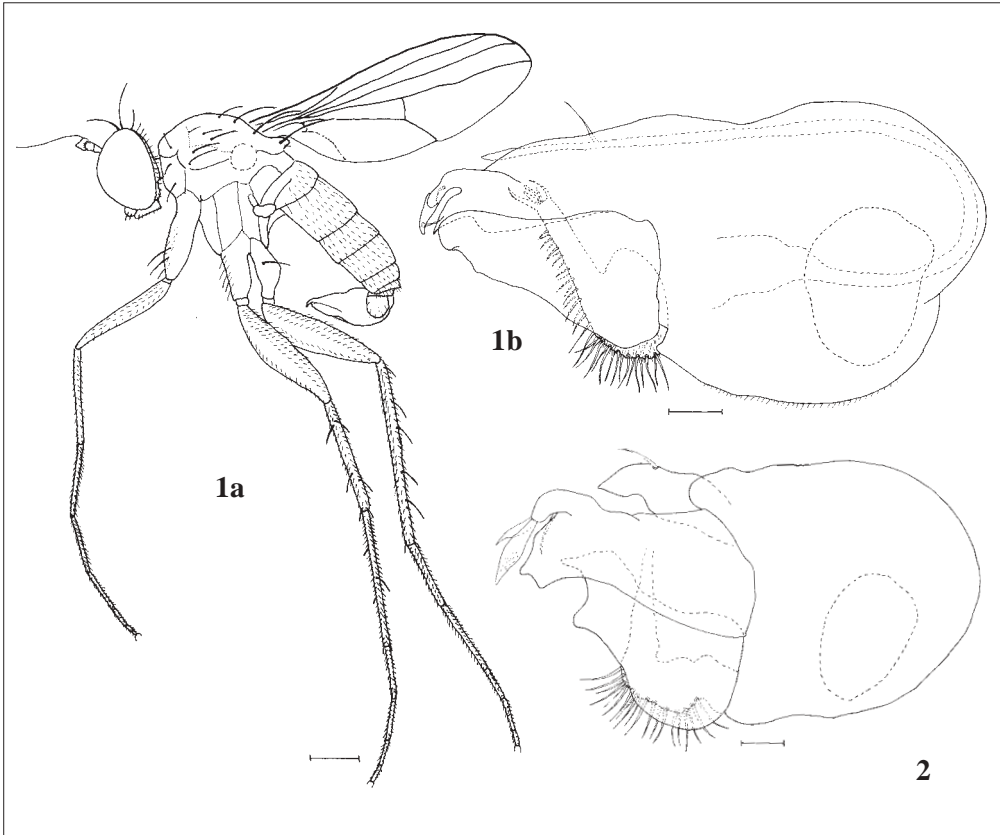
**Male.** Length: holotype: body 4.6, wing 5.1; thorax 1.95, abdomen 2.1. **Head:** Ocellars 1.6 times as long as verticals; postverticals 0.9 times as long as verticals; uppermost postoculars 0.8 times as long as verticals; eyes practically contiguous on face; first flagellomere 0.8 times as long as basal width, yellow; arista about 10 times as long as first flagellomere; palp yellow.

**Thorax:** Ochreous-yellow; mesonotal depression metallic green with grey pruinosity; dorsum of scutellum and postnotum dark brown; pleura ochreous-yellow; ac not present; dc consisting of 3 strong setae and 2–3 shorter setae anteriorly; dorsum of mesonotum covered with dense short setulae including anterior 1/3 of mesonotal depression. **Legs:** IIT with strong ad setae at 1/5 and 2/3, strong pd setae at 1/4 and 3/4, a strong av seta at 1/3, a strong pv seta at 1/2, and 3 strong apical setae; IIT<sub>1</sub> with a strong posterior seta basally; III broken off. Relative podomere ratios: I: 51, 55, 42/29/18/9/?; II: 63, 64, 67/24/16/10/5; III: ?, ?, ?/?/?/?/?. **Wing:** Anterior part with brownish infuscation; M with a weak flexion; RMx ratio = 1.6, CuAx ratio = 0.7; lower calypter ochreous with a brown rim and with a fan of ochreous setae; halter ochreous.

**Abdomen:** As in *N. brevitibia*. Hypopygium (Fig. 2): hypandrium narrow and tapering; epandrial lobe developed as a long, broad single arm with a strong dorsal and ventral seta; VSur narrow and rectangular, with a ventroapical curved lobe bearing a long and a shorter flattened leaf-like seta apically and a strong seta subapically; DSur triangular with a subapical lobe and an apical pointed tip which is covered by the VSur; cercus hidden under DSur, with a median internal projection.

**Female:** Unknown.

**Distribution:** Brazil.



**Fig. 1a–b:** *Neurigona brevitibia* spec. nov., male – **a:** Habitus, left lateral (left wing removed); – **b:** Hypopygium, left lateral. Scale bars: fig. a = 0.5 mm; fig. b = 0.1 mm. **Fig. 2:** *Neurigona cantareira* spec. nov. Male hypopygium, left lateral. Scale bar = 0.1 mm.

**Etymology:** The name refers to the collecting site.

**Remarks:** *N. cantareira* also has ac and dc setae strongly reduced, but not as strongly as in *N. brevitibia*. Both species are closely related and can be separated by the characters given in the key.

### The *tenuicauda* group

**Diagnosis.** Abdominal segment 5 narrow and pedunculate, without ventral projection; segment 7 also pedunculate; epanthrium ventrally distinctly convex and tube-shaped, and basolaterally strongly compressed; IIT with 2 strong ad and strong ventral setae; IIT<sub>1</sub> without strong dorsal setae; VSur narrow and tapering, with an acute median and a tapering lateral projection; DSur without a distinct apical appendage; hypandrium long and narrow; male fore tarsomeres often modified.

### *Neurigona tenuicauda* spec. nov.

(Fig. 3a–b)

**Material:** **Holotype** male: VENEZUELA: Venezuela, Aragua, Henri Pittier Nat. Park, Pico Guacamaya, 1830 m, malaise trap, 15–30.xi.1997, T. PAPE. [MIZA]. **Paratypes:** 35 males: same data. [NHRS].

**Description**

**Male.** Length: holotype: body 4.1, wing 4.4; thorax 1.4, abdomen 2.5; paratypes: wing 4.1–4.6. **Head:** Face and clypeus with dense ochreous-brown pruinosity; eyes almost touching on face, narrowest distance between eyes 1.5 times the diameter of adjacent facets; ocellars 2.7 times as long as verticals; postverticals 1.5 times as long as verticals; uppermost postoculars 0.9 times as long as verticals, uppermost 4–5 setae black; first flagellomere yellow, apical half brown, 0.8 times as long as basal width; arista about 9 times as long as first flagellomere; palp yellow with 2 black apical setae.

**Thorax:** Mesonotum ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown with blue-violet green reflections, and with a faint dark narrow stripe anteriorly between ac rows and along dc rows; pleura pale yellow. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, strong av seta at 1/3, small pv seta at 1/2, and 3 apical setae;  $IIT_1$  with a strong posterior seta basally, and several small setulae; IIIT with 4 strong dorsal setae, basalmost smaller. Relative podomere ratios: I: 42, 48, 44/22/15/9/5; II: 52, 59, 60/18/12/8/5; III: 60, 90, 25/27/15/10/5. **Wing:** With brownish infuscation; M with a weak flexion and subparallel with  $R_{4+5}$ ; RMx ratio = 1.2, CuAx ratio = 0.4; lower calypter pale with brown rim and a fan of brownish-golden setae; halter pale with brownish knob.

**Abdomen:** Ochreous-yellow; terga 2–4 with a dark brown dorsal band; sternum 8 dark brown; segment 5 narrow and slightly pedunculate, without ventral projection (Fig. 3a); epandrium and surstyli dark brown to black; cercus pale with pale setae. Hypopygium (Fig. 3b): hypandrium narrow and short, about 3 times as long as basal width; epandrial lobe long and triangular, with 1 subapical and 2 basal setae; VSur with short pointed median projection, lateral projection apically straight and pointed; DSur apically rounded; cercus with a digitiform median projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Venezuela.

**Etymology:** The name refers to the narrow postabdomen lacking a ventral projection on male abdominal segment 5.

**Remarks:** A diagnostic feature of *N. tenuicauda* is the conspicuous narrow and tapering glossy black surstyli.

*Neurigona limonensis* spec. nov.

(Fig. 4)

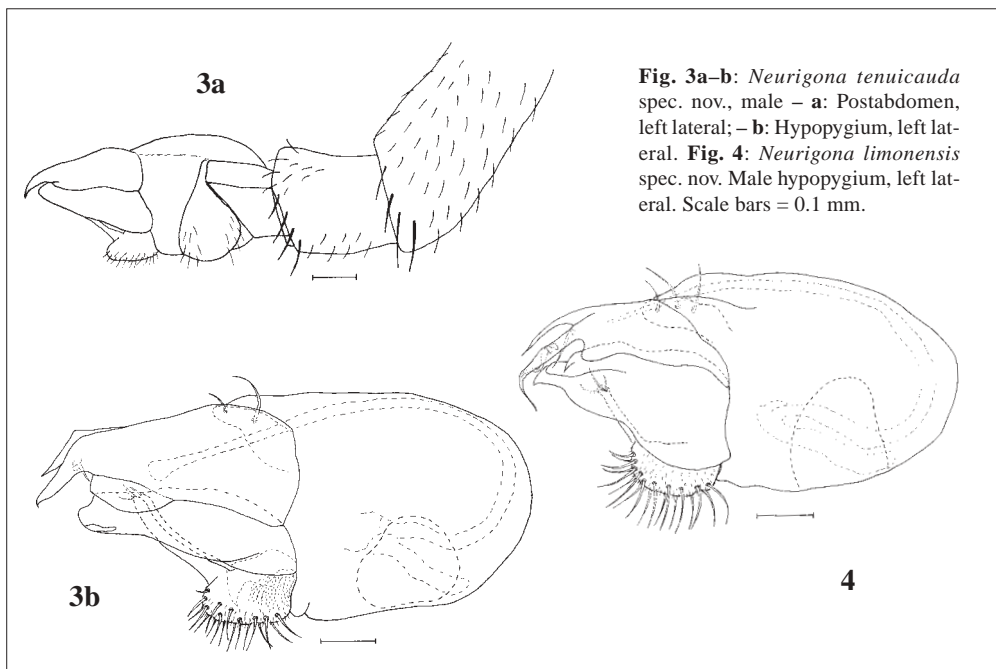
**Material:** **Holotype** male: COSTA RICA: Costa Rica, Hiloy Cerere; A. C. Amistad; Prov. Limon, 100–200 m, 5.x.–7.xi.1993, LN 184600\_643400, #2437, malaise, G. CARBELLO. [INBio]. **Paratypes:** COSTA RICA: 1 male: same data. [INBio]. VENEZUELA: 1 male: Venezuela, T.F. Amaz., Cerro de la Neblina, Basecamp, 140 m, 0° 50' N, 66° 10' W, 21–28 February 1985 / Malaise trap, in rainforest, P. J. & P. M. SPANGLER, R. A. FAITOUTE & W. E. STEINER colfs. [USNM].

**Description**

**Male.** Length: holotype: body 2.7, wing 3.6; thorax 1.1, abdomen 1.5; paratypes body 3.0, wing 3.1–3.3. **Head:** Ocellars 1.8 times as long as verticals; postverticals as long as verticals; postoculars pale yellow, except uppermost 3 setae black, uppermost seta 0.8 times as long as verticals; eyes contiguous on face; face and clypeus with dense ochreous-yellow pruinosity; palp pale yellow, with 2 black apical setae and black hairs; antenna: first flagellomere yellow, apical half brown, about as long as wide, relatively small and as wide as pedicel; arista about 10 times as long as first flagellomere.

**Thorax:** As in *N. tenuicauda*, but mesonotal depression and dorsum of scutellum with metallic green reflections. **Legs:** Yellow, IIT with ad setae at 1/4 and 2/3, pd setae at 1/5 and 3/4, a strong ventral seta at about 1/2, and 3 apical setae;  $IIT_1$  with a strong posterior seta basally; IIIT with 3–4 strong dorsal setae. Relative podomere ratios: I: 50, 53, 50/29/19/10/6; II: 60, 60, 71/21/16/10/5; III: 65, 100, 28/31/18/12/5. **Wing:** Hyaline, with a brownish tinge; M with a weak flexion and subparallel with  $R_{4+5}$ ; RMx ratio = 1.2, CuAx ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of brown-golden setae; halter stem pale yellow, knob infuscated.

**Abdomen:** As in *N. tenuicauda*. Hypopygium (Fig. 4): epandrium globular, strongly compressed basolaterally, ventrally convex and tubular; hypandrium very narrow and pointed; epandrial lobe broad, apically curved and acute, with a strong basal, a ventral and a subapical seta; VSur narrow and



**Fig. 3a–b:** *Neurigona tenuicauda* spec. nov., male – **a:** Postabdomen, left lateral; – **b:** Hypopygium, left lateral. **Fig. 4:** *Neurigona limonensis* spec. nov. Male hypopygium, left lateral. Scale bars = 0.1 mm.

triangular, with a narrow pointed median projection and a filiform downcurved, more lateral projection bearing two median setae; DSur triangular projecting, with two apical acute tips; cercus with a digitiform median internal projection with apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica, Venezuela.

**Etymology:** The name refers to province of the collecting site.

**Remarks:** The specimen from Venezuela shows some differences in the genitalic features and could represent a different species, but more material is required for clarification.

*Neurigona pressitarsis* spec. nov.

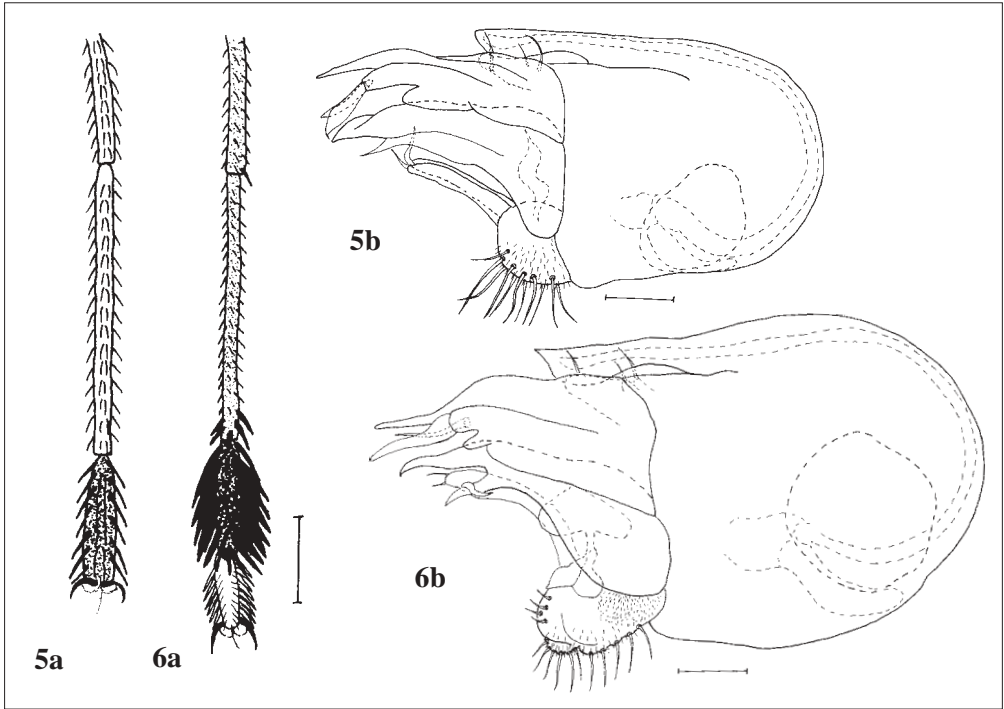
(Fig. 5a–b)

**Material:** **Holotype** male: VENEZUELA: Venezuela, Aragua, Henri Pittier Nat. Park, nr Rancho Grande, 1150 m, malaise trap, 15–30.xi.1997, T. PAPE. [MIZA]. **Paratype:** VENEZUELA: 1 male: Venezuela, Aragua, Henri Pittier Nat. Park, Pico Guacamaya, 1830 m, malaise trap, 15–30.xi.1997, T. PAPE. [NHRS].

**Description**

**Male.** Length: holotype: body 4.0, wing 4.4; thorax 1.2, abdomen 2.2; paratype: body: 4.3, wing 4.8. **Head:** Face and clypeus with dense ochreous pruinosity; eyes touching on face; ocellars 3.0 times as long as verticals; postverticals 1.8 times as long as verticals; uppermost postoculars 1.4 times as long as verticals, uppermost 1–2 setae black; first flagellomere yellow, apical half brown, 0.8 times as long as basal width; arista about 9 times as long as first flagellomere; palp yellow with 2–3 brown apical setae. **Thorax:** As in *N. tenuicauda*. **Legs:** Yellow, IIT and IIIT infuscated;  $It_5$  dark brown and compressed dorsoventrally (Fig. 5a), diameter about twice the diameter of  $It_4$  (MSSC); IIT with strong ad setae at 1/5 and 2/3, a ventral seta near 1/2, and 3 apical setae;  $II_1$  with a strong posterior seta basally; IIIT with 3–4 small dorsal setae on basal half. Relative podomere ratios: I: 43, 49, 59/23/17/12/7; II: 47, 57, 63/18/12/8/4; III: 52, 93, 25/28/16/10/4. **Wing:** M with a weak flexion and subparallel with  $R_{4+5}$ ; RMx ratio = 1.4, CuAx ratio = 0.4; lower calypter pale with brown rim and a fan of brownish setae; halter pale ochreous with brownish knob.





**Fig. 5a–b:** *Neurigona pressitarsis* spec. nov., male – a: Fore tarsomeres, dorsal; – b: Hypopygium, left lateral. **Fig. 6a–b:** *Neurigona starki* spec. nov., male – a: Fore tarsomeres, dorsal; – b: Hypopygium, left lateral. Scale bars = 0.1 mm.

**Abdomen:** As in *N. tenuicauda*; terga 5–7 brown. Hypopygium (Fig. 5b): hypandrium broad and tapering, about 3 times as long as basal width; epandrial lobe long and ovate, with a pointed tip, and with a subapical and 2 basal setae; VSUR with an acute median projection, lateral projection with a leaf-like flattened tip and a median flattened seta; DSUR very narrow and tapering, with a pointed tip and a subapical pointed projection; cercus with an internal sinuous process and a digitiform median projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Venezuela.

**Etymology:** The name refers to the compressed  $It_5$ .

**Remarks:** *N. pressitarsis* has  $It_5$  flattened and dark brown, but with normal vestiture, and not pennate as in *N. plumitarsis*.

### *Neurigona starki* spec. nov.

(Fig. 6a–b)

**Material:** **Holotype** male: VENEZUELA: Venezuela, Aragua, Henri Pittier Nat. Park, Pico Periquito, 1680 m, malaise trap, 15–30.xi.1997, T. PAPE. [MIZA].

### Description

**Male.** Length: holotype: body 5.1, wing 4.7; thorax 1.5, abdomen 2.9. **Head:** Face and clypeus with dense ochreous-yellow pruinosity; eyes touching on face; ocellars 2.0 times as long as verticals; postverticals 1.0 times as long as verticals; uppermost postoculars 1.4 times as long as verticals, uppermost 1–2 setae black; first flagellomere yellow, apical half brown, 0.8 times as long as basal width; arista about 8 times as long as first flagellomere; palp yellow with 2–3 brown apical setae.

**Thorax:** As in *N. tenuicauda*. **Legs:** Yellow, IIT and IIIT infuscated;  $It_{1-3}$  long and thin,  $It_{2+3}$  compressed;  $It_4$  black and pennate with a bilateral row of black flattened setae (Fig. 6a);  $It_5$  silvery-white with white flattened hairs (MSSC); IIT with strong ad setae at 1/5 and 2/3, a ventral seta near 1/2, and 3 strong apical setae; II $t_1$  with a strong posterior seta basally; IIIT with 2–3 small dorsal setae on basal half. Relative podomere ratios: I: 44, 57, 52/29/10/5/3; II: 48, 56, 63/18/12/7/3; III: 53, 88, 26/27/15/10/4.

**Wing:** Relatively narrow; M with a weak flexion and subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of yellow-golden setae; halter pale yellow with brownish knob.

**Abdomen:** As in *N. tenuicauda*, but sternum 8 and epandrium bright yellow; VSur whitish; DSur brown; cercus white with white setae. Hypopygium (Fig. 6b): hypandrium long and straight, about 5 times as long as basal width; epandrial lobe broad and triangular, with 1 subapical and 2 basal setae; VSur with narrow acute median projection, lateral projection with a flattened and pointed apical appendage and a strong median seta; DSur with a pointed curved apex, and a subapical pointed projection; cercus rounded, with a lateral internal ovate process and a digitiform median projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Venezuela.

**Etymology:** The name is dedicated to the German Dipterist Andreas STARK (Halle) who has supported me with the editing and presentation of this series of revisionary papers.

**Remarks:** *N. starki* is distinguished by the striking yellow sternum 8 and the hypopygium which is a unique feature among Neotropical members of *Neurigona*. See also under *N. plumitarsis*.

### *Neurigona plumitarsis* spec. nov.

(Fig. 7a–b)

**Material:** **Holotype** male: COSTA RICA: Est. La Casona, R.B. Monteverde, Prov. Punta, Costa Rica, 1520 m, 12–19 Mar 1993, N. OBANDO, G. BARBOSA, A. POUND, L N 253250\_449700 #2676 [INBio]. **Paratype:** COSTA RICA: male: same data. [INBio].

#### Description

**Male.** Length: holotype: body 3.9, wing 4.4; thorax 1.5, abdomen 2.1; paratype: body 3.9, wing 4.4.

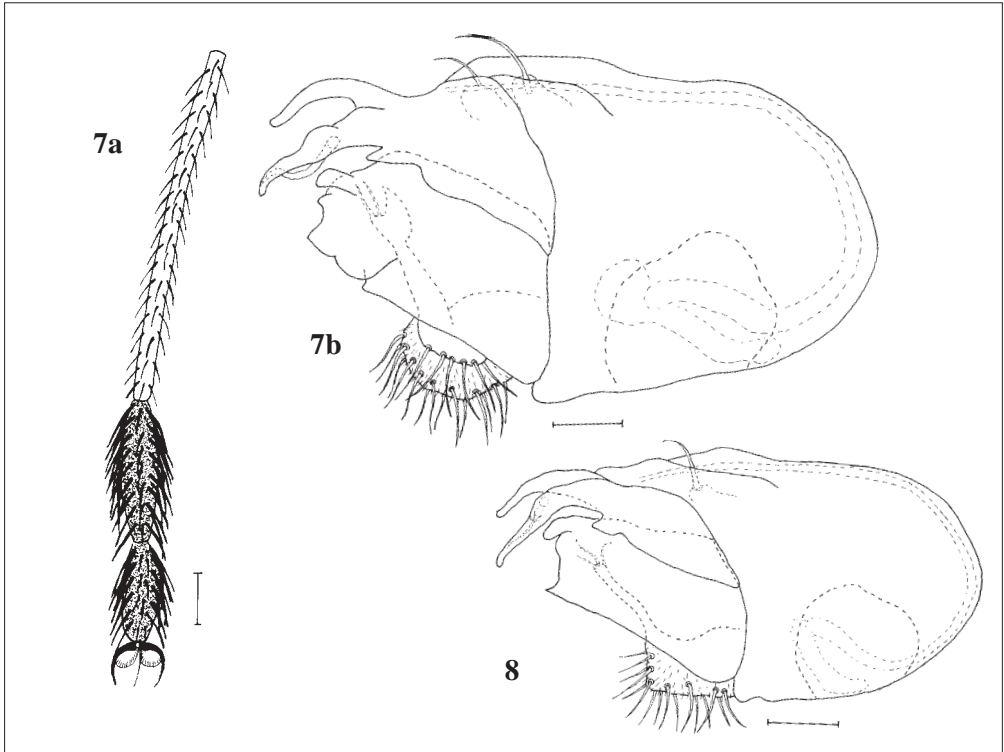
**Head:** Face and clypeus with dense ochreous-yellow pruinosity; eyes almost contiguous on face, distance between eyes on face equal to diameter of adjacent facets; ocellars 2.4 times as long as verticals; postverticals black and 1.4 times as long as verticals; uppermost postoculars 1.0 times as long as verticals, only uppermost seta black; first flagellomere yellow, apical half brown, 0.8 times as long as basal width; arista about 8 times as long as first flagellomere; palp yellow with 2 black apical setae.

**Thorax:** As in *N. tenuicauda*, but mesonotal depression and dorsum of scutellum without metallic reflections and without a dark narrow stripe between ac and along dc rows. **Legs:** Yellow;  $It_{4+5}$  broadened and black, pennate with a bilateral row of black flattened setae (Fig. 7a) (MSSC); IIT with strong ad setae at 1/5 and 2/3, a pd seta at 1/6, a strong av seta at about 1/3, and 2 strong apical setae; II $t_1$  with a strong posterior seta basally; IIIT with a row of 4–5 strong dorsal setae. Relative podomere ratios: I: 46, 54, 47/23/18/8/5; II: 54, 64, 62/19/15/9/5; III: 58, 100, 25/28/15/11/5. **Wing:** M with a weak flexion and parallel with  $R_{4+5}$ ; RMx ratio = 1.4, CuAx ratio = 0.5; lower calypter yellow with dark brown rim and a fan of yellowish-brown setae; halter pale yellow with brownish knob.

**Abdomen:** As in *N. tenuicauda*; cercus with a dark brown basal lobe bearing brown setae. Hypopygium (Fig. 7b): hypandrium very narrow and tapering; LEp short and ovate, with a long subapical seta; MEp short and stout, with a subapical seta; VSur narrow and tapering, with an acute median projection and a tapering downcurved lateral projection bearing a strong curved median seta; DSur rectangular; cercus rounded, with a lateral lobe bearing long apical setae and with a digitiform median internal projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica.



**Fig. 7a–b:** *Neurigona plumitarsis* spec. nov., male – **a:** Fore tarsomeres, dorsal; – **b:** Hypopygium, left lateral. **Fig. 8:** *Neurigona alajuella* spec. nov. Male hypopygium, left lateral. Scale bars, = 0.1 mm.

**Etymology:** The name refers to the modified male fore tarsomeres.

**Remarks:** *N. plumitarsis*, *N. starki*, and *N. melini* are the only known Neotropical *Neurigona* species with pennate male fore tarsomeres, a feature which is also present in species from other biogeographic regions, such as the Palearctic type species *Neurigona quadrifasciata* (FABRICIUS). Although this character seems to be a rare MSSC in *Neurigona*, it is a strong synapomorphy in *Bickelomyia*.

### *Neurigona alajuella* spec. nov.

(Fig. 8)

**Material:** **Holotype** male: COSTA RICA: Alajuella, Finca San Gabriel, 2 O Dos Rios, 600 m, VIII/89, Col. HANSON. [INBio]. **Paratypes:** COSTA RICA: 1 male: Costa Rica, Hiltoy Cerere, A.C. Amistad, Prov. Limon, LN 184600\_64300, #2418, 100–200 m, 30.vii–26.viii 1996, malaise, G. GARBALLO. 1 male: same data, but July 1993, #2270. [all INBio].

### Description

**Male.** Length: holotype: body 3.2, wing 3.5; thorax 1.1, abdomen 1.8; paratypes: wing 3.3–3.5.

**Head:** Face and clypeus with dense ochreous-yellow pruinosity; eyes contiguous on face; ocellars 1.8 times as long as verticals; postverticals black and 0.9 times as long as verticals; uppermost postoculars 0.5 times as long as verticals, with uppermost 3 setae black; first flagellomere yellow, slightly infuscated apically and dorsally, as long as basal width; arista about 8 times as long as first flagellomere; palp yellow with 2 black apical setae.

**Thorax:** As in *N. tenuicauda*, but mesonotal depression and dorsum of scutellum with metallic green reflections. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, without pd setae, a strong av seta at 1/3, and 2 strong apical setae; II<sub>1</sub> with a strong posterior seta basally; IIIT with 3–4 strong dorsal setae.

Relative podomere ratios: I: 49, 54, 53/26/17/13/7; II: 55, 60, 67/22/15/10/5; III: 63, 100, 28/30/17/12/5.

**Wing:** M with a very weak flexion; RMx ratio = 1.2, CuAx ratio = 0.5; lower calypter pale yellow with brown rim and a fan of yellowish-brown setae; halter pale yellow with brownish knob.

**Abdomen:** As in *N. tenuicauda*. Hypopygium (Fig. 8): hypandrium very narrow and tapering; LEp long and blade-like, with a subapical seta; MEp short and broad, with a basal and an apical seta; VSur narrow and tapering, with a narrow pointed median projection and a narrow downcurved lateral projection bearing a strong median seta; DSUR rectangular; cercus angular with a digitiform median internal projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the collecting site.

**Remarks:** *N. alajuela* is similar to *N. plumitarsis*, but is separated by the unmodified male fore tarsomeres.

### The *orbicularis* group

**Diagnosis.** Abdomen relatively short and stout, not distinctly longer than thorax; abdominal segment 5 with a ventral lobe; VSur blunt and rounded, or hook-shaped and downcurved; IIIT with 1–2 strong ad setae in addition to the dorsal setae; eyes separated on face (except in *N. yacambo*); first flagellomere small and about as wide as pedicel; DSUR with a U-shaped or cup-like apical appendage; hypandrium with a pair of lateral arms (gonocoxites).

#### *Neurigona orbicularis* BECKER

(Fig. 9)

*Neurigona orbicularis* BECKER, 1922 – BECKER (1922: 162).

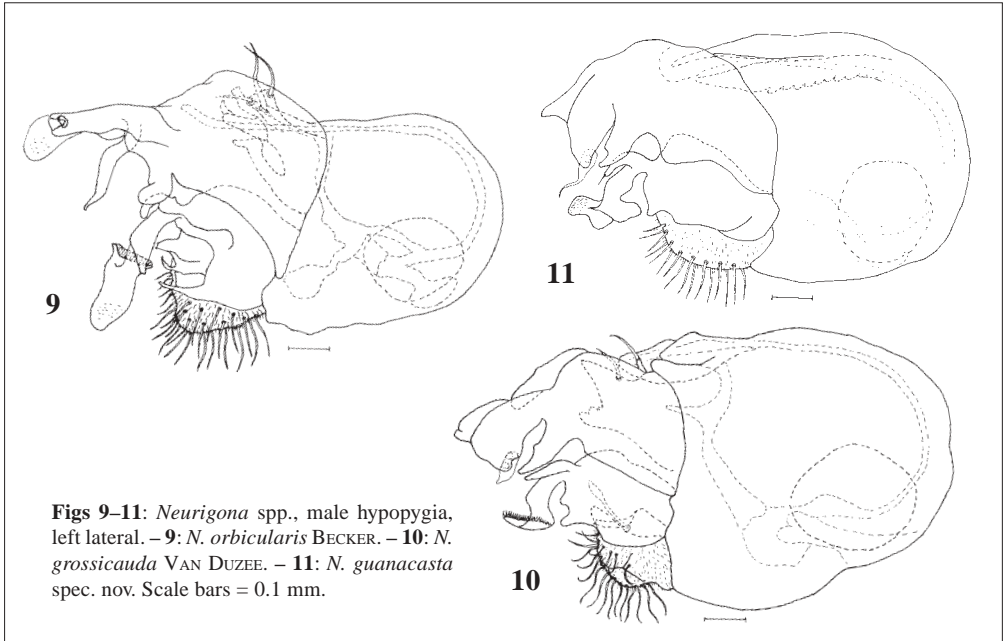
**Material:** Lectotype here designated: male: Paraguay, San Bernardino, K. FIEBRIG S.V. / *Neurigona orbicularis* det. Becker / Zool. Mus. Berlin / *Neurigona orbicularis* Becker, lectotype des., det. St. NAGLIS 3.2000 / Gen. Prep. No. SN2000–12, Mar. 2000, St. NAGLIS. [ZMHB]. **Paralectotypes:** 1 male, 6 females same locality [ZMHB]. 1 male, 1 female same locality [NMW].

#### Redescription

**Male.** Length: lectotype: body 2.9, wing 3.0; thorax 1.2, abdomen 1.6. **Head:** Ocellars 1.5 times as long as verticals, postverticals 1.3 times as long as verticals, uppermost postoculars 1.0 times as long as verticals and uppermost 2 setae black, remaining setae yellow; eyes separated on face, narrowest distance on face about 0.5 times the distance between ocellar setae; face and clypeus with dense greyish-white pruinosity; palp yellow, with 2 strong yellowish-brown apical setae and brown hairs; antenna: first flagellomere as long as wide, yellow, distal half infuscated; arista about 9 times as long as first flagellomere.

**Thorax:** Ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown, with metallic green and blue reflections; pleura pale yellow. **Legs:** Yellow; IIT with strong ad setae at 1/4 and 2/3, smaller pd setae at 1/6 and 3/4, and 3 apical setae; II<sub>1</sub> with a pair of short posterior setae basally; IIIT with a short dorsal seta at 1/10, a strong pale yellow dorsal seta at mid-length, and a strong ad seta at 1/4. Relative podomere ratios: I: 47, 45, 37/24/11/9/5; II: 59, 67, 52/24/15/9/5; III: 60, 95, 26/35/19/14/6. **Wing:** hyaline, with a yellowish tinge; M with a weak flexion and subparallel with R<sub>4+5</sub> in distal half; RMx ratio = 1.1, CuAx ratio = 0.4; lower calypter pale yellow with a fan of yellow-golden setae; halter stem yellow, knob brownish-yellow.

**Abdomen:** Ochreous-yellow; terga 2–4 with a brown lateral spot, which is dorsally extended on segment 3; segment 5 yellow with a dark brown rectangular ventral projection; sternum 8 brown; epandrium dark brown and surstyli ochreous-yellow; cercus white with white setae. Hypopygium (Fig. 9): hypandrium lanceolate and about 3 times as long as basal width, with a bilateral pair of narrow pointed gonocoxites which are about 3/4 as long as hypandrium; LEp hook-shaped with a strong flattened seta; MEp cylindrical with 2 long apical setae; VSur apically stout and rounded, with



a median pointed projection; DSur with a long cup-shaped projection; cercus short with short setae. **Female:** Similar to male except as noted: face broader, narrowest distance between eyes on face about equal to the distance between ocellar setae; IIT with 3–4 small ventral setae; IIIT with several short dorsal setae and with the strong dorsal seta at mid-length black and not pale yellow as in male. Podomere ratios as: I: 52, 50, 41/24/15/10/5; II: 55, 72, 54/22/17/8/5; III: 62, 97, 25/32/19/7/6.

**Distribution:** Paraguay.

**Remarks:** The pale dorsal seta on IIIT in males is a diagnostic character. Since BECKER did not specify a holotype, a lectotype is here designated to fix the interpretation of the name.

### *Neurigona grossicauda* VAN DUZEE

(Fig. 10)

*Neurigona grossicauda* VAN DUZEE, 1931 – VAN DUZEE (1931: 24).

**Material: Holotype:** GUYANA: male: Br. Guiana, S.A. II. 21, 1913, [underside of label:] ac. 4276 / *Neurigona grossicauda* Holotype, VAN DUZEE / Gen. Prep. No. SN2000–3, Jan. 2000, ST. NAGLIS. [AMNH]. **Allotype:** GUYANA: female: Br. Guiana, S.A. II. 21, 1913 [underside of label:] ac. 4276 / *Neurigona grossicauda*, Allotype, VAN DUZEE [postabdomen missing]. [AMNH]. **Additional material:** PERU: 6 males: Avipas, Madre de Dios, Peru, 1–15.X.1962, L. PENA, 400m. 3 males: same data, but 10–20.IX.1962. 1 male: same data, but 20–30.IX.1962. 29 females: same data, but 1–15.X.1962, 10–20.IX.1962, 20–30.IX.1962. [all CNC]. 1 male: 20.VIII.1965, San Antonio, Loreto, Peru, J.C. HITCHCOCK. [CAS]. GUYANA: 1 male: Guyana, Kanuku Mts., Moco Moco River, 3° 18.2' N, 59° 38.9' W, 29 April 1995, W.N. MATHIS. [USNM].

### Redescription.

**Male.** Length: holotype: body 3.4, wing 3.9; thorax 1.4, abdomen 1.4; variation: body 3.2–4.1, wing 3.9–4.4. **Head:** Ocellars 1.6 times as long as verticals, postverticals 1.4 times as long as verticals; postoculars yellow, uppermost 2 setae near vertex black, uppermost seta as long as verticals; eyes separated on face, narrowest distance on face equal to about half the distance between ocellar setae; face and clypeus with dense greyish pruinosity, with a narrow yellow band below antennae and above clypeus; palp yellow with 2 black apical setae and black hairs; antenna: first flagellomere yellow, apical half infuscated, about as long as wide; arista about 11 times as long as first flagellomere.

**Thorax:** As in *N. orbicularis*, but with a metallic green stripe extended anteriad between ac rows for

2/3 the length of mesonotum. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, strong pd setae at 1/10, 1/3, and 2/3, av seta at 1/2, two small pv setae, and three apical setae;  $II_1$  with a strong posterior seta basally, and with a dorsal seta at 1/2; IIIT with strong ad setae at 1/4 and 2/3, with 4–5 dorsal setae, and with 3 apical setae. Relative podomere ratios: I: 44, 54, 46/27/16/9/5; II: 57, 72, 67/22/15/8/4; III: 66, 102, 30/35/20/8/5. **Wing:** hyaline, with a brownish tinge; M with a weak flexion; RMx ratio = 1.2, CuAx ratio = 0.6; lower calypter pale yellow, with a fan of golden-brown setae; halter yellow.

**Abdomen:** As in *N. orbicularis*; terga 2–4 with a more or less distinct brown dorsal band; segment 5 with a short ventral lobe; cercus yellow with yellow setae. Hypopygium (Fig. 10): hypandrium narrow and tapering, with a bilateral pair of narrow pointed gonocoxites which are about 1/4 as long as epandrium; LEp broad and ovate with a long subapical seta; MEp digitiform with a long apical seta; VSur apically broad and rectangular, with an incision, but without apical seta; DSUR U-shaped apically, with a fringed apical process; cercus short with short setae.

**Female:** Similar to male except as noted: face slightly broader, about as broad as distance between ocellar setae; tergal bands of abdomen more distinctly dark brown (the allotype has antennae, most setae on head and thorax broken off, and postabdomen missing).

**Distribution:** Guyana, Peru.

**Remarks:** *N. grossicauda* was described by VAN DUZEE from a male and a female from former British Guiana. The disjunct occurrence in Guyana and Peru suggests a wider distribution across northern South America.

### *Neurigona guanacasta* spec. nov.

(Fig. 11)

**Material:** **Holotype** male: COSTA RICA: Costa Rica, Guanacaste, Cerro El Hacha, 300 m, V–IX/87 / Ex Malaise trap understory Park loc. 17–52. [AMNH]. **Paratypes:** 11 males: same data [all AMNH].

#### **Description**

**Male.** Length: holotype: body 3.0, wing 3.7; thorax 1.2, abdomen 1.9; paratypes: body 2.8 – 3.9.

**Head:** Face with ochreous-yellow pruinosity; eyes distinctly separated on face, 0.8 times as broad as distance between ocellar setae; ocellars 1.6 times as long as verticals; postverticals 1.2 times as long as verticals; uppermost postoculars 0.5 times as long as verticals; first flagellomere yellow, 0.8 times as long as basal width; arista about 11 times as long as first flagellomere; palp yellow with 2 strong apical setae.

**Thorax:** As in *N. orbicularis*, with a narrow dark stripe between ac rows and along dc rows. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, strong pd setae at 1/8 and 2/3, a strong ventral seta at 1/2, and 3 strong apical setae;  $II_1$  with a strong posterior seta basally; IIIT with ad setae at 1/5 and 2/3 and with several dorsal setae. Relative podomere ratios: I: 45, 50, 41/25/16/10/7; II: 53, 65, 56/24/17/10/5; III: 60, 92, 28/33/21/14/6. **Wing:** M with a weak flexion; RMx ratio = 1.2, CuAx ratio = 0.6; lower calypter pale yellow with a fan of yellowish-brown setae; halter pale yellow.

**Abdomen:** As in *N. orbicularis*; terga 3–5 with a brown dorsal band; segment 5 with a short stout ventral lobe, sometimes hidden under venter; cercus yellow with pale setae; hypandrium brown, gonocoxites black. Hypopygium (Fig. 11): hypandrium narrow and tapering, with a bilateral pair of long pointed gonocoxites; epandrial lobe present as a long triangular arm with a median projection and with a strong dorsal and ventral seta; VSur apically broad, with an incision and an apical curved flag-like seta; DSUR apically bilobate, with a subapical curved projection bearing a short seta; cercus short with short setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the collecting site.

**Remarks:** *N. guanacasta* is similar to *N. grossicauda* but can be differentiated by the characters given in the key. Both species are probably sister-species.



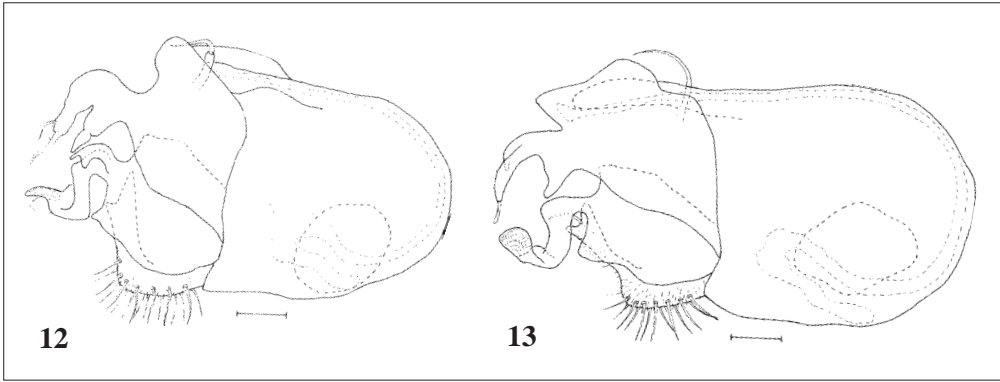
*Neurigona yacambo spec. nov.*

(Fig. 12)

**Material:** Holotype male: VENEZUELA: Venez. Yacambo, 1200 m, 10.V.81, H.K. TOWNES. [CNC].**Description****Male.** Length: holotype: body 3.3, wing 3.3; thorax 1.1, abdomen 1.8. **Head:** Face and clypeus with ochreous pruinosity; eyes practically contiguous on face; ocellars 1.8 times as long as verticals; postverticals 1.4 times as long as verticals; uppermost postoculars 1.0 times as long as verticals and black, remaining setae yellow; first flagellomere yellow and apical half brown, as long as basal width; arista about 10 times as long as first flagellomere; palp yellow with 2 strong black apical setae.**Thorax:** As in *N. orbicularis*, with a narrow dark stripe between ac rows and along dc rows. **Legs:** Yellow; II broken off; IIIT with a strong ad seta at 1/5, and with 2–3 weak dorsal setae. Relative podomere ratios: I: 44, 51, 40/25/19/8/5; II: missing; III: 55, 92, 24/32/17/11/5. **Wing:** M with a faint flexion; RMx ratio = 1.2, CuAx ratio = 0.5; lower calypter pale yellow with a fan of golden-brown setae; halter pale yellow.**Abdomen:** As in *N. orbicularis*; terga 2–4 with a broad dark brown dorsal band; segment 5 with a short stout brown ventral lobe; terga 4+5 with strong pale lateral and ventral setae. Hypopygium brown, apical projection of surstyli pale yellow; cercus white with pale setae. Hypopygium (Fig. 12): hypandrium narrow and tapering, with a bilateral pair of narrow pointed gonocoxites; LEp present as a short lobe with a long basal and a short apical seta; MEp digitiform with a subapical and a long apical seta; VSur apically digitiform with a small subapical and a strong flattened apical seta, and with a ventral pointed lobe; DSUR U-shaped with an apical fan-shaped projection, and with a curved basal appendage; cercus short, with a median projection and with short setae.**Female:** Unknown.**Distribution:** Venezuela.**Etymology:** The name refers to the collecting site.**Remarks:** *N. yacambo* is the only member of the *orbicularis* group which has contiguous eyes on face.*Neurigona pitilla spec. nov.*

(Fig. 13)

**Material:** Holotype male: COSTA RICA: Est. Pitilla, 9 km S. Santa Cecilia, Prov. Guana, Costa Rica, 700 m, SET 1994, C. MORAGA, LN 330200\_380200 #3199. [INBio]. **Paratypes:** 2 males: same data, but P. RIOS, #3206. [INBio].**Description****Male.** Length: holotype: body 3.3, wing 3.5; thorax 1.4, abdomen 1.6; paratypes: body 2.8 – 3.0.**Head:** Face and clypeus with greyish pruinosity; eyes close but distinctly separated on face, distance on face 1/3 the distance between ocellar setae; ocellars 1.7 times as long as verticals; postverticals 1.3 times as long as verticals; uppermost postoculars 1.0 times as long as verticals and black, remaining setae yellow; first flagellomere yellow and apical half brown, as long as basal width; arista about 11 times as long as first flagellomere; palp yellow with 2 strong black apical setae.**Thorax:** As in *N. orbicularis*. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, strong pd setae at 1/8 and 2/3, a short dorsal seta at 1/3, a strong ventral seta at 1/2, and 3 strong apical setae; IIT<sub>1</sub> with a strong posterior seta basally and several short setulae; IIIT with strong ad setae at 1/4 and 2/3 and with several dorsal setae. Relative podomere ratios: I: 47, 52, 42/27/16/8/5; II: 56, 70, 61/24/17/9/5; III: 62, 99, 29/34/20/14/6. **Wing:** M with a weak flexion; RMx ratio = 1.0, CuAx ratio = 0.6; lower calypter pale yellow with a fan of brown setae; halter yellow.**Abdomen:** As in *N. orbicularis*; segment 5 with a short stout brown ventral lobe; terga 4+5 with pale lateral and ventral setae. Hypopygium brown, apical projection of surstyli pale translucent; cercus white with pale setae. Hypopygium (Fig. 13): hypandrium narrow and tapering, with a bilateral pair of long pointed gonocoxites; LEp long and S-curved with a strong basal seta; MEp epandrial lobe present as two digitiform arms each with a long curved seta; VSur hook-like and apically down-



**Figs 12–13:** *Neurigona* spp., male hypopygia, left lateral. – **12:** *N. yacambo* spec. nov. – **13:** *N. pitilla* spec. nov. Scale bars = 0.1 mm.

curved, bearing a stout apical seta; DSur apically with a U-shaped lobe; cercus short with short setae, and with a median projection bearing an apical seta.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the collecting site.

**Remarks:** *N. pitilla* is characterized by the conspicuous hook-shaped VSUR which is visible to the naked eye.

### The *magnipalpa* group

**Diagnosis.** First flagellomere very small, about as large as pedicel; wings infuscated; thorax with a row of short setulae between anterior dc and ac rows; only 1 sr present; abdominal segment 5 with a distinct long dark brown ventral projection; VSUR narrow and tapering, with a single strong downcurved apical projection, DSUR somewhat folded, with a serrate distal rim; cercus dark brown; palp sometimes greatly enlarged.

#### *Neurigona magnipalpa* spec. nov.

(Fig. 14a–b)

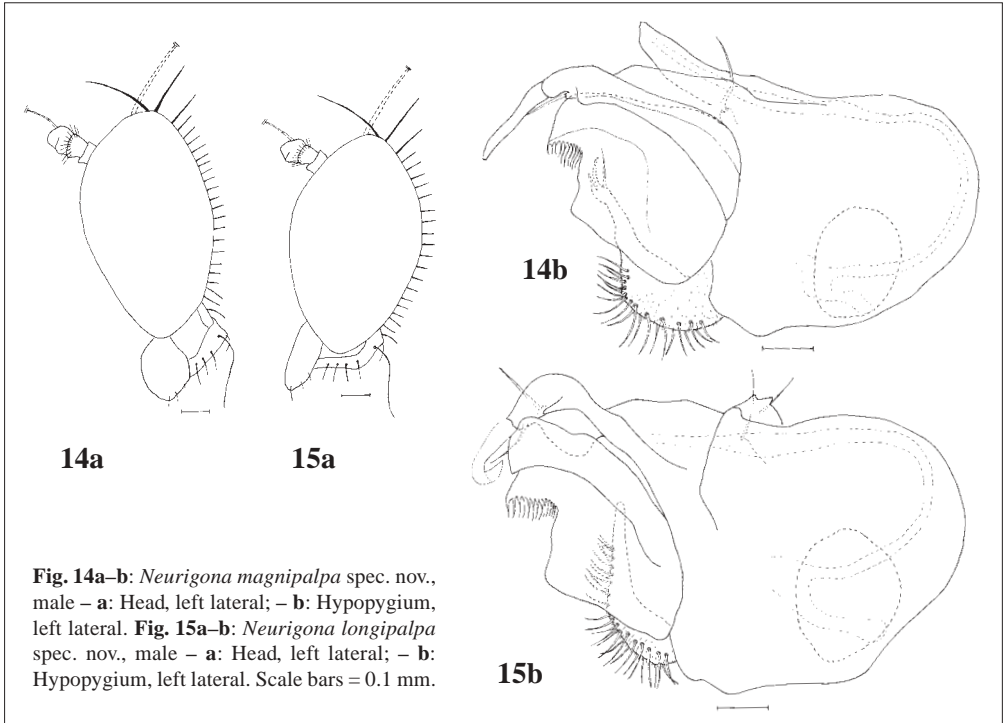
**Material:** **Holotype** male: COSTA RICA: Costa Rica, Sector Cocori, 30 km al Norte de Cariari, A.C. Tortuguero, Prov. Limon, 100 m, 22.ix.–23.xi.1993, malaise, LN286000–657500 #2436. [INBio]. **Paratype:** COSTA RICA: 1 male: same data. [INBio].

#### Description

**Male.** Length: holotype: body 4.0, wing 3.9; thorax 1.4, abdomen 2.4; paratype: body 3.8, wing 3.8.

**Head:** Verticals and ocellars broken off; postoculars pale yellow, except uppermost 3 setae black, uppermost seta 0.8 times as long as verticals; eyes contiguous on face; face and clypeus with dense ochreous-yellow pruinosity; palp strongly enlarged and slightly longer than proboscis (Fig. 14a), rounded, pale white, entirely bare except some white apical setulae; pedicel truncate against first flagellomere; first flagellomere yellow, about 0.8 times as long as basal width, relatively small and as wide as pedicel; arista about 12 times as long as first flagellomere.

**Thorax:** Mesonotum ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown with metallic green reflections; with a brown narrow stripe extending anteriorly of mesonotal depression between ac rows. Pleura pale yellow. **Legs:** All legs yellow, but IIT, IIt, IIIT, and IIIIt strongly infuscated, IIIIf with a brown lateral longitudinal stripe; IIT with ad setae at 1/3 and 2/3, pd seta at 1/4, a strong av



**Fig. 14a–b:** *Neurigona magnipalpa* spec. nov., male – **a:** Head, left lateral; – **b:** Hypopygium, left lateral. **Fig. 15a–b:** *Neurigona longipalpa* spec. nov., male – **a:** Head, left lateral; – **b:** Hypopygium, left lateral. Scale bars = 0.1 mm.

seta at 1/3, and 2 strong apical setae; II<sub>1</sub> with a strong posterior seta basally and a strong ad seta at about 1/2; IIIT with 4–5 strong dorsal setae, and 3 apical setae. Relative podomere ratios: I: 55, 50, 47/28/16/11/6; II: 65, 58, 78/26/19/12/6; III: 67, 103, 23/40/22/14/7. **Wing:** Hyaline, but with a strong dark brown infuscation, more densely in anterior part between R<sub>1</sub> and M; M with a weak flexion and slightly converging towards R<sub>4+5</sub>; RMx ratio = 1.3, CuAx ratio = 0.6; lower calypter pale yellow with a brown rim and a fan of pale yellow setae; halter pale yellow, knob slightly infuscated.

**Abdomen:** Ochreous-yellow; terga 2–4 with a dark brown dorsal band; segments 5–7 pale yellow; sternum 8 dark brown; segment 5 with a dark brown triangular ventral projection. Epandrium and surstyli dark brown to black, except apical part of surstyli which is pale; cercus dark brown with brown setae, median projection white. Hypopygium (Fig. 14b): epandrium globular; hypandrium strongly upcurved apically; LEp broad and ovate, with 2 subapical setae; MEp short and bifurcate with two apical setae; VSur narrow and triangular, with a long strong blade-like apical projection, and a subapical seta; DSur broad and ovate, with an apical row of fine curved hair-like setulae; cercus with a digitiform median projection bearing three apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the enlarged palps.

**Remarks:** Although enlarged palps can be found in other subfamilies, it is a rare MSSC in the Neurigoninae and only present in the *magnipalpa* group.

### *Neurigona longipalpa* spec. nov.

(Fig. 15a–b)

**Material:** **Holotype** male: COSTA RICA: Costa Rica, Hitoy Cerere, A.C. Amistad, Prov. Limon, LN 184600\_64300, #2418, 100–200 m, 30.vii.–26.viii.1996, malaise, G. CARBALLO. [INBio].

**Description**

**Male.** Length: holotype: body 4.1, wing 4.5; thorax 1.4, abdomen 2.3. **Head:** Face and clypeus with dense pale yellow pruinosity; eyes contiguous on face; ocellars broken off; postverticals 1.0 times as long as verticals; uppermost postoculars 0.6 times as long as verticals, uppermost 3–4 setae black and remaining setae yellow; first flagellomere yellow with apical half infuscated, 0.7 times as long as basal width; arista about 12 times as long as first flagellomere; palp pale silvery-white, longer than proboscis (Fig. 15a), about twice as long as basal width, bare with a pale apical seta.

**Thorax:** As in *N. magnipalpa*. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, without pd setae, with a strong av seta at 1/4, a pd seta at 1/2, and 2 strong apical setae; II<sub>1</sub> with a strong posterior seta basally, 1 strong and 1 smaller ad setae, and 1 apical seta in addition to small setulae; IIIT with strong dorsal setae at 1/4 and 1/2. Relative podomere ratios: I: 47, 43, 40/25/17/8/5; II: 57, 50, 65/23/17/?/?; III: 62, 94, 23/34/20/13/6. **Wing:** Distinctly infuscated; M with a flexion and slightly curved anterior towards R<sub>3+5</sub>; RMx ratio = 1.3, CuAx ratio = 0.6; lower calypter pale yellow with a brown rim and a fan of yellow setae; halter pale yellow.

**Abdomen:** As in *N. magnipalpa*. Hypopygium (Fig. 15b): hypandrium not upcurved; LEp strongly enlarged, roundish, with a subapical seta; MEp hardly visible, with 2 strong setae; VSur narrow and triangular, with a strong curved apical projection, and a subapical seta; DSur broad and ovate, strongly folded, with an apical row of fine curved hair-like setulae; cercus with a digitiform median projection.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the unusual elongated palps.

**Remarks:** *N. longipalpa* can be separated from *N. magnipalpa* by the shape of the palp as given in the key.

*Neurigona longitarsis spec. nov.*

(Fig. 16a–b)

**Material:** **Holotype** male: COSTA RICA: Send ac. Pittier, Prov. Punta, Costa Rica, 1800–2050 m, 13 Jun 1995, A. PICADO, L.W. QUATE, Malaise, L S 331800 577400 #5893. [INBio].

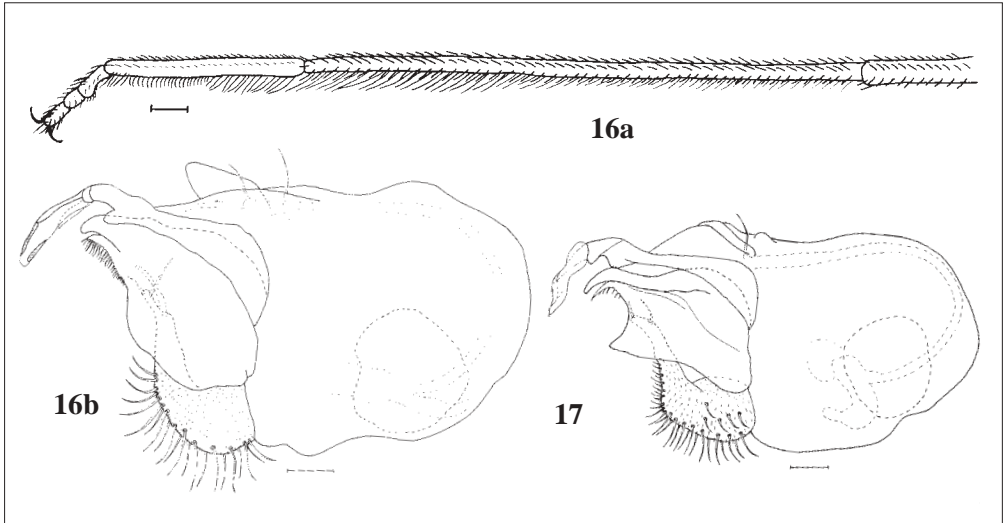
**Description**

**Male.** Length: holotype: body 5.0, wing 5.0; thorax 1.8, abdomen 2.9. **Head:** Face and clypeus with dense ochreous pruinosity; eyes touching on face; ocellars 2.0 times as long as verticals; postverticals 0.8 times as long as verticals; uppermost postoculars 0.6 times as long as verticals and uppermost 5–6 setae black, remaining setae yellow; first flagellomere yellow, apical half infuscated, small, as wide as pedicel, 0.8 times as long as basal width; arista about 12 times as long as first flagellomere; palp pale with 2 black apical setae.

**Thorax:** As in *N. magnipalpa*, but with mesonotal depression and dorsum of scutellum dark brown.

**Legs:** Yellow; It<sub>1</sub> strongly elongated, 1.5 times as long as IT, with a ventral row of long setulae which are twice as long as diameter of tarsus in apical half (Fig. 16a); It<sub>2</sub> flattened, ventrally with a row of long black setulae on basal half and fine yellow setulae on apical half; It<sub>3-5</sub> very short and slightly broadened, with black dorsal setulae and fine yellow ventral setulae (all MSSC); IIT with strong ad setae at 1/4 and 2/3; II<sub>1-5</sub> broken off; IIIT with 3 strong dorsal setae on basal half. Relative podomere ratios: I: 55, 53, 75/28/4/3/3; II: 63, 62, ?/?/?/?/?; III: 67, 110, 27/?/?/?/?/??. **Wing:** Slightly infuscated; M with a faint flexion and subparallel with R<sub>4+5</sub>; RMx ratio = 1.3, CuAx ratio = 0.6; lower calypter pale yellow with a brown rim and a fan of golden setae; halter stem yellow, knob brown.

**Abdomen:** Ochreous-yellow, terga 2–4 with a dark brown dorsal band; segment 5 ochreous-yellow with a brown ovate ventral projection; sternum 8 dark brown. Hypopygium dark brown, except apical part of surstyli which is pale; cercus basally dark brown, apically pale, with pale setae, with a dark brown basal extension. Hypopygium (Fig. 16b): hypandrium long and upcurved, about 8 times as long as basal width; epandrial lobe bifurcate with a long apical seta on each end; VSur with only one projection which is flattened apically; DSur pointed-triangular, apical rim with a fine setula-like structure; cercus with a median projection bearing 2 apical and 1 strong flattened subapical setae.



**Fig. 16a–b:** *Neurigona longitarsis* spec. nov., male – a: Fore tarsomerus; – b: Hypopygium, left lateral. **Fig. 17:** *Neurigona aragua* spec. nov. Male hypopygium, left lateral. Scale bars = 0.1 mm.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the greatly elongated fore tarsomerus.

**Remarks:** *N. longitarsis* is separated from all its Neotropical congeners by the conspicuously modified fore tarsomerus.

### *Neurigona aragua* spec. nov.

(Fig. 17a)

**Material:** **Holotype** male: VENEZUELA: Venezuela, Aragua, Henri Pittier Nat. Park, Pico Guacamaya, 1830 m, malaise trap, 15–30.xi.1997, T. PAPE. [MIZA].

### Description

**Male.** Length: holotype: body 3.3, wing 3.6; thorax 1.2, abdomen 2.0. **Head:** Face and clypeus with dense ochreous pruinosity; eyes touching on face; ocellars 1.8 times as long as verticals; postverticals 0.9 times as long as verticals; uppermost postoculars 0.6 times as long as verticals and uppermost 4–6 setae black, remaining setae yellow; first flagellomere yellow, apical half infuscated, very small, as wide as pedicel, 0.6 times as long as basal width; arista about 11 times as long as first flagellomere; palp ochreous with 2 black apical setae.

**Thorax:** As in *N. magnipalpa*, but with mesonotal depression and dorsum of scutellum dark brown.

**Legs:** Yellow;  $It_{2-5}$ , IIT and IIt, IIIT and IIIIt distinctly infuscated; IIT with strong ad setae at 1/5 and 2/3; IIt<sub>1</sub> with a strong posterior seta basally, but without strong setae in addition to the small setulae; IIIIt with 2–3 small dorsal setae which are not distinctly longer than remaining setulae. Relative podomere ratios: I: 49, 52, 53/26/12/7/5; II: 65, 62, 73/25/17/11/6; III: 67, 104, 28/37/19/14/6. **Wing:** Distinctly infuscated, especially in anterior part; M with flexion and a slight bend, subparallel with  $R_{4+5}$ ; RMx ratio = 1.5, CuAx ratio = 0.5; lower calypter pale with a brown rim and a fan of golden setae; halter stem yellow, knob infuscated.

**Abdomen:** Ochreous-yellow, terga 2–4 with a broad dark brown dorsal band; segment 5 entirely dark brown with a long black rectangular ventral projection; sternum 8 dark brown. Hypopygium dark

brown, except hypandrium and apical part of surstyli which are pale; cercus dark brown, apically ochreous, with pale setae. Hypopygium (Fig. 17): hypandrium long and slightly upcurved, about 5 times as long as basal width; epandrial lobe triangular with a long apical seta and two basal setae; VSUR with only one projection with a flattened apical appendage; DSUR U-shaped apically, rim with a fine setula-like serration; cercus with a median projection bearing an apical and a subapical seta.

**Female:** Unknown.

**Distribution:** Venezuela.

**Etymology:** The name refers to the province where the specimen was collected.

**Remarks:** *N. aragua* is similar to *N. longitarsis*, but has unmodified fore tarsomeres and a U-shaped DSUR.

### The *banksi* group

**Diagnosis.** Abdomen long and slender, tapering distally; abdominal segment 5 distinctly wider than segment 4, with a ventral projection; VSUR with a long and straight slender median projection which is longer than lateral projection, lateral projection with a flattened apical appendage; DSUR with a serrate distal rim; first flagellomere large and distinctly wider than pedicel; pedicel slightly projecting into first flagellomere on lateral and on median side; IIIT with strong dorsal setae; postvertical seta as long as or longer than vertical seta; larger species with wing length usually more than 4 mm.

### *Neurigona banksi* VAN DUZEE stat. nov.

(Fig. 18a–b)

*Neurigona banksi* VAN DUZEE, 1929 – VAN DUZEE (1929: 30).

**Material: Holotype** male: PANAMA: Canal Zone, Barro Colorado, 22.VII. 1924, N. BANKS / [red label] Type 16002 / [label with red border] *Neurigona banksi*, Holotype, VAN DUZEE / Gen. Prep. No. SN2000–21, St. NAGLIS 2000. [MCZ]. **Additional material:** PANAMA: 1 male: Darien Prov., Santa Fe., Panama v-25-67 / D. M. DE LONG & C. A. TRIPLEHORN / malaise trap. [MCZ]. 1 male: Ft. Gulsck, Panama, Qtrs. 40 A, at light, June 1980, H. J. HARLAN. [USNM]. COSTA RICA: 1 male: Estacion Sirena, Prov. Puntá, Costa Rica, 1–100 m, DIC 1994, G. FONSECA, L S 270500 508300 #4367. 1 male: same data but SET 1995, L S 270500 508300 #6512. 1 male: Costa Rica, Prov. Puntarenas, Est. Aguja. Sendero Aio. 300 m, 18–22 OCT 1996, A. AZOFEIFA, L S 276750 526550 #44783. 1 male: Costa Rica, Hitoy Cerere, A. C. Amistad, Prov. Limón, LN 184600 64300 #2418, 100–200 m, 30-vii–26-viii1996, malaise, G. CARBALLO. 1 male: Costa Rica, Puntarenas, San Vito, Jardín Bot., Las Cruces, VI–VII/88, 1200 m, Col. P. HANSON. [all INBio] VENEZUELA: 1 male: Venezuela, T.F. Amaz., Cerro de la Neblina, Basecamp, 140 m, 0° 50' N, 66° 10' W, 23 February 1985. [USNM]. GUYANA: 1 male: Guyana, Moco-Moco, Lethem, 30 km east, 30 18.2' N, 590 39.0' W, WAYNE N. MATHIS. [USNM]. ECUADOR: 1 male: Pompeya, Napo R., Pastaza, Ecuad., 14–22.V.1965, L. PENA. 1 male: Coca, Napo R., Napo, Ecuador, 250 m, L. PENA. [all CNC]. PERU: 1 male: Avispas, Madre de Dios, Peru, 10–20.IX.1962, L. PENA, 400 m. [CNC]. 1 male: Peru, Madre de Dios, Puerto Maldando, 6–11.I.1984, leg. L. HUGGERT. [MZLU]. 1 male: Peru, Monson Valley, Tingo Maria, XII-9-1954. [CAS]. BOLIVIA: 2 males: Bolivia, Beni, Rio Itenez at mouth of Rio Baures, IX-25–X-7-1964. 1 male: same data but X-2-1964. 1 male: same data but IX-12–18-1964. 1 male: Bolivia, Santa Cruz, Rio Ichilo, Jul. 24–26 1964, J.K. BOUSEMAN. [all AMNH]. BRAZIL: 1 male: Nova Teutonia, 27° 11' S, 52° 23' W, Brazil, 300–500 m, X–1965, Fritz PLAUMANN. 18 males: same data but 13.I.1960, 19.I.1960, 2.II.1960, 12.IV.1960, 28.X.1960, 2.I.1961, 26.III.1961, X.1962, XI.1962, 12.XI.1962, 21.XI.1962, 16.XI.1963, 10.XI.1963, X.1964, X.1964, XI.1964, XI.1964, II.1965. [all CNC]. 1 male: Nova Teutonia, Santa Catarina, Brazil, X.1964, Fritz PLAUMANN. [MCZ]. 1 male: Brazil, Rio de Janeiro, Oct. Nov. Dec. Jan. 1937–38, R.C. SHANNON. 1 male: R. d. Janeiro, Brazil, IX.1938 / Yel Fev Serv, MES Brazil, R.C. SHANNON. 1 male: Brazil, Para, Rio Xingu Camp, 52° 22' W, 3° 39' S, ca. 60 km S. Altamira, 2–8 Oct 1986, P. SPANGLER & O. FLINT. [all USNM]. 7 males: Brazil, Dept. Rondônia, Rio Guapore, opp. mouth of Rio Baures (Bolivia), Sept 23–29 1964, BOUSEMAN & LUSSENHOP. [all AMNH]. 1 male: Est. S. Paulo, S. Cantareira, Chapadao, BARRETTO col. 9–[1?]945. 1 male: Serra do Navio, Terr. Amapa, Brasil, 29.X.1957, J. LANE. [all MZSP]. 3 males: Brasil, Roraima, Rio Uraricoera, Ilha de Maraca, 19–24.VII.1987, 21–30.XI.1987, 02–13.V.1987, J. A. RAFAEL, L. S. AQUINO. [all INPA].



## Redescription

**Male (holotype).** Length: holotype: body 5.2, wing 4.7; thorax 1.6, abdomen 3.2; variation: body 4.0–5.5, wing 3.7–5.3. **Head:** Ocellars 1.7 times as long as verticals; postverticals 1.0 times as long as verticals and black; uppermost postoculars 0.8 times as long as verticals, uppermost 2 setae black, remaining setae yellow; eyes contiguous on face; face and clypeus with dense greyish-white pruinosity with a yellowish tinge; palp yellow, with 2 yellow apical setae and brown hairs; antenna: yellow; pedicel slightly projecting into first flagellomere on lateral and on median side, with a circlet of short black setae; first flagellomere slightly infuscated on distal half, wider than pedicel and 0.7 times as long as basal width; arista about 10 times as long as first flagellomere.

**Thorax:** Ochreous-yellow; mesonotal depression and dorsum of scutellum metallic green with bronze reflections, this colour extending anteriorly of mesonotal depression between ac rows; pleura pale yellow. **Legs:** Yellow; IT with short pd setae at 1/5 and 2/3; IIT with strong ad setae at 1/5 and 2/3, strong pd setae at 1/5, 1/3 and 2/3, a strong av seta at 1/3, small pv setae at 1/2 and 2/3, and 3 apical setae; IIt<sub>1-5</sub> and hind legs broken off; IIIT [separately glued on label] with a row of 5 strong dorsal setae, and several smaller ventral setulae. Relative podomere ratios: I: 48, 52, 46/26/18/9/5; II: 62, 67, ?/?/?/?/?; III: 66, 100, ?/?/?/?/? **Wing:** Hyaline, with a greyish tinge; M with a gentle bend and subparallel with R<sub>4+5</sub>; RMx ratio = 1.3, CuAx ratio = 0.6; lower calypter yellow, with a fan of golden-yellow setae; halter stem yellow and knob brown.

**Abdomen:** Ochreous-yellow; terga 2–4 with a dark brown dorsal band; segment 5 dark brown, distinctly wider than segment 4 in lateral view (Fig. 18a), with dense white hairs, and with a dark brown ventral projection; segments 6 and 7 yellowish-brown; sternum 8 dark brown with white hairs; hypopygium entirely dark brown, except surstyli which are brownish-yellow; cercus with a basal brown extension with brown setae, distally white with white setae. Hypopygium (Fig. 18b): hypandrium short and narrow, about 3 times as long as basal width; LEp broad and tapering, with a short subapical and a strong basal seta; MEp present as a short tubercle with a small apical seta; VSur with a long and narrow median projection; lateral projection with a leaf-like apical appendage and a flattened median seta; DSur with a serrate distal rim; cercus with a basal extension bearing strong setae, and with a median projection.

**Female:** Unknown.

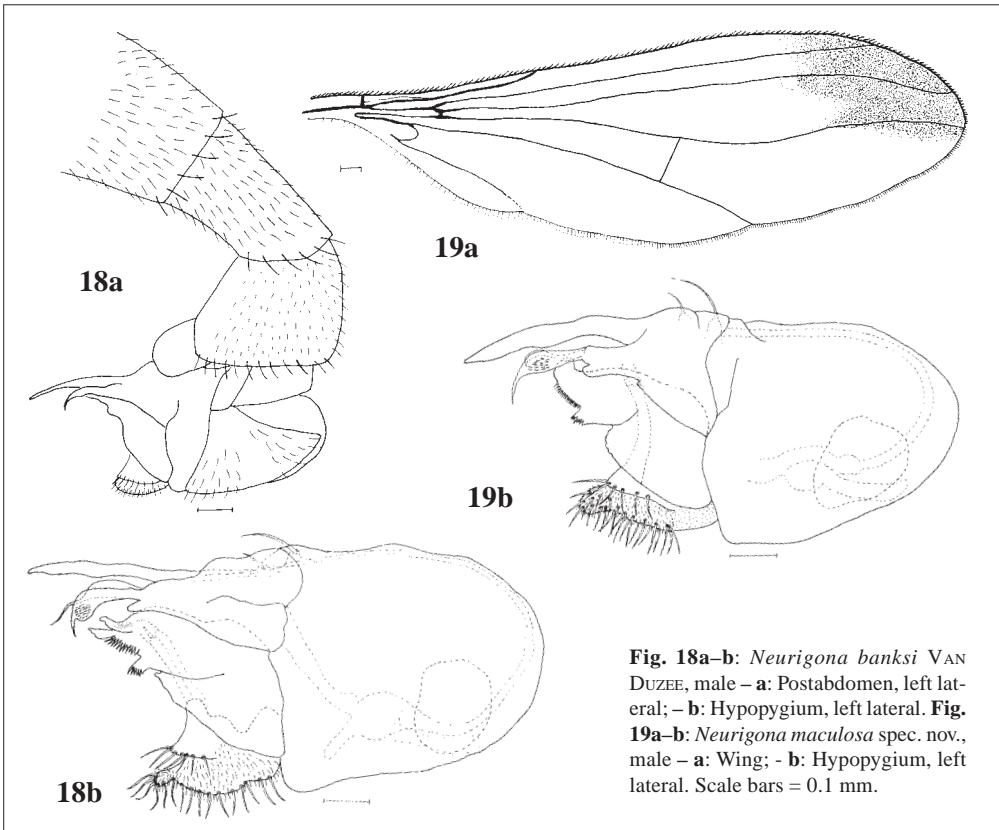
**Distribution:** Costa Rica, Panama, Venezuela, Guyana, Ecuador, Peru, Bolivia, Brazil.

**Remarks:** *N. banksi* was synonymized with *N. derelicta* PARENT, 1928 by ROBINSON (1970), but he could not recall the reasons for this (ROBINSON pers. comm.). Since *N. derelicta* was described from a female which cannot be accurately interpreted, it is treated as nomen dubium in this work, and *N. banksi* is removed from synonymy. *N. banksi* shows a high degree of variation regarding body colour and leg setation, and possibly represents a species-complex. The variation is given in the following format: character: variation from / variation to. Colour of IIT/IIIT and IIt/IIIt: pale yellow / brown infuscated; colour of terga 1–4: ochreous-yellow with a narrow brown basal band / dark brown with a narrow yellow marginal band; setation of IIT: without pd setae / with 3 pd setae; setation of IIt<sub>1</sub>: without strong dorsal seta / with a strong dorsal seta; setation of IIIT: without ad setae in addition to the dorsal setae / with strong ad setae at 1/4 and 2/3. The genitalia also show some slight variations, especially in the shape and featurings of DSur. I have examined a male paratype (CAS) of *N. banksi*, which had been labelled as such by VAN DUZEE and which had the same data as the holotype except for a collecting date of 24.V.1924, but this specimen is *N. sirena*. *N. banksi* has an extraordinarily wide distribution across central and northern South America. It appears to be a lowland species, occurring up to 1200 m.

## *Neurigona maculosa* spec. nov.

(Fig. 19a–b)

**Material:** **Holotype** male: LESSER ANTILLES: Tobago, St. John, Hermitage, 11° 18.9' N, 60° 34.5' W, 22 Apr. 1994 / collected by H. B. WILLIAMS. [USNM]. **Paratypes:** 2 males: same data. [USNM]. PANAMA: 1 male: Barro Colorado, Is. Canal Zone, May 1967 / ROGER D. AKRE, Malaise trap. 1 male: Panama–Canal Zone, Barro Colorado Is.



**Fig. 18a–b:** *Neurigona banksi* VAN DUZEE, male – **a:** Postabdomen, left lateral; – **b:** Hypopygium, left lateral. **Fig. 19a–b:** *Neurigona maculosa* spec. nov., male – **a:** Wing; – **b:** Hypopygium, left lateral. Scale bars = 0.1 mm.

II.21.67 No., ROGER D. AKRE. 2 males: Panama Canal Zone, Barro Colorado Is. Malaise Trap, II-17 and II-18 1967, ROGER D. AKRE. [all WSU].

**Description**

**Male.** Length: holotype: body 3.7, wing 4.1; thorax 1.4, abdomen 2.3; paratypes: body 4.1, wing 4.3–3.7. **Head:** Face and clypeus with dense pale ochreous pruinosity; eyes touching on face; ocellars 2.0 times as long as verticals; postverticals 1.1 times as long as verticals; uppermost postoculars 0.8 times as long as verticals, uppermost 3 setae black, remaining setae yellow; pedicel slightly projecting into first flagellomere on lateral and on median side; first flagellomere yellow, apical half brown, 0.8 times as long as basal width, and 1.8 times as wide as pedicel; arista about 9 times as long as first flagellomere; palp pale yellow with 2 yellow apical seta.

**Thorax:** As in *N. banksi*. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, with a tiny pd seta at 1/5 and a stronger one at 3/4, with a strong ventral seta at 1/3, and 3 strong apical setae; II<sub>1</sub> with a strong posterior seta basally, and 2 smaller dorsal setae; IIIT with 4–5 strong dorsal setae. Relative podomere ratios: I: 47, 47, 44/22/16/10/7; II: 55, 63, 65/20/14/9/4; III: 59, 94, 25/31/18/12/4. **Wing:** With a brown apical spot (Fig. 19a); M with a faint flexion at 1/3 from dm-cu and subparallel with R<sub>4+5</sub>; RMx ratio = 1.4, CuAx ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of brown-golden setae; halter yellow with brownish knob.

**Abdomen:** As in *N. banksi*. Hypopygium (Fig. 19b): hypandrium short, about 4 times as long as wide; LEp pointed-triangular, with a subapical seta; MEp very short, with a long apical seta; VSur with median projection long and narrow; lateral projection with a leaf-like apical appendage and a flattened median seta; DSur with a distinct incision, and with a serrate apical border; cercus with a basal extension bearing strong setae, and with a median projection.

**Female:** Unknown.

**Distribution:** Lesser Antilles (Tobago), Panama.

**Etymology:** The name refers to the conspicuous brown apical wing maculation.

**Remarks:** *N. maculosa* is very similar to *N. banksi* in both external and genitalic characters, but is differentiated by the conspicuous brown apical wing maculation which is a unique feature among the Neotropical members of *Neurigona*.

***Neurigona albitarsis* spec. nov.**

(Fig. 20)

**Material:** **Holotype** male: COSTA RICA: Est. Pitilla, 9 km S. Santa Cecilia, P. N. Guanacaste, A. C. Guanacaste, Prov. Guana, Costa Rica, 700 m, Jun[e] 1994, P. Rios, L N 330200\_380200 #2996. [INBio].

**Description**

**Male.** Length: holotype: body 4.1, wing 4.1; thorax 1.4, abdomen 2.6. **Head:** Face and clypeus with dense pale ochreous pruinosity; eyes touching on face; ocellars 2.0 times as long as verticals; postverticals 1.1 times as long as verticals; uppermost postoculars 0.9 times as long as verticals and uppermost seta black, remaining setae yellow; pedicel slightly projecting into first flagellomere on lateral and on median side; first flagellomere yellow, apical half brown, 0.6 times as long as basal width, and 2 times as wide as pedicel; arista about 9 times as long as first flagellomere; palp pale yellow with 2 yellow apical seta.

**Thorax:** As in *N. banksi*. **Legs:** Yellow;  $It_5$  white with white hairs (MSSC); IIT with strong ad setae at 1/6 and 2/3, with a tiny pd seta at 1/6 and a stronger one at 2/3, with a strong av seta at 1/3, and 3 strong apical setae;  $III_1$  with a strong posterior seta basally, and with some small setulae; IIIT with 4–5 strong dorsal setae, and a small anterior seta at 3/4. Relative podomere ratios: I: 43, 48, 44/22/17/10/5; II: 52, 62, 65/19/13/8/5; III: 58, 92, 27/29/17/10/5. **Wing:** With a brown infuscation; M with a very weak flexion at 1/3 from dm-cu and almost straight, subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.6; lower calypter pale yellow with a brown rim and a fan of brown-golden setae; halter yellow with brownish knob.

**Abdomen:** As in *N. banksi*. Hypopygium (Fig. 20): hypandrium narrow, about 6 times as long a wide LEp digitiform, with a subapical and an apical seta; MEp very short, with a long curved apical seta; VSur with median projection long and narrow, lateral projection with a beak-like apex; DSur with a serrate apical border; cercus with a basal extension bearing strong setae, and with a median projection.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the white colour of the fifth tarsomeres of fore leg.

**Remarks:** *Neurigona albitarsis* is the only member of the *banksi* group with modified fore tarsomeres. The white colour of fore tarsomeres is a feature which is also present in *N. melini* which has  $It_{3+4}$  white and  $It_5$  pennate, in *N. starki* which has  $It_5$  white and  $It_4$  pennate, and in *Viridigona argyrotarsis* NAGLIS which has  $It_{3+4}$  white.

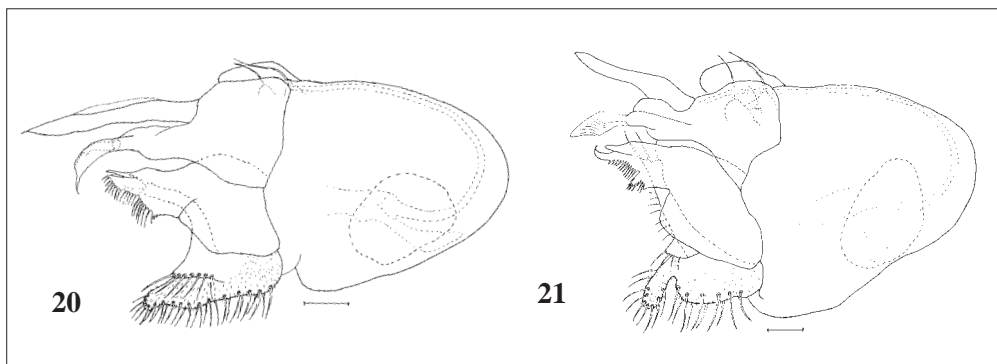
***Neurigona pseudobanksi* spec. nov.**

(Fig. 21)

**Material:** **Holotype** male: BRAZIL: Nova Teutonia, 27° 11' S, 52° 23' W, Brasil, 300–500 m, X.1962, Fritz PLAUANN. [CNC]. **Paratypes:** BRAZIL: 2 males: same data, but 7.XI.1960 and 3.XI.1962. [CNC].

**Description**

**Male.** Length: holotype: body 5.0, wing 4.9; thorax 1.7, abdomen 2.8; paratypes: body 5.0, wing 5.1. **Head:** Face and clypeus with dense pale yellow pruinosity; eyes separated on face, distance between eyes 1.5 times the diameter of adjacent facets; ocellars 2.0 times as long as verticals; postverticals 1.0 times as long as verticals; uppermost postoculars 0.8 times as long as verticals and uppermost 3 setae black, remaining setae yellow; pedicel slightly projecting into first flagellomere; first flagellomere



**Figs 20–21:** *Neurigona* spp., male hypopygia, left lateral. – **20:** *N. albitarsis* spec. nov. – **21:** *N. pseudobanksi* spec. nov. Scale bars = 0.1 mm.

yellow, apical half brown, 0.8 times as long as basal width, and 1.8 times as wide as pedicel; arista about 6.5 times as long as first flagellomere; palp pale yellow with 2 yellow apical seta.

**Thorax:** As in *N. banksi*. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, with a strong av seta at 1/3, and 3 strong apical setae; II<sub>t</sub> with a strong posterior seta basally; IIIT with 3–4 strong dorsal setae on basal half. Relative podomere ratios: I: 50, 52, 48/26/17/10/6; II: 61, 69, 70/22/17/9/5; III: 67, 105, 26/35/19/13/6. **Wing:** Slightly infuscated; M with a faint flexion and subparallel with  $R_{4+5}$ ; RMx ratio = 1.4, CuAx ratio = 0.7; lower calypter pale yellow with a brown rim and a fan of brown-golden setae; halter ochreous-brown.

**Abdomen:** As in *N. banksi*. Hypopygium (Fig. 21): hypandrium short, about 4 times as long as basal width; LEp broad and ovate, with a subapical seta and a dorsal seta; MEp short and thumb-like, with a long curved apical seta; VSur with median projection long, narrow and directed upwards; lateral projection triangular, apically shaped like a parallelogram; DSur with a strong incision, and with a serrate apical border; cercus with a digitiform apical lobe, and a median projection.

**Female:** Unknown.

**Distribution:** Brazil.

**Etymology:** The name refers to the close relationship with *N. banksi*.

**Remarks:** *N. pseudobanksi* is very similar to *N. banksi* but can be differentiated by the genitalic characters as given in the key.

### The americana group

**Diagnosis.** Abdomen relatively long and slender, but not tapering distally; abdominal segment 5 as wide as segment 4, with a ventral projection; VSur with a curved median projection which is shorter than lateral projection; first flagellomere usually wider than pedicel, slightly projecting into first flagellomere on lateral and on median side.

#### *Neurigona americana* PARENT

(Fig. 22)

*Neurogona americana* PARENT, 1934 – PARENT (1934: 275).

**Material:** **Holotype** male: COSTA RICA: Costa Rica, La Caja b. San José, H. SCHMIDT / [red label:] Type / *Neurogona americana* n. sp. Type O. PARENT / Gen. Prep. No. SN2000–5, Feb. 2000, St. NAGLIS. [NMW].

#### Redescription

**Male (holotype).** Length: holotype: body (abdomen contracted) 2.6, wing 3.7; thorax 1.4, abdomen 1.5. **Head:** Ocellars broken off, postverticals 0.9 times as long as verticals, uppermost postoculars

0.5 times as long as verticals and black; eyes contiguous on face; face and clypeus with dense ochreous pruinosity; palp yellow with 2 brown apical setae and brown hairs; proboscis yellow; antenna: first flagellomere yellow, brown on distal half, 1.2 times as long as basal width; arista about 6 times as long as first flagellomere.

**Thorax:** Mesonotum ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown, with metallic blue-green reflections, this colour extending anteriad between ac rows; pleura pale yellow. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, strong pd seta at 1/8, strong av seta at 1/4, a small ventral seta at 1/2, and 4 strong apical setae;  $II_t_1$  longer than tibia, with 1 strong posterior seta basally, 1 strong dorsal seta at 1/2, and 2 small ad setae at 1/4 and 1/2;  $II_{t_{2,5}}$  broken off; IIIT with strong dorsal setae at 1/5, 1/3, and 1/2, and a smaller seta at 2/3; a small ventral seta at 1/2; IIIIt1 with 3–5 small ventral setae; IIIIt2–5 broken off. Relative podomere ratios: I: 40, 40, 35/20/11/8/6; II: 48, 47, 58/?/?/?/?/?; III: 54, 85, 23/?/?/?/?/? **Wing:** Hyaline, with a greyish tinge; M with a slight bend and subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.5; lower calypter pale yellow, with brown rim and a fan of yellow setae; halter with yellow stem and dark brown knob.

**Abdomen:** Ochreous-yellow; terga 2–4 with a dark brown dorsal band; segment 5 entirely yellow with a dark brown ventral projection which has a narrow pale rim; segments 6+7 yellow; sternum 8 brown with yellow setae; hypopygium dark brown; surstyli apically yellow; cercus basally brown and apically white. Hypopygium (Fig. 22): hypandrium short and narrow, about 1.5 times as long as basal width; LEp short and triangular, with a subapical and a basal seta; MEp present as a small tubercle with seta; VSur with a narrow median projection, lateral projection stout and downcurved; DSur apically pointed and upcurved, with a dorsal incurved seta-like appendage; cercus with a median projection.

**Female:** Unknown

**Distribution:** Costa Rica.

**Remarks:** A distinctive character of *N. americana* is the seta-like appendage on DSur, which is also present in *N. hachaensis*, *N. nervosa* and *N. signifera*, and probably indicates a close relationship between these species.

### *Neurigona hachaensis* spec. nov.

(Fig. 23a–b)

**Material:** **Holotype** male: COSTA RICA: Costa Rica, Guanacaste, Cerro El Hacha, 300 m, V–IX.87, D. JANZEN / EX Malaise trap, understory, Park Ioc. 17–52. [AMNH]. **Paratypes:** COSTA RICA: 3 males: same data. [AMNH]. 1 male: Costa Rica, San Luis, R. B. Monteverde, Prov. Punta, 1040 m, II.1993, malaise, LN 250850 449250 1897, Z. FUENTES. [INBio].

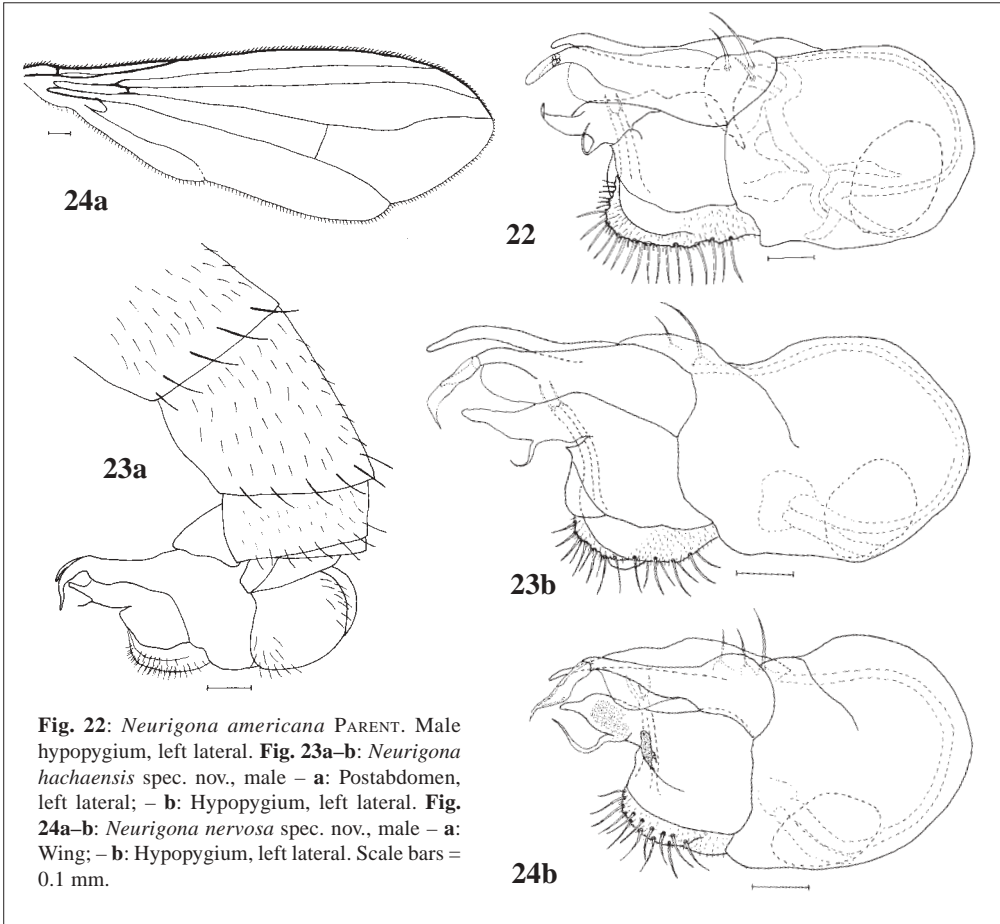
#### Description

**Male.** Length: holotype: body 4.1, wing 3.7; thorax 1.3, abdomen 2.2; paratypes: wing 3.6–3.8.

**Head:** Face and clypeus with dense yellow pruinosity; eyes touching on face; ocellars 2 times as long as verticals; postverticals 1.1 times as long as verticals; uppermost postoculars 0.6 times as long as verticals and uppermost 2 setae black, remaining setae yellow; pedicel slightly projecting into first flagellomere on lateral and on median side; first flagellomere entirely yellow, 0.9 times as long as basal width, and 1.7 times as wide as pedicel; arista about 7 times as long as first flagellomere; palp pale yellow with 2 black apical seta.

**Thorax:** As in *N. americana*. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, with a smaller pd seta at 1/6, with a strong av seta near 1/2, and 3 strong apical setae;  $II_t_1$  with a strong posterior seta basally, and 1 strong dorsal seta near 1/2; IIIT with 4–5 strong dorsal setae. Relative podomere ratios: I: 50, 50, 43/26/15/10/6; II: 61, 63, 73/22/15/9/5; III: 67, 104, 30/35/?/?/?/? **Wing:** With brown infuscation, especially on anterior part between costa and M; M with a weak bend and flexion at 1/2 from dm-cu and subparallel with  $R_{4+5}$ ; RMx ratio = 1.2, CuAx ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of yellow setae; halter yellow with brownish knob.

**Abdomen:** As in *N. americana*. Hypopygium (Fig. 23a, b): hypandrium broad and tapering, about 2 times as long as basal width; LEp short and triangular, with a subapical seta; MEp very short, with an apical seta; VSur with median projection narrow and downcurved, lateral projection with a flattened



**Fig. 22:** *Neurigona americana* PARENT. Male hypopygium, left lateral. **Fig. 23a–b:** *Neurigona hachaensis* spec. nov., male – **a:** Postabdomen, left lateral; – **b:** Hypopygium, left lateral. **Fig. 24a–b:** *Neurigona nervosa* spec. nov., male – **a:** Wing; – **b:** Hypopygium, left lateral. Scale bars = 0.1 mm.

leaf-like apical appendage and a flattened median seta; DSur apically elongated and tapering, with a dorsal curved seta-like process and an incision; cercus with a median bilateral projection.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the collecting site.

**Remarks:** See under *N. americana*.

***Neurigona nervosa* spec. nov.**

(Fig. 24a–b)

**Material:** **Holotype** male: COSTA RICA: Costa Rica, Guanacaste, Cerro El Hacha, 300 m, V–IX.87, D. JANZEN / EX Malaise trap, understory, Park Ioc. 17–52. [AMNH]. **Paratypes:** 4 males: same data. [AMNH].

**Description**

**Male.** Length: holotype: body 3.5, wing 3.3; thorax 1.3, abdomen 1.9; paratypes: body 3.2–3.6, wing 3.5–3.6. **Head:** Face and clypeus with dense ochreous-yellow pruinosity; eyes touching on face; ocellars 1.7 times as long as verticals; postverticals 0.9 times as long as verticals; uppermost postoculares 0.7 times as long as verticals and uppermost 3 setae black, remaining setae yellow; first flagellomere entirely yellow, 0.8 times as long as basal width, and 1.6 times as wide as pedicel; arista about 8 times as long as first flagellomere; palp pale yellow with 2 black apical setae.



**Thorax:** As in *N. americana*, but mesonotal depression and dorsum of scutellum metallic blue violet. **Legs:** Yellow; IIT with a small ad seta at 2/3, with a strong av seta at 1/2, and with 3 strong apical setae; IIt<sub>1</sub> with a strong posterior seta basally, and 1 small but distinct dorsal seta at 1/2; IIIT with 3–4 dorsal setae slightly projecting through the other dorsal setulae. Relative podomere ratios: I: 45, 45, 42/24/14/9/6; II: 55, 57, 65/21/16/9/5; III: 60, 97, 27/32/19/12/5. **Wing:** With faint greyish infuscation; M with a distinct bend and flexion at 1/2 from dm-cu converging towards R<sub>4+5</sub>; RMx ratio = 1.4, CuAx ratio = 0.4; crossvein beyond middle of wing, proximal section of M about 1.25 times as long as distal section (measured from r-m) (Fig. 24a); wing margin with a distinct lobe at CuA and A; lower calypter pale yellow with a brown rim and a fan of yellow setae; halter yellow, basal part of knob brownish.

**Abdomen:** As in *N. americana*. Hypopygium (Fig. 24b): hypandrium short, about 3 times as long as basal width; LEp short and triangular, with a subapical seta; MEp very short, with 2 apical setae; VSur with median projection narrow and downcurved, lateral projection with a flattened leaf-like apical appendage; DSur apically pointed, with a dorsal curved seta-like process which is longer than apex of DSur; cercus with a median projection.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the striking position of the crossvein.

**Remarks:** The distal position of crossvein dm-cu is diagnostic for *N. nervosa* and *N. subnervosa*. But in terms of its genitalic characters, *N. nervosa* is closely related to *N. americana*.

### *Neurigona signifera* ALDRICH

(Fig. 25)

*Neurigona signifera* ALDRICH, 1896 – ALDRICH (1896: 337).

*Neurigona signifera* error.

**Material:** LESSER ANTILLES: DOMINICA: 4 males: Clarke Hall, Dominica, BWI, March 2 1964, H. ROBINSON. / *Neurigona signifera* ALDRICH [det. H. Robinson]. 1 male: same data, but March 15, 1964. 1 male: same data, but February 5, 1964. 11 females: same data, but February, March, and November 1964. [all USNM].

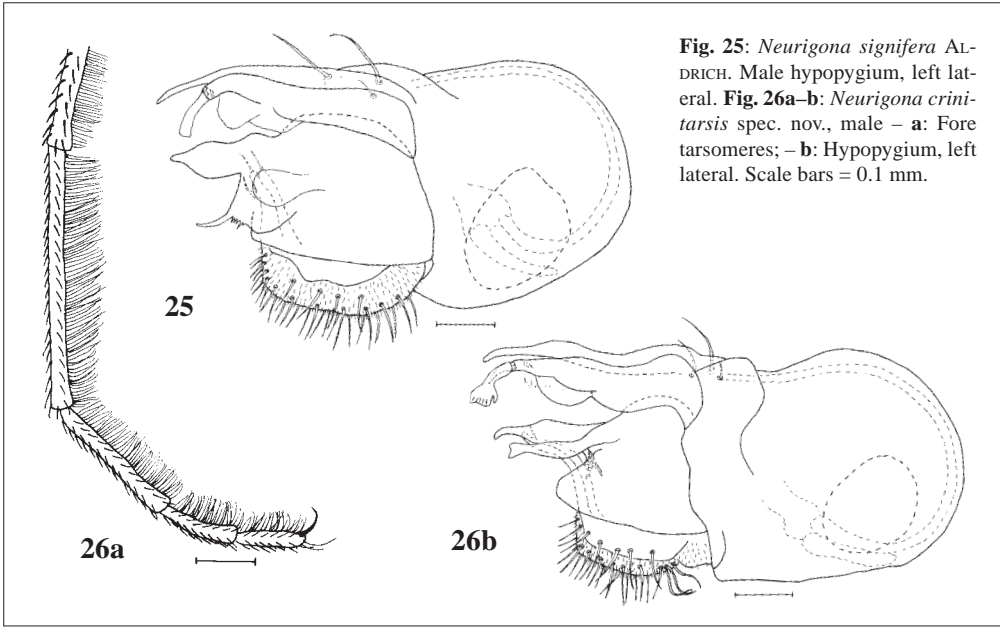
### Description

**Male.** Length: body 3.9–4.4, wing 3.7–3.9. **Head:** Face and clypeus with dense ochreous-brown pruinosity; eyes touching on face (leaving a narrow stripe which is as broad as diameter of adjacent facets); ocellars 2.0 times as long as verticals; postverticals 0.9 times as long as verticals; uppermost postoculars 0.6 times as long as verticals and uppermost seta brown, remaining setae yellow; first flagellomere yellow, apical half infuscated, 0.7 times as long as basal width, 1.3 times as wide as pedicel; arista about 9 times as long as first flagellomere; palp pale yellow with 2 yellow apical setae.

**Thorax:** As in *N. americana*, but dc consisting of 3 strong setae and 2 smaller setulae anteriorly, restricted posteriorly of mesonotal suture; only 1 strong sr present. **Legs:** Yellow, IIT with strong ad setae at 1/4 and 2/3, a strong pd seta at 1/5, a strong av seta at 1/3, a strong pv seta at 1/2, and 3 apical setae; IIt<sub>1</sub> with a strong posterior seta basally; IIIT with 3 strong dorsal setae on basal half and a strong ad seta at 1/5. Relative podomere ratios: I: 50, 52, 39/22/15/9/5; II: 62, 60, 67/23/15/9/4; III: 65, 99, 24/34/20/12/6. **Wing:** With a brownish tinge; M with a very weak flexion and subparallel with R<sub>4+5</sub>; RMx ratio = 1.2, CuAx ratio = 0.6; lower calypter pale yellow with a brown rim and a fan of yellowish-brown setae; halter stem yellow and knob brown.

**Abdomen:** As in *N. americana*. Hypopygium (Fig. 25): hypandrium long and slender, about 4 times as long as basal width; LEp broad and ovate with a strong apical and basal seta; MEp present as two short tubercles each with an apical seta; VSur with a slender median projection, lateral projection downcurved with a stout flattened appendage; DSur with a triangular ventral lobe and a more dorsal hook-shaped process; cercus with a short lateral extension and a median projection bearing an apical seta.

**Female:** Similar to male except as noted: eyes separated on face; face with dense ochreous-brown pruinosity; distance between eyes equal to distance between ocellar setae; reduction of dc as in male.



**Fig. 25:** *Neurigona signifera* ALDRICH. Male hypopygium, left lateral. **Fig. 26a–b:** *Neurigona crinitarsis* spec. nov., male – **a:** Fore tarsomeres; – **b:** Hypopygium, left lateral. Scale bars = 0.1 mm.

**Distribution:** St. Vincent, Dominica.

**Remarks:** ALDRICH (1896) described *N. signifera* from 2 males and 2 females from St. Vincent. I could not find the types of *N. signifera*; they are missing from the collection of the BMNH (J. CHAINÉY pers. comm.), and must therefore be treated as lost. ROBINSON (1975) redescribed *N. signifera* (as *signifer*) based on material from Dominica. Although I have some doubts about ROBINSON'S determination, I accept it here in the absence of type material.

***Neurigona crinitarsis* spec. nov.**

(Fig. 26a–b)

**Material:** **Holotype** male: MEXICO: Jalapa, Ver. Mexico, V. 21 1946, J. D. PALLISTER. [AMNH].

**Description**

**Male.** Length: holotype: body 2.9 (abdomen strongly contracted), wing 3.5; thorax 1.3, abdomen 1.4.

**Head:** Face and clypeus with dense ochreous pruinosity; eyes touching on face; ocellars 1.9 times as long as verticals; postverticals broken off; uppermost postoculars 0.6 times as long as verticals and uppermost 2 setae black, remaining setae yellow; pedicel slightly projecting into first flagellomere on lateral and on median side; first flagellomere yellow, apical half slightly infuscated, 0.9 times as long as basal width, and 1.3 times as wide as pedicel; arista about 9 times as long as first flagellomere; palp pale yellow with 2 black apical seta.

**Thorax:** As in *N. americana*. **Legs:** Yellow; IT ventrally with dense erect hairs which are as long as diameter of tibia;  $It_{1-5}$  ventrally with dense erect hairs which are 2 times as long as diameter of tarsomeres (Fig. 26a) (all MSSC); IIT with strong ad setae at 1/5 and 2/3, a smaller pd seta at 1/6, a strong av seta at 1/2, and 3 strong apical setae;  $II_t_1$  with a strong posterior seta basally, with 2 strong ad setae, 2 strong av setae, and additional smaller setulae; IIIT with 3–4 strong dorsal setae on basal half. Relative podomere ratios: I: 50, 50, 39/22/12/8/5; II: 58, 57, 63/20/15/9/5; III: 62, 98, 26/30/18/13/7. **Wing:** With slight infuscation; M with a distinct bend at 1/2 from dm-cu and subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.4; lower calypter pale yellow with a fan of yellow setae; halter yellow.

**Abdomen:** As in *N. americana*. Hypopygium (Fig. 26b): hypandrium short and narrow, about 2 times as long as basal width; LEp broad and ovate with 2 median setae; MEp very small, with an apical seta; VSur with median projection narrow and tapering, lateral projection with a flattened blossom-

like apical appendage and a strong median seta; DSur with a tapering and pointed median projection and a digitiform stout lateral projection, and with a stronger sclerotized stellate process; cercus with a median projection.

**Female:** Unknown.

**Distribution:** Mexico.

**Etymology:** The name refers to the conspicuous setation of the fore tarsomeres.

**Remarks:** *N. crinitarsis* is easily recognized by the long dense ventral hairs on fore tarsomeres.

***Neurigona subnervosa* spec. nov.**

(Fig. 27)

**Material:** **Holotype** male: MEXICO: Mexico, Veracruz, Lake Catemaco, 18.VI.1969, B.V. PETERSON. [CNC].

**Paratypes:** 1 male: MEXICO: Xicotepec, Puebla, Mex. 2.8.mi. W., May 15 [19]68, 3522 / cloud forest, malaise trap, M.W. McFADDEN. [WSU]. GUATEMALA: 1 male: Guatemala / Coll. D.G. EISEN. 1 male: Sa Emilia, Pochuta, 1000 m, Feb. Mar. [19]31 / Guatemala, J. BEQUAERT. [both AMNH].

**Description**

**Male.** Length: holotype: body 4.0, wing 3.8; thorax 1.5, abdomen 2.0; paratypes: body 3.2–4.4, wing 3.5–3.9. **Head:** Face and clypeus with dense ochreous-yellow pruinosity; eyes touching on face; ocellars 1.5 times as long as verticals; postverticals 1.1 times as long as verticals; uppermost postoculars 0.7 times as long as verticals and uppermost 2–3 setae black, remaining setae yellow; first flagellomere pale yellow with apical half slightly infuscated, 0.8 times as long as basal width, and 1.7 times as wide as pedicel; arista about 10 times as long as first flagellomere; palp pale yellow with 3 brown apical setae.

**Thorax:** As in *N. americana*. **Legs:** Yellow; IIT with small ad setae at 1/5 and 2/3, a small av seta at 1/2, and 3 apical setae; IIT<sub>1</sub> with a strong posterior seta basally; IIIT with 3–4 small dorsal setae slightly projecting through the other dorsal setulae. Relative podomere ratios: I: 48, 52, 41/30/16/10/6; II: 62, 65, 68/26/18/10/6; III: 67, 106, 25/38/21/14/6. **Wing:** With faint greyish infuscation; M with a distinct bend and flexion at 1/2 from dm-cu, converging towards R<sub>4+5</sub>; RMx ratio = 1.7, CuAx ratio = 0.5; crossvein beyond middle of wing, proximal section of M about 1.05 times as long as distal section (measured from r-m); wing margin with a faint lobe at CuA and A; lower calypter pale yellow with a fan of brown-golden setae; halter pale yellow.

**Abdomen:** As in *N. americana*. Hypopygium (Fig. 27): hypandrium short, about 3 times as long as basal width; LEp short and ovate, with a subapical seta; MEp very short, with 2 apical setae; VSur with a narrow tapering median projection, lateral projection with a flattened blade-like apical appendage; DSur with a digitiform median and a spatulate lateral projection; cercus with a median bilateral projection.

**Female:** Unknown.

**Distribution:** Mexico, Guatemala.

**Etymology:** The name refers to its similarity with *N. nervosa* in the distal position of the crossvein.

**Remarks:** See under *N. nervosa*.

***Neurigona argentifacies* spec. nov.**

(Fig. 28)

**Material:** **Holotype** male: COSTA RICA: Costa Rica, Hitoy Cerere, A.C. Amistad, Prov. Limon, 100–200 m, 14.ii.–20.v.1993, LN 184600 643400, #2425, Malaise, G. CARBELLO. [INBio]. **Paratypes:** 2 males: same data. [INBio]. BRAZIL: 1 male: Nova Teutonia, 27° 11' S, 52° 23' W, Brazil, 300–500 m, 16.IV.1965, Fritz PLAUMANN. [CNC].

**Description**

**Male.** Length: holotype: body 3.7, wing 3.7; thorax 1.2, abdomen 2.3; paratypes: wing 3.3–3.7; specimen from Brazil: body (abdomen contracted) 3.0, wing 3.5. **Head:** Face and clypeus with dense silvery-white pruinosity; eyes separated on face, narrowest distance between eyes about twice the diameter of adjacent facets; ocellars and verticals broken off; uppermost 2 postoculars black, remaining setae yellow; first flagellomere broken off; palp pale white with 3–4 brown apical setae.

**Thorax:** As in *N. americana*, but mesonotal depression and dorsum of scutellum metallic blue-violet, this colour largely extending anteriorly to mesonotal suture and laterad of dc rows. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, a smaller pd seta at 1/6, a strong av seta at 1/2, and 3 strong apical setae; IIIT with 4 strong dorsal setae. Relative podomere ratios: I: 48, 50, 42/27/18/9/5; II: 62, 60, ?/?/?/?/?; III: 65, 102, 26/?/?/?/??. **Wing:** With a brownish tinge; M with a weak flexion and subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.5; lower calypter pale yellow with a fan of golden setae; halter stem yellow with ochreous knob.

**Abdomen:** As in *N. americana*. Hypopygium (Fig. 28): hypandrium short and narrow, apically bifurcate; epandrial lobes visible as 3 short tubercles each with an apical seta; VSur with median projection slender and downcurved, lateral projection with a flattened hook-like apical appendage and a strong S-shaped median seta; DSur with two distal projections: ventral projection narrow and tapering, dorsal projection lobate with a curved tip; cercus with a lateral extension, with a median bilateral projection.

**Female:** Unknown.

**Distribution:** Costa Rica, Brazil.

**Etymology:** The name refers to the silvery-white face.

**Remarks:** *N. argentifacies* is distinguished from all other members of the *americana* group by the distinctly separated eyes on face. The specimen from Brazil shows slight differences in the shape of DSur and could represent a different species, but more material is needed for clarification.

### *Neurigona montebello* spec. nov.

(Fig. 29)

**Material:** Holotype male: MEXICO: Montebello Nat. Park, Chiapas 5000', 31.V.1969, B.V. PETERSON (Mal.). [CNC].

#### Description.

**Male.** Length: holotype: body 4.6, wing 4.4; thorax 1.7, abdomen 2.5. **Head:** Face and clypeus with dense ochreous-brown pruinosity; eyes touching on face; ocellars 1.8 times as long as verticals; postverticals 1.0 times as long as verticals; uppermost postoculars 0.6 times as long as verticals and uppermost 2–3 setae black, remaining setae yellow; pedicel slightly projecting into first flagellomere on lateral and on median side; first flagellomere yellow, dorsally with brown infuscation, 0.8 times as long as basal width, and 1.5 times as wide as pedicel; arista about 8 times as long as first flagellomere; palp pale yellow with 2 brown apical setae.

**Thorax:** As in *N. americana*. **Legs:** Yellow; IIT with small ad seta at 1/6 and a longer one at 1/2, a minute pd setula at 1/6, a strong av seta near 1/2, and 3 apical setae; II<sub>1</sub> with a strong posterior seta basally, and 1 strong ad seta near 1/2 and additional small setulae; IIIT with 4–5 small dorsal setulae of different sizes. Relative podomere ratios: I: 46, 49, 39/27/15/11/5; II: 58, 62, 75/25/16/9/5; III: 65, 110, 32/37/18/13/5. **Wing:** With brown infuscation, especially on anterior part between costa and M; M with a weak bend at 1/2 from dm-cu becoming subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.4; lower calypter pale whitish with a fan of pale setae; halter pale whitish.

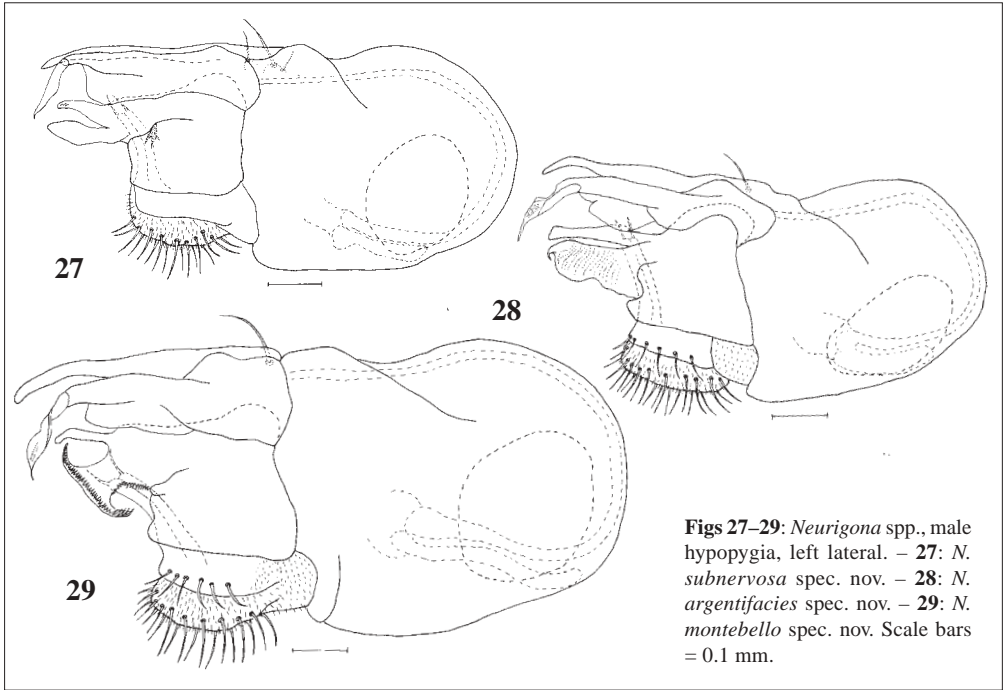
**Abdomen:** As in *N. americana*. Hypopygium (Fig. 29): hypandrium short and narrow, about 2 times as long as basal width; LEp short and ovate, with a subapical and a long basal seta; MEp present as a short tubercle, with an apical seta; VSur with a narrow and downcurved median projection, lateral projection with a flattened leaf-like apical appendage and a strong sinuous median seta; DSur with a median digitiform projection and a lateral anchor-like projection with a serrate apical rim; cercus with a lateral extension bearing long setae, and a median digitiform projection with apical setae.

**Female:** Unknown.

**Distribution:** Mexico.

**Etymology:** The name refers to the collecting site.

**Remarks:** *N. montebello* has a characteristic anchor-shaped DSur with a serrate rim which separates it from other members of the *americana* group.



**Figs 27–29:** *Neurigona* spp., male hypopygia, left lateral. – 27: *N. subnervosa* spec. nov. – 28: *N. argentifacies* spec. nov. – 29: *N. montebello* spec. nov. Scale bars = 0.1 mm.

***Neurigona procera* spec. nov.**

(Fig. 30a–b)

**Material:** **Holotype** male: HONDURAS: Honduras, Cortés, Parque Nacional Cusuco, 5 km N Buenos Aires, 15o 29' N, 88o 13' W, 30.IX.1995, leg. R. CAVE / Malais trap in oak/pine cloud forest. [MZLU].

**Description**

**Male.** Length: holotype: body 8.0, wing 6.0; thorax 2.0, abdomen 5.6. **Head:** Face and clypeus with dense ochreous-brown pruinosity; eyes touching on face; verticals, ocellars, postverticals, and uppermost postoculars broken off, uppermost 2–3 postoculars brown and remaining setae yellow; first flagellomere broken off; palp pale yellow with 2 yellow apical setae.

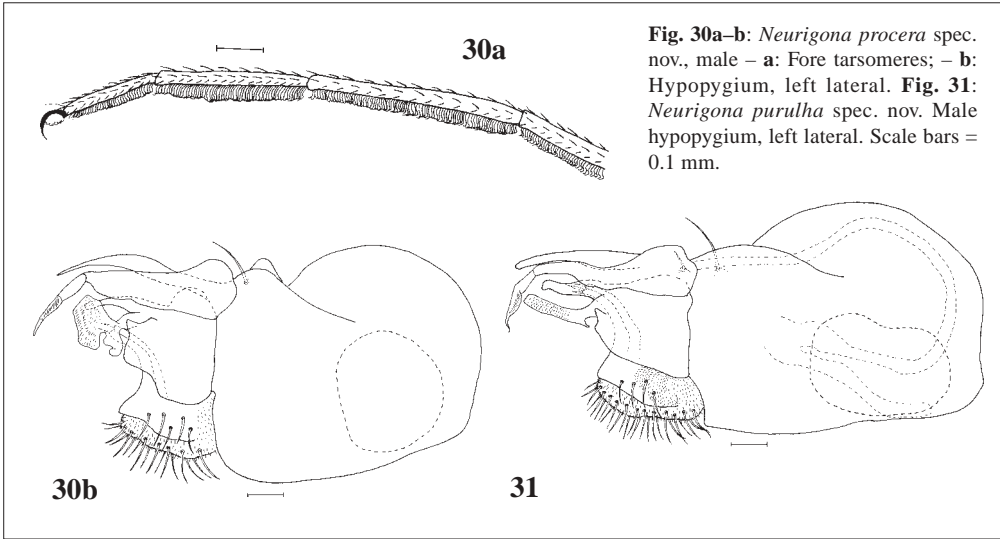
**Thorax:** As in *N. americana*. **Legs:** Yellow,  $It_{2-5}$  with dense apically-curved ventral hairs which are as long as diameter of tarsomeres (Fig. 30a) (MSSC); IIT with strong ad setae at 1/5 and 2/3, a shorter pd seta at 1/6, a strong av seta at 1/3, and 3 apical setae;  $III_t_1$  with a strong posterior seta basally and a strong ad seta near 1/2; IIIT with 4–5 dorsal setae. Relative podomere ratios: I: 45, 42, 41/21/14/11/5; II: 60, 64, 71/20/14/9/5; III: 65, 103, 25/33/18/11/5. **Wing:** With a brownish tinge; M with a distinct bend converging to and apically subparallel with  $R_{4+5}$ ; RMx ratio = 1.6, CuAx ratio = 0.6; lower calypter pale yellow with a brown rim and a fan of yellowish-brown setae; halter pale yellow.

**Abdomen:** As in *N. americana*; segment 4 with a ventral rounded projection; segment 5 elongated with a relatively short dark brown ventral projection. Hypopygium (Fig. 30b): hypandrium short and slender; LEp broad and ovate with a short subapical and strong basal seta; MEp present as a short tubercle with a strong apical seta; VSur with a slender median projection, lateral projection down-curved with an acute flattened appendage; DSur with a median digitiform and a laterally-flattened rectangular apical appendage; cercus with a long lateral extension and a median digitiform projection bearing an apical seta.

**Female:** Unknown.

**Distribution:** Honduras.

**Etymology:** The name refers to the large body size.



**Remarks:** *N. procera* and *N. purulha* are closely related through their large body size and genitalic characters, and are probably sister-species.

*Neurigona purulha* spec. nov.

(Fig. 31)

**Material:** **Holotype** male: GUATEMALA: Guatemala, BV, 8 km S. Purulha, 20–25.V.[19]91, MT H. HOWDEN. [CNC].

**Paratype:** 1 male: same data. 1 female: same data. [CNC].

**Description**

**Male.** Length: holotype: body 5.9, wing 5.8; thorax 1.9, abdomen 3.6. **Head:** Face and clypeus with dense ochreous-brown pruinosity; eyes touching on face; ocellars 1.7 times as long as verticals; postverticals 1.0 times as long as verticals; uppermost postoculars 0.8 times as long as verticals and uppermost 2 setae black, remaining setae yellow; first flagellomere yellow, slightly infuscated apically and dorsally, 0.8 times as long as basal width, and 1.5 times as wide as pedicel; palp pale yellow with 2 yellow apical setae.

**Thorax:** As in *N. americana*, but mesonotal depression and dorsum of scutellum metallic blue-violet.

**Legs:** Yellow,  $It_{2-5}$  with dense straight ventral hairs which are as long as diameter of tarsomeres (MSSC); IIT with strong ad setae at 1/6 and 2/3, a shorter pd seta at 1/7, a strong av seta near 1/2, a small posterior setula at 3/4, and 3 apical setae;  $IIt_1$  with a strong posterior seta basally and a strong ad seta near 1/2; IIIT with 5–6 strong dorsal setae. Relative podomere ratios: I: 43, 45, 44/24/17/12/6; II: 58, 59, 71/21/16/10/5; III: 65, 99, 25/32/19/13/5. **Wing:** With a brownish tinge; M with a distinct bend converging with and apically subparallel with  $R_{4+5}$ ;  $RMx$  ratio = 1.5,  $CuAx$  ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of brownish setae; halter pale yellow and slightly infuscated.

**Abdomen:** As in *N. americana*; segment 4 with a small ventral rounded projection. Hypopygium (Fig. 31): hypandrium broad and short, about 2 times as long as basal width; LEp broad and ovate with a short subapical and strong basal seta; MEp present as a short tubercle with an apical seta; VSUR with a slender median projection, lateral projection downcurved with an acute flattened appendage; DSUR with a median digitiform and a lateral flattened blade-like appendage; cercus with a long lateral extension and a median digitiform projection bearing apical setae.

**Female:** Similar to male except as noted: eyes separated on face; face with dense ochreous pruinosity; distance between eyes twice the distance between ocellar setae; IIT with 2 ad, 3 pd, and 1 strong av setae.



**Distribution:** Guatemala.

**Etymology:** The name refers to the collecting site.

**Remarks:** See under *N. procera*.

*Neurigona lamellata* spec. nov.

(Fig. 32)

**Material:** **Holotype** male: COSTA RICA: Costa Rica, Prov. Puntarenas, Centro Juvenil Tropical, Sendero Mirador, 100 m, 5–12 Jul 1997, M. LOBO, Malaise, LS 294700 517100 #47735. [INBio]. **Paratypes:** COSTA RICA: 1 male: Estacion Sirena, Prov. Punta, Costa Rica, 1–100 m, FEB 1995, G. FONSECA, LS 270500 508300 #4369. 1 male: same data, but DIC 1994, #4367. 1 male: Costa Rica, Puntar., Golfo Dulce, 10 km W Piedras Blancas, 100 m, III–V 1989, HANSON. 1 male: Est. Cacao, lado SO Vol. Cacao, P.N. Guanacaste, Prov. Guanacaste, Costa Rica, 800–1600 m, 12–16 Jul 1993, E. LOPEZ, L S 323300 375700 #2217. [all INBio]. 1 male: Costa Rica, Guanacaste, Cerro El Hacha, 300 m, V–IX 87, D. JANZEN. [AMNH]. 1 male: Costa Rica, Puntarenas, La Amistad Nat. Park, 8° 57' N, 82° 50' W, 21–23 Feb. 1991, 1500 m, Norman D. PENNY, Malaise Trap. [CAS]. PANAMA: 1 male: Panama, Chiriqui Pr. Cerro Horqueta Rd., 1 km N Boquete, 1300 m, VII.2.1996, GILLOGLY & SCHAFFNER. [TAMU]. HONDURAS: 1 male: Honduras, Olancho, Catacamas, 15° 50' N, 85° 51' W, VIII. 1995, leg. R. CAVE. [MZLU].

**Description**

**Male.** Length: holotype: body 3.6, wing 3.4; thorax 1.2, abdomen 1.9; paratypes: body 3.8–4.4, wing 3.7–4.6. **Head:** Face and clypeus with dense ochreous-brown pruinosity; eyes touching on face; ocellars 1.7 times as long as verticals; postverticals 0.9 times as long as verticals; uppermost postoculars 0.8 times as long as verticals and uppermost 3–4 setae black, remaining setae yellow; first flagellomere yellow, brown in apical half and dorsally, 0.8 times as long as basal width, and 1.7 times as wide as pedicel; palp pale yellow with 2 brown apical setae.

**Thorax:** As in *N. americana*, but metallic green colour largely extending anteriorly between dc and ac rows. **Legs:** Yellow, IIT with strong ad setae at 1/5 and 2/3, a shorter pd seta at 1/6, a strong av seta at 1/3, a small posterior setula at 3/4, and 3 apical setae; II<sub>1</sub> with a strong posterior seta basally, with a strong ad seta near 1/2 and additional shorter setulae; IIIT with 4 strong dorsal setae; III<sub>1</sub> with a short ventral seta. Relative podomere ratios: I: 49, 50, 43/28/16/12/7; II: 58, 60, 70/24/14/10/5; III: 63, 98, 27/34/19/12/6. **Wing:** With an ochreous tinge; M with a weak bend and subparallel with R<sub>4+5</sub>; RMx ratio = 1.4, CuAx ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of brownish setae; halter stem ochreous-yellow and knob brown.

**Abdomen:** As in *N. americana*; cercus white, with a conspicuous dark brown projecting concave lateral extension. Hypopygium (Fig. 32): hypandrium broad and long; LEp short and triangular with a subapical seta; MEp present as 2 short tubercles each with an apical seta; VSur with a very slender median projection, lateral projection downcurved with a pointed flattened appendage; DSUR with a median digitiform projection and a lateral flattened tapering appendage which has a dorsal triangular lobe; cercus with a laterally-projecting concave lamella and a median digitiform projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica, Panama, Honduras.

**Etymology:** The name refers to the conspicuous lateral lamella on the cercus.

**Remarks:** The laterally-projecting lamella on the cercus is diagnostic for the species.

*Neurigona obscurata* spec. nov.

(Fig. 33)

**Material:** **Holotype** male: MEXICO: Mexico, Chiapas, Yerba Buena, Hwy 195, 24.VI.1969, B.V. PETERSON. [CNC]. **Paratypes:** MEXICO: 1 female: same data as holotype. 1 male: same data. 1 male: Mexico, Chis. San Cristobal de Las Casas 7087, 18–19.V.1969, B. V. PETERSON. 4 males: same data, but 11.VI., 11.VI., 12.VI., 28.VI. 3 females: same data, but 25.V., 11.VI., 28.VI. 1 male: Mex. Chiapas, San Cristobal 7000'(ft.), 26 May 1969, H. J. TESKEY. 1 female: same data. 1 male: Mex. Chis. 7200 ft., S. Crist. la Casas, 14 May 1969, W. R. M. MASON. 2 females: Mex. Chis. 6500 ft., 20 mi N. Bochil, Yerba Buena, 24 June 1969, W.R.M. MASON. [all CNC]. 1 male: Mexico, Chiapas, San Cristobal de las Casas 2195 m, 30.VIII.1974, D.E. & J.A. BREEDLOVE [CAS].

**Description**

**Male.** Length: holotype: body 4.4, wing 4.3; thorax 1.7, abdomen 2.2; paratypes: body 3.5–4.6, wing 3.8–4.4. **Head:** Face and clypeus with dense ochreous-brown pruinosity; eyes touching on face; ocellars 1.7 times as long as verticals; postverticals 1.2 times as long as verticals; uppermost postoculars 1.0 times as long as verticals and uppermost 1–2 setae black, remaining setae yellow; first flagellomere yellow, apical half and dorsum infuscated, 0.8 times as long as basal width, 1.5 times as wide as pedicel, pedicel slightly projecting into first flagellomere on lateral and on median side; arista about 9 times as long as first flagellomere; palp pale yellow with 2 black apical setae.

**Thorax:** Largely dark brown, with a more or less broad ochreous-yellow stripe laterad of dc rows; mesonotal depression and dorsum of scutellum metallic blue-green, this colour extending as a broad stripe anteriorly between dc rows; pleura mainly dark brown, pale yellow below wing base. **Legs:** Yellow, IIIIF infuscated dorsally and ventrally; IIT with strong ad setae at 1/5 and 2/3, a smaller pd seta at 1/6, a strong av seta at about 1/2, and 3 apical setae; IIT<sub>1</sub> with a strong posterior seta basally and a strong ad seta at 1/2; IIIT with 4 strong dorsal setae. Relative podomere ratios: I: 42, 48, 37/23/11/9/6; II: 55, 61, 62/21/15/8/5; III: 60, 96, 26/32/18/13/6. **Wing:** With a brownish tinge; M with a weak flexion and subparallel with R<sub>4+5</sub>; RMx ratio = 1.3, CuAx ratio = 0.4; lower calypter pale yellow with a fan of pale yellow setae; halter pale yellow.

**Abdomen:** As in *N. americana*; tergum 1 yellow, terga 2–7 mostly dark brown with a narrow yellow posterior rim. Hypopygium (Fig. 33): hypandrium very short and slender; LEp short and ovate with a basal and a subapical seta; MEp present as a tubercle with an apical seta; VSur with a very short median projection, lateral projection downcurved with a leaf-like flattened appendage and a strong long median seta basally; DSur with an apical and a subapical lobe; cercus with a lateral extension and a median projection bearing a flattened apical seta.

**Female:** Similar to male except as noted: dorsum of mesonotum more ochreous-yellow; eyes separated on face; face with dense ochreous-brown pruinosity; distance between eyes 1.3 times the distance between ocellar setae; IIT with 2 ad, 2 pd, 1 strong av, and 1 small pv setae.

**Distribution:** Mexico.

**Etymology:** The name refers to the largely dark brown thorax and abdomen.

**Remarks:** *N. obsucrata* is separated from all other Neotropical congeners by its unusual darkened body colour. Although a dark brown thorax is unique so far as known in Neotropical *Neurigona*, it is present in several Palaearctic species but in combination with dense greyish pruinosity. It appears to be a highland species, found only above 2000 m.

***Neurigona tatumbia* spec. nov.**

(Fig. 34)

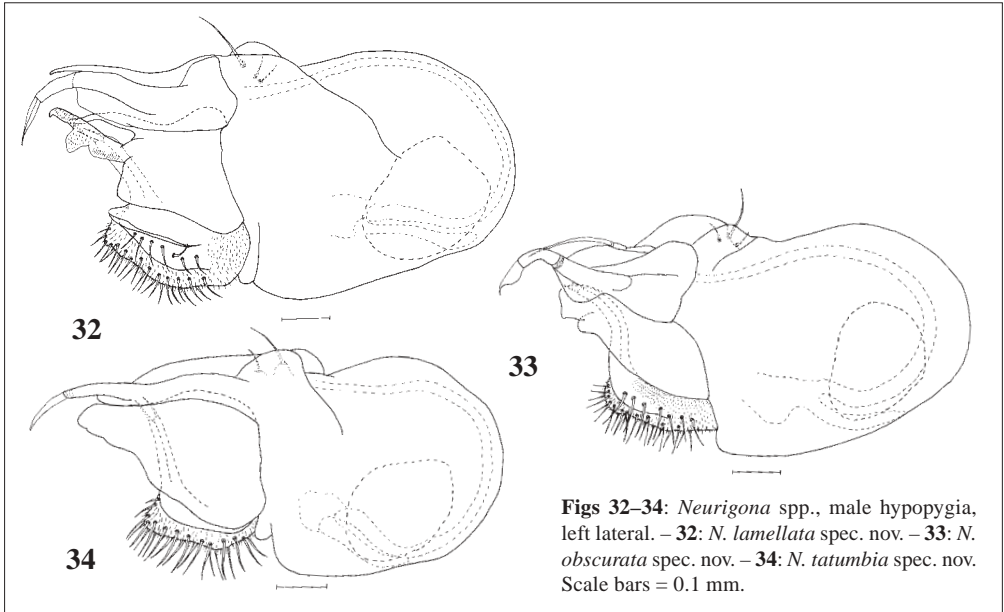
**Material:** **Holotype** male: HONDURAS: Honduras, Francisco Morazan, Macuelizo, Tatumbia, 17.X.1995, leg. R. CAVE. [MZLU]. **Paratype:** 1 male: same data. [MZLU]. MEXICO: 1 male: Mexico, Chiapas, 5 miles north Nuevo Tenochtitlan, 3000' (ft.), July, 29 1990, Robert W. JONES. [TAMU].

**Description**

**Male.** Length: holotype: body 4.1, wing 4.2; thorax 1.4, abdomen 2.6; paratype: body 3.8, wing 3.5.

**Head:** Face and clypeus with dense ochreous pruinosity; eyes touching on face; ocellars 1.6 times as long as verticals; postverticals 0.9 times as long as verticals; uppermost postoculars 0.5 times as long as verticals and uppermost 2 setae black, remaining setae yellow; first flagellomere yellow, apical half slightly infuscated, 2 times as wide as pedicel, 0.8 times as long as basal width; pedicel slightly projecting into first flagellomere on lateral and on median side; arista about 7 times as long as first flagellomere; palp pale with 2 yellow apical setae.

**Thorax:** As in *N. americana*. **Legs:** Yellow; IIT with strong ad setae at 1/5 and 2/3, strong pd seta at 1/6, strong av seta at 1/3, and 3 apical setae; IIT<sub>1</sub> with a strong posterior seta basally and a strong ad seta at 1/2; IIIT with 5–6 strong dorsal setae. Relative podomere ratios: I: 44, 44, 38/22/12/9/5; II: 53, 55, 61/19/14/9/5; III: 59, 90, 25/30/18/12/6. **Wing:** Slightly infuscated; M with a very weak



**Figs 32–34:** *Neurigona* spp., male hypopygia, left lateral. – 32: *N. lamellata* spec. nov. – 33: *N. obscurata* spec. nov. – 34: *N. tatumbia* spec. nov. Scale bars = 0.1 mm.

flexion and subparallel with  $R_{4+5}$ ; RMx ratio = 1.6, CuAx ratio = 0.5; lower calypter pale yellow with a fan of brown-golden setae; halter stem pale yellow, knob brownish-yellow.

**Abdomen:** As in *N. americana*. Hypopygium (Fig. 34): hypandrium narrow and tapering; LEp short and ovate with 2 subapical setae; MEp very short with an apical seta; VSUR with only one narrow apical projection which is apically pointed and flattened; DSUR triangular tapering; cercus with a median projection bearing an apical seta.

**Female:** Unknown.

**Distribution:** Honduras, Mexico.

**Etymology:** The name refers to the collecting site.

**Remarks:** *N. tatumbia* is somewhat separated from the remaining members of the *americana* group by the absence of a median projection on VSUR.

### Unplaced species of *Neurigona*

The following species cannot be assigned to any of the previously defined species-groups and are somewhat isolated, especially as regards their genitalic characters.

#### *Neurigona melini* FREY

(Fig. 35a–b)

*Neurogona melini* FREY, 1928 – FREY (1928: 22).

**Material:** **Holotype** male: PERU: Roque, Ost-And.[en], 28.3.[19]25, MELIN; [underside of label:] SV. Amaz. Exp., 1923–25 / [red label:] Spec. typ. No [without number] / *Neurogona Melini* n. sp. R. FREY det. / Mus. Zool. Helsinki, Loan Nr.: D 00–53 / Gen. Prep. No. SN2000–11, Mar. 2000, St. NAGLIS. [MZHF].

#### Redescription

**Male (holotype).** Length: holotype: body 5.0, wing 5.1; thorax 1.8, abdomen 3.2. **Head:** Ocellars 1.8 times as long as verticals, postverticals 0.6 times as long as verticals, uppermost postoculars 0.5 times as long as verticals and uppermost 3 setae black, remaining setae yellow; eyes contiguous on face; face and clypeus with dense pale yellowish pruinosity; palp yellow, with 2 strong brown apical

seta and brown hairs; antenna: yellow; first flagellomere dark brown on distal half, 0.8 times as long as basal width; arista about 11 times as long as first flagellomere.

**Thorax:** Ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown, without any blue or green reflections; pleura pale yellow. **Legs:** Yellow; IT with 3–4 long apicoventral setae;  $It_1$  dark-brown;  $It_{3+4}$  slightly flattened dorsoventrally, entirely white, with short dense white hairs;  $It_5$  black, with fringe of anterior and posterior row of black spatulate setae, which are about twice as long as diameter of tarsomere (Fig. 35a) (all MSSC); IIF slightly flattened dorsoventrally in apical 2/3; IIT strongly flattened dorsoventrally, with strong anterior setae at 1/5, 1/2 and apically;  $It_1$  greatly elongated, about 1.6 times the length of tibia, slightly flattened dorsoventrally, with a long and strong posterior seta basally, with 4–5 short anterior setae, and with an irregular row of short posterior and ventral setulae (MSSC); IIIT with short dorsal setae at 1/5, 1/3, and 1/2, an irregular row of small ventral setulae, and 3 apical setae; III $It_1$  with 1 strong ventral seta at 4/5. Relative podomere ratios: I: 54, 90, 72/31/10/10/7; II: 55, 62, 102/25/19/10/5; III: 61, 106, 36/44/22/14/5. **Wing:** Hyaline, with a brownish tinge, especially in anterior half; M with a slight bend and subparallel with  $R_{4+5}$ ; RMx ratio = 1.6, CuAx ratio = 0.5; lower calypter pale yellow with brown rim and a fan of yellow setae; halter yellow, knob with apical dark brown tip.

**Abdomen:** Ochreous-yellow; terga 2–4 with a broad dark brown dorsal band; segment 5 dorsally yellow, with a dark brown ventral rectangular projection; segments 6 and 7 yellowish-brown; sternum 8 dark brown; hypopygium and surstyli dark brown; epandrial lobes and hypandrium yellow; cercus basally dark brown, with a white apical margin and white setae. Hypopygium (Fig. 35b): hypandrium long and lanceolate, about 5 times as long as basal width; LEp long and curved, with a subapical seta; MEp fused with LEp, broad and ovate, with 2 setae; VSur with a single projection bearing a rectangular flattened apical appendage; DSur with a digitiform projection; cercus with a median projection bearing 1 flattened and 2 normal setae.

**Female:** Unknown

**Distribution:** Peru.

**Remarks:** *N. melini* can be easily identified by the conspicuously modified fore tarsomeres (see also under *N. plumitarsis*).

### *Neurigona fuscicosta* ROBINSON

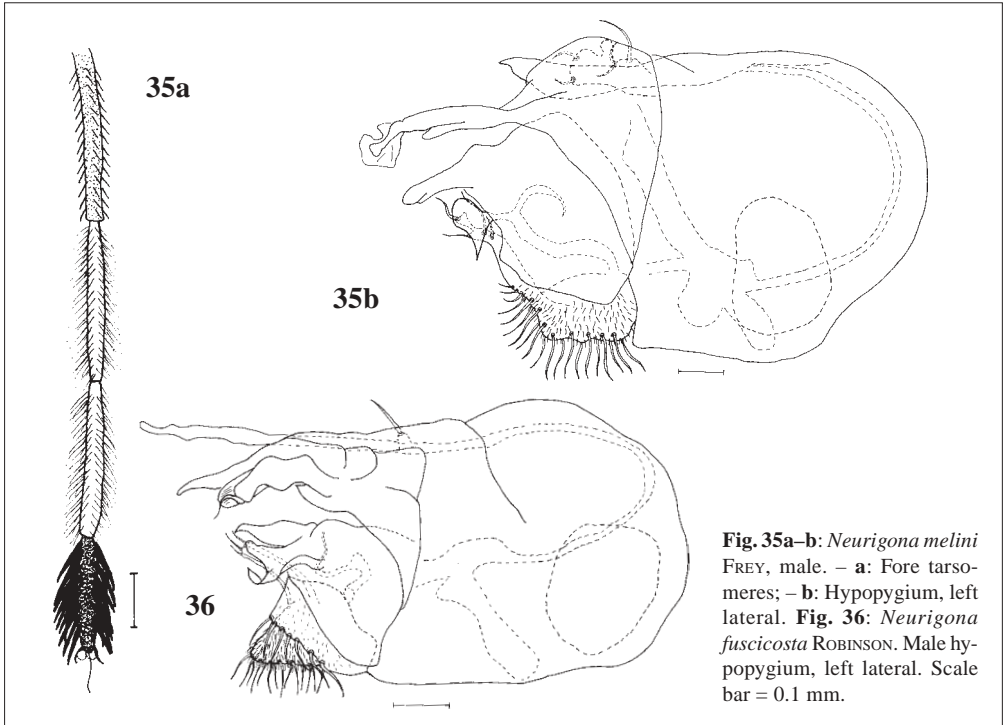
(Fig. 36)

*Neurigona fuscicosta* ROBINSON, 1975 – ROBINSON (1975: 23).

**Material:** **Holotype** male: Lesser Antilles DOMINICA: Clarke Hall, Dominica BWI, March 2, 1964, H. ROBINSON / Holotype male, *Neurigona fuscicosta* H. ROBINSON. [USNM]. **Paratypes:** DOMINICA: 1 male: Clark Hall, Dominica BWI, March 1, 1964 / Clarke Hall, Dominica BWI, March 1, 1964, H. ROBINSON / [red label:] Paratype male, *Neurigona fuscicosta* H. ROBINSON / Gen. Prep. No. SN2000–22, St. NAGLIS 2000. 1 male: same data but March 2, 1964. 1 male: same data but April 17, 1964 / Gen. Prep. No. SN2000–23, St. NAGLIS 2000. 1 female: same data but February 28, 1964. 1 female: same data but March 3, 1964. 1 female: same data but March 3, 1964 / Allotype female, *Neurigona fuscicosta* H. ROBINSON. 1 male: Dominica W.I., Manets Gutter, 7 March 1965, W. W. Wirth / Bredin-Archbold, Smithsonian Bio. Surv. Dominica / [red label:] Paratype *Neurigona fuscicosta* H. ROBINSON. 1 male: Dominica W.I., Manets Gutter, 7 March 1965, W. W. WIRTH / Bredin-Archbold, Smithsonian Bio. Surv. Dominica / [red label:] Paratype *Neurigona fuscicosta* H. ROBINSON. 1 female: same data but March 1, 1965. [all USNM].

### Redescription

**Male.** Length: holotype: body 4.2, wing 4.2; thorax 1.5, abdomen 2.3; paratypes: males: body 3.6–3.9, wing 3.9–4.3; females: body 4.1–4.5; wing 4.2–4.5. **Head:** Ocellars 1.6 times as long as verticals; postverticals 0.8 times as long as verticals; uppermost postoculars 0.5 times as long as verticals and uppermost 3 setae black, remaining setae yellow; eyes practically contiguous on face, narrowest distance equal to 1/4 the diameter of adjacent anterior facets; face and clypeus with dense brownish-yellowish pruinosity; palp yellow, with 2 strong yellow apical seta and brown hairs; antenna: yellow; pedicel slightly projecting into first flagellomere on lateral side and more distinctly on median side; first flagellomere with distal half brownish, 0.7 times as long as wide; arista about 9.5 times as long as first flagellomere.



**Fig. 35a–b:** *Neurigona melini* FREY, male. – **a:** Fore tarsomeres; – **b:** Hypopygium, left lateral. **Fig. 36:** *Neurigona fuscicosta* ROBINSON. Male hypopygium, left lateral. Scale bar = 0.1 mm.

**Thorax:** Ochreous-yellow; mesonotal depression and dorsum of scutellum metallic green with bronze reflections, this colour not extending anteriorly; pleura pale yellow. **Legs:** Yellow;  $It_{3+4}$  with short erect pale ventral hairs (MSSC); IIT with strong ad setae at 1/5 and 2/3, strong pd setae at 1/5 and 2/3, a strong av seta at 1/3, small pv setae at 1/3 and 2/3, and 4 apical setae;  $II_1$  with a strong posterior seta basally; IIIT with strong setae at 1/10, 1/4 and 1/2, with 3–4 small ventral setae, and with 3 apicoventral setae. Relative podomere ratios: I: 42, 48, 42/19/13/9/6; II: 54, 62, 65/22/14/8/4; III: 59, 91, 23/32/18/9/5. **Wing:** Hyaline, with a greyish tinge, anterior area from costa to  $R_{4+5}$  distinctly brown infuscated, between  $R_{4+5}$  and M less infuscated; M with a slight bend and subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.5; lower calypter brownish-yellow with dark brown rim, with a fan of golden-yellow setae; halter stem yellow and knob brown.

**Abdomen:** Ochreous-yellow; terga 2+3 with a broad dark brown band; tergum 4 entirely yellow with long dense pale setae; segment 5 dorsally yellow and ventrally brown, with dense long pale dorsal setae, and with a long narrow filiform ventral projection; segments 6+7 yellowish-brown; sternum 8 dark brown with pale hairs; hypopygium entirely dark brown, except surstyli and epandrial lobes brownish-yellow, cercus distally white with white setae. Hypopygium (Fig. 36): hypandrium short and bifurcate, about 1.5 times as long as basal width; LEp short, with an apical hook and a subapical seta; MEp fused with LEp, short and round, with an apical seta; VSur with a narrow median projection, lateral projection with a curved apical seta; DSur with a median tapering lobe, and a lateral bifurcate projection; cercus with a lateral extension bearing strong setae, and a median projection.

**Female:** Similar to male but lacking MSSC and as noted: eyes distinctly separated, narrowest distance on face about equal to distance between ocellar setae. Face and clypeus with dense brownish-yellow pruinosity; clypeus slightly projecting; podomere ratios as: I: 42, 48, 39/19/12/6/5; II: 53, 61, 57/18/14/7/4; III: 58, 88, 20/29/16/9/5; wing less distinctly darkened on anterior area.

**Distribution:** Dominica.

**Remarks:** The long filiform ventral cuticular projection on the fifth abdominal segment of the male and the dark infuscation along the costal area are striking characters of the species.

*Neurigona micra* spec. nov.

(Fig. 37a–b)

**Material:** **Holotype** male: COSTA RICA: Est. Pitilla, 9 km S. Santa Cecilia, Prov. Guana, Costa Rica, 700 m, Set. 1994, P. RIOS, L N 330200 380200 #3206. [INBio].

**Description**

**Male.** Length: holotype: body 2.5, wing 2.6; thorax 1.0, abdomen 1.2. **Head:** Face and clypeus with dense greyish-ochreous pruinosity; eyes touching on face; ocellars 1.7 times as long as verticals; postverticals 0.7 times as long as verticals; uppermost postoculars 0.3 times as long as verticals and uppermost 2–3 black, remaining setae yellow; first flagellomere yellow, apical half slightly infuscated, 0.8 times as long as basal width, and 1.3 times as wide as pedicel; arista about 8 times as long as first flagellomere; palp yellow with 2 black apical setae.

**Thorax:** Ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown with metallic blue-green reflections; a row of 4–5 short setulae between ac and anterior 3 dc; pleura pale yellow.

**Legs:** Yellow,  $It_{2-5}$  with a ventral row of dense curved hairs which are 3 times as long as diameter of tarsomeres (Fig. 37a) (MSSC);  $It_5$  as long as  $It_4$ ; IIT with small ad setae at 1/3 and 2/3 and a small pd seta at 1/4 which are as long as diameter of tibia, and 3 apical setae, no ventral setae; II<sub>t</sub> with a strong posterior seta basally, and small ad setulae at 1/2 and 3/4 and additional shorter setulae; IIIT with 4 dorsal setae, proximal 2 setae smaller. Relative podomere ratios: I: 50, 51, 47/23/18/15/14; II: 58, 50, 68/25/19/11/6; III: 62, 94, 28/33/20/14/6. **Wing:** With a yellowish tinge; M with a very weak flexion which is scarcely visible and straight, subparallel with  $R_{4+5}$ ; RMx ratio = 1.1, CuAx ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of golden setae; halter stem yellow and knob brownish.

**Abdomen:** Relatively short and stout; ochreous-yellow; terga 2–4 with a dark brown dorsal spot; segment 5 with a triangular dark brown ventral projection which lies flat on the hypopygium; sternum 8 dark brown. Hypopygium dark brown; cercus ochreous, mainly covered by DSur. Hypopygium (Fig. 37b): hypandrium broad and short, about as long basal width; epandrial lobes asymmetric: left LEp S-shaped and narrow, right LEp broad and ovate with a hook-like apex, both without setae; left MEp long and blade-like, MEp not present; VSUR almost round and strongly projecting above ventral rim of epandrium, apically with a flattened leaf-like appendage, with a short spine-like seta and a long curved seta; DSUR almost rectangular and longer than VSUR; cercus with lateral extension and a median digitiform projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the small body size.

**Remarks:** *N. micra* is distinguished by the small body size, the modification of fore tarsomeres, and the large hypopygium.

*Neurigona sirena* spec. nov.

(Fig. 38)

**Material:** **Holotype** male: COSTA RICA: Est. Pitilla, 9 km S. Santa Cecilia, P.N. Guanacaste, Prov. Guana, Costa Rica, 700 m, May 1994, P. RIOS, L N 330200 380200 #2997. [INBio]. **Paratypes:** COSTA RICA: 2 males: same data but VI. and X. 1994. 3 males: Estacion Sirena, Prov. Punta, Costa Rica, 1–100 m, DIC 1994, G. FONSECA, L S 270500 508300 #4367. 1 male: same data but ENE 1995 #4368. 1 male: Costa Rica, Grano de Oro, Chirripo Turrialba, A.C. Amistad, Prov. Carta, 1120 m, ix.1993, L N 200600 595900, #2436, malaise, P. CAMPOS. [all INBio]. PANAMA: 27 males: Barro Colorado, Is. Canal Zone, malaise trap, Roger D. AKRE, II, IV, V, 1967, VI, VII, VIII, 1968. [all WSU]. 1 male: Barro Colorado, Canal Zone, II.21.1929, C. H. CURRAN. [AMNH]. VENEZUELA: 1 male: T. F. Amaz., Cerro de la Neblina, Basecamp, 140 m, 0° 50' N, 66° 10' W, 10–20 February 1985. [USNM]. GUYANA: 1 male: Ceiba ca. 40 km S Georgetown, 6° 29' N, 58° 13' W, 21 April 1995, Wayne N. MATHIS. [USNM]. PERU: 1 male: Avispas, Madre de Dios, Peru, 1–15.X.1962, L. PENA, 400 m. [CNC]. BRAZIL: 4 males: Brazil, Belem Para, Ipean, III.21/23.1970, J M & B A CAMPBELL. [CNC]. 1 male: Brasil, Amazonas, Manaus, R. Ducke, 30.XI.1981, J. A. RAFAEL. [INPA].



**Description**

**Male.** Length: holotype: body 3.7, wing 3.9; thorax 1.5, abdomen 1.8; paratypes: body 3.3–3.9, wing 3.3–4.5. **Head:** Face and clypeus with dense greyish-yellow pruinosity; eyes practically touching on face, leaving a narrow stripe which is narrower than adjacent facets; ocellars 1.6 times as long as verticals; postverticals 0.8 times as long as verticals; uppermost postoculars 0.8 times as long as verticals and uppermost 4–5 setae black, remaining setae yellow; first flagellomere yellow, apical half brown, 0.9 times as long as basal width, and 1.6 times as wide as pedicel; arista about 7 times as long as first flagellomere; palp pale yellow with 2 black apical setae.

**Thorax:** Ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown with metallic green reflections, this colour largely extending anteriorly as a triangle between dc and ac rows; pleura pale yellow. **Legs:** Yellow, IIT with strong ad setae at 1/5 and 2/3, strong pd setae at 1/6 and 3/4, a strong av seta at 1/3, a smaller pv seta at 1/2, and 3 apical setae;  $III_1$  with a strong posterior seta basally, and a strong ad seta near 1/2 and additional shorter setulae; IIIT with 5 strong dorsal setae, basal 1–2 setae often smaller. Relative podomere ratios: I: 40, 44, 36/22/12/8/5; II: 52, 49, 63/20/15/9/5; III: 58, 90, 23/28/17/10/5. **Wing:** With a distinct brown infuscation, especially on anterior part; M with a very faint bend and almost straight, subparallel with  $R_{4+5}$ ; RMx ratio = 1.5, CuAx ratio = 0.5; lower calypter pale yellow with a brown rim and a fan of brownish setae; halter stem yellow and knob brownish.

**Abdomen:** Ochreous-yellow, terga 2–4 with a dark brown dorsal band; segment 5 with a short ovate dark brown ventral projection; sternum 8 dark brown. Hypopygium dark brown; cercus basally brownish, distally white. Hypopygium (Fig. 38): hypandrium basally broad and apically pointed, about 2 times as long as basal width; LEp short and ovate with an apical node and a subapical seta; MEp present as a short tubercle with an apical and a more basal seta; VSur with a very short and slender median projection and a very long and strong median seta, laterally convex and apically rounded, with an upcurved and a straight flattened apical seta; DSur with a short curved lobe and a serrate rim; cercus with a short lateral extension and a median digitiform projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica, Panama, Venezuela, Guyana, Peru, Brazil.

**Etymology:** The name refers to one of the collecting sites of the type material.

**Remarks:** The unusual rounded shape of VSur is diagnostic for the species.

*Neurigona latifacies* spec. nov.

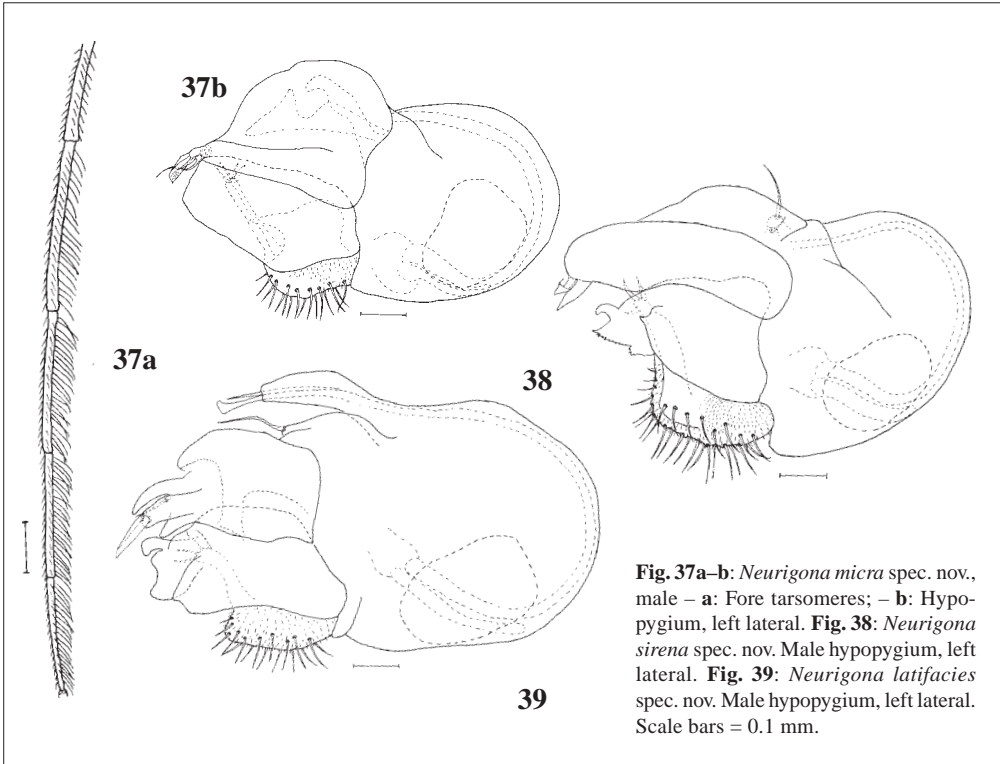
(Fig. 39)

**Material:** Holotype male: COSTA RICA: La Suiza, CR, Jul, PABLO SCHILD / AL MELANDER Collection 1961. [USNM].

**Description**

**Male.** Length: holotype: body 4.3, wing 4.6; thorax 1.6, abdomen 1.9. **Head:** Face and clypeus with dense ochreous pruinosity; eyes distinctly separated on face, narrowest distance between eyes greater than distance between ocellar setae; ocellars 1.5 times as long as verticals; postverticals 0.9 times as long as verticals; uppermost postoculars 0.7 times as long as verticals and uppermost 2 setae black, remaining setae yellow; first flagellomere ochreous-yellow, 0.8 times as long as basal width, and 1.6 times as wide as pedicel; arista about 8 times as long as first flagellomere; palp ochreous without distinct apical setae.

**Thorax:** Ochreous-yellow; mesonotal depression and dorsum of scutellum dark brown without metallic reflections; thoracic setation normal; pleura ochreous-yellow. **Legs:** Yellow; IIT with ad setae at 1/5, 1/2 and 3/4, pd setae at 1/4 and 3/4, a strong av seta near 1/2, a smaller pv seta at 1/2 (position variable), and 3 apical setae;  $III_1$  with a strong posterior seta basally, and small ad setae at 1/3, 1/2 and 3/4 and additional shorter setulae; IIIT with 5 strong dorsal setae. Relative podomere ratios: I: 44, 45, 35/22/14/8/5; II: 53, 54, 62/20/15/8/4; III: 61, 91, 25/29/17/?/??. **Wing:** With a brownish tinge; M with a very weak flexion, subparallel with  $R_{4+5}$ ; RMx ratio = 1.3, CuAx ratio = 0.6; lower calypter yellow with a fan of golden setae; halter yellow.



**Fig. 37a–b:** *Neurigona micra* spec. nov., male – **a:** Fore tarsomeres; – **b:** Hypopygium, left lateral. **Fig. 38:** *Neurigona sirena* spec. nov. Male hypopygium, left lateral. **Fig. 39:** *Neurigona latifacies* spec. nov. Male hypopygium, left lateral. Scale bars = 0.1 mm.

**Abdomen:** Relatively broad and stout; ochreous-yellow; terga 2–3 with a brown dorsal band; segment 5 with a triangular ochreous ventral projection; sternum 8 ochreous-brown. Hypopygium dark brown, apical part of surstyli pale; cercus whitish. Hypopygium (Fig. 39): hypandrium broad and long, broadened apically, strongly upcurved and projecting beyond ventral border of hypopygium, about 3 times as long as basal width; LEp long and tapering, with long subapical and short apical setae; MEp ovate with a long apical seta; VSur with three apical lobes and a flattened beak-like appendage; DSur with a hook-shaped subapical lobe; cercus with a median digitiform projection bearing apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the unusually broad male face.

**Remarks:** *N. latifacies* has an unusual broad face in males and a conspicuous long and projecting hypandrium.

### Phylogenetic Analysis

The following list enumerates the apomorphic character states and their polarities that were used for the phylogenetic analysis. The plesiomorphic character states have been used for the definition of a hypothetical ancestral ground-plan of the Neurigoninae.

The phylogenetic characters are defined in the following format:

*n*) character: plesiomorphic (ancestral) state / **apomorphic (derived) state**

Synapomorphies of *Neurigona* + *Bickelomyia*

- 1) *Colour of thorax and abdomen*:  
metallic green / **ochreous-yellow by reduction of melanisation**
- 2) *Proboscis*:  
with short setae / **with a pair of long sinuous basoventral setae**
- 3) *Postvertical setae*:  
as long as postocular setae / **several times as long as postocular setae**
- 4) *Uppermost postocular seta*:  
as long as remaining postocular setae / **distinctly longer than remaining postocular setae**
- 5) *Metatarsus of middle leg*:  
without posterior setae basally / **with a strong posterior seta basally or a pair of short setae at this position**
- 6) *Shape of male cercus*:  
without a median projection / **with a digitiform median internal projection**

**Discussion**

*Neurigona* and *Bickelomyia* are closely related and share several synapomorphies which support the hypothesis that *Bickelomyia* is derived from *Neurigona*. I could not find any autapomorphies for *Neurigona*, and so it remains a paraphyletic rest-group. I have refrained from establishing new taxonomic categories but have defined species-groups as a basis for further phylogenetic analysis of *Neurigona* on a worldwide scale. But *Bickelomyia* is a monophyletic group based on strong autapomorphies which are defined in NAGLIS (2002b).

The apomorphic character state 1), the reduction of melanisation on thorax and abdomen, resulting in an ochreous-yellow colour has evolved several times within different dolichopodid subfamilies. Although this yellow body colour is not a valuable character for generic definition, it seems to be a constant and useful diagnostic feature for separating *Neurigona* from *Viridigona*, which has a metallic green thorax. I could not find any intermediate states, except for *Neurigona obscurata* which has a dark brown thorax with a more or less broad metallic green stripe on the disc, but all its other characters are characteristic for *Neurigona*. This dark brown thoracic colour can also be found in Palaearctic *Neurigona* species, which have in addition dense greyish pruinosity. Although closely related to *Neurigona*, some species in *Bickelomyia* have a dark metallic thorax. In the Nearctic and Palaearctic regions, *Neurigona* species have been described with a metallic green mesonotum (VAN DUZEE 1913, NEGROBOV 1987, NEGROBOV & FURSOV 1988) and these require further investigation. The Australian genus *Arachnomyia* WHITE also has a metallic green thorax and contains 3 described species, but I have seen an *Arachnomyia* species with an ochreous-yellow body among 8 undescribed species in the Australian Museum, Sydney. Both *Viridigona* and *Arachnomyia* are closely related and probably have a common Gondwanan origin.

**Acknowledgements**

I am grateful to the following curators and support staff for the loan of material (for full names of Institutions, see Material and methods): Ch. BARR (EMEC); E. M. CANCELLO (MZSP); J. CHAINEY (BMNH); R. CONTRERAS-LICHTENBERG (NMW); J. CUMMING (CNC); R. DANIELSSON (MZLU); D. GRIMALDI and T. NGUYEN (AMNH); U. KALLWEIT (SMTD); M. KOTRBA (formerly ZMHB); T. PAPE (NHRS), N. D. PENNY and K. J. RIBARDO (CAS); P. D. PERKINS (MCZ); J. RAFAEL (INPA); E. G. RILEY (TAMU); K. SCHNEIDER (MLUH); P. VILKAMAA (MZHF); N. WOODLEY (USNM); R. S. ZACK (WSU); J. ZIEGLER (DEI); M. ZUMBADO (INBio). I also thank Dan BICKEL (Sydney), Bernhard MERZ (Geneva) and Adrian PONT (Oxford) for valuable comments on the manuscript, and Harold ROBINSON (Washington) for information on *N. signifera* and *N. banksi*.

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The paper was accepted on 10 Mai 2003.  
**Editum: 15 December 2003.**

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