

# Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) IV: *Viridigona* gen. nov.

[Revision der neotropischen Neurigoninae (Diptera: Dolichopodidae) IV:  
*Viridigona* gen. nov.]

by  
Stefan M. NAGLIS

Zurich (Switzerland)

## Abstract

The Neotropical species of *Viridigona* gen. nov. (Diptera: Dolichopodidae) are revised. Diagnoses and keys to the species and species-groups are given. The following species are described as new: *V. albisigna* spec. nov. (Peru, Venezuela), *V. amazonica* spec. nov. (Brazil, Venezuela), *V. argyrotarsis* spec. nov. (Costa Rica), *V. asymmetrica* spec. nov. (Costa Rica), *V. beckeri* spec. nov. (Brazil), *V. bisetosa* spec. nov. (Chile), *V. cecilia* spec. nov. (Costa Rica), *V. costaricensis* spec. nov. (Costa Rica), *V. flavipyga* spec. nov. (Costa Rica), *V. guana* spec. nov. (Costa Rica), *V. limona* spec. nov. (Costa Rica), *V. longicornis* spec. nov. (Chile), *V. longiseta* spec. nov. (Belize, Brazil), *V. magnifica* spec. nov. (Brazil, Peru, Venezuela, Costa Rica), *V. merzi* spec. nov. (Chile, Argentina), *V. mexicana* spec. nov. (Mexico), *V. minima* spec. nov. (Mexico, Panama, Costa Rica), *V. nigrisigna* spec. nov. (Panama, Costa Rica), *V. panamensis* spec. nov. (Panama), *V. papallacta* spec. nov. (Ecuador), *V. ponti* spec. nov. (Brazil), *V. puntarena* spec. nov. (Costa Rica), *V. rondinha* spec. nov. (Brazil, Bolivia), *V. subrondinha* spec. nov. (Brazil), *V. teutonia* spec. nov. (Brazil), *V. tinalandia* spec. nov. (Ecuador). *Neurigona viridis* VAN DUZEE and *Neurigona thoracica* VAN DUZEE are transferred to *Viridigona*. *Neurigona cinereicollis* VAN DER WULP and *Neurigona lamprostethus* PHILIPPI are regarded as nomina dubia. *Viridigona* is differentiated from the closely related genus *Neurigona* mainly by plesiomorphic conditions such as a metallic green body, and by autapomorphies involving the reduction or loss of leg setation.

## Key words

Dolichopodidae, Neurigoninae, *Viridigona*, revision, new genus, new species, Neotropical Region

## Zusammenfassung

Die neotropischen Arten von *Viridigona* gen. nov. (Diptera: Dolichopodidae) werden revidiert. Diagnosen und Schlüssel für die Arten und Art-Gruppen werden dargestellt. Die folgenden Arten werden neu beschrieben: *V. albisigna* spec. nov. (Peru, Venezuela), *V. amazonica* spec. nov. (Brasilien, Venezuela), *V. argyrotarsis* spec. nov. (Costa Rica), *V. asymmetrica* spec. nov. (Costa Rica), *V. beckeri* spec. nov. (Brasilien), *V. bisetosa* spec. nov. (Chile), *V. cecilia* spec. nov. (Costa Rica), *V. costaricensis* spec. nov. (Costa Rica), *V. flavipyga* spec. nov. (Costa Rica), *V. guana* spec. nov. (Costa Rica), *V. limona* spec. nov. (Costa Rica), *V. longicornis* spec. nov. (Chile), *V. longiseta* spec. nov. (Belize, Brasilien), *V. magnifica* spec. nov. (Brasilien, Peru, Venezuela, Costa Rica), *V. merzi* spec. nov. (Chile, Argentinien), *V. mexicana* spec. nov. (Mexiko), *V. minima* spec. nov. (Mexiko, Panama, Costa Rica), *V. nigrisigna* spec. nov. (Panama, Costa Rica), *V. panamensis* spec. nov. (Panama), *V. papallacta* spec. nov. (Ecuador), *V. ponti* spec. nov. (Brasilien), *V. puntarena* spec. nov. (Costa Rica), *V. rondinha* spec. nov. (Brasilien, Bolivien), *V. subrondinha* spec. nov. (Brasilien), *V. teutonia* spec. nov. (Brasilien), *V. tinalandia* spec. nov. (Ecuador). *Neurigona viridis* VAN DUZEE und *Neurigona thoracica* VAN DUZEE werden zu *Viridigona* transferiert. *Neurigona cinereicollis* VAN DER WULP und *Neurigona lamprostethus* PHILIPPI werden als nomina dubia behandelt. *Viridigona* unterscheidet sich von der nahe verwandten Gattung *Neurigona* hauptsächlich durch plesiomorphe Merkmale, wie zum Beispiel dem metallisch grünen Körper und durch Autapomorphien, welche die Reduktion oder den Verlust der Behaarung der Beine betreffen.

## Stichwörter

Dolichopodidae, Neurigoninae, *Viridigona*, Revision, neue Gattung, neue Arten, neotropische Region

## Introduction

This is the fourth part of a revision of the Neotropical Neurigoninae, dealing with the new genus *Viridigona* gen. nov. of the tribe Neurigonini. The preceding parts of this revision treated the tribe Coeloglutini (NAGLIS 2001a) comprising the genera *Coeloglutus* ALDRICH, *Neotonnoiria* ROBINSON, and *Paracoelogluts* NAGLIS, the tribe Dactylomyiini (NAGLIS 2001b) including the genera *Argentinia* PARENT, *Dactylomyia* ALDRICH, *Macroductylomyia* NAGLIS, and *Systemoides* NAGLIS, and a first contribution to the tribe Neurigonini (NAGLIS 2002) including the genus *Bickelomyia* NAGLIS. For a general introduction see NAGLIS (2001a). The large genus *Neurigona* RONDANI currently contains 122 described species and is worldwide in distribution. The genus forms a heterogeneous assemblage of species with neurigonine-like characters, and so a separation of the monophyletic groups based on phylogenetic analysis has become necessary. The genera and species outside the Neotropics, especially the Nearctic species of *Neurigona*, could not be taken into consideration in 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); 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 Sao Paulo, Sao Paulo (MZSP); 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 millimeters: 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 narrowest/widest distance between eyes on frons (measured below ocellar tubercle and above base of antennae); ratio of narrowest/widest distance between eyes on face; ratio of narrowest/widest distance between eyes on clypeus; ratio of length of posterior ac to distance between ac rows; 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; 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 illustra-

tions. Common features are listed in the generic diagnosis and are not usually repeated in the species descriptions. Species descriptions of the principal species of a species-group are given in full, whereas species descriptions of the remaining species of a species-group are reduced and are confined to differences or significant characters.

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

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 anteriorly of apex and close to vein  $R_{4+5}$ , with the distance between both veins at wing margin at most half length of crossvein dm-cu; legs without 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 yellow; wing vein M straight or bent, usually joining costa at apex or posteriorly 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 bearing long setae in both sexes which are several times as long as postocular setae ..... **Bickelomyia**
  - Male abdominal segment 5 with or without ventral projection, if present then only partially covering the ventral border of the hypopygium; hypopygium at base not projecting above dorsum of abdomen; male IIC with normal setation; male  $It_{4+5}$  usually not pennate; aedeagus usually present as a single arm with a pointed tip; ventral postcranium usually with setae which are not distinctly longer than postocular setae ..... **4**

4. Thorax and abdomen metallic green except abdominal segments 1 and 2 which are often yellow; IIT usually with only 1-2 ad setae; IIt<sub>1</sub> without strong setae; proboscis without a pair of long ventral setae; male It<sub>4</sub> usually flattened dorsoventrally with ventral pubescence; male cercus often elongated and with special setation ..... *Viridigona*
- Thorax and abdomen mainly ochreous-yellow, metallic green at most on mesonotal depression and scutellum, abdominal segments usually with dark tergal bands, mesonotum sometimes dark brown and often with dense pruinosity; IIT usually with strong ad, pd and ventral setae; IIt<sub>1</sub> with a strong posterior seta basally and often with additional strong setae; proboscis with a pair of long sinuous ventral setae; male fore tarsomeres not or otherwise modified; male cercus usually short and rounded, with short setae

*Neurigona*

**Genus *Viridigona* gen. nov.**

**Type species:** *Neurigona viridis* VAN DUZEE, 1913 – VAN DUZEE (1913: 43).

**Diagnosis**

**Head:** Eyes usually contiguous on face in males; face and clypeus entirely covered with dense pruinosity. Antennal scape short and bare; pedicel short and truncate with first flagellomere; first flagellomere 0.8–1.5 times as long as basal width (greatly elongated in males of the *longicornis* group); arista distinctly dorsal, with microscopic pubescence. Dorsal postcranium slightly concave; postocular setae uniseriate, uppermost ones not distinctly longer; pairs of long ocellar, shorter vertical, and short postvertical setae present; ventral postcranium with long setae; proboscis with short ventral hairs.

**Thorax:** Bright metallic green or dark metallic bronze-green, with greyish or ochreous pruinosity; metepimeron yellow; posterior 1/3 of mesonotum flattened; ac with 2 rows ending at mesonotal depression; dc comprising 6 strong setae, decreasing in length anteriorly, posterior 2 pairs bordering mesonotal depression, dc rows extending anteriorly of mesonotal suture; with some irregular setulae anteriorly of dc and anterolaterally of mesonotum; 1 pa, 2 sa, 2 sr, 2 np, 1 hm, and 1 pm present; median scutellar setae long, laterals present as small hairs. Proepisternum below with 1 strong seta and sometimes with additional small setae, and above with 1 small seta. **Legs:** All legs yellow and elongate; IC with 2 strong anterolateral setae; male It<sub>4+5</sub> usually slightly flattened dorsoventrally, It<sub>4</sub> 1.5–2.0 times as broad as It<sub>3</sub>, with a velvety pale pubescence ventrally (MSSC); male fore tarsomeres sometimes modified with special colouration (eg silvery-white in *V. argyrotarsis*); IIF sometimes with a cluster of short setulae or with one strong basoventral seta (MSSC); IIT with 1–2 strong ad setae in both sexes, rarely with 1 strong pd seta, ventral setae absent (in females this reduction is sometimes less developed as for example in some specimens of *V. magnifica*, where strong ventral setae on IIT or strong dorsal setae on IIIT are present), male IIT sometimes flattened dorsoventrally (MSSC); IIt without strong setae; IIIC with a strong lateral seta; IIIT without, with only 1, or with several weak dorsal setae in both sexes. **Wing:** Hyaline, with yellowish or brownish tinge, sometimes infuscated anteriorly; vein R<sub>4+5</sub> curved posteriorly distally and joining wing margin anteriorly of apex; vein M with a flexion or “bosse alaire” and subparallel with R<sub>4+5</sub>, joining costa posteriorly of apex; crossvein dm-cu about 1.0–1.5 times as long as distance between R<sub>4+5</sub> and M at wing apex, and 0.4–1.0 times as long as distal section of CuA; A present and not reaching wing margin.

**Male abdomen:** Elongate and longer than thorax; metallic green or dark bronze, tergum 1 usually entirely yellow, terga 2+3 often partially yellow; tergum 1 with a ring of long apical setae; segment 5 often with a ventral cuticular projection (Fig. 25c); postabdomen semi-

pedunculate (segment 7 forming a short peduncle attached to sternum 8); sternum 8 lying on hypopygial foramen. Hypopygium: epandrium globular, hypandrium basally fused to epandrium and distal 1/3-1/2 free; MEp and LEp present; VSur arching distad and usually bearing special apical setation or appendages which are often asymmetric; DSur short and rounded, with a strong curved and flattened apical seta; cercus often elongated and sometimes U-shaped, often with conspicuous setation; hypopygial foramen positioned laterally.

**Female oviscapt:** Characteristic for *Neurigonini*: terga 9+10 elongated and tapering, cercus basally fused with terga 9+10, digitiform and as long as or longer than terga 9+10 (see BICKEL 1998, Fig. 2c).

**Etymology:** *Viridigona* is a combination of the Latin word ‘*viridis*’, meaning ‘green’, and the ending of ‘*Neurigona*’, referring to the conspicuous metallic green thorax and abdomen. The gender is feminine.

**Remarks.** *Viridigona* differs from the large heterogeneous genus *Neurigona* by the characters given in the differential diagnosis (Tab. 1). It can be subdivided into several distinct species-groups.

### List of species and species-groups of *Viridigona*

#### *longicornis* group

*longicornis* spec. nov. (Chile)

#### *bisetosa* group

*bisetosa* spec. nov. (Chile)

*merzi* spec. nov. (Chile, Argentina)

#### *albisigna* group

*albisigna* spec. nov. (Peru, Venezuela )

*nigrisigna* spec. nov. (Panama, Costa Rica)

*rondinha* spec. nov. (Brazil, Bolivia)

*subrondinha* spec. nov. (Brazil)

#### *viridis* group

*argyrotarsis* spec. nov. (Costa Rica)

*asymmetrica* spec. nov. (Costa Rica)

*beckeri* spec. nov. (Brazil)

*cecilia* spec. nov. (Costa Rica)

*costaricensis* spec. nov. (Costa Rica)

*flavipyga* spec. nov. (Costa Rica)

*guana* spec. nov. (Costa Rica)

*limona* spec. nov. (Costa Rica)

*longiseta* spec. nov. (Belize, Brazil)

*magnifica* spec. nov. (Brazil, Peru, Venezuela, Costa Rica)

*mexicana* spec. nov. (Mexico)

*panamensis* spec. nov. (Panama)

*papallacta* spec. nov. (Ecuador)

*ponti* spec. nov. (Brazil)

*puntarena* spec. nov. (Costa Rica)

*teutonia* spec. nov. (Brazil)

*thoracica* (VAN DUZEE) **comb. nov.** (*Neurigona*) (Panama, Dominica, Ecuador, Venezuela, Peru)

*tinalandia* spec. nov. (Ecuador)

*viridis* (VAN DUZEE) **comb. nov.** (*Neurigona*) (eastern USA, Costa Rica ?)

#### Unplaced species of *Viridigona*

*amazonica* spec. nov. (Brazil, Venezuela)

*minima* spec. nov. (Mexico, Panama, Costa Rica)

#### Nomina dubia

*cinereicollis* VAN DER WULP, 1888: 370 (*Saucropus*) (Argentina)

*lamprostethus* PHILIPPI, 1865: 776 (*Dolichopus*) (Chile) [female only]

**Remarks.** *V. viridis* is known from the eastern United States and was listed by ROBINSON (1970) from Costa Rica. I could not find this species in the material I examined nor a reference to the locality, and the record of *V. viridis* from the Neotropics was probably based on a misidentification. The types of *Neurigona cinereicollis* could not be found and are most probably lost (B. BRUGGE, C. VAN ACHTERBERG, P. BEUK, pers. comm.) and VAN DER WULP’s description is inadequate for accurate interpretation. However, it contains the description of

modified male middle tarsomeres, a feature that is not present in Neotropical Neurigoninae but is found in e.g. the Palearctic *Oncopygius* Mlk. It is thus possible that *N. cinereicollis* belongs to another subfamily, and it is regarded here as a nomen dubium. *N. lamprostethus* was described from a female, and the short original description is insufficient for accurate interpretation. The types must be treated as lost and so *N. lamprostethus* is also regarded as a nomen dubium.

**Tab. 1:** Differential diagnosis for *Viridigona* and *Neurigona*.

Character	<i>Viridigona</i>	<i>Neurigona</i>
colour of thorax	entirely metallic green	ochreous-yellow, except mesonotal depression and scutellum which are often metallic green; or dark brown, often with dense pruinosity
colour of abdomen	dark metallic green, segment 1+2 often yellow	ochreous-yellow, often with dark tergal bands
proboscis	with short ventral hairs	with a pair of long sinuous basoventral setae
postvertical setae	not distinctly longer than postocular setae	several times as long as postocular setae
uppermost postocular seta	not distinctly longer than the succeeding setae	usually distinctly longer than the succeeding setae
setation of IIT	with 1-2 ad setae, pd setae usually absent, without ventral setae	with ad and pd setae, usually with ventral setae
setation of II <sub>1</sub>	without strong setae	with a strong posterior seta basally and often with additional strong setae
setation of IIIT	without or with only weak dorsal setae	usually with several strong dorsal setae
male fore tarsomeres	It <sub>4+5</sub> usually dorsoventrally flattened, It <sub>4</sub> with ventral pubescence	usually unmodified or otherwise modified
male cercus	often elongated with special setation	usually short and rounded, with short setae

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

Males of *Viridigona* are often similar in external characters, and striking MSSC are not usually present. Accurate identification often requires genitalia preparation. The following key is mainly based on male hypopygial characters, but other features are used where possible. *V. viridis* is included in the key but is most probably not Neotropical.

1. First flagellomere about 3 times as long as basal width (Fig. 1b); IIF with a strong basoventral seta; IIIT with a posterior row of setae on distal half (in both sexes); large species with wing length more than 5 mm; hypopygium entirely black; cercus with a lateral fan of long setae (Fig. 1a); hypopygium (Fig. 1c) (*longicornis* group) ..... ***longicornis* spec. nov.**

- First flagellomere at most 1.5 times as long as basal width; IIF without a strong basoventral seta but sometimes with several short setulae; IIIT without distinct posterior row of setae; wing length usually less than 5 mm; other features various ..... 2
- 2. Thorax and abdomen dark metallic bronze-green; IIT with ad setae reduced or absent, if present then at most as long as diameter of tibia; abdominal segments 2 and 3 longer than succeeding segments, segment 2 narrow and downcurved (Fig. 2a); DSur with 2-3 flattened apical setae (Fig. 2b, 3); surstyli entirely or partially yellow (*bisetosa* group) ... 3
- Thorax bright metallic green; IIT with 2 strong ad setae which are usually longer than diameter of tibia; abdominal segments 2 and 3 not conspicuously longer than succeeding segments, segment 2 not narrower; DSur with one single flattened apical seta; surstyli varied in colour ..... 4
- 3. Abdominal segment 5 with a pair of long sinuous apicodorsal setae (Fig. 2a); VSur and DSur entirely yellow; IIIT without dorsal seta; first flagellomere about as long as basal width; hypopygium (Fig. 2b) ..... ***bisetosa* spec. nov.**
- Abdominal segment 5 without a pair of long sinuous setae; VSur dark brown, DSur yellow; IIIT with a dorsal seta at about middle; first flagellomere about 1.5 times as long as basal width; hypopygium (Fig. 3) ..... ***merzi* spec. nov.**
- 4. Cercus with very long adhesive lyre-like setae which are about twice as long as hypopygium (Fig. 27b); cercus brown with acute apical projection (Fig. 27a); DSur conspicuously longer than VSur; first flagellomere shorter than basal width; abdominal segment 5 without cuticular ventral projection; IIIT with a strong dorsal seta at 3/5 ..... ***amazonica* spec. nov.**
- Cercus with setae shorter than hypopygium; cercus usually white or yellow; other features various ..... 5
- 5. Left and right VSur symmetric distally (Fig. 28);  $It_4$  not flattened; sternum 8 with remarkable long pale setae; wing length less than 3 mm; VSur brown, with an incision; DSur yellow; cercus yellow and ovate with short setae; IIF with several striking basoventral setae; terga 1+2 yellow ..... ***minima* spec. nov.**
- Left and right VSur with asymmetric distal projection (Fig. 4, Fig. 25b);  $It_4$  usually flattened; sternum 8 without long pale setae; other features various ..... 6
- 6. VSur distally with a narrow curved or forceps-like projection (Fig. 4); cercus with white setae; abdominal segment 5 without distinct ventral cuticular projection; IIIT with a short pale dorsal seta at mid-length (*albignea* group) ..... 7
- VSur distally with a strong backcurved hook-shaped projection (Fig. 25b); cercus usually with conspicuous brown setae; abdominal segment 5 usually with a prominent ventral cuticular projection (Fig. 25c); setation of IIIT various (*viridis* group) ..... 10
- 7. VSur with a bifurcate distal projection; cercus with an apical flag of fused setae; VSur hyaline white ..... 8
- VSur with a narrow slightly bent distal projection, not bifurcate; cercus without apical flag of fused setae; VSur hyaline or dark brown ..... 9
- 8. Cercus with white apical flag of fused setae (Fig. 4); right VSur with dorsal and ventral lobes of bifurcate projection not equal in length; left VSur with flattened subapical setae ..... ***albignea* spec. nov.**
- Cercus with black apical flag of fused setae (Fig. 5); right VSur with dorsal and ventral lobes of bifurcate projection subequal in length; left VSur with normal apical setae ..... ***nigrisignea* spec. nov.**

9. VSur dark brown; cercus apically with long curved setae (Fig. 6); strong subapical seta on right VSur not flattened; IIF without dense ventral hairs on basal third; abdominal segments 4 and 5 without long ventral setae; first flagellomere distinctly shorter than basal width; wing length less than 3 mm ..... **rondinha spec. nov.**
- VSur hyaline yellowish; cercus apically with flattened fused setae each with a minute hair at tip (Fig. 7); strong subapical seta on right VSur strongly flattened; IIF with a cluster of dense ventral hairs on basal third; abdominal segments 4 and 5 with long pale ventral setae; first flagellomere as long as basal width; wing length more than 3 mm ...  
..... **subrondinha spec. nov.**
10. IF with dense pale hairs anterovantrally on basal 2/3 which are about 1/2 as long as diameter of femur; cercus U-shaped with strong apical setae; right VSur with a leaf-like seta, left VSur with a curved, apically furcate seta (Fig. 8) (eastern USA) .....  
..... **viridis VAN DUZEE**
- IF without dense pale hairs anteroventrally; other features various ..... **11**
11.  $It_{3+4}$  silvery-white, with white hairs; cercus apically bifurcate with two separated rows of brown setae of different lengths, setae of lateral row twice as long as setae of median row (Fig. 19); IIT with 2 strong ad and 1 strong pd setae ..... **argyrotarsis spec. nov.**
- $It_{3+4}$  not silvery-white ..... **12**
12. Surstyli entirely translucent yellow; cercus yellow, U-shaped, and strongly upcurved, with an apical digitiform lobe and with yellow setae (Fig. 26); VSur with dense setulae on distal rim; right VSur with a long beak-like appendage; abdominal segments 3-5 with long ventral hairs; postvertical setae and upper postocular setae black .....  
..... **flavipyga spec. nov.**
- Without this combination of characters; surstyli usually dark brown or hyaline white, if yellow then cercus short and ovate; cercus usually white or partially dark brown; VSur without dense setulae on distal rim; other features various ..... **13**
13. Apical setae on cercus forming an adhesive or coalescent triangular cluster (Fig. 23); cercus U-shaped and broadened apically ..... **14**
- Apical setae on cercus not forming an adhesive cluster; cercus not distinctly U-shaped and broadened apically ..... **16**
14. IIC and IIIC dark brown; adhesive cluster of setae on cercus black; mesonotum with a purplish-black lateral patch posteriad of mesonotal suture; cercus with a long digitiform lobe (Fig. 25a); IIT flattened dorsoventrally; ..... **magnifica spec. nov.**
- IIC and IIIC yellow; adhesive cluster of setae on cercus yellow; mesonotum without purplish-black patch; cercus without long digitiform lobe ..... **15**
15. VSur dark brown; IIF with ventral setae on basal 1/4; IIT with a short pd seta at 2/3 and not flattened dorsoventrally;  $It_4$  slightly flattened dorsoventrally; wing length more than 4 mm; cercus with three short apical lobes; left VSur with a pointed subapical seta (Fig. 24) ..... **mexicana spec. nov.**
- VSur hyaline white; IIF without ventral setae; IIT without pd seta but slightly flattened dorsoventrally;  $It_4$  not flattened dorsoventrally; wing length less than 4 mm; cercus without apical lobes; left VSur with a flattened subapical seta (Fig. 23) .... **cecilia spec. nov.**
16. Cercal apical setae distinctly longer than basal cercus, sometimes asymmetric on right cercus only; cercus often with a digitiform lobe ..... **17**
- Cercal apical setae at most as long as basal cercus; cercus without digitiform lobe **20**
17. Cercus with a digitiform lobe; IIT without pd seta; wing length usually less than 4 mm; cercal setation symmetric; other features various ..... **18**



- Cercus without digitiform lobe; IIT with a strong pd seta at 2/3; wing length more than 4 mm; cercal setation asymmetric: apical setae on right cercus twice as long as apical setae on left cercus (Fig. 18a, 18b); IIT dorsoventrally flattened ..... *puntarena spec. nov.*
- 18. Cercal apical setae about 4 times as long as basal cercus and basally fused (Fig. 22); digitiform cercal lobe about 1/4 the length of apical setae; VSur dark brown ..... *longiseta spec. nov.*
- Cercal apical setae about 2 times as long as basal cercus and not basally fused; digitiform cercal lobe about 1/2 the length of apical setae ..... 19
- 19. VSur dark brown; cercal apical setae dark brown; IIT slightly flattened dorsoventrally; abdominal segment 5 not visible; hypopygium (Fig. 20) ..... *costaricensis spec. nov.*
- VSur whitish hyaline; cercal apical setae golden-yellow; IIT not flattened dorsoventrally; abdominal segment 5 visible; hypopygium (Fig. 21) ... *panamensis spec. nov.*
- 20. Cerci conspicuously asymmetric: right cercus about twice as long as left cercus (Fig. 17a, 17b); right VSur with an expanded blade-like subapical seta; DSur whitish hyaline; postvertical setae long and brown ..... *asymmetrica spec. nov.*
- Cerci subequal in length; other features various ..... 21
- 21. Cercus small and ovate, not longer than basal width, with short pale setae ..... 22
- Cercus distinctly longer than basal width, with long brown apical setae ..... 24
- 22. Cercus with a short apical ovate lobe (Fig. 9, 10); surstyli entirely yellow ..... 23
- Cercus with a short apical digitiform projection (Fig. 11), surstyli brown; left VSur with a flattened, apically serrate seta; right VSur with a flattened leaf-like seta; IIIT without dorsal setae ..... *limona spec. nov.*
- 23. Left VSur with a strong upcurved seta; right VSur with a leaf-like, apically pointed and downcurved seta (Fig. 9); IIIT with a pale dorsal seta at 1/3; first flagellomere dark brown, 1.5 times as long as basal width ..... *beckeri spec. nov.*
- Left VSur with a straight apically flattened furcate seta; right VSur with a leaf-like elliptical seta (Fig. 10); IIIT without dorsal seta; first flagellomere entirely yellow, as long as basal width ..... *tinalandia spec. nov.*
- 24. Apical setae on cercus in one row, sometimes somewhat irregular, all setae about equal in length; IIT slightly flattened dorsoventrally ..... 25
- Apical setae on cercus in two distinctly separated rows (sometimes asymmetrically on left or on right cercus only), setae sometimes of different lengths; IIT usually not flattened ..... 26
- 25. Abdominal segment 5 with long ventral hairs which are about as long as epandrium; VSur dark brown, DSur hyaline white; hypopygium (Fig. 13) ..... *guana spec. nov.*
- Abdominal segment 5 without long ventral hairs; VSur and DSur dark brown; hypopygium (Fig. 12) ..... *thoracica VAN DUZEE*
- 26. Abdominal segment 4 with long ventral hairs; cercus with a row of 2 and a row of 7–9 flattened setae (Fig. 16); mesonotum with a purplish patch on area of mesonotal suture ..... *ponti spec. nov.*
- Abdominal segment 4 without long ventral hairs; cercus with two rows each consisting of 7–12 flattened setae; mesonotum without purplish patch on area of mesonotal suture ..... 27
- 27. Cercal setation asymmetric (left cercus with a row of long setae and a row of distinctly shorter setae, right cercus with two rows of long setae), cercus broadened and bilobate apically (Fig. 14); proximal section of vein CuA 4 times as long as distal section; postvertical setae black; mesonotum with ochreous pruinosity ... *papallacta spec. nov.*

- Cercal setation symmetric, cercus triangular and tapering apically (Fig. 15); proximal section of vein CuA 2.5 times as long as distal section; postvertical setae yellow; mesonotum with whitish pruinosity ..... *teutonia spec. nov.*

### The *longicornis* Group

The *longicornis* species-group consists of one species and is defined by the following characters: male first flagellomere greatly elongated, 3 times as long as basal width; male eyes separated on face; costa of wing slightly swollen in both sexes; IIIT with a posterior row of strong setae on distal half in both sexes; crossvein dm-cu as long as distal section of CuA; abdominal segment 2 flattened dorsoventrally, narrower than other segments and curved, with a ventrolateral cuticular fold; male abdominal segment 5 without ventral cuticular projection; hypopygium entirely black; cercus with a lateral fan of long setae; large species with wing length 6–7 mm.

**Remarks:** The *longicornis* group and the *bisetosa* group are known from South-West Chile and have synapomorphies such as the abdominal shape and the hypopygial features which indicate that they are probable sister-groups.

#### *Viridigona longicornis spec. nov.*

(Fig. 1a-c)

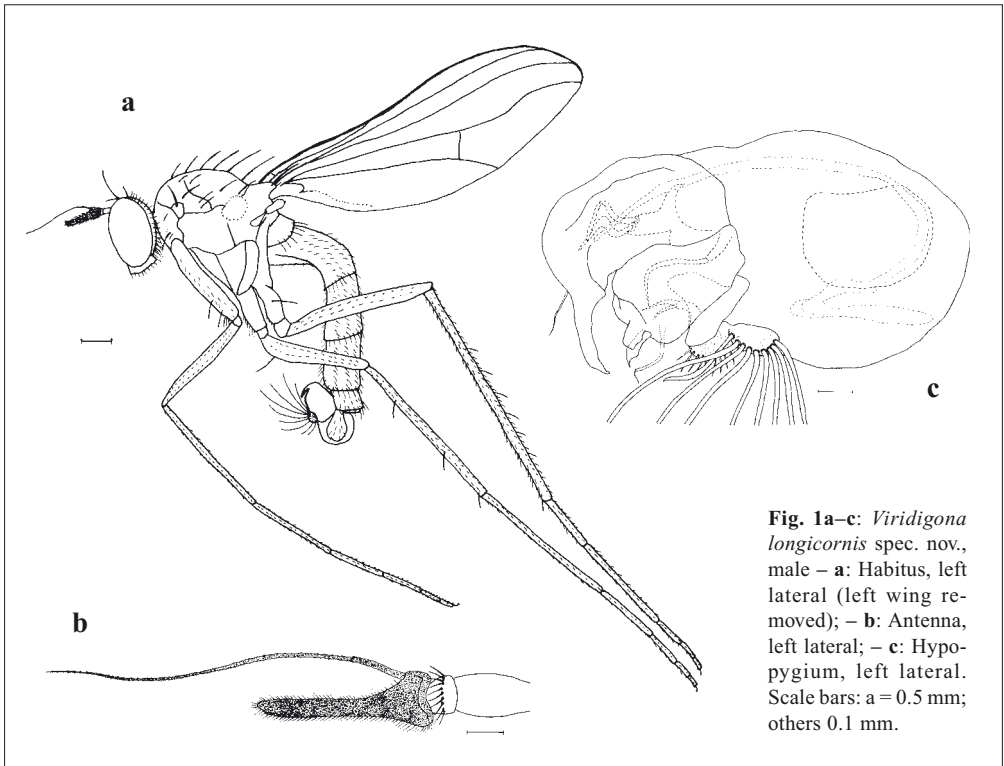
**Material:** Holotype male: CHILE: Dalcahue, Isla Chiloe, Chiloe Chile, 17–31. I. 62, PENA. [CNC]. Paratypes: 1 male: same data, but 1–8. II.62. 1 female: same data. [all CNC].

### Description

**Male.** Length: holotype: body length 7.1 mm, wing length 6.1 mm; thorax 2.13 mm, abdomen (segments 1–6) 3.93 mm. Habitus (Fig. 1a).

**Head:** Frons metallic green with bronze reflections and with greyish pruinosity especially along eye margins; occiput metallic green with greyish pruinosity; with a pair of black vertical setae, a pair of long black diverging ocellar setae 2.5 times as long as verticals, and a pair of black postvertical setae as long as verticals. Postocular setae short, pale yellow. Eyes very close on face but distinctly separated; narrowest distance on face about 1/3 the distance between ocellar setae. Face and clypeus with dense greyish-white pruinosity. Palp ovate, yellow, with 2–3 short yellow apical setae and yellow hairs; proboscis yellow, with yellow hairs. Antenna: scape slightly elongated, yellow and bare; pedicel yellow, globose, truncate with first flagellomere, with a cirlet of short brown setae; first flagellomere (Fig. 1b) remarkably elongated, about 3 times as long as basal width (MSSC), dark brown; arista almost basal, bare, about 2 times as long as first flagellomere. Ratio narrowest/widest distance between eyes on frons 37/48; ratio narrowest/widest distance between eyes on face: 3/17; ratio narrowest/widest distance between eyes on clypeus: 9/15.

**Thorax:** Mesonotum, scutellum, and postnotum metallic green with blue and violet reflections, and with weak greyish-white pruinosity. Pleura concolorous with mesonotum but with more dense pruinosity. All thoracic setae black except as noted: ac with 2 rows of 10–12 short setulae ending at mesonotal depression, about 2 times as long as the distance between rows; dc comprising 6 strong setae, decreasing in size anteriorly. Additional strong black setae include: 1 pa, 2 sa, 2 sr, 2 np, 1 hm, and 1 pm. Scutellum with 2 strong median scutellar setae, laterals present as tiny hairs. Proepisternum below with 1 strong, long, and 2–3 small pale setae, and above with 1 small yellow seta. **Legs:** All legs yellow, IIC and IIIC darkened anterolaterally, IIIF and IIIIt slightly infuscated; setae on legs including coxae black, except as noted. **I:** IC with some strong yellow apical anterior setae, and with 2 strong yellowish-brown anterolateral setae; It<sub>4</sub> slightly broadened and flattened dorsoventrally, with a velvety yellow pubescence ventrally (MSSC); It<sub>5</sub> also with a yellow velvety pubescence. **II:** IIC with several yellow anterior setae; trochanter with a small seta; IIF with a strong black ventral seta at 1/5 (MSSC), and with a row of small av spine-like setulae opposite the strong seta; IIT slightly flattened dorsoventrally



**Fig. 1a–c:** *Viridigona longicornis* spec. nov., male – **a:** Habitus, left lateral (left wing removed); – **b:** Antenna, left lateral; – **c:** Hypopygium, left lateral. Scale bars: a = 0.5 mm; others 0.1 mm.

(MSSC), with strong ad setae at 1/4 and 2/3, and with 2 strong apical setae. **III:** IIIC with a strong black lateral seta at 1/3, surrounded by several short white hairs; IIIT slightly broadened apically, with a row of 6–8 short dorsal setae, a stronger curved dorsal seta at about middle, with a row of short posterior setae on apical half; with 3 black and 1 yellow apical setae. Relative podomere ratios: I: 44, 54, 45/27/15/9/8; II: 49, 79, 65/27/15/8/5; III: 64, 108, 26/45/19/11/6. **Wing:** Hyaline, with a brownish tinge; costa slightly swollen;  $R_{2+3}$  straight to wing margin;  $R_{4+5}$  curved posteriad from distal 3/4 towards M; M with a flexion at 1/3 between crossvein dm-cu and apex, becoming straight and subparallel with  $R_{4+5}$  towards wing margin;  $R_{4+5}$  joining wing margin anteriad, and M posteriad of apex; crossvein dm-cu about 1.5 times as long as distance between  $R_{4+5}$  and M at wing apex, and 1.0 times as long as distal section of CuA; A distinct and not reaching wing margin. Lower calypter yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Greatly elongated, about twice as long as thorax; dorsal setae and hairs black, lateral and ventral setae and hairs pale yellow; terga 1–5 metallic bronze-green; tergum 1 with a yellow lateral patch; tergum 2 with a yellow anterolateral patch and a yellow posteromarginal band. Segment 2 slightly flattened dorsoventrally, narrower than other segments and downcurved, with a ventrolateral cuticular fold; segment 5 without cuticular ventral projection. Sternum 8 somewhat bulging outwards, dark brown with pale setae. Epandrium, surstylar lobes, and cercus dark brown-black, cercal setae yellowish-brown. Hypopygium (Fig. 1c): epandrium large and globular, hypandrium short and broad, basally fused to epandrium and distal 1/2 free; MEp tapering and narrow, bearing a long apical seta; LEp longer, sinuous, with a short subapical seta; VSur rectangular, arching distad of DSur, bearing a long seta; DSur short, with an apical blade-like seta, and a long curved slender seta; cercus short and rounded, with a lateral ovate lobe bearing very long sinuate setae which are about as long as entire hypopygium.

**Female:** Similar to male but without MSSC and as noted: First flagellomere short, pointed-triangular, about as long as wide; face broader, distance between eyes equal to distance between ocellar

setae; posteriormost postoculars darkened; IIT with 1 strong av and 3 weaker pv setae; abdomen metallic bronze, tergum 1 largely yellow, terga 2–3 with narrow yellow posterior band.

**Distribution:** South-West Chile (Isla Chiloe).

**Etymology:** The name refers to the conspicuously elongate first flagellomere in males.

**Remarks.** The remarkable elongation of the first flagellomere in males is a distinct and unique character within *Viridigona*.

### The *bisetosa* Group

The *bisetosa* species-group is characterized by the following features: surstylus entirely or partially yellow; cercus short, with short pale setae; colouration of thorax and abdomen dark metallic bronze-green; setae on IIT greatly reduced or lost; male abdominal segments 2 and 3 conspicuously longer than succeeding segments and segment 2 narrower than succeeding segments and downcurved; male eyes separated on face; male abdominal segment 5 without ventral cuticular projection.

#### *Viridigona bisetosa* spec. nov.

(Fig. 2a–b)

**Material:** **Holotype** male: CHILE: Estero la Jaula, Curico, Chile, I.1964, L. PENA, *Nothofagus*. [CNC]. **Paratypes:** CHILE: 12 males: same data. 11 males, 1 female: Chile, Cautin, los Colques, L. Villarica, N., 16–25.I.65, PENA. 9 males, 1 female: El Coigula, Curico, Chile, 20–26.I.64, PENA. 8 males: Rio Blanco, Malleco, Chile, II.1964, PENA, 1100–2000 m. 1 male: Dalcahue, Isla Chiloe, Chiloe, Chile, 1–8.II.62, PENA. 1 female: same data, but 17–22.I.62. 1 female: same data, but 17–31.I.62. [all CNC]. **Additional material:** 1 male: Dalcahue, I. Chiloe, Chile, I. 1962, L.E. PENA. 2 males: 30 km N. de Villarica, Cautin, Chile, 12.II.1964, T. CEKALOVIC. [MZSP]. 1 male: Chile, Nuble Prov., Las Trancas, rd. nr., Termas de Chillan, 1270–1350 m, 36° 54' S - 71° 31' W, 15.II.1967, E. I. SCHLINGER. 4 males: same data, but 28.I.1967. 1 male: same data, but 29.I.1967, Malaise. [CAS].

### Description.

**Male.** Length: holotype: body length 4.3 mm, wing length 3.7 mm; thorax 1.31 mm, abdomen (segments 1–6) 2.53 mm; male body length variation: 3.8–4.8 mm. Habitus (Fig. 2a).

**Head:** Frons metallic green with bronze reflections and with greyish-white pruinosity; with a pair of brown short vertical setae, a pair of long black diverging ocellar setae 2.5 as long as verticals, and a pair of pale postvertical setae as long as verticals. Postocular setae pale yellow; ventral postcranium with some long pale yellow setae below. Eyes close together on face but distinctly separated; narrowest distance on face about 1/3 the distance between ocellar setae. Face and clypeus with dense greyish-white pruinosity. Palp ovate and whitish-yellow, with 2 short pale apical setae and white hairs; proboscis yellow, with yellow hairs. Antenna: scape slightly elongated, yellow and bare; pedicel yellow, globose, truncate with first flagellomere, with a cirlet of short brown setae; first flagellomere rounded-triangular, dark brown, with a narrow yellow basal stripe, bearing fine hairs, about 1.0 times as long as basal width; arista dorsal and almost basal, with microscopic pubescence, about 6 times as long as first flagellomere. Ratio narrowest/widest distance between eyes on frons: 23/36; ratio narrowest/widest distance between eyes on face: 4/14; ratio narrowest/widest distance between eyes on clypeus: 6/12.

**Thorax:** Mesonotum, scutellum, and postnotum metallic bronze-green with weak greyish-white pruinosity. Pleura concolorous with mesonotum but with more dense greyish-white pruinosity; metepimeron yellow. All thoracic setae black with brownish reflections except as noted: ac with 2 rows of 10–12 short setulae ending at mesonotal depression, posterior setae about 1.5 times as long as distance between rows; dc comprising 6 strong setae, decreasing in size anteriorly. Additional strong setae include: 1 pa, 2 sa, 2 sr, 2 np, 1 hm, and 1 pm. Scutellum with 2 strong median scutellar setae, laterals present as tiny hairs. Proepisternum below with 1 strong pale seta, and above with 1 small pale seta. **Legs:** All legs yellow, IIC slightly darkened anteriorly; setae on legs including coxae brownish-black, except as noted. I: IC with some apical anterior setae, and with 2 strong yellowish-brown

anterolateral setae;  $It_4$  and  $It_5$  slightly flattened dorsoventrally,  $It_4$  with a velvety yellow pubescence ventrally (MSSC). **II:** IIC with several brownish-yellow anterior setae; trochanter with a small seta; IIF with a basoventral row of 3–5 short erect setae (MSSC); IIT slightly flattened dorsoventrally (MSSC), with 1 small ad seta at 3/4, and with 3–4 small apical setae. **III:** IIIC with a strong lateral seta at 1/3, varying from dark brown to yellow; IIIT with an irregular row of short dorsal setulae, and 4–5 small apical setae. Relative podomere ratios: I: 34, 39, 26/20/11/5/5; II: 34, 63, 56/23/11/5/3; III: 52, 84, 19/36/14/8/4. **Wing:** Hyaline, with a yellowish tinge;  $R_{2+3}$  slightly curved posteriad before wing margin;  $R_{4+5}$  curved posteriad distally toward M; M with a flexion at 1/2 between crossvein dm-cu and apex, and subparallel with  $R_{4+5}$ ;  $R_{4+5}$  joining wing margin anteriorly and M posteriad of apex; crossvein dm-cu about 1.6 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.6 times as long as distal section of CuA; A present only as a trace on membrane and almost reaching wing margin. Lower calypter pale yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Strongly elongated, more than twice as long as thorax; setae and hairs black with brown reflections. Terga 1–6 metallic bronze-green; tergum 1 largely yellow; tergum 2 with a yellow distolateral patch and a yellow marginal band; tergum 3 with a narrow distomarginal band; segment 2 slightly flattened dorsoventrally, narrower than other segments and downcurved, with a cuticular fold ventrolaterally; segment 5 with a pair of long sinuate dorsoapical setae (MSSC), and with a pair of short ventral ovate cuticular processes for partially hiding the hypopygium at rest; sternum 8 somewhat bulging outwards, dark brown with pale setae. Epandrium dark brown, surstyli entirely pale yellow, cercus brown with pale setae. Hypopygium (Fig. 2b): epandrium large and globular, hypandrium elongate and narrow, basally fused to epandrium and distal 1/2 free; MEp narrow and tapering, bearing a long apical seta; LEp broad and ovate, with two strong setae on distal part and with an apical spine; VSur rectangular, arching distad of DSur, apically pointed, and bearing an apical and subapical flattened seta; DSur short and ovate, with two leaf-like and a normal apical setae; cercus short and rounded, with a posterior triangular lobe and long setae.

**Female:** Similar to male but without MSSC and as noted: Face distinctly broader, distance between eyes as wide as distance between ocellar setae; IIT with strong ad setae at 1/3 and 2/3, and with 2–3 pv setae. Tergum 1 entirely yellow; terga 2–4 with a broad yellow apical band.

**Distribution:** Central and South-West Chile.

**Etymology:** The name *bisetosa* refers to the striking pair of long sinuate setae on the fifth abdominal segment in males.

**Remarks.** *V. bisetosa* is closely related to *V. merzi* but can be differentiated by the characters given in the key. Females of *V. bisetosa* are quite similar to females of *V. merzi*, but can be identified by the lack of a distinct dorsal seta on IIIT and by the broad yellow apical band on terga 2–4.

### *Viridigona merzi* spec. nov.

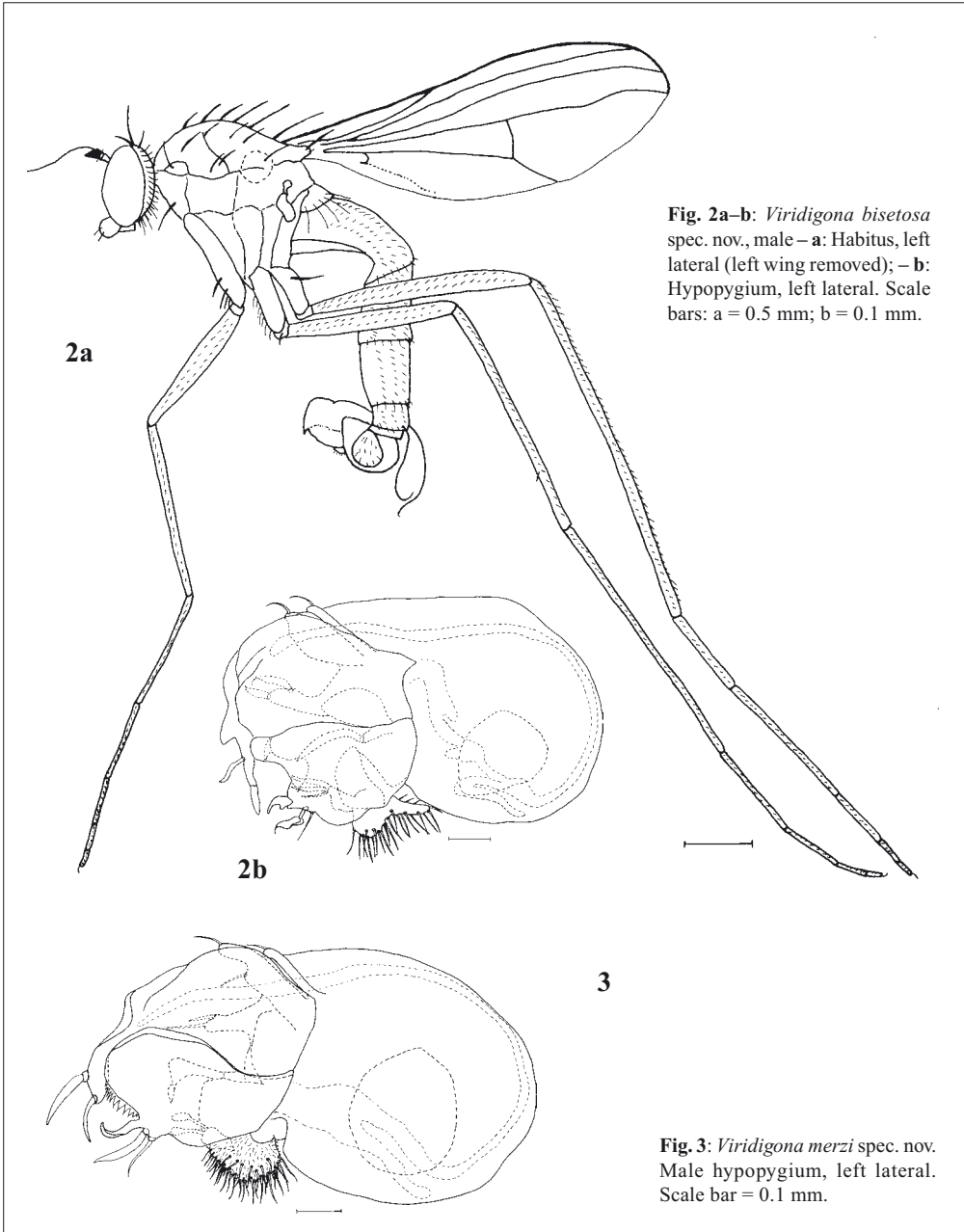
(Fig. 3)

**Material:** **Holotype** male: CHILE: Rio Blanco, Malleco, Chile, II.1964, PENA, 1100–2000 m. [CNC]. **Paratypes:** CHILE: 1 male, 2 females: Rio Maniguales, 72° 30' W, 45° 25' S, Aysen, Chile, 26–28.I.61, PENA. 1 male: Chile, Cautin, Los Colgues, L. Villar., 1965, PENA, 1–15. Jan. 1 female same data, but 16–25.I.65. 1 male: Chile, Linares, Fundo Malcho, 11–21.XI.1965, L. E. PENA. 1 male: Ensenada, Chile, Llanquihue, 13–15.I.62, PENA. 1 male: Dalcahue, Isla Chiloe, Chiloe, Chile, 1–8.II.62, PENA. 1 male, 1 female: same data, but 17–22.I.62. 1 female same data, but 17–31.I.62. 1 male: Estero la Jaula, Curico, Chile, I. 1964, L. PENA, *Nothofagus*. [all CNC]. **Additional material** CHILE: 1 male: Chile, 20 km E. of Temuco, Cautin, 1-8-51 / ROSS and MICHELBACHER Collectors [CAS]. ARGENTINA: 1 male: Bariloche, Rio Negro, Agr [Arg?], Nov 1926, R. & E. SHANNON [USNM].

### Description

**Male.** Length: holotype: body length 4.2 mm, wing length 4.3 mm; thorax 1.65 mm, abdomen (segments 1–6) 2.1 mm; male body length variation: 3.4–4.3 mm.

**Head:** With a pair of short black vertical setae, a pair of long black diverging ocellar setae 3.0 times as long as verticals, and a pair of black postvertical setae as long as verticals; eyes almost touching, narrowest distance on face about 1/5 the distance between ocellar setae; pedicel with a circlet of short



**Fig. 2a–b:** *Viridigona bisetosa* spec. nov., male – **a:** Habitus, left lateral (left wing removed); – **b:** Hypopygium, left lateral. Scale bars: a = 0.5 mm; b = 0.1 mm.

**Fig. 3:** *Viridigona merzi* spec. nov. Male hypopygium, left lateral. Scale bar = 0.1 mm.

black setae; first flagellomere rounded-triangular, entirely dark brown, about 1.5 times as long as basal width; arista about 4 times as long as first flagellomere.

**Thorax:** Mesonotum, scutellum, and postnotum metallic bronze-green with purplish reflections on dorsum and with weak greyish-white pruinosity, more densely on mesonotal depression; ac length of posterior setae about 2 times the distance between rows. **Legs:** Yellow, IIC and IIIC slightly darkened anteriorly, IIIF and IIIT sometimes slightly infuscated; IC with some yellow apical anterior setae, and with 2 strong yellow anterolateral setae; It<sub>4+5</sub> slightly flattened dorsoventrally, It<sub>4</sub> with a velvety

yellow pubescence ventrally (MSSC); IIF with a basoventral row of 2-5 short erect setae (MSSC); IIT slightly flattened dorsoventrally (MSSC), with small ad setae at 1/5 and 2/3, and apically; IIIT with a curved black dorsal seta at about middle in addition to several short dorsal setulae. Relative podomere ratios: I: 44, 52, 35/24/14/8/6; II: 46, 70, 51/26/15/8/5; III: 60, 89, 22/39/19/11/5. **Wing:** crossvein dm-cu about 1.3 times as long as distance between  $R_{4+5}$  and M at wing apex, and 0.7 times as long as distal section of CuA; lower calypter pale yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Distinctly longer than thorax, but not as long as in *V. bisetosa*; setae and hairs mostly brownish-yellow. Terga 1–6 metallic bronze-green; tergum 1 yellow laterally; tergum 2 sometimes with a small yellow lateral patch (variable). Segment 2 slightly flattened dorsoventrally, narrower than other segments and downcurved, with a cuticular fold ventrolaterally. Segment 5 with a pair of short ventral ovate cuticular processes for partially hiding the hypopygium at rest. Sternum 8 somewhat bulging outwards, brown with a yellow margin and pale setae. Epandrium dark brown, VSUR dark brown, DSUR pale yellow, cercus yellow with pale setae. Hypopygium (Fig. 3): epandrium large and globular, hypandrium elongate and narrow, basally fused to epandrium and distal 1/2 free; MEp very slender and elongate, with a long apical seta; LEp basally broad and narrowed distally, with a short apical and subapical seta, and with a slender digitiform projection similar to the MEp bearing a long apical seta; VSUR rectangular, strongly arching distad of DSUR, apically tapering, bearing a strong flattened subapical and a curved apical seta; DSUR ovate, with a serrate distal border and with two flattened setae and a strong normal seta apically; cercus short and rounded with long setae.

**Female:** Similar to male but without MSSC and as noted: Face distinctly broader, distance between eyes as wide as distance between ocellar setae; IIT with 2–3 pv setae. Tergum 1 with a yellow patch; terga 2 and 3 with a narrow yellowish apical band.

**Distribution:** Central and South-West Chile, Argentina.

**Etymology:** The species is dedicated to Bernhard MERZ (Geneva) who has supported me in many ways over the years.

**Remarks:** Females of *V. merzi* are quite similar to females of *V. bisetosa*, but can be identified by the presence of a distinct dorsal seta on IIIT, and by the darker abdomen with only terga 2 and 3 having a narrow yellow apical band.

### The *albisigna* Group

The *albisigna* species-group is characterized by the following features: VSUR with an asymmetric narrow curved or forceps-like distal projection; cerci elongated and symmetric, white with white setae; IIIT with a short pale dorsal seta; male eyes contiguous on face; abdominal segment 5 without ventral cuticular projection.

#### *Viridigona albisigna* spec. nov.

(Fig. 4)

**Material:** **Holotype** male: PERU: Quincemil, Cuzco Peru, 13–31.VIII. '62, L. PENA, 780 m. [CNC]. **Paratypes:** PERU: 6 males: same data. 5 males: same data, but 1–15.VIII. 5 males: same data, but 15–30.X. 3 males: Avipas, Madre de Dios, Peru, 1–15.X.1962, L. PENA, 400 m. 1 male: same data, but 10–20.IX. [all CNC]. **Additional material:** VENEZUELA: 2 males: Venezuela, T. F. Amaz., Cerro de la Niblina, 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].

### Description

**Male.** Length: holotype: body length 2.6 mm, wing length 2.8 mm; thorax 1.17 mm, abdomen (segments 1–6) 1.35 mm; male body length variation: 2.3–3.2 mm.

**Head:** Frons and occiput metallic green with weak greyish pruinosity; with a pair of black vertical setae, a pair of long black diverging ocellar setae 1.5 times as long as verticals and with a posterior pair of tiny setae, and a pair of short black postvertical setae 0.5 times as long as verticals. Postocular setae pale yellow, uppermost seta 1.5 times as long as succeeding setae, uppermost 2–3 setae black; ventral postcranium with some pale setae below. Eyes contiguous on face. Face and clypeus very narrow with dense

greyish-white pruinosity. Palp ovate and yellow, with 2 short brown apical setae and brown hairs; proboscis brownish-yellow, with yellow hairs. Antenna: scape short and yellow; pedicel yellow and truncate with first flagellomere, with a circlet of short black setae; first flagellomere rounded-triangular, yellow, apical half brown, as long as basal width; arista dorsal, with short pubescence, about 8 times as long as first flagellomere. Ratio narrowest/widest distance between eyes on frons: 27/39; ratio narrowest/widest distance between eyes on face: 0/8; ratio narrowest/widest distance between eyes on clypeus: 4/6.

**Thorax:** Mesonotum, scutellum, and postnotum metallic green with blue and bronze reflections, with weak greyish pruinosity; mesonotal depression and scutellum with golden reflections. Pleura dark metallic green with dense greyish pruinosity; metepimeron yellow. Thoracic setae black except as noted: ac with 2 rows of 10–12 short setulae, length of posterior setae about 2 times as long as distance between rows; dc comprising 6 strong setae, decreasing in size anteriorly. Additional strong setae include: 1 pa, 2 sa, 2 sr, 2 np, 1 hm, and 1 pm. Scutellum with 2 strong median scutellar setae, laterals short, about 1/5 as long as medians. Proepisternum with 1 strong pale seta below. **Legs:** All legs yellow,  $It_1$  and IIC slightly infuscated anteriorly; setae on legs including coxae brownish-black. **I:** IC with some apical anterior setae and with 2 strong anterolateral setae;  $It_{4+5}$  slightly flattened dorsoventrally,  $It_4$  with a velvety yellow pubescence ventrally (MSSC). **II:** IIC with several anterior setae; trochanter with a strong and a smaller setae; IIT with strong ad setae at 1/4 and 2/3, and with 2 strong apical setae. **III:** IIIC with a strong lateral seta; trochanter with a strong seta; IIIT with a short pale dorsal seta before mid-length, and 2 small apical setae. Relative podomere ratios: I: 42, 51, 35/22/12/9/4; II: 47, 64, 56/27/15/6/4; III: 56, 88, 23/38/18/12/5. **Wing:** Hyaline, with a greyish tinge;  $R_{2+3}$  running straight towards wing margin;  $R_{4+5}$  curved posteriad distally towards M; M with weak flexion at middle between crossvein dm-cu and apex, and subparallel with  $R_{4+5}$ ;  $R_{4+5}$  joining wing margin anteriorly and M posteriad of apex; crossvein dm-cu about 1.2 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; A weak and not reaching wing margin. Lower calypter pale yellow with a fan of brown-golden setae; haltere yellow. **Abdomen:** All setae and hairs black with brown reflections. Tergum 1 yellow; terga 2–5 dark metallic green with bronze reflections, but tergum 2 with a yellow lateral patch; sternum 8 dark brown. Epanandrium dark brown, VSUR hyaline white, DSUR dark brown; cercus white with white setae and a white apical flag. Hypopygium (Fig. 4): epanandrium large and globular, hypandrium broad and apically pointed; MEp short with a long strong apical seta; LEp ovate with an apical and subapical seta; left VSUR with a narrow curved projection bearing 3 flattened setae at mid-length, subapically and apically; right VSUR with a forceps-like projection which has a long dorsal lobe and a shorter ventral lobe, each lobe with a strong flattened apical seta; cercus elongate with a lateral row of strong curved setae and a striking white apical flag of fused setae.

**Female:** Unknown.

**Distribution:** Peru, Venezuela.

**Etymology:** The name refers to the white apical flag on the cercus.

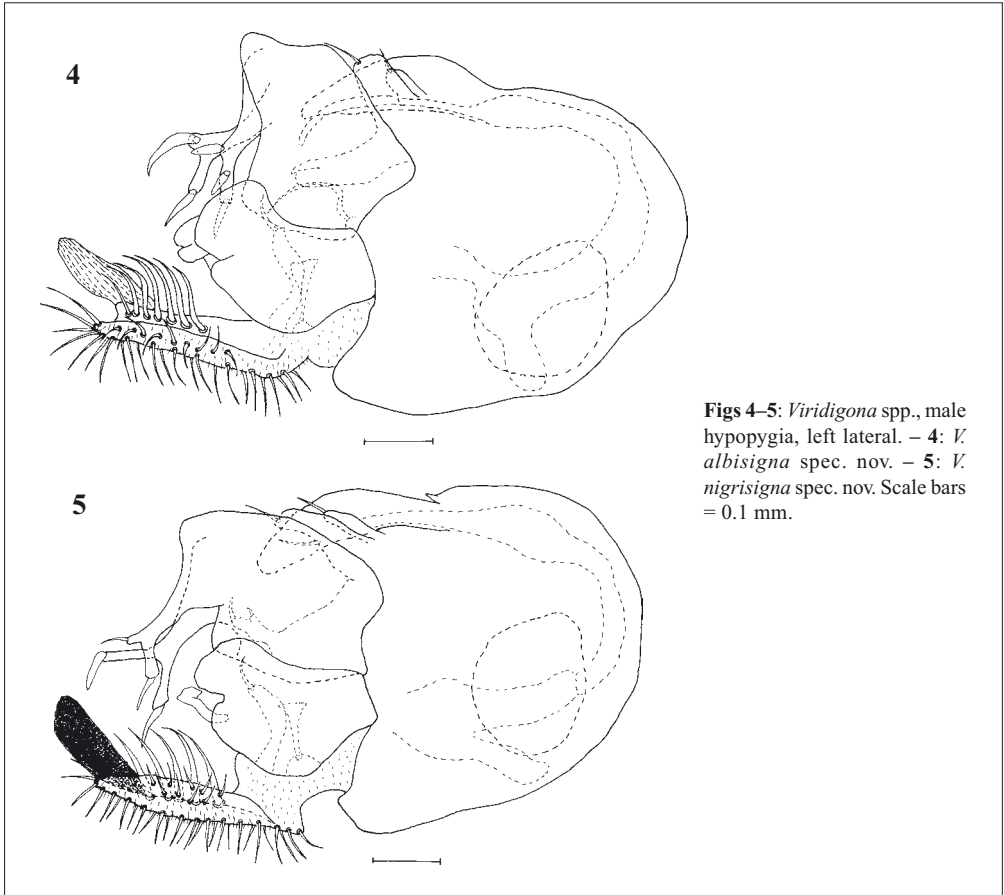
**Remarks.** *V. albisigna* is very similar to *V. nigrisigna*. Both species are probably sister-species and can be separated by the genitalic characters given in the key. *V. albisigna* is distributed in the northern part of South America (Peru, Venezuela), whereas *V. nigrisigna* has its distribution in Central America (Panama, Costa Rica).

### *Viridigona nigrisigna* spec. nov.

(Fig. 5)

**Material:** **Holotype** male PANAMA: Panama, Canal Zone, Barro Colorado Isl., 17 June 1978, SILBERGLIED/AIELLO. [USNM]. **Paratypes:** PANAMA: 2 males: same data [USNM]. **Additional material:** COSTA RICA: 1 male: Est. Hitoy Cerere, 100 m, R. Cerere, Res. Biol. Hitoy Cerere, Prov. Limon, Costa Rica, G. CARBALLO, 27–13 abr 1992, L-N 184200,643300. 3 males: same data but Jul 1992, Oct 1992, Nov 1992. 1 male: Valle La Estrella, R. B. Hitoy Cerere, A.C. Amistad, Prov. Limon, Costa Rica, 100–200 m. Ene 1994, G. CARBALLO, L N 184600\_643400 # 2575. 1 male: Costa Rica, Hitoy Cerere, A. C. Amistad, Prov. Limon, LN 18466\_64300, #2418, 100–200 m, 30.vii.–26.viii. 1996, malaise, G. CARBALLO. [all INBio].





**Figs 4–5:** *Viridigona* spp., male hypopygia, left lateral. – 4: *V. albisigna* spec. nov. – 5: *V. nigrisigna* spec. nov. Scale bars = 0.1 mm.

## Description

**Male.** Length: holotype: body length 2.5 mm, wing length 2.4 mm; thorax 1.05 mm, abdomen (segments 1–6) 1.26 mm; male body length variation: 2.5–2.7 mm.

**Head:** Postvertical setae black and 0.7 times as long as verticals; uppermost postocular setae black; first flagellomere as long as basal width, yellow with apical half brown; arista about 8 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with blue and bronze reflections and with greyish pruinosity; pleura with more dense greyish pruinosity; ac with posterior pair 2 times as long as distance between rows. **Legs:** It<sub>4+5</sub> slightly flattened (MSSC); IIT with strong ad setae at 1/4 and 2/3; IIIT with a short pale dorsal seta before middle. Relative podomere ratios: I: 49, 55, 42/25/13/7/5; II: 57, 70, 65/31/17/8/5; III: 65, 98, 28/43/21/12/5. **Wing:** Crossvein dm-cu about 1.1 times as long as distance between R<sub>4+5</sub> and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter pale yellow with a fan of brown setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 dark metallic green with bronze and blue reflections, tergum 2 with a yellow lateral patch; tergum 5 without distinct ventral cuticular projection; sternum 8 dark brown. Epandrium dark brown, VSUR hyaline white, DSUR dark brown; cercus white with white setae and a black apical flag. Hypopygium (Fig. 5): epandrium large and globular, hypandrium broad and apically pointed; MEp short with a long strong apical seta; LEp ovate with an apical and subapical seta; left VSUR with a narrow forceps-like projection which has a long dorsal lobe and a shorter ventral lobe, each lobe with an apical seta; right VSUR also with a forceps-like projection which has

dorsal and ventral lobes subequal in length, each lobe with a strong flattened apical seta; DSur ovate with a long flattened and blunt apical seta; cercus greatly elongated with a lateral row of strong curved setae and a striking black apical flag of fused setae.

**Female:** Unknown.

**Distribution:** Panama, Costa Rica.

**Etymology:** The name refers to the black apical flag on the cercus.

**Remarks:** See comments under *V. albisigna*.

***Viridigona rondinha spec. nov.***

(Fig. 6)

**Material:** **Holotype** male BRAZIL: Dep. Rondinha, Rio Guapore, opp. mouth of Rio Baures, Bolivia, September 23, 1964, BOUSEMAN and LUSSENHOP. [AMNH]. **Paratypes:** BRAZIL: 2 males: same data [AMNH]. **Additional material:** BOLIVIA: 1 male: Beni, Rio Itenez, at mouth of Rio Baures, IX.25–X.7.1964. [AMNH].

**Description**

**Male.** Length: holotype: body length 2.85 mm, wing length 2.6 mm; thorax 1.08 mm, abdomen (segments 1–6) 1.56 mm; male body length variation: 2.6–2.8 mm.

**Head:** Postvertical setae brown and 0.6 times as long as verticals; uppermost postocular setae brown; first flagellomere reniform and very short, shorter than basal width, yellow with apical half infuscated; arista about 11 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with blue and bronze reflections and with weak greyish pruinosity; pleura with more dense greyish pruinosity; ac with posterior pair 2 times as long as distance between rows. **Legs:** IC with brown apical and 2 anterolateral setae; It<sub>4+5</sub> slightly flattened (MSSC); IIT with strong ad setae at 1/4 and 2/3; IIIT with a short pale dorsal seta before middle, and 3 black apical setae. Relative podomere ratios: I: 42, 47, 31/20/11/6/4; II: 48, 58, 54/25/14/7/4; III: 56, 84, 22/38/19/12/5. **Wing:** Crossvein dm-cu about 1.1 times as long as distance between R<sub>4+5</sub> and M at wing margin, and 0.4 times as long as distal section of CuA; lower calypter pale yellow with a fan of brown setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2-5 dark metallic green with bronze and blue reflections; tergum 2 with a yellow lateral patch; tergum 5 without distinct ventral cuticular projection; sternum 8 dark brown. Epandrium dark brown, VSUR and DSUR dark brown; cercus white with white setae. Hypopygium (Fig. 6): epandrium large and globular, hypandrium long and narrow, tapering; MEp digitiform with a strong flattened blade-like apical seta; LEp ovate with 2 short subapical setae; left VSUR with a narrow curved projection which has a short flattened seta at mid-length and subapically, and a flattened blade-like seta apically; right VSUR with a narrow curved projection bearing a strong curved subapical seta and 2 short flattened apical setae; DSUR ovate with a long flattened, blunt and slightly curved apical seta; cercus elongated with a lateral row of strong curved setae, and a median lobe bearing long curved apical setae.

**Female:** Unknown.

**Distribution:** Brazil, Bolivia.

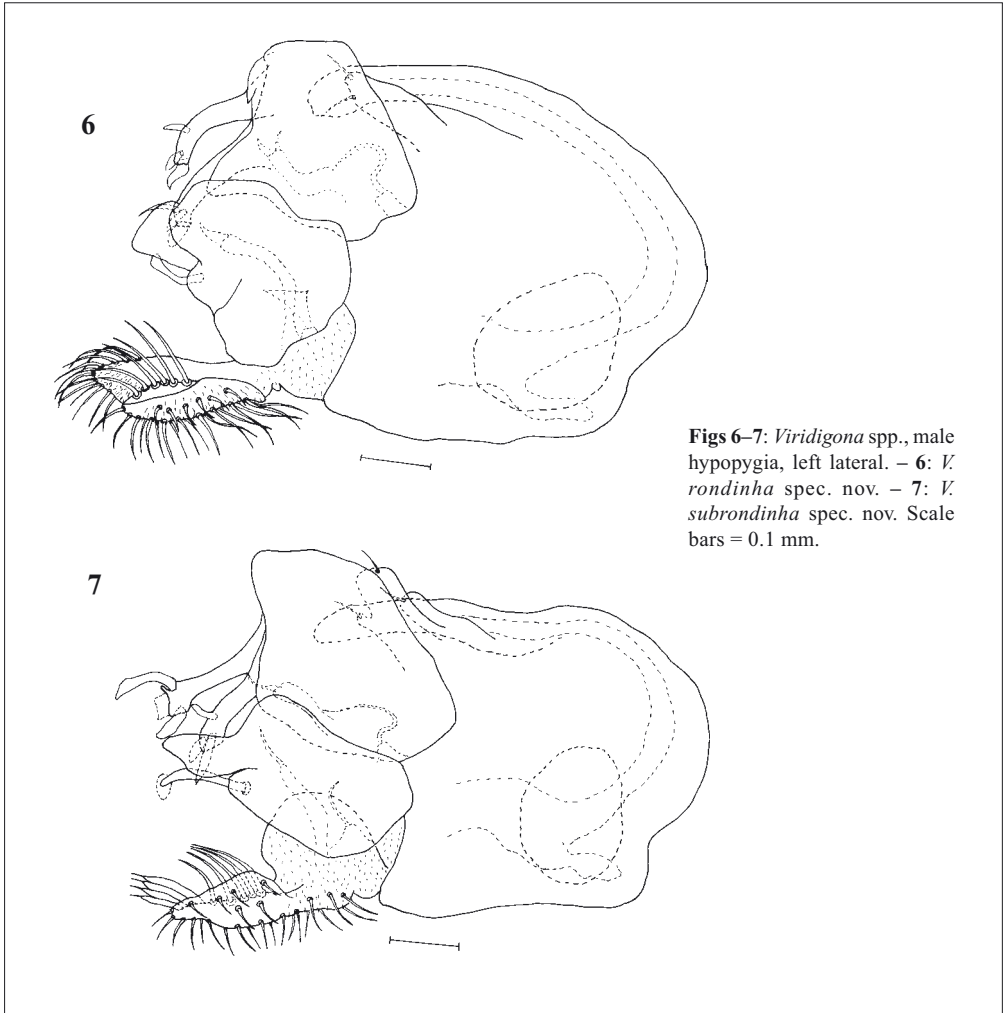
**Etymology:** The name refers to the collecting site.

**Remarks:** *V. rondinha* and *V. subrondinha* are closely related according to their hypopygial characters, but can be distinguished by the characters given in the key. They are probably sister-species.

***Viridigona subrondinha spec. nov.***

(Fig. 7)

**Material:** **Holotype** male BRAZIL: Nova Teutonia, 27°11' S, 52°23' W, Brazil, 300–500 m, 16.X.1962, Fritz PLAUMANN. [CNC].



**Figs 6–7:** *Viridigona* spp., male hypopygia, left lateral. – 6: *V. rondinha* spec. nov. – 7: *V. subrondinha* spec. nov. Scale bars = 0.1 mm.

### Description

**Male.** Length: holotype: body length 3.5 mm, wing length 3.2 mm; thorax 1.26 mm, abdomen (segments 1–6) 2.4 mm.

**Head:** Postvertical setae brown and 0.7 times as long as verticals; uppermost postocular setae brown; first flagellomere triangular and as long as basal width, dark brown with a narrow yellow basal stripe; arista about 7 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with bronze and golden reflections and with greyish pruinosity; pleura with more dense greyish pruinosity; ac with posterior pair 2 times as long as distance between rows. **Legs:** IC with black apical and 2 anterolateral setae;  $It_{4+5}$  slightly flattened (MSSC),  $It_4$  with pale velvety pubescence ventrally,  $It_5$  with a long fine dorsoapical spine; IIF with a dense multiserial cluster of short brown setae ventrally on basal third (all MSSC); IIT with strong ad setae at 1/4 and 2/3; IIIT with a curved pale dorsal seta before middle. Relative podomere ratios: I: 51, 56, 39/22/12/7/5; II: 58, 73, 55/29/17/9/5; III: 64, 101, 26/41/22/14/6. **Wing:** Crossvein dm-cu about 1.0 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.4 times as long as distal section of CuA; lower calypter pale yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 dark metallic bronze with metallic green and purplish reflections, tergum 2 with a yellow lateral patch; tergum 5 without distinct ventral cuticular projection; tergum 4 and 5 with long pale ventral setae; sternum 8 dark brown. Epandrium dark brown, VSUR basal half brown and distal half hyaline yellowish, DSUR yellowish-brown; cercus white with white setae. Hypopygium (Fig. 7): epandrium large and globular, hypandrium broad and tapering; MEp digitiform with a strong flattened apical seta; LEp ovate with 2 short subapical setae and with a short lobe bearing a long apical seta; left VSUR with a narrow curved projection bearing a short flattened subapical and 2 flattened apical setae; right VSUR with a narrow curved projection bearing a strong flattened, a curved subapical, and a shorter flattened apical seta; DSUR rectangular and apically pointed, with a long flattened apical seta; cercus elongated with a lateral row of strong curved setae and apically with 4–5 flattened fused setae each bearing a minute short hair at tip.

**Female:** Unknown.

**Distribution:** Brazil.

**Etymology:** The name refers to the similarity with *V. rondinha*.

**Remarks:** See comments under *V. rondinha*.

### The *viridis* Group

The *viridis* species-group is a large group of often very similar species and is characterized by the following features: VSUR with a strong backcurved and hook-shaped distal projection, each with a subapical asymmetric appendage; cerci more or less asymmetric, white with usually conspicuous brown setae; male eyes contiguous or separated on face; abdominal segment 5 with a ventral cuticular projection.

#### *Viridigona viridis* (VAN DUZEE, 1913) comb. nov.

(Fig. 8)

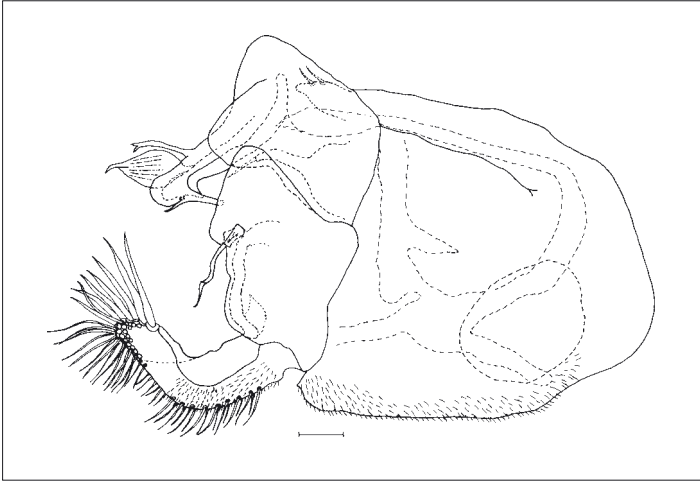
*Neurigona viridis* VAN DUZEE, 1913 – VAN DUZEE 1913: 43.

**Material:** **Lectotype** male (designated by ARNAUD 1979): S. Wales N. Y., 7-9-11, M C VAN DUZEE / [red bordered label:] *Neurigona viridis*, Holotype VAN DUZEE / [red label:] Lectotype male *Neurigona viridis* VAN DUZEE det 1974, PH ARNAUD & V FLEE / California Academy of Sciences Type No. 3396 / Gen. Prep. No. SN2000-19, July 2000, St. NAGLIS. [CAS]. **Paralectotypes:** 2 males: S. Wales N. Y., 7-9-11, M C VAN DUZEE / [green label:] M C VAN DUZEE Collection / [red bordered label:] *Neurigona viridis*, Paratype Van Duzee / [yellow label:] Paralectotype *Neurigona viridis* VAN DUZEE det 1974 PH ARNAUD & V FLEE. 1 female: S. Wales N. Y., 7-9-11, M C VAN DUZEE / [red bordered label:] *Neurigona viridis*, Alotype VAN DUZEE / [red label:] Allolectotype *Neurigona viridis* VAN DUZEE det 1974 PH ARNAUD & V FLEE [all CAS]. **Paratypes:** 1 male: Glencarlyn 23 July Va. / Collection N. BANKS / Paratype / [red label] Type 13510 / [red bordered label] *Neurigona viridis* VD / Gen. Prep. No. SN2000-20, July 2000, St. NAGLIS. 1 female: Glencarlyn 23 July Va. / Collection N. BANKS / Paratype. [both MCZ].

### Description

**Male.** Length: lectotype: body length 3.4 mm, wing length 3.5 mm; thorax 1.4 mm, abdomen (segments 1–6) 1.6 mm; paralectotypes: body length 3.5–3.6 mm, wing length 3.2–3.4 mm.

**Head:** Frons and occiput metallic green, with bronze reflections and greyish pruinosity, especially along lateral eye margins. Setae black with brown reflections except as noted: with a pair of vertical setae, a pair of long diverging ocellar setae 2.0 times as long as verticals, and a pair of pale postvertical setae about 3/4 as long as verticals. Postocular setae pale-white, uppermost setae not distinctly longer; ventral postcranium with some long pale setae below. Eyes contiguous on face. Face and clypeus covered with dense greyish-white pruinosity. Palp yellow, with 2 strong yellow apical seta and yellow hairs; proboscis yellowish, with short pale hairs. Antenna: scape and pedicel yellow, pedicel with a circlet of short brown setae; first flagellomere yellow, distal half infuscated, about as long as wide; arista dorsal, with short pubescence, about 6.5 times as long as first flagellomere. Ratio narrowest/widest distance between eyes on frons: 27/36; ratio narrowest/widest distance between eyes on face: 0/11; ratio narrowest/widest distance between eyes on clypeus: 5/12.



**Fig. 8:** *Viridigona viridis* (VAN DUZEE). Male hypopygium, left lateral. Scale bar = 0.1 mm.

**Thorax:** Mesonotum, scutellum and postnotum metallic green, with greyish pruinosity and bronze reflections, scutellum ventrally yellowish. Pleura concolorous with mesonotum, with more dense greyish pruinosity, metepimeron yellow. Thoracic setae black with brown reflections except as noted: ac in 2 rows of 10–12 setulae, about 2 times as long as distance between rows; dc consisting of 6 strong setae. Additional strong black setae include: 1 pa, 2 sa, 2 sr, 2 np, 1 hm, and 1 pm. Lateral scutellar setae about 1/5 as long as medians. Lower proepisternum with 1 strong pale ppl and some hairs. **Legs:** All legs yellow; setae on legs brownish-black, except as noted: **I:** IC with strong yellow apical and 2 strong yellow anterolateral setae; IF with dense pale hairs anteroventrally on basal 2/3 which are about 1/2 as long as diameter of femur (MSSC);  $It_{4+5}$  dorsoventrally flattened,  $It_4$  about 2 times as broad as  $It_3$ ,  $It_5$  about 1.5 times as broad as  $It_3$ ;  $It_4$  with pale velvety pubescence ventrally (all MSSC). **II:** IIC with several anterior yellow or brownish setae; IIT slightly flattened dorsoventrally (MSSC), with strong ad setae at 1/5 and 2/3, and with 2 apical setae. **III:** IIIC with a strong brown lateral seta; IIIT with a dorsal and a posterior irregular row of short setae, and with 2–3 apical setae. Relative podomere ratios: I: 44, 44, 28/18/8/6/5; II: 43, 67, 58/28/15/7/5; III: 52, 86, 24/39/19/10/5. **Wings:** Hyaline, with a yellowish tinge;  $R_{2+3}$  straight to wing margin;  $R_{2+3}$  and  $R_{4+5}$  parallel from crossvein dm-cu to wing margin; both veins slightly curved posteriad before wing margin; M with a weak flexion at middle from crossvein dm-cu;  $R_{4+5}$  joining wing margin anterior of apex, and M posteriad of apex; crossvein dm-cu about 1.2 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; A present as a trace on membrane and almost reaching wing margin. Lower calypter pale yellow, with a fan of pale yellow setae; haltere yellow. **Abdomen:** Setae and hairs yellow, apical setae of terga longer; tergum 1 yellow, tergum 2 yellow with a dorsal metallic bronze-green posterior band, terga 3–4 dark metallic bronze-green with a narrow yellow postmarginal band; segment 5 entirely metallic bronze-green, with a ventral cuticular projection; segment 6 and 7 brown; sternum 8 dark brown with pale hairs. Epandrium and epandrial lobes dark brown; surstylar lobes yellowish-brown; cercus with basal half white with white setae, distal half yellowish with yellow setae. Hypopygium (Fig. 8): epandrium large and globose, hypandrium fused to epandrium, narrow and apically pointed; epandrial lobes short and rounded, LEp with 2 short ventral setae, MEp with 1 strong ventral seta; left VSur with a narrow tube-like apically bifurcate seta, right VSur with a flattened leaf-like seta; DSur broad and short, with a long ribbon-like curved apical seta; cercus elongated and U-shaped, projecting forward and bearing 6–8 strong apical spine-like setae and dorsal setae.

**Female:** Similar to male but without MSSC and as noted: face broader, eyes not contiguous, narrowest distance between eyes on face about 3/4 the distance between ocellar setae. IF also with dense pale hairs anteroventrally but distinctly shorter than in male; IIT with 2–3 small ventral setae; IIIT

with a strong dorsal seta at about middle in addition to the small dorsal setae. Tergum 1 yellow, terga 2–5 dark metallic bronze-green with a broad yellow posterior band. Setae on abdomen yellowish-brown.

**Distribution:** Eastern USA, Costa Rica ?

**Remarks.** ROBINSON (1970) listed *V. viridis* from Costa Rica. I could not find this species among the Neotropical material I examined nor the reference on which ROBINSON based his decision to treat the species as a member of the Neotropical region. ROBINSON (pers. comm.) could not remember why he made that entry in his catalog and stated that it could have been a mistake. *V. viridis* should therefore most probably be excluded from the Neotropical catalog.

*Viridigona beckeri* spec. nov.

(Fig. 9)

**Material: Holotype** male: BRAZIL: Nova Teutonia 17°11' S, 52° 23' W Brazil, 300–500 m, X.1962, Fritz PLAUMANN. [CNC].

**Description**

**Male.** Length: holotype: body length 3.1 mm, wing length 3.2 mm.

**Head:** Eyes contiguous; face and clypeus with silvery pruinosity; ocellar setae 2.5 times as long as verticals; first flagellomere 1.5 times as long as basal width, dark brown with a narrow yellow stripe basally; arista about 4.5 times as long as first flagellomere.

**Thorax:** Mesonotum light metallic green with silvery pruinosity; pleura with more dense silvery pruinosity; ac strong, posterior pairs 2 times as long as distance between rows. **Legs:** It<sub>4</sub> very weakly flattened (MSSC); IIIT with a yellow downcurved dorsal seta at 1/3. Relative podomere ratios: I: 46, 52, 38/22/13/8/5; II: 51, 68, 57/27/15/8/4; III: 57, 92, 25/43/19/11/5. **Wing:** Crossvein dm-cu about 1.4 times as long as distance between R<sub>4+5</sub> and M at wing margin, and 0.6 times as long as distal section of CuA; lower calypter pale yellow, with a fan of yellow setae; haltere yellow.

**Abdomen:** Hypopygium (Fig. 9): hypandrium short and tapering; MEp short and thumb-like, with a strong apical seta; LEp broad and ovate, with two short subapical setae; left VSur with a strong up-curved seta; right VSur with a flattened leaf-like apically-curved seta; DSur short and ovate, with a flattened and curved strong seta; cercus short and rounded, with a short apical lobe bearing long setae.

**Female:** Unknown.

**Distribution:** Brazil.

**Etymology:** The species is dedicated to the German dipterist Theodor BECKER (1840–1928), who provided the first comprehensive monograph of the Neotropical Dolichopodidae.

**Remarks.** *V. beckeri* and *V. tinalandia* are very similar in genitalic features and are probably sister-species.

*Viridigona tinalandia* spec. nov.

(Fig. 10)

**Material: Holotype** male: ECUADOR: ECU, Pichincha 16 km SE Sto. Domingo, Tinalandia, 680 m, 15-30.VI.75, S. & J. PECK / ex Malaise Trap mounted from alcohol. [CNC].

**Description**

**Male.** Length: holotype: body length 3.7 mm, wing length 3.2 mm.

**Head:** Eyes contiguous on face; ocellar setae broken off; first flagellomere as long as basal width, entirely yellow; arista about 7 times as long as first flagellomere; palp whitish with a strong and a weaker black seta.

**Thorax:** Mesonotum light metallic green with greyish pruinosity; pleura with more dense greyish pruinosity; ac strong, posterior pairs three times as long as distance between rows; remaining thoracic setae broken off. **Legs:** It<sub>4</sub> very weakly flattened (MSSC); IIT with strong ad setae at 1/3 and 2/3, more distal seta distinctly stronger and longer; IIIT without dorsal setae. Relative podomere ratios: I: 45, 51, 37/25/12/7/5; II: 51, 68, 60/32/17/7/5; III: 60, 95, 25/45/20/12/5. **Wing:** Crossvein dm-cu

about 1.3 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter pale yellow, with a fan of yellow setae; haltere whitish-yellow.

**Abdomen:** Hypopygium (Fig. 10): hypandrium short and tapering; MEp short; LEp broad and rectangular, with two short subapical setae; left VSUR with a spatulate bifurcate strong seta, right VSUR with a flattened ovate leaf-like seta; DSUR short and ovate, with a flattened and curved strong seta; cercus short and rounded, with a short apical lobe bearing long setae.

**Female:** Unknown.

**Distribution:** Ecuador.

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

**Remarks:** See under *V. beckeri*.

### *Viridigona limona* spec. nov.

(Fig. 11)

**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].

#### **Description**

**Male.** Length: holotype: body length 2.6 mm, wing length 2.9 mm; thorax 0.96 mm, abdomen (segments 1–6) 1.41 mm.

**Head:** Eyes contiguous on face; ocellar setae broken off; first flagellomere as long as basal width, yellow, apical half brown; arista about 9 times as long as first flagellomere; palp yellowish-brown with a strong and 2 weaker black setae.

**Thorax:** Mesonotum metallic green with blue and violet reflections and with greyish-ochreous pruinosity; pleura with more dense greyish pruinosity; ac strong, posterior pairs 2 times as long as distance between rows; most thoracic setae broken off. **Legs:** Fore legs missing; IIT with strong ad setae at 1/3 and 2/3; III trochanter with a brown spot; IIIT without dorsal setae. Relative podomere ratios: I: missing; II: 52, 70, tarsomeres missing; III: 58, 96, tarsomeres missing. **Wing:** Crossvein dm-cu about 1.1 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.4 times as long as distal section of CuA; lower calypter pale yellow with a fan of pale yellow setae; haltere whitish-yellow.

**Abdomen:** Terga 1+2 pale yellow; tergum 2 with a broad metallic bronze-green middorsal band; terga 3+4 metallic bronze-green with a narrow pale posterior band; tergum 5 brown with metallic green reflections, and with a rectangular ventral projection bearing some strong apical setae; terga 6+7 brown; sternum 8 brown. Epandrium and VSUR brown, DSUR pale yellow; cercus white with pale setae. Hypopygium (Fig. 11): hypandrium short and tapering; MEp short with a long apical seta; LEp broad and thumb-like, with two short apical setae; left VSUR with a flattened, apically broadened and serrate seta, right VSUR with a flattened and ovate leaf-like seta; DSUR short and ovate, with a flattened short seta; cercus short and rounded, with a short digitiform lobe which bears an apical fan of long setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

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

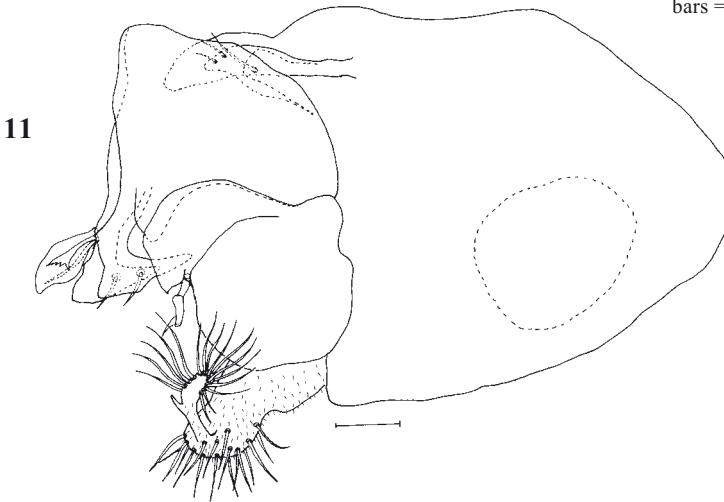
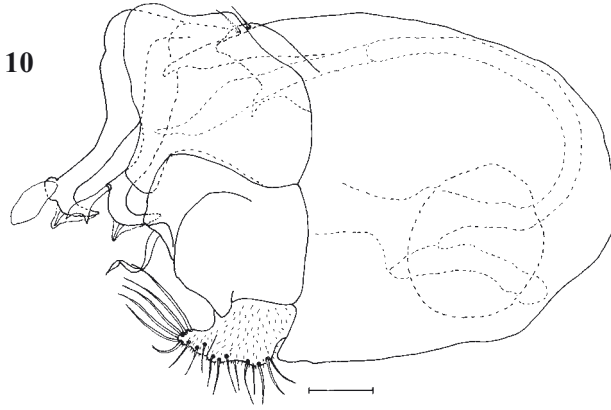
**Remarks:** *V. limona* has similar cercal features to those of *V. tinalandia* and *V. beckeri*, but can be distinguished by the short cercal digitiform lobe and by the other characters given in the key.

### *Viridigona thoracica* (VAN DUZEE, 1931) comb. nov.

(Fig. 12)

*Neurigona thoracica* VAN DUZEE, 1931 – VAN DUZEE 1931: 178.

**Material:** **Holotype** female: PANAMA: Barro Colo Isld., Canal Zone, 3. I. 1929 / Collector C. H. Curran / *Neurigona thoracica*, Holotype, VAN DUZEE [examined]. [AMNH]. **Additional material:** 3 males: LESSER ANTILLES



**Figs 9–11:** *Viridigona* spp., male hypopygia, left lateral. –9: *V. beckeri* spec. nov. –10: *V. tinalandia* spec. nov. –11: *V. limona* spec. nov. Scale bars = 0.1 mm.



(DOMINICA): Clark Hall, Dominica, BWI, March II, 1964 / *Neurigona thoracica* VAN DUZEE male [det. ROBINSON]. 2 males: same data but March 4 and 21, 1964. 3 females: same data but March 4, 6, and 11, 1964. [all det. ROBINSON]. [all USNM]. ECUADOR: 1 male: Ecuador, Mera, Napo-Pastaza, 11-12-1955 / E. I. SCHLINGER & E. S. ROSS collectors. [CAS]. VENEZUELA: 1 male: Venezuela, T. F. Amaz., Cerro de la Neblina, Basecamp 140 m, 0° 50' N, 66° 10' W, 20 February 1985 / Malaise trap, in rainforest, P. J. & P. M. SPANGLER, R. A. FAITOUTE, W. E. STEINER colrs. [USNM]. PERU: 1 male: Quincemil, Cuzo, Peru, 1–15. XI. 1962, L. PENA, 700 m. [CNC]. 1 male: Peru, Monson Valley, Tingo Maria, XII-9-1954 / E. I. SCHLINGER & E. S. ROSS collectors. [CAS].

### Description

**Male.** Length: body length 3.7 mm, wing length 3.5 mm; thorax 1.44 mm, abdomen (segments 1–6) 1.8 mm. body length variation: 2.9–3.8 mm..

**Head:** Eyes contiguous on face; ocellar setae 2 times as long as verticals; first flagellomere as long as basal width, yellow, apical half brown; arista about 8 times as long as first flagellomere; palp brown with a strong brown and a weaker yellow seta.

**Thorax:** Mesonotum metallic green with blue reflections and with greyish-ochreous pruinosity; pleura with more dense greyish pruinosity; ac with posterior pairs 1.5 times as long as distance between rows. **Legs:** It<sub>4+5</sub> flattened (MSSC), It<sub>4</sub> about 1.5 times as broad as It<sub>3</sub>; IIT slightly flattened with strong ad setae at 1/5 and 2/3; IIIT with a small brown dorsal seta at about 1/2. Relative podomere ratios: I: 47, 51, 40/22/11/8/5; II: 48, 72, 61/29/15/6/5; III: 58, 91, 24/44/20/10/7. **Wing:** Crossvein dm-cu about 1.2 times as long as distance between R<sub>4+5</sub> and M at wing margin, and 0.6 times as long as distal section of CuA; lower calypter yellow with a brown rim and a fan of yellow setae; haltere yellow, club with a brown spot.

**Abdomen:** Tergum 1 yellow; terga 2–5 dark metallic green with bronze, blue and violet reflections, tergum 2 with a yellow lateral patch; terga 2–4 with a broad greyish postmarginal band; tergum 5 with a ventral cuticular projection; sternum 8 dark brown. Epandrium and surstyli dark brown; cercus white with white basal and strong brown apical setae. Hypopygium (Fig. 12): hypandrium short and tapering; MEp short and triangular with an apical seta; LEp slightly broader with a short apical seta; left VSur with a slender curved seta, right VSur with an expanded triangular blade-like seta and with a hook-like spur; DSUR short and ovate, with a flattened apically-fringed seta; cercus elongated, with a ventral comb of long brown curved setae in addition to short white setae.

**Female:** Similar to male but without MSSC and as noted: Eyes distinctly separated, distance between eyes about 3/4 the distance between ocellar setae; IIT with some short ventral setulae; dorsal seta on IIIT more distinct.

**Distribution:** Panama, Lesser Antilles (Dominica), Ecuador, Venezuela, Peru.

**Remarks:** *Neurigona thoracica* was described by VAN DUZEE from a single female from Panama. ROBINSON (1975) redescribed it from male specimens from Dominica. Since most females of *Viridigona* lack clear diagnostic features for accurate identification, I have some doubt about ROBINSON'S determination but accept it here in order to conserve the name *thoracica*.

### *Viridigona guana* spec. nov.

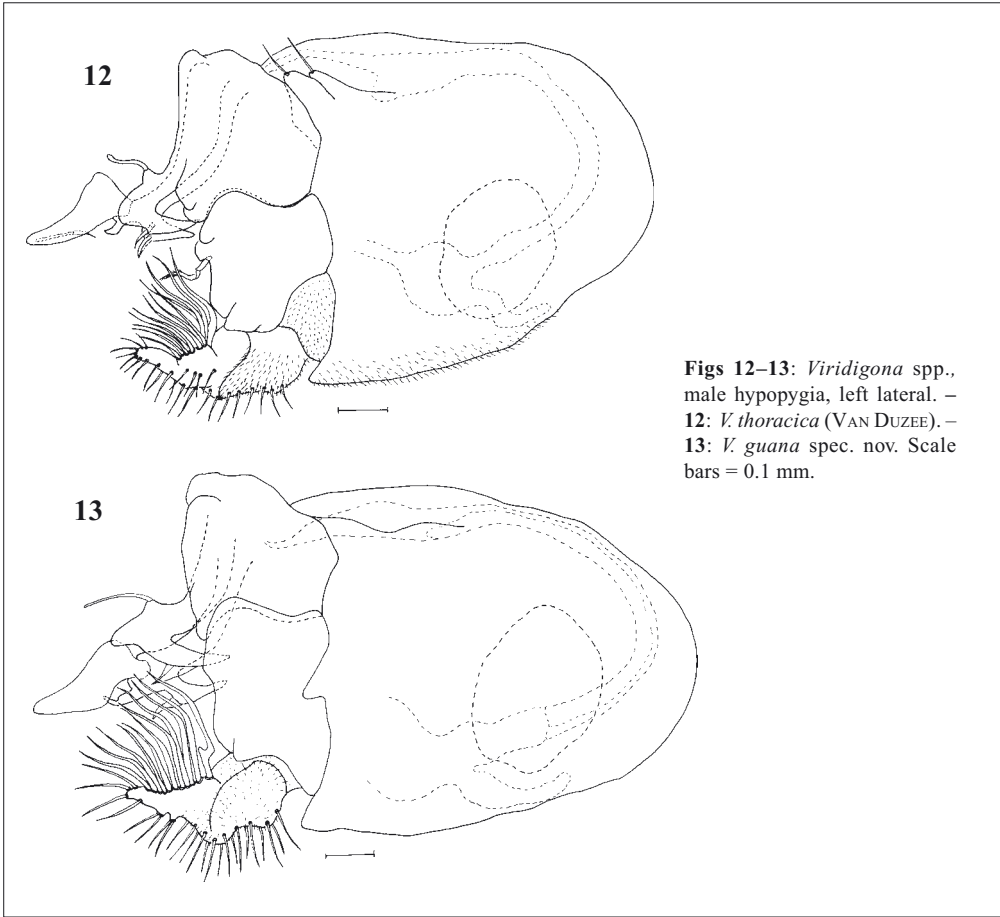
(Fig. 13)

**Material:** **Holotype** male: COSTA RICA: Estacion Pitilla, 9 km S. de Santa Cecilia, Prov. Guana, Costa Rica, 700 m, Dic 1994, P. RIOS, L N 329950 380450 # 4372. [INBio]. **Paratypes:** COSTA RICA: 3 males: same data as holotype but May 1994 and Apr 1995. [INBio].

### Description

**Male.** Length: holotype: body length 3.0 mm, wing length 3.4 mm; thorax 1.28 mm, abdomen (segments 1–6) 1.48 mm; paratypes: body length 3.2–3.7 mm, wing length 3.7–3.9 mm.

**Head:** Eyes contiguous on face; ocellar setae 2.0 times as long as verticals; postvertical setae yellow and 0.7 times as long as verticals; uppermost postocular setae yellow and not longer than the following yellow setae; first flagellomere slightly shorter than basal width, yellow with apical half infuscated; arista about 9 times as long as first flagellomere.



**Figs 12–13:** *Viridigona* spp., male hypopygia, left lateral. – **12:** *V. thoracica* (VAN DUZEE). – **13:** *V. guana* spec. nov. Scale bars = 0.1 mm.

**Thorax:** Mesonotum metallic green with blue and bronze reflections and with greyish pruinosity; pleura with more dense silvery-grey pruinosity; ac with posterior pairs 1.5 times as long as distance between rows. **Legs:**  $It_{4+5}$  slightly flattened (MSSC); IIT slightly flattened dorsoventrally, with strong ad setae at 1/4 and 2/3; IIIT without strong dorsal setae. Relative podomere ratios: I: 47, 51, 49/21/13/9/6; II: 53, 74, 65/34/18/9/5; III: 60, 95, 24/51/20/16/5. **Wing:** Crossvein dm-cu about 1.4 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.6 times as long as distal section of CuA; lower calypter pale yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 metallic green with bronze reflections, tergum 2 yellow laterally; terga 2–4 with a greyish postmarginal band; tergum 5 with a ventral cuticular projection bearing long sinuous hairs which are about as long as epandrium (MSSC); sternum 8 dark brown. Epandrium dark brown; VSur dark brown, DSur hyaline; cercus white with brown apical setae. Hypopygium (Fig. 13): hypandrium short and broad, apically tapering; MEp digitiform with a strong flattened subapical seta; LEp broader and ovate, with 2 subapical setae; left VSur with a strong downcurved subapical seta; right VSur with a large strongly flattened hatchet-like subapical appendage and a short pointed apical spine; DSur rectangular, with a flattened curved apical seta; cercus triangular, with a row of flattened setae decreasing in length distally, basalmost seta S-shaped.

**Female:** Unknown.

**Distribution:** Costa Rica.

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

**Remarks.** *V. guana* is closely related to *V. thoracica* according to the genitalic features but can be differentiated by the characters given in the key.

***Viridigona papallacta* spec. nov.**

(Fig. 14)

**Material: Holotype** male: ECUADOR: Ecuador, Papallacta, Napo-Pastaza Prov., 29 January 1958, R. W. HODGES, 10,500 feet Elev. / Collection of Calif. Acad. of Sci. 1994 Gift Fred C. HARMSTON. [CAS].

**Description**

**Male.** Length: holotype: body length 5.5 mm, wing length 6.1 mm; thorax 1.83 mm, abdomen (segments 1–6) 2.93 mm.

**Head:** Eyes contiguous on face; ocellar setae 2 times as long as verticals; postvertical setae black; first flagellomere as long as basal width, entirely dark brown; arista about 6.5 times as long as first flagellomere; palp brown with 3 strong brown apical setae.

**Thorax:** Mesonotum metallic green with bronze reflections and with ochreous pruinosity; pleura with more dense ochreous and greyish pruinosity; ac with posterior pairs 1.5 times as long as distance between rows. **Legs:** IIC and IIIC dark brown anteriorly;  $It_4$  slightly flattened (MSSC),  $It_5$  broken off; IIT not flattened, with strong ad setae at 1/5 and 2/3; IIIT broken off. Relative podomere ratios: I: 44, 54, 42/30/16/11/?; II: 48, 76, 69/?/?/?/?/?; III: ?, ?/?/?/?/?/?. **Wing:** Anterior part with brownish tinge; crossvein dm-cu about 1.5 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.8 times as long as distal section of CuA; lower calypter pale yellow with a brown rim and a fan of yellow setae; haltere yellowish-ochreous.

**Abdomen:** Tergum 1 yellow with a brown dorsal patch; terga 2–5 dark metallic green with bronze and blue reflections, tergum 2 with a yellow lateral patch, segment 3 with a yellow ventral stripe; terga 2–4 with a greyish postmarginal band; tergum 5 with a ventral cuticular projection; terga 6–7 and sternum 8 dark brown. Epandrium and surstyli dark brown; cercus basally white with white setae, distally brown with strong brown apical setae. Hypopygium (Fig. 14): hypandrium short and tapering; MEp thumb-like with a strong apical seta; LEp broader and leaf-like with a short apical and subapical seta; left VSur with a slender curved apically-fringed seta and a fringed lobe; right VSur with a leaf-like apically curved seta; DSur short and ovate, with a curved and flattened seta; cercus apically broad and bilobate, with asymmetric setation: left cercus with two separated ventral rows of setae, more lateral row with long flattened setae, more median row with distinctly shorter setae; right cercus with two separated rows of long flattened setae which are equal in length.

**Female:** Unknown.

**Distribution:** Ecuador.

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

**Remarks.** *V. papallacta* is closely related to *V. teutonia*, but can be differentiated by the characters given in the key.

***Viridigona teutonia* spec. nov.**

(Fig. 15)

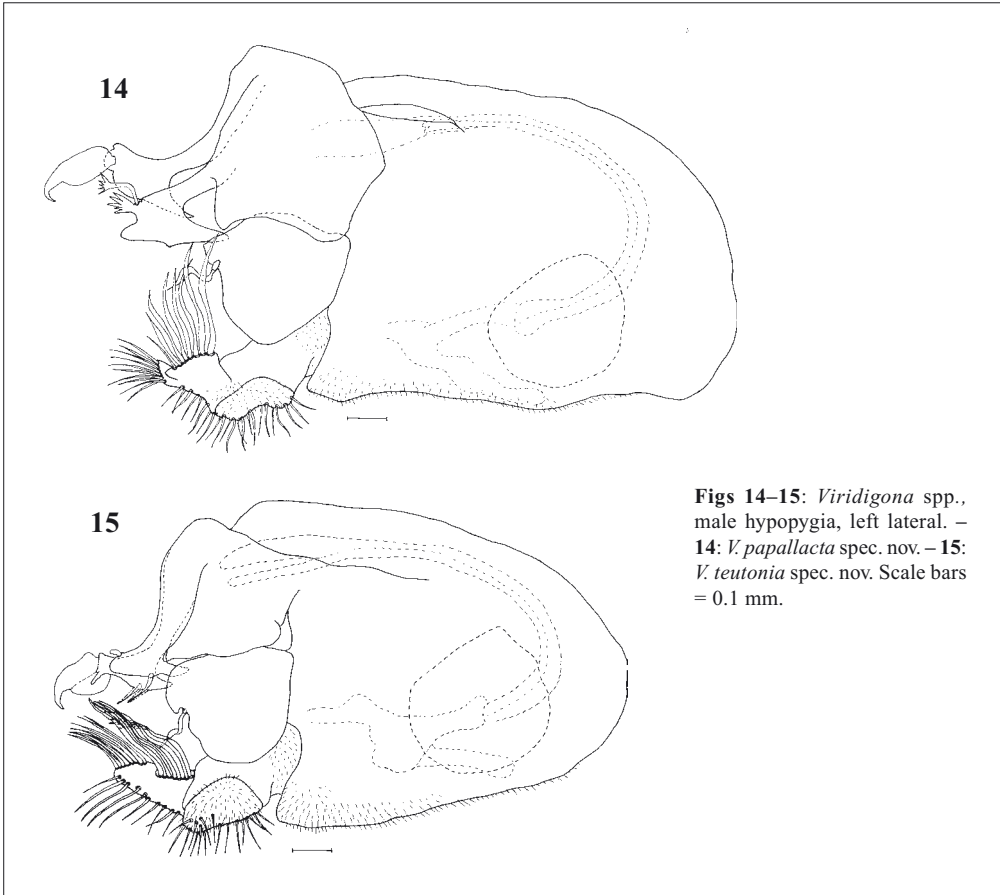
**Material: Holotype** male: BRAZIL: Nova Teutonia, 27° 11' S, 52° 23' W, Brazil, 300–500 m, X. 1944, Fritz PLAUANN. [CNC].

**Description**

**Male.** Length: holotype: body length 4.5 mm, wing length 4.2 mm; thorax 1.65 mm, abdomen (segments 1–6) 2.1 mm.

**Head:** Ocellar setae 2.3 times as long as verticals; postvertical setae yellow; first flagellomere as long as basal width, yellow with apical 2/3 brown; arista broken off; palp brown with 2 brown apical setae.

**Thorax:** Eyes contiguous on face; mesonotum metallic green with blue and violet reflections and with greyish pruinosity; pleura with more dense greyish pruinosity; ac with posterior pairs 2 times as



**Figs 14–15:** *Viridigona* spp., male hypopygia, left lateral. – **14:** *V. papallacta* spec. nov. – **15:** *V. teutonia* spec. nov. Scale bars = 0.1 mm.

long as distance between rows. **Legs:** It<sub>4+5</sub> flattened (MSSC), It<sub>4</sub> about 1.5 times as broad as It<sub>3</sub>; IIT not flattened, with strong ad setae at 1/5 and 2/3, and with 2 apical setae; IIIT without strong dorsal setae. Relative podomere ratios: I: 44, 52, 36/24/10/6/4; II: 48, 74, 53/27/15/7/4; III: 58, 92, 21/44/190/10/5. **Wing:** Crossvein dm-cu about 1.4 times as long as distance between R<sub>4+5</sub> and M at wing margin, and 0.6 times as long as distal section of CuA; lower calypter yellow with a fan of yellow setae; haltere yellow. **Abdomen:** Tergum 1 yellowish; terga 2–5 dark metallic green with bronze and blue reflections, tergum 2 with a yellow lateral patch; terga 2–4 with a greyish postmarginal band; tergum 5 with a ventral cuticular projection; sternum 8 dark brown. Epandrium dark brown, surstyli yellowish-brown; cercus basally white with white setae, distally brown with strong brown apical setae. Hypopygium (Fig. 15): hypandrium short and broad; MEp narrow and pointed apically, with an apical seta; LEp broader and ovate with two subapical setae; left VSUR with a subapical short spine (a broken seta?), right VSUR with a subapical curved beak-like seta and a straight spur; DSUR short and round, with a curved flattened seta; cercus elongated-triangular, with two separated ventral combs of setae, each consisting of 7–10 long flattened setae.

**Female:** Unknown.

**Distribution:** Brazil.

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

**Remarks.** See under *V. papallacta*.

*Viridigona ponti* spec. nov.

(Fig. 16)

**Material:** **Holotype** male: BRAZIL: Nova Teutonia, 27° 11' S, 52° 23' W, Brazil, 300-500 m, 15.XI. 1962, Fritz PLAUMANN. [CNC].

**Description**

**Male.** Length: holotype: body length 4.5 mm, wing length 4.2 mm; thorax 1.65 mm, abdomen (segments 1–6) 2.1 mm.

**Head:** Eyes contiguous on face; face with ochreous and clypeus with white pruinosity; postvertical setae black; vertical setae broken off; both first flagellomeres broken off; palp brown with 2 brown apical setae.

**Thorax:** Mesonotum metallic green with blue and bronze reflections and with greyish-ochreous pruinosity, and with a distinct purplish patch on area of mesonotal suture; pleura with more dense greyish pruinosity; ac with posterior pairs 3 times as long as distance between rows. **Legs:**  $It_4$  only slightly flattened in apical half (MSSC),  $It_5$  not flattened; IIT not flattened, with strong ad setae at 1/5 and 2/3; IIIT without strong dorsal setae. Relative podomere ratios: I: 47, 55, 40/24/13/9/7; II: 54, 68, 57/29/15/7/5; III: 62, 97, 21/46/21/12/6. **Wing:** Crossvein dm-cu about 1.3 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter brown with a fan of brown setae; haltere yellow.

**Abdomen:** Tergum 1 yellowish; terga 2–5 dark metallic green with bronze and blue reflections, tergum 2 with a yellow lateral patch; terga 2–4 with a greyish postmarginal band; sternum 4 with long ventral setae which are about as long as hypopygium; tergum 5 with a ventral cuticular projection; sternum 8 dark brown. Epandrium dark brown, surstyli yellowish-brown; cercus yellow with brown apical setae. Hypopygium (Fig. 16): hypandrium very broad, with short setulae; MEp narrow and digitiform, with a strong apical seta; LEp narrow and tapering, apically blunt, with an apical and a subapical seta and with a basal lobe bearing an apical seta; left VSur with a short subapical spine (a broken seta?), right VSur with an ovate appendage with a triangular-pointed apex; DSur short and ovate, with a flattened apical seta; cercus elongated as a rectangle, with an apical comb of 7–9 long straight flattened setae, and with a separated pair of subapical long sinuous flattened setae.

**Female:** Unknown.

**Distribution:** Brazil.

**Etymology:** The name is dedicated to Adrian C. PONT (Oxford) who provided valuable advice.

**Remarks.** *V. ponti* is characterized by the two flattened and separated cercal apical setae.

*Viridigona asymmetrica* spec. nov.

(Fig. 17a–b)

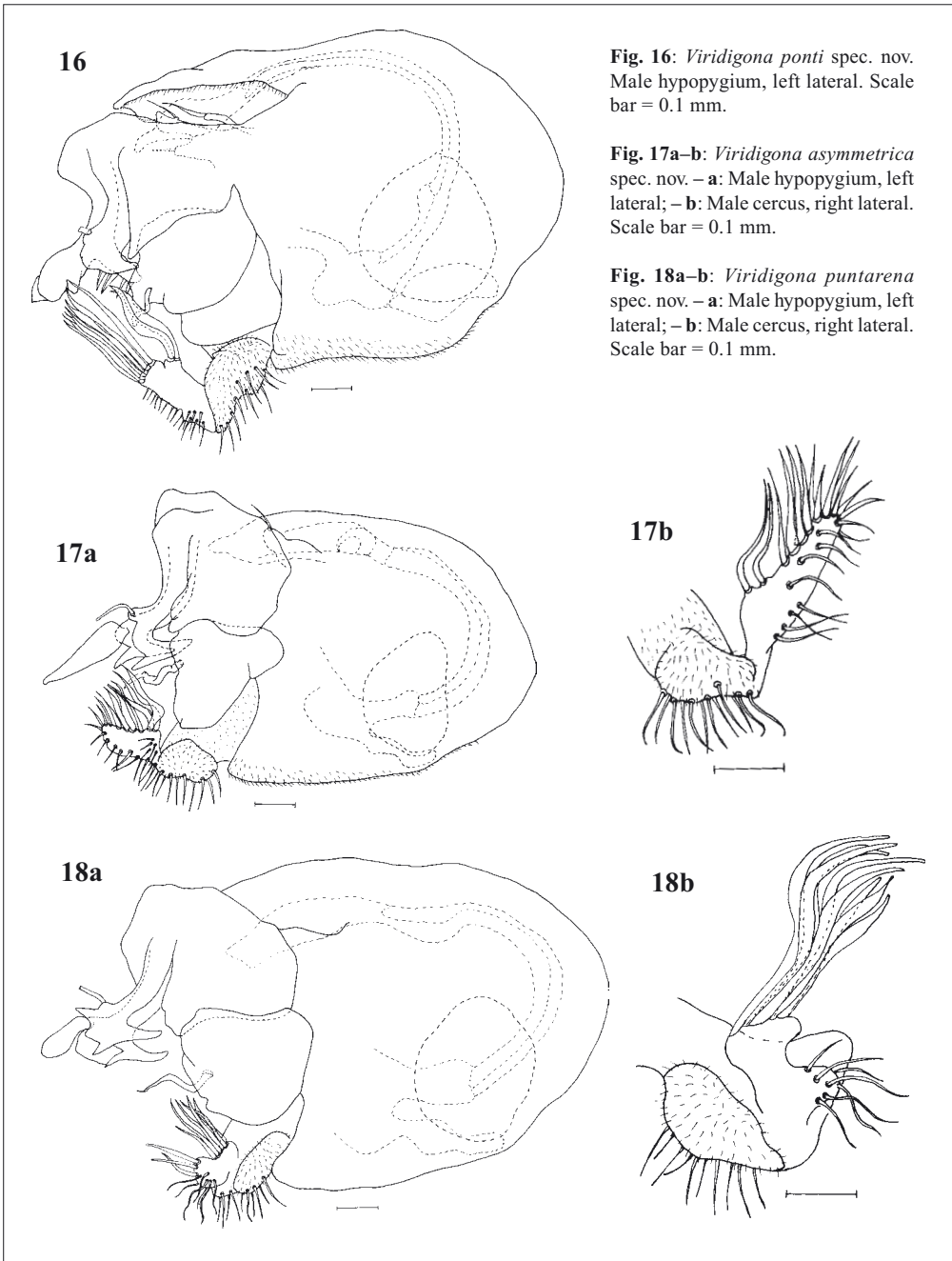
**Material:** **Holotype** male: COSTA RICA: Costa Rica: Hitoy Cerere, A.C. Amistad, Prov. Limon, 100–200 m, 30.x.–7.xi. 1993, LN 184600\_643400, #2437, malaise, G. CARBELLO. [INBio]. **Paratypes:** 8 males: same data but 14.ii.–20.v. 1993. 3 males: same data but 30.vii.–26.viii. 1996. [all INBio]. **Additional material:** COSTA RICA: 1 male: Florenica, C.R. IX-10-20, A. ALFARO. [USNM].

**Description**

**Male.** Length: holotype: body length 3.5 mm, wing length 3.6 mm; thorax 1.36 mm, abdomen (segments 1–6) 1.75 mm; paratypes: body length 2.8–3.5 mm.

**Head:** Eyes contiguous; ocellar setae 2.0 times as long as verticals; postvertical setae black, 0.7 times as long as verticals; uppermost postocular setae yellow; first flagellomere shorter than basal width, rounded apically, yellow with apical half infuscated; arista about 10 times as long as first flagellomere; palp large and yellow with two brown apical setae.

**Thorax:** Mesonotum metallic green with bronze and blue reflections and with weak greyish pruinosity; pleura dark metallic green with dense greyish pruinosity; lower proepisternum with a strong yellow seta. **Legs:** All legs including coxae entirely yellow; IC with black apical and 2 strong black anterolateral setae;  $It_4$  only slightly flattened in apical half (MSSC),  $It_5$  also slightly flattened; IIT not flattened, with strong ad setae at 1/4 and 2/3; IIIT without dorsal setae. Relative podomere ratios: I: 46, 51, 42/21/10/7/5; II: 50, 67, 62/30/17/7/5; III: 58, 93, 23/48/21/12/5. **Wing:** Crossvein dm-cu



**Fig. 16:** *Viridigona ponti* spec. nov. Male hypopygium, left lateral. Scale bar = 0.1 mm.

**Fig. 17a–b:** *Viridigona asymmetrica* spec. nov. – a: Male hypopygium, left lateral; – b: Male cercus, right lateral. Scale bar = 0.1 mm.

**Fig. 18a–b:** *Viridigona puntarena* spec. nov. – a: Male hypopygium, left lateral; – b: Male cercus, right lateral. Scale bar = 0.1 mm.

about 1.4 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.7 times as long as distal section of CuA; lower calypter yellow, with a fan of brown setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 dark metallic bronze-green, tergum 2 with a yellow basal band and a yellow lateral patch; terga 2–4 with a yellowish-grey postmarginal band; tergum 5 with a short ventral cuticular projection; sternum 8 dark brown. Epandrium dark brown, VSur dark brown, DSur whitish hyaline; cercus white with dark brown apical setae. Hypopygium (Fig. 17a, 17b): hypandrium

basally broad and apically tapering; MEp digitiform with a strong apical seta; LEp ovate, with a short apical seta; left VSur with a strong L-shaped subapical seta, right VSur with a strongly expanded blade-like seta; DSur short and ovate, with a long flattened seta; cerci asymmetric: left cercus (Fig. 17a) short and rectangular with several strong flattened and curved subapical setae, right cercus (Fig. 17b) elongated-triangular with two curved more basal and several flattened subapical and apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the striking asymmetric shape of both cerci.

**Remarks.** The conspicuously asymmetric length of both cerci is a strong autapomorphy of *V. asymmetri-ca*, although some asymmetric cercal features are present in the *viridis* group, especially in the setation.

### *Viridigona puntarena* spec. nov.

(Fig. 18a–b)

**Material: Holotype** male: COSTA RICA: Est. Pittier, Puntarenas, Costa Rica, 1670 m, 4–22 Ene 1996, E. NAVARRO, LS 330900\_577400 # 6813. [INBio].

#### Description

**Male.** Length: holotype: body length 4.4 mm, wing length 4.6 mm; thorax 1.70 mm, abdomen (segments 1–6) 2.09 mm.

**Head:** Eyes contiguous on face; ocellar setae 2.3 times as long as verticals; postvertical setae yellow and 0.8 times as long as verticals; uppermost postocular setae yellow and slightly longer than the following yellow setae; first flagellomere as long as basal width, yellow, apical 3/4 dark brown; arista about 8 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with bronze reflections, and with ochreous pruinosity; pleura with more dense greyish pruinosity; ac with posterior pairs 2 times as long as distance between rows. **Legs:** It<sub>4+5</sub> slightly flattened (MSSC); IIT slightly flattened dorsoventrally, with strong ad setae at 1/4 and 2/3, and with one strong pd seta at 2/3; IIIT without strong dorsal setae. Relative podomere ratios: I: 40, 44, 35/25/14/7/4; II: 45, 65, 58/27/14/7/4; III: 54, 90, 24/42/17/9/5. **Wing:** Crossvein dm-cu about 1.2 times as long as distance between R<sub>4+5</sub> and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter pale yellow with a fan of brown-golden setae; haltere yellow with a dark spot.

**Abdomen:** Tergum 1 yellow; terga 2–5 metallic green with bronze reflections, tergum 2 yellow laterally; terga 2–4 with a greyish postmarginal band; tergum 5 mostly hidden under tergum 4, with a short ventral cuticular projection; sternum 8 black. Epandrium black, surstyli dark brown; cercus basally white and apically dark brown, with dark brown apical setae. Hypopygium (Fig. 18): hypandrium broad and tapering; MEp long and digitiform with a strong apical seta; LEp slightly longer, ovate, with an apical and a subapical seta; left VSur with an erect subapical seta (broken off?); right VSur with a flattened leaf-like subapical appendage; DSur short and ovate, with a flattened apical seta; cercus short, with remarkable asymmetric setation: left cercus with a comb of 6–8 strong median and a separated group of 3 strong spine-like apical setae; right cercus with long flattened s-curved apical setae which are twice as long as setae on left cercus.

**Female:** Unknown.

**Distribution:** Costa Rica.

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

**Remarks:** *V. puntarena* has a remarkably asymmetric cercal setation.

### *Viridigona argyrotarsis* spec. nov.

(Fig. 19)

**Material: Holotype** male: COSTA RICA: Est. Pitilla, 9 km S. Santa Cecilia, Prov. Guana, Costa Rica, 700 m, Oct 1994, P. RIOS, L N 330200\_380200 # 3294. [INBio]. **Paratype:** COSTA RICA: 1 male: same data as holotype but May 1994 # 2997. [INBio].

## Description

**Male.** Length: holotype: body length 3.5 mm, wing length 3.3 mm; thorax 1.32 mm, abdomen (segments 1–6) 1.64 mm; paratype: body length 3.7 mm, wing length 3.6 mm.

**Head:** Eyes contiguous on face; face and clypeus with white pruinosity; ocellar setae 2.0 times as long as verticals; postvertical setae black, 0.8 times as long as verticals; uppermost postocular setae black and longer than the following yellow setae; first flagellomere about as long as basal width, yellow with apical half infuscated; arista about 7 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with blue and bronze reflections, polished; pleura with dense silvery-grey pruinosity; ac with posterior pairs 2 times as long as distance between rows. **Legs:**  $It_{3+4}$  slightly flattened and silvery-white with white hairs (MSSC); IIT not flattened, with strong ad setae at 1/4 and 2/3, and with a strong pd seta at 3/5; IIIT without strong dorsal setae. Relative podomere ratios: I: 42, 48, 39/23/9/6/5; II: 44, 62, 54/27/14/6/3; III: 52, 83, 24/41/19/10/4. **Wing:** Crossvein dm-cu about 1.4 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter pale yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 metallic green with bronze reflections, tergum 2 with a yellow lateral patch; terga 2–4 with a greyish postmarginal lateral band; tergum 5 with a ventral cuticular projection; sternum 8 dark brown. Epandrium and surstyli dark brown; cercus basally white and apically with a dark brown rim with brown apical setae. Hypopygium (Fig. 19): hypandrium short and tapering; MEp thumb-like, with a strong subapical seta; LEp broader and ovate, with 2 subapical setae; left VSur with a strong upcurved subapical seta, right VSur with a triangular appendage with a pointed curved apex and a dorsal and ventral lobe and with a dorsal triangular projection; DSUr rectangular, with a flattened apical seta; cercus U-shaped and apically with two lobes: lateral lobe with 4–5 long setae, median lobe with 5–6 flattened setae which are half as long as lateral setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

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

**Remarks.** *V. argyrotarsis* is the only known species of the genus with special modified male fore tarsomeres.

## *Viridigona costaricensis* spec. nov.

(Fig. 20)

**Material: Holotype** male: COSTA RICA: Est. Pitilla, 9 km S. de Santa Cecilia, P.N. Guanacaste, Prov. Guana, Costa Rica, 700 m, Jul 1994, P. RIOS, L N 330200\_380200 # 3140. [INBio]. **Paratypes:** COSTA RICA: 3 males: same data as holotype, but 22 Ago 1993, Oct 1994, Abr 1995. [INBio].

## Description

**Male.** Length: holotype: body length 3.0 mm, wing length 3.1 mm; thorax 1.20 mm, abdomen (segments 1–6) 1.25 mm; paratypes: body length 3.0–3.2 mm, wing length 3.0–3.6 mm.

**Head:** Eyes contiguous on face; ocellar setae 1.9 times as long as verticals; postvertical setae yellow and 0.7 times as long as verticals; uppermost postocular setae yellow and not longer than the following yellow setae; first flagellomere as long as basal width, yellow, apical half infuscated; arista about 7 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with blue and bronze reflections and with greyish pruinosity; pleura with more dense greyish pruinosity; ac with posterior pairs 2 times as long as distance between rows. **Legs:**  $It_{4+5}$  slightly flattened (MSSC); IIT slightly flattened dorsoventrally, with strong ad setae at 1/4 and 2/3; IIIT without strong dorsal setae. Relative podomere ratios: I: 48, 52, 39/29/14/8/5; II: 51, 73, 68/38/29/9/5; III: 62, 99, 31/52/26/14/5. **Wing:** Crossvein dm-cu about 1.2 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter pale yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 metallic bronze-green, tergum 2 yellow laterally; terga 2–4 with a greyish postmarginal band; tergum 5 hidden under tergum 4, with a ventral cuticular projec-



tion; sternum 8 dark brown. Epandrium and surstyli dark brown; cercus whitish-yellow with brown apical setae. Hypopygium (Fig. 20): hypandrium tapering to a triangle; MEp short and broad with a strong subapical seta; LEp ovate with a pointed curved apex and with 2 minute subapical setae; left VSUR with a long downcurved subapical seta; right VSUR with a flattened blade-like subapical appendage; DSUR short and ovate, with a flattened apically furcate seta; cercus with two separated rows of apical setae: lateral row with 3–4 long setae, median row with 6–8 setae which are 3/4 as long as laterals, and with a digitiform lobe bearing long setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the country where the types were collected.

**Remarks:** *V. costaricensis* is closely related to *V. panamensis* according to the genitalia features, but can be differentiated by the characters given in the key.

### *Viridigona panamensis* spec. nov.

(Fig. 21)

**Material:** **Holotype** male: PANAMA: Panama, Canal Zone, Panama City, Monsoon Forest, Canopy fogging, 15–30.vii.1979, E. BROADHEAD et. al., tree no 12. [BMNH]. **Paratype:** 1 male: same data. [BMNH].

#### **Description**

**Male.** Length: holotype: body length 3.8 mm, wing length 3.4 mm; thorax 1.44 mm, abdomen (segments 1–6) 1.8 mm. Paratype body length: 3.5 mm.

**Head:** Eyes contiguous; ocellar setae 1.8 times as long as verticals; postvertical setae yellow, 0.5 times as long as verticals; uppermost postocular setae yellow; first flagellomere as long as basal width, apically rounded, yellow with apical 3/4 infuscated; arista about 7 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with bronze reflections and with weak greyish pruinosity; pleura dark metallic green with dense greyish pruinosity; lower proepisternum with a strong yellow seta.

**Legs:** All legs including coxae entirely yellow; IC with brown apical and 2 strong anterolateral setae;  $It_4$  slightly flattened (MSSC),  $It_5$  also slightly flattened with a tiny dorsoapical spine; IIT with strong ad setae at 1/4 and 2/3; IIIT without strong dorsal setae. Relative podomere ratios: I: 43, 49, 33/23/11/6/4; II: 46, 64, 62/32/16/7/5; III: 53, 86, 27/46/21/11/5. **Wing:** Crossvein dm-cu about 1.2 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter yellow, with a fan of yellow setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 dark metallic bronze-green, tergum 2 with a yellow basal band and a yellow lateral patch; terga 2–4 with a grey postmarginal band; tergum 5 with a ventral cuticular projection; sternum 8 dark brown. Epandrium dark brown, VSUR whitish hyaline, DSUR brown; cercus white with brown-golden apical setae. Hypopygium (Fig. 21): hypandrium broad and rounded; MEp digitiform with a strong subapical seta; LEp ovate and apically pointed; left VSUR with a strong and straight seta, right VSUR with a flattened appendage; DSUR short and ovate, with a long flattened seta; cercus with long flattened and curved apical setae which are about twice as long as basal cercus, and with a digitiform lobe which is 1/2 as long as apical setae bearing long setae.

**Female:** Unknown.

**Distribution:** Panama.

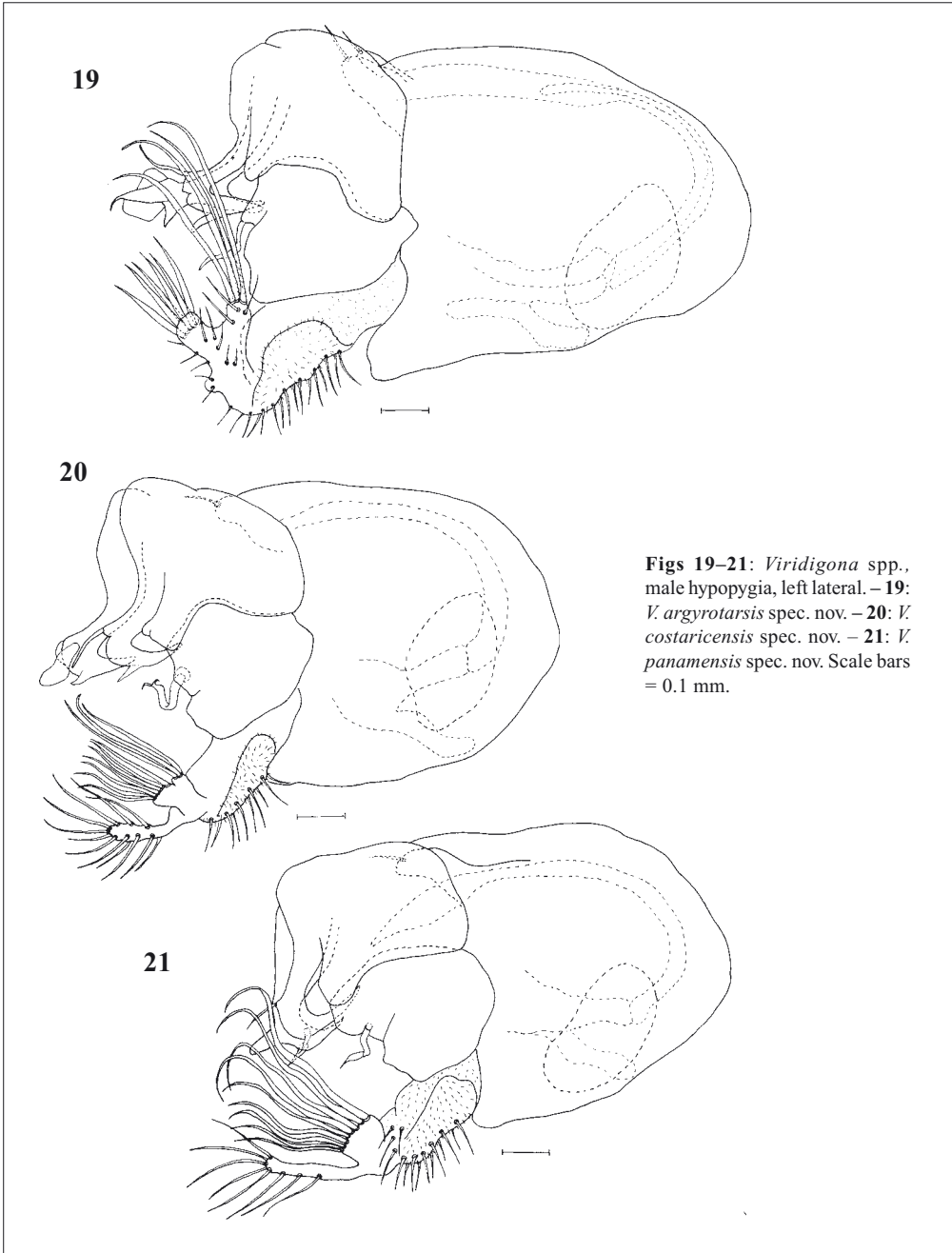
**Etymology:** The name refers to the country where the types were collected.

**Remarks.** See under *V. costaricensis*.

### *Viridigona longiseta* spec. nov.

(Fig. 22)

**Material:** **Holotype** male: BELIZE: Br. Honduras, Middlesex, 125 m, 20.IV.1965, E. C. WELLING. [CNC]. **Paratypes:** 2 males: same data, but 15.IV. and 1.IV. [CNC]. **Additional material:** BRAZIL: 2 males: Nova Teutonia, 27° 11' S, 52° 23' W, Brazil, 300–500 m, 20.IV.1965, Fritz PLAUMANN. 1 male: same data, but 14.IV.1965 [all CNC].

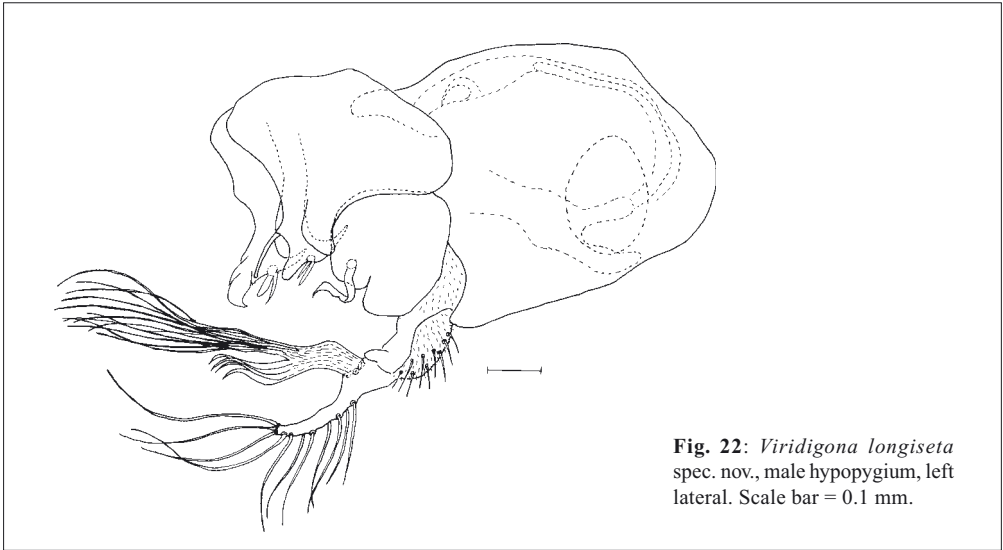


**Figs 19–21:** *Viridigona* spp., male hypopygia, left lateral. – **19:** *V. argyrotarsis* spec. nov. – **20:** *V. costaricensis* spec. nov. – **21:** *V. panamensis* spec. nov. Scale bars = 0.1 mm.

**Description**

**Male.** Length: holotype: body length 3.3 mm, wing length 3.1 mm; thorax 1.14 mm, abdomen (segments 1–6) 1.68 mm. Body length variation: 2.8–3.0 mm.

**Head:** Eyes contiguous; ocellar setae 2.0 times as long as verticals; postvertical setae yellow, 0.4 times as long as verticals; uppermost postocular setae yellow; first flagellomere as long as basal



**Fig. 22:** *Viridigona longiseta* spec. nov., male hypopygium, left lateral. Scale bar = 0.1 mm.

width, apically rounded, yellow with apical 3/4 infuscated; arista about 7 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with bronze reflections and with weak greyish pruinosity; pleura dark metallic green with dense greyish pruinosity; lower proepisternum with a strong yellow seta.

**Legs:** All legs including coxae yellow; IC with brown apical and 2 strong anterolateral setae;  $It_4$  slightly flattened (MSSC),  $It_3$  also slightly flattened with a tiny dorsoapical spine; IIT with strong ad setae at 1/4 and 2/3; IIIT without strong dorsal setae. Relative podomere ratios: I: 46, 52, 39/26/12/7/5; II: 52, 69, 64/34/17/8/5; III: 60, 94, 28/51/22/12/5. **Wing:** Crossvein dm-cu about 1.2 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter yellow, with a fan of yellow setae; haltere yellow.

**Abdomen:** Similar to *panamensis*. Epandrium dark brown, VSur and DSur dark brown; cercus white with brown apical setae. Hypopygium (Fig. 22): hypandrium broad and rounded; MEp digitiform with a strong apical seta; LEp ovate, apically pointed; left VSur with a strong and straight subapical seta, right VSur with a flattened curved seta; DSur short and ovate, with a long flattened seta; cercus with long apical setae which are about 4 times as long as basal cercus and with shorter curved flattened setae which are fused basally, and with a digitiform lobe which is 1/4 as long as apical setae bearing long sinuous setae.

**Female:** Unknown.

**Distribution:** Belize, Brazil.

**Etymology:** The name refers to the conspicuous long cercal setation.

**Remarks.** *V. longiseta* has the longest cercal setation within the *viridis*-group.

### *Viridigona cecilia* spec. nov.

(Fig. 23)

**Material: Holotype** male: COSTA RICA: Est. Pitilla, 9 km S. Sta. Cecilia, Prov. Guana, Costa Rica, 700 m, 22 Ago. 1993, C. MORAGA, LN 330200\_380200 # 2322. [INBio].

### Description

**Male.** Length: holotype: body length [head missing], wing length 3.3 mm; thorax 1.25 mm, abdomen (segments 1–6) 1.44 mm.

**Head:** Missing.

**Thorax:** Mesonotum metallic green with bronze reflections, and with ochreous and greyish pruinosity; pleura with more dense greyish pruinosity; ac with posterior pairs 4 times as long as distance between rows. **Legs:** IC with yellow apical and anterolateral setae;  $It_{4+5}$  not flattened; IIT slightly flattened dorsoventrally, with strong ad setae at 1/5 and 2/3, more basal seta smaller; IIIT with a small dorsal seta at 1/3. Relative podomere ratios: I: 44, 51, 40/30/14/9/6; II: 52, 72, 64/30/18/9/5; III: 60, 94, 27/44/21/13/6. **Wing:** Crossvein dm-cu about 1.3 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; lower calypter yellow with a fan of yellow setae; haltere yellow.

**Abdomen:** Terga 1+2 yellow; tergum 2 with a small dark posterodorsal band; terga 3-5 metallic green with bronze and blue reflections; terga 2-4 with a small greyish postmarginal band; tergum 5 with a distinct ventral cuticular projection; sternum 8 black. Epandrium black, VS<sub>ur</sub> hyaline white; DS<sub>ur</sub> dark brown; cercus basally white and apically dark brown, adhesive median setae yellow; lateral setae dark brown. Hypopygium (Fig. 23): hypandrium broad and tapering; MEp long and broad with a strong apical seta; LEp shorter and bilobate, median lobe with two short apical and subapical setae, lateral lobe with long apical seta; left VS<sub>ur</sub> with flattened subapical seta; right VS<sub>ur</sub> with a long strong and straight subapical seta; DS<sub>ur</sub> short and ovate, with a pointed apex and a flattened apical seta; cercus upcurved, with an apical cluster of dense adhesive setae, and with a row of strong sinuous ventral and weaker dorsal setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

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

**Remarks.** *V. cecilia*, *V. mexicana*, and *V. magnifica* have an adhesive or coalescent cluster of apical setae as a unique feature within the *viridis* group, which appears to be a synapomorphy of these species.

### *Viridigona mexicana* spec. nov.

(Fig. 24)

**Material:** **Holotype** male: MEXICO: Mexico, Chiapas Mpio: San Cristobal, Reserva Huitepec, From Malaise trap, Aug. 14-20, 1990, Robert W. JONES. [TAMU]. **Paratypes:** 4 males: same data as holotype, but Aug. 8-13, 1990. [all TAMU].

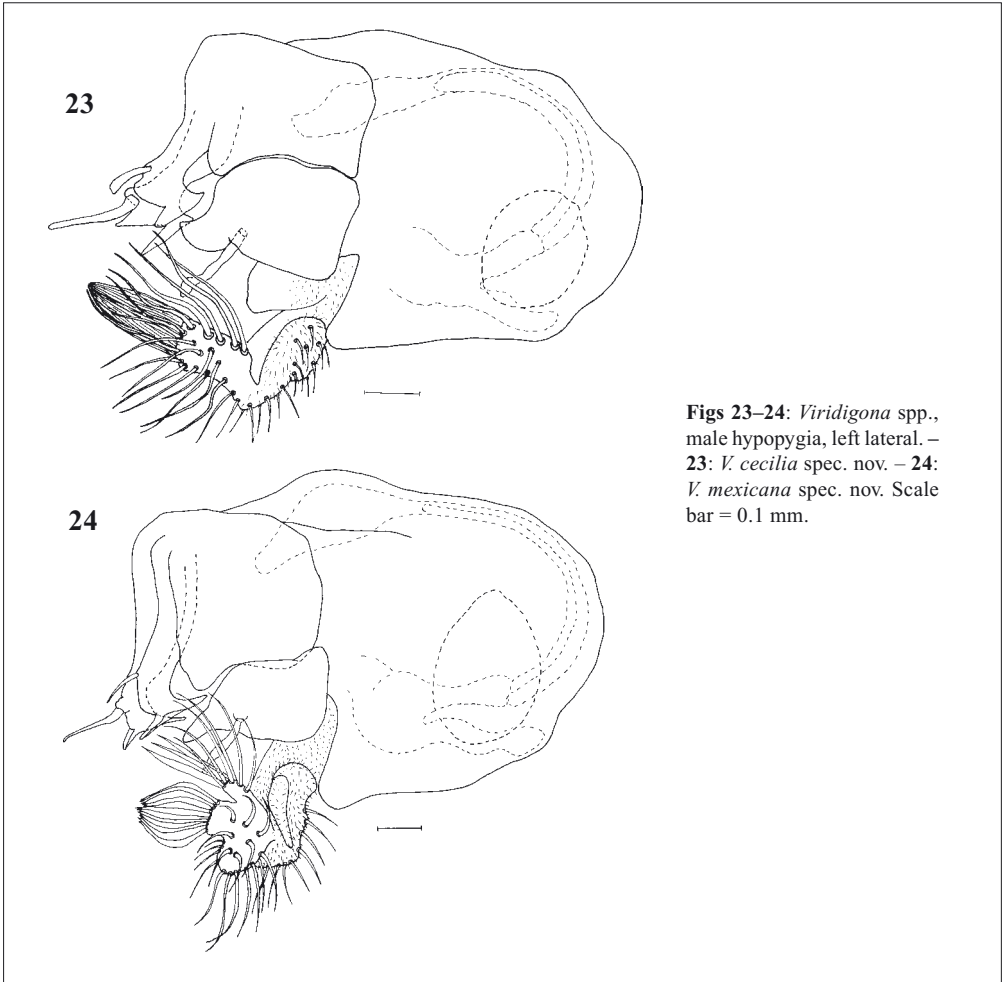
### Description

**Male.** Length: holotype: body length 4.6 mm, wing length 4.6 mm; thorax 1.64 mm, abdomen (segments 1-6) 2.42 mm; paratypes: body length 4.1-4.6 mm.

**Head:** Eyes distinctly separated on face; ocellar setae 2.0 times as long as verticals; postvertical setae yellow, 0.75 times as long as verticals, very close to verticals; uppermost postocular setae yellow; first flagellomere as long as basal width, triangular, dark brown; arista about 7.5 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with bronze reflections and with greyish pruinosity; pleura dark metallic green with dense greyish pruinosity; proepisternum below with a strong yellow seta and some hairs, and above with a smaller yellow seta; posterior pairs of ac 3 times as long as distance between rows; lateral scutellars 1/5 as long as medians. **Legs:** All legs yellow, apical part of IIIT and IIIIt infuscated; IC with 2 strong yellow anterolateral setae;  $It_4$  only slightly flattened in apical half (MSSC),  $It_5$  with a dorsoapical narrow spine; IIF with a row of 4-6 pale ventral setae on basal 1/3; IIT with strong ad setae at 1/5 and 2/3, and with a smaller dorsal seta at about 2/3; IIIT with several short dorsal setae. Relative podomere ratios: I: 43, 55, 46/28/17/12/7; II: 46, 78, 69/32/17/10/5; III: 66, 104, 24/47/22/13/6. **Wing:** Crossvein dm-cu about 1.3 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.6 times as long as distal section of CuA; lower calypter yellow, with a fan of yellow setae; haltere yellow-ochreous.

**Abdomen:** As in *V. magnifica*, but cercus with yellow apical setae. Hypopygium (Fig. 24): hypandrium short and triangular; MEp digitiform with a strong apical seta; LEp leaf-like and pointed, with 2



**Figs 23–24:** *Viridigona* spp., male hypopygia, left lateral. – **23:** *V. cecilia* spec. nov. – **24:** *V. mexicana* spec. nov. Scale bar = 0.1 mm.

small subapical setae; left VSur with a strong curved seta, right VSur with a long straight seta; DSur short and triangular, with a flattened seta; cercus elongated and U-shaped, distal half broadened apically and divided into three short lobes: inner lobe with long apical and long flattened subapical setae, middle lobe with a row of adhesive flattened setae (during clearing of the genitalia they become more separated), outer lobe with long curved setae.

**Female:** Unknown.

**Distribution:** Mexico.

**Etymology:** The name refers to the country where the types were collected.

**Remarks.** See under *V. cecilia*.

***Viridigona magnifica* spec. nov.**

(Fig. 25a–c)

**Material:** **Holotype** male: PERU: Avispas, Madre de Dios, Peru, 10–20.IX.1962, L. PENA, 400 m. [CNC]. **Paratypes:** 9 males: same data as holotype. 1 male, 2 females: same data but 1–15.X.1962. 1 female: same data but 20–30.IX.1962. 1 male: Quincemil, Cuzo, Peru, 1–15.XI.1962, L. PENA, 700 m. 1 male: same data but 15–30.X.1963. [all CNC]. **Additional material:** BRAZIL: 1 male: Brasil, Amazonas, Manaus, R. Ducke, Copa Arv, 26.XI.1981, J. A. RAFAEL.

1 male same data but 24.IX.1981. [all INPA]. VENEZUELA: 1 female: Venezuela, T. F. Amaz., Cerro de la Nablina, Basecamp, 140 m, 21–28 Feb. 1985. [USNM]. COSTA RICA: 3 males: Est. Pitilla 9 km S. Santa Cecilia, Prov. Guana, Costa Rica, 700 m, 22 Aug 1993, Jun 1994, Oct 1994. [INBio].

### Description

**Male.** Length: holotype: body length 4.4 mm, wing length 4.0 mm; thorax 1.65 mm, abdomen (segments 1–6) 1.95 mm; paratypes: body length 4.25–5.0 mm.

**Head:** Eyes contiguous; ocellar setae 2.0 times as long as verticals; postvertical setae black, 0.7 times as long as verticals and very close to verticals; uppermost 3 postocular setae black; first flagellomere as long as basal width, rounded apically, dark brown; arista about 8 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with bronze and purplish reflections, without pruinosity, with a distinct purplish-black patch on area of mesonotal suture; pleura dark metallic green with dense greyish pruinosity; lower proepisternum with a strong yellow seta and several long hairs. **Legs:** IIC and IIIC dark brown; IIIT apically and IIII entirely infuscated; IC with 2 strong black anterolateral setae;  $It_4$  only slightly flattened in apical half (MSSC),  $It_5$  with a dorsoapical narrow spine; IIT dorsoventrally flattened with strong ad setae at 1/4 and 2/3; IIIT with several short dorsal setae, more distal seta longer. Relative podomere ratios: I: 50, 57, 44/28/14/9/7; II: 56, 73, 62/31/15/7/5; III: 63, 102, 26/47/23/11/6. **Wing:** Crossvein dm-cu about 1.3 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.6 times as long as distal section of CuA; lower calypter yellow, with a fan of yellow setae; haltere yellow-ochreous.

**Abdomen:** Tergum 1 yellowish; terga 2–5 dark metallic green with bronze reflections, tergum 2 with a yellow basal band and a yellow lateral patch; terga 2–4 with a greyish postmarginal band; tergum 5 with a strong triangular ventral cuticular projection (Fig. 25c); sternum 8 dark brown. Epandrium black, surstyli dark brown; cercus U-shaped, basal part white, apical part dark brown with dark brown apical setae. Hypopygium (Figs. 25a, 25b): hypandrium very short and blunt; MEp digitiform with a strong apical seta; LEp broad and ovate, with a short curved apical spine, and with 2 small subapical setae; left VSur with a spatulate seta and a tuft of short hairs, right VSur with a long straight seta, and a triangular appendage; DSur short and ovate, with a flattened seta; cercus elongated and U-shaped, distal half broadened apically and divided into an inner and an outer part; outer part formed as a transparent ovate shield covering partially the inner part, and apically with a digitiform lobe bearing long sinuous setae; inner part broad and spatulate, covered with tiny spine-like setulae, apically with a dense row of long flattened setae which form a coalescent triangular cluster (during clearing of the genitalia they become more separated).

**Female:** Similar to male but without MSSC and as noted: Eyes distinctly separated, distance between eyes about 3/4 the distance between ocellar setae; first flagellomere wider; setation of IIT more strongly developed and varying from 2 strong ad and 2 short ventral setae to 3 strong ad setae, 1 short pd seta, 2 strong av setae, and 3 strong pv setae; IIIT with 3–4 strong dorsal setae (see also Discussion).

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

**Etymology:** The name refers to the remarkable body size and colouration.

**Remarks:** *V. magnifica* has one of the most highly developed and complex male cercal features within the *viridis* group (see also under *V. cecilia*). The species has a wide distribution area in Central America and northern South America.

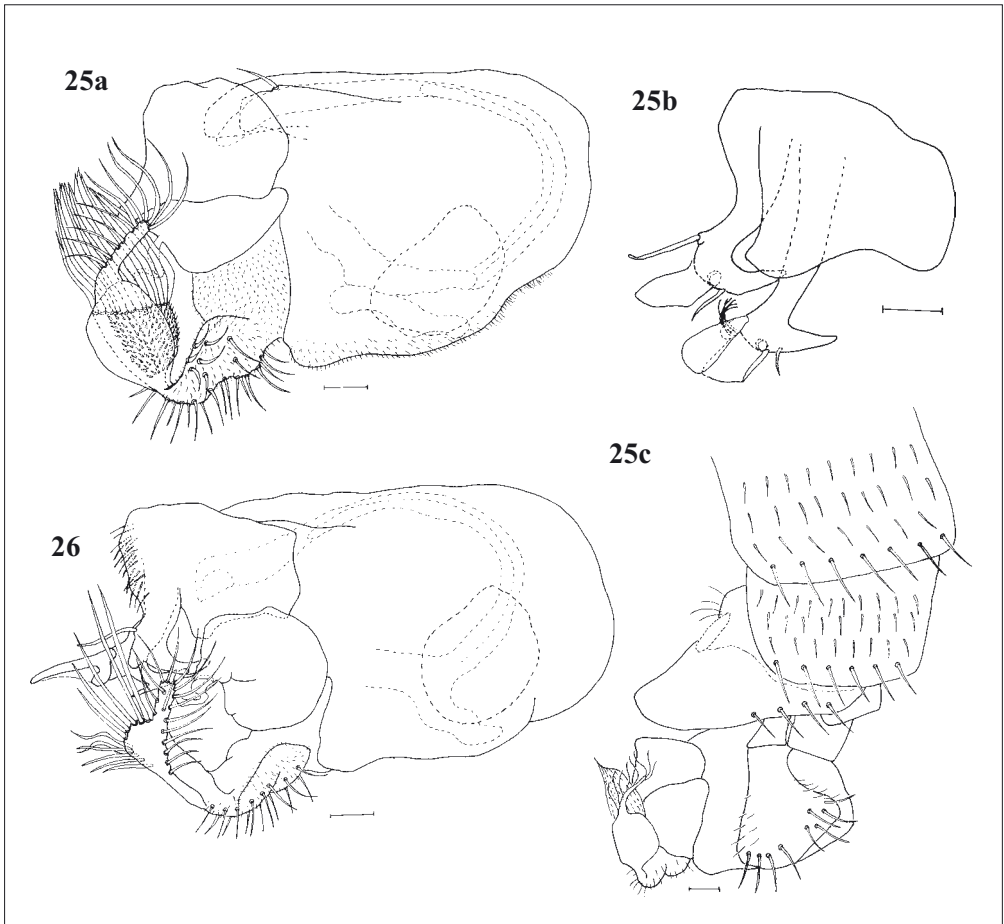
### *Viridigona flavipyga* spec. nov.

(Fig. 26)

**Material: Holotype** male: COSTA RICA: Est. Pitilla, 9 km S. Santa Cecilia, Prov. Guana, Costa Rica, 700 m, Oct. 1994, P. Ríos, L N 330200\_380200 # 3294. [INBio].

### Description

**Male.** Length: holotype: body length 3.2 mm, wing length 3.4 mm; thorax 1.27 mm, abdomen (segments 1–6) 1.35 mm.



**Fig. 25a–b:** *Viridigona magnifica* spec. nov., male – a: Hypopygium, left lateral; – b: VSur, left lateral; – c: Postabdomen, left lateral. Scale bar = 0.1 mm.

**Fig. 26:** *Viridigona flavipyga* spec. nov. Male hypopygium, left lateral. Scale bar = 0.1 mm.

**Head:** Eyes contiguous on face; ocellar setae broken off; postvertical setae black and 0.7 times as long as verticals; uppermost 3–5 postocular setae black and not longer than the following yellow setae; first flagellomere as long as basal width, yellow, apical half dark brown; arista about 8 times as long as first flagellomere.

**Thorax:** Mesonotum metallic green with bronze reflections, and with ochreous and greyish pruinosity; pleura with more dense greyish pruinosity; ac with posterior pairs 4 times as long as distance between rows. **Legs:** All legs broken off except IF, IIF, IIIF–IIIt<sub>3</sub>, IIIT without strong dorsal setae. Relative podomere ratios: I: 41, ?, ?/?/?/?/?; II: 43, ?, ?/?/?/?/?; III: 51, 83, 21/37/14/?/??. **Wing:** Infuscated in anterior part; crossvein dm-cu about 1.5 times as long as distance between R<sub>4+5</sub> and M at wing margin, and 0.7 times as long as distal section of CuA; lower calypter pale with brown rim and with a fan of brown setae; haltere yellow.

**Abdomen:** Tergum 1 yellow; terga 2–5 metallic bronze-green, tergum slightly 2 yellow laterally; terga 2+3 with a greyish postmarginal band; tergum 5 hidden under tergum 4, with a ventral cuticular projection; sternum 8 dark brown. Epandrium dark brown; surstyli translucent yellow; cercus yellow with yellow-golden apical setae. Hypopygium (Fig. 26): hypandrium broad and tapering; MEP short

and digitiform with a strong apical seta; LEp ovate and apically pointed, with an apical and a subapical seta; left VSUR with a long subapical seta; right VSUR with a long subapical beak-like appendage; DSUR short and rounded, with a flattened sinuous apical seta; cercus strongly upcurved and U-shaped, with an apical digitiform lobe and with long and strong apical setae.

**Female:** Unknown.

**Distribution:** Costa Rica.

**Etymology:** The name refers to the conspicuous yellow colour of the hypopygium.

**Remarks.** *V. flavipyga* has several striking characters such as the yellow colour of the hypopygium, the cercal shape and setation, and the dense setulae on the distal rim of VSUR.

### Unplaced species of *Viridigona*

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

#### *Viridigona amazonica* spec. nov.

(Fig. 27a–b)

**Material:** **Holotype** male: BRAZIL: Brasil, Amazonas, 26 km NE Manaus, Reserva Ducke, 13.X.1988 / J.A. RAFAEL, Arm. Suspensa 15 metros. [INPA]. **Paratypes:** BRAZIL: 20 males: same data, 22.IV–13.X.1988. [all INPA]. **Additional material:** BRAZIL: 1 male: Brasil, Amazonas, Manaus-FUA, 24.III.1982, E. L. OLIVEIRA [INPA]. VENEZUELA: 1 male: 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 colfs. [USNM].

### Description

**Male.** Length: holotype: body length 3.4 mm, wing length 2.8 mm; thorax 1.15 mm, abdomen (segments 1–6) 1.73 mm; male body length variation: 2.7–3.4 mm.

**Head:** Frons metallic blue-green with violet reflections and with weak greyish pruinosity; with a pair of short black vertical setae, a pair of long black diverging ocellar setae 1.5 times as long as verticals and with a posterior pair of tiny setae, and a pair of short black postvertical setae 0.5 as long as verticals. Postocular setae pale yellow, uppermost seta 2 times as long as the succeeding setae, uppermost 3–5 setae black; ventral postcranium with some long pale yellow setae below. Eyes contiguous on face. Face and clypeus very narrow with dense greyish-white pruinosity. Palp ovate and whitish-yellow, with 2 short brown apical setae and brown hairs; proboscis brownish-yellow, with yellow hairs. Antenna: scape short and yellow; pedicel yellow, globose and truncate with first flagellomere, with a circlet of short brown setae; first flagellomere rounded triangular, yellow, apical half infuscated, as long as basal width; arista dorsal, with short pubescence, about 9 times as long as first flagellomere. Ratio narrowest/widest distance between eyes on frons: 23/34; ratio narrowest/widest distance between eyes on face: 0/7; ratio narrowest/widest distance between eyes on clypeus: 4/5.

**Thorax:** Mesonotum, scutellum, and postnotum metallic blue-green with violet reflections, with weak greyish pruinosity and with golden reflections especially on mesonotal depression and scutellum. Pleura concolorous with mesonotum but with more dense greyish pruinosity; metepimeron yellow. All thoracic setae black with brownish reflections except as noted: ac with 2 rows of 8–10 short setulae, length of posterior setae about equal to the distance between rows; dc comprising 6 strong setae, decreasing in size anteriorly. Additional strong setae include: 1 pa, 2 sa, 2 sr, 2 np, 1 hm, and 1 pm. Scutellum with 2 strong median scutellar setae, laterals short, about 1/7 as long as medians. Proepisternum with 1 strong pale seta below. **Legs:** All legs yellow, IIC slightly infuscated anteriorly; setae on legs including coxae brownish-black except as noted. **I:** IC with some apical anterior setae and with 2 strong anterolateral setae;  $It_{4+5}$  slightly flattened dorsoventrally,  $It_4$  with a velvety yellow pubescence ventrally (MSSC). **II:** IIC with several anterior setae; trochanter with a strong seta; IIT slightly flattened dorsoventrally (MSSC), with small ad setae at 1/4 and 3/4, and with a strong apical seta. **III:** IIIC with a strong lateral seta at 1/4; trochanter with a strong seta; IIIT with a short curved dorsal seta beyond mid-length, and 3–4 small apical setae. Relative podomere ratios: I:



45, 52, 31/20/13/7/4; II: 52, 67, 67/39/19/9/5; III: 60, 97, 28/53/24/19/5. **Wing:** Hyaline, with a yellowish tinge;  $R_{2+3}$  practically straight to wing margin;  $R_{4+5}$  curved posteriad distally toward M; M with a weak flexion at 3/4 between crossvein dm-cu and apex, and subparallel with  $R_{4+5}$ ;  $R_{4+5}$  joining wing margin anteriorly and M posteriad of apex; crossvein dm-cu about 1.4 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.5 times as long as distal section of CuA; A distinct and almost reaching wing margin. Lower calypter pale yellow with a fan of brown setae; haltere yellow.

**Abdomen:** Distinctly longer than thorax; all setae and hairs black with brown reflections. Terga 1+2 yellow, tergum 2 with a metallic green dorsal patch; terga 3–5 entirely metallic green; terga 6+7 and sternum 8 dark brown. Epandrium and surstyli dark brown, cercus brown with extremely long whitish setae. Hypopygium (Fig. 27a–b): epandrium large and globular, hypandrium basally broad and apically pointed; MEp broad with a strong flattened apical seta; LEp digitiform with an apical seta; VSur rectangular and tapering distally; DSUr rectangular and longer than VSur; cercus with a narrow apical projection bearing a strong median and 3 long apical setae, and with extremely long whitish setae which are about twice as long as entire hypopygium.

**Female:** Unknown.

**Distribution:** Brazil, Venezuela.

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

**Remarks.** *V. amazonica* is distinct from all its congeners by the remarkable elongation of the cercal setation.

### *Viridigona minima* spec. nov.

(Fig. 28)

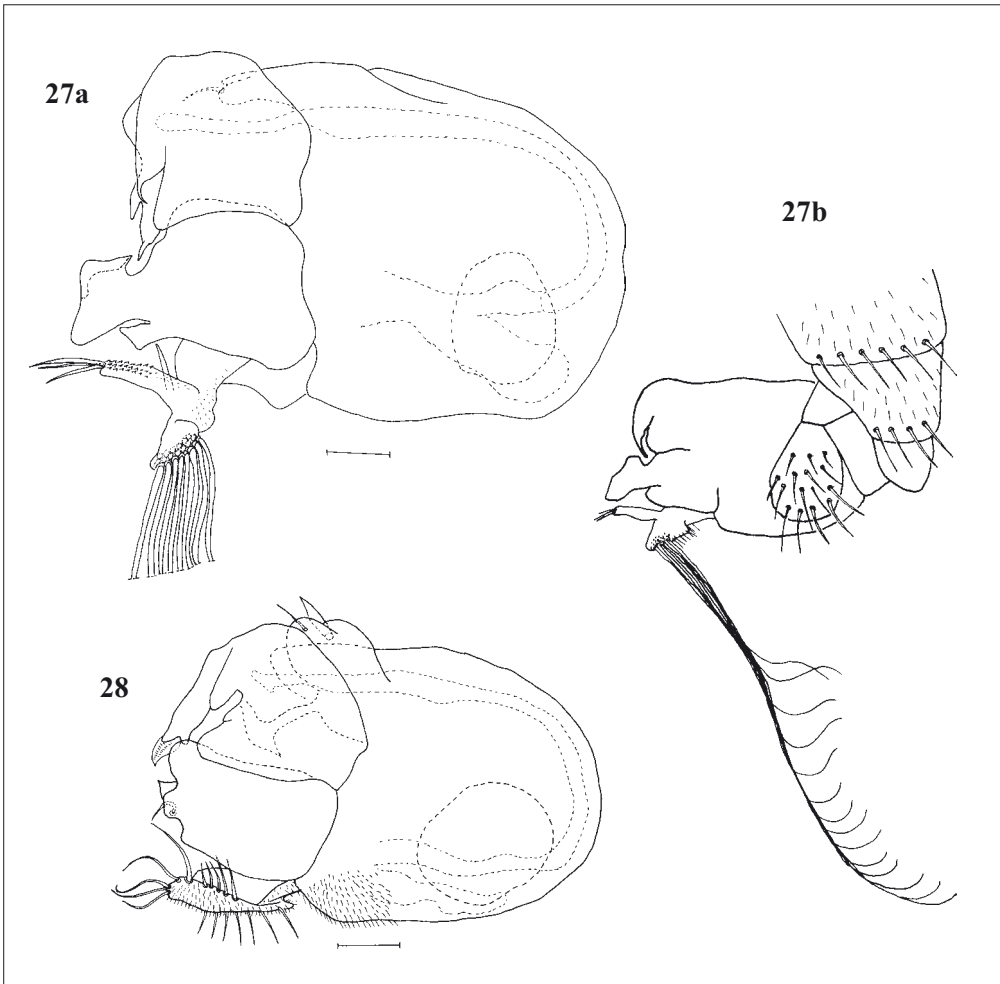
**Material:** **Holotype** male: MEXICO: Mexico, Tamps. Est. Biol. Los Cedros, Comes Farias, 350 m, VII-27-30-1993, J.B. WOOLLEY & K. WIKSE, 93/023, malaise trap. [TAMU]. **Paratype:** 1 male, 3 females: same data. [TAMU]. **Additional material:** PANAMA: 1 male: Panama, Canal Zone, Colon, Humid forest, Canopy fogging, 2–14.VII.1979, E. BROADHEAD et al., B. M. 1979-125 [BMNH]. 1 female: Panama, Colon, Colon, Prov., 2 km S Sabanita, 23.VI.–1.VII.1999, A. GILLOGLY, el 120 m, malaise trap, 99/101 [TAMU]. COSTA RICA: 1 male: Est. Pitilla, 700 m, 9 km S Sta. Cecilia, P. N. Guanacaste, Prov. Guana, Costa Rica, P. RIOS, May 1991. [INBio].

### Description

**Male.** Length: holotype: body length 2.6 mm, wing length 2.5 mm; thorax 0.87 mm, abdomen (segments 1–6) 1.59 mm.

**Head:** Frons and occiput metallic green with weak greyish pruinosity; with a pair of black vertical setae, a pair of long black diverging ocellar setae 1.6 as long as verticals and with a posterior pair of short setae, and a pair of short brown postvertical setae 0.8 as long as verticals. Postocular setae pale yellow, uppermost seta 1.5 times as long as succeeding setae; ventral postcranium with some longer pale yellow setae below. Eyes contiguous on face; face with dense ochreous and clypeus with dense white pruinosity. Palp ovate and whitish-yellow, with short pale setae and hairs; proboscis yellow, with yellow hairs. Antenna: scape short and yellow; pedicel yellow, with a circlet of short brown setae; first flagellomere rounded triangular, yellow, apical half infuscated, as long as basal width; arista dorsal, with short pubescence, about 8 times as long as first flagellomere. Ratio narrowest/widest distance between eyes on frons: 22/34; ratio narrowest/widest distance between eyes on face: 0/11; ratio narrowest/widest distance between eyes on clypeus: 3/4.

**Thorax:** Mesonotum, scutellum, and postnotum metallic green with blue and violet reflections, with weak greyish pruinosity especially on mesonotal depression. Pleura concolorous with mesonotum but with more dense greyish pruinosity; metepimeron yellow. All thoracic setae black with brownish reflections except as noted: ac with 2 rows of 8–10 short setulae, length of posterior setae about 2 times as long as the distance between rows; dc comprising 6 strong setae, decreasing in size anteriorly. Additional strong setae include: 1 pa, 2 sa, 2 sr, 2 np, 1 hm, and 1 pm. Scutellum with 2 strong median scutellar setae, laterals short, about 1/8 as long as medians. Proepisternum with 1 strong pale seta below. **Legs:** All legs including coxae yellow; setae on legs black, except as noted. **I:** IC with pale apical anterior setae and with 2 pale strong anterolateral setae;  $It_4$  not flattened,  $It_5$  very weakly



**Fig. 27a–b:** *Viridigona amazonica* spec. nov., male. – **a:** Hypopygium, left lateral – **b:** Postabdomen, left lateral. Scale bar = 0.1 mm.

**Fig. 28:** *Viridigona minima* spec. nov. Male hypopygium, left lateral. Scale bar = 0.1 mm.

flattened ventrally (MSSC). **II:** IIC with pale and brown anterior setae; trochanter with a strong brown seta; IIF with conspicuous ventral setae on basal 1/4, length about half diameter of femur (MSSC); IIT with ad setae at 1/4 and 2/3, and with 3 apical seta. **III:** IIIC with a strong black to yellow lateral seta; trochanter with a strong seta; IIIT with a strong black curved dorsal seta at mid-length, and 3-4 small apical setae. Relative podomere ratios: I: 46, 47, 32/19/11/7/5; II: 53, 61, 58/31/18/10/5; III: 61, 94, 24/43/22/15/6. **Wing:** Hyaline, with an ochreous tinge;  $R_{2+3}$  straight to wing margin;  $R_{4+5}$  slightly curved posteriad distally toward M; M with a weak flexion at 1/2 between crossvein dm-cu and apex, and subparallel with  $R_{4+5}$ ;  $R_{4+5}$  joining wing margin anteriad and M posteriad of apex; crossvein dm-cu about 1.1 times as long as distance between  $R_{4+5}$  and M at wing margin, and 0.4 times as long as distal section of CuA; A distinct and almost reaching wing margin. Lower calypter pale yellow with a fan of golden-yellow setae; haltere pale yellow.

**Abdomen:** Dorsal setae brown, ventral setae yellow; terga 1+2 yellow; tergum 2 with a small dark dorsal spot; terga 3–6 metallic green; terga 4+5 with long pale ventral setae; tergum 5 without ventral cuticular projection; tergum 7 brownish; sternum 8 dark brown with striking long pale setae. Epan-

drium dark brown; VSur dark brown, DSur ochreous-yellow; cercus yellow with short pale setae. Hypopygium (Fig. 28): epandrium large and globular, hypandrium basally broad and apically pointed; MEp broad with a strong flattened apical seta; LEp ovate with a long curved subapical seta; VSur ovate with a distal incision and a straight symmetric projection lying in conformity with curvature of VSur and not projecting distally; DSur rectangular, with a curved apical seta; cercus with some longer apical setae.

**Female:** Similar to male except as noted: Eyes distinctly separated, distance between eyes about 1/2 the distance between ocellar setae; first flagellomere infuscated on apical half; apical setae on IC varying from yellow to black; IIT with 2–3 short ventral setulae; tergum 2 with a dark dorsal band.

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

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

### Phylogenetic Analysis of the genus *Viridigona*

The following list enumerates the apomorphic character states and their polarities that were used for the phylogenetic analysis of the genus *Viridigona*. The plesiomorphic character states have been used for the definition of a hypothetical ancestral ground-plan of the Neurigoninae. A comprehensive analysis of the phylogenetic relationships of all the genera of the Neotropical Neurigoninae will be proposed after completion of the revision.

The phylogenetic characters are defined in the following format:

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

#### Apomorphies of *Viridigona*

- 1) *Male It<sub>4+5</sub>*: unmodified / **slightly broadened and flattened dorsoventrally, It<sub>4</sub> with a ventral pile of short pale pubescence (MSSC)**
- 2) *Setation of IIT*: with strong ad, pd and ventral setae / **setae reduced to 2 ad setae; pd and ventral setae lost**
- 3) *Setation of IIt<sub>1</sub>*: with strong setae / **setae completely lost**
- 4) *Setation of IIIT*: with strong dorsal setae / **dorsal setae lost or reduced to one or several weak setae**

### Discussion

*Viridigona* has many plesiomorphic character states such as the metallic green thorax and abdomen, the presence of 6 strong dc, vein M parallel with vein R<sub>4+5</sub> and joining costa posteriad of apex. The genus thus represents the more basal lineage within the tribe Neurigonini. But it also has several autapomorphies which define its monophyly within the Neurigonini. These consist mainly in the reduction or loss of leg setation as described in character states 2) – 4). Some species (*V. puntarena*, *V. argyrotarsis*) show an intermediate stage of character state 2) as they have a strong pd seta. In females, this reduction of leg setation is sometimes in a more plesiomorphic condition, as in *V. magnifica* where some specimens have strong ventral setae on IIT and strong dorsal setae on IIIT. Character state 1), the slightly broadened and flattened It<sub>4+5</sub> and the ventral pile of pubescence on It<sub>4</sub>, is a strong synapomorphy. The single known species within *Viridigona* with specially modified fore tarsomeres is *V. argyrotarsis*, which has silvery-white It<sub>3+4</sub>. The modification of the fore tarsomeres is a general trend in male Neurigoninae and it is remarkably developed in members of several genera such as *Neurigona* RONDANI, *Bickelomyia* NAGLIS, *Dactylomyia* ALDRICH

and *Macroductylomyia* NAGLIS. It is a feature known to be involved in courtship behaviour (BICKEL 1998). A list of characters separating *Viridigona* from *Neurigona* is given in the differential diagnosis (Tab. 1).

## Acknowledgements

I am grateful to the following curators and support staff for the loan of material (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); 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 D. BICKEL (Sydney), B. MERZ (Geneva), and A. C. PONT (Oxford) for valuable comments on the manuscript, and H. ROBINSON (Washington) who provided information on *Neurigona viridis*.

## Literature

- ARNAUD, Ph. Jr. (1979): A catalog of the types of Diptera in the collection of the California Academy of Sciences. – *Myia* **1**: 1–505.
- BICKEL, D. J. (1998): The Dolichopodidae (Diptera) of Midway Atoll, with a new species of *Dactylomyia* ALDRICH, and taxonomic notes on the subfamily Neurigoninae. – Records of the Hawaiian Biological Survey for 1997 – Part I: Articles. Bishop Museum Occasional Papers **55**: 45–55; Honolulu.
- MCALPINE, J. F. (1981): 2. Morphology and terminology - adults. In: McALPINE, J. F. et al. (eds): Manual of Nearctic Diptera. Vol. 1. – Research Branch, Agriculture Canada, Monograph No. **27**: 9–63. Ottawa.
- NAGLIS, St. M. (2001a): Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) I: *Coeloglutus* ALDRICH, *Neotonnoiria* ROBINSON, and *Paracoeloglutus* gen. nov., with the definition of the tribe Coeloglutini stat. nov. – *Studia dipterologica* **8**(1): 189–206; Halle (Saale).
- NAGLIS, St. M. (2001b): Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) II: *Argentinia* PARENT, *Dactylomyia* ALDRICH, *Macroductylomyia* gen. nov. and *Systemoides* gen. nov., with the definition of a new tribe Dactylomyiini. – *Studia dipterologica* **8**(2): 475–504; Halle (Saale) [erschienen 2002].
- NAGLIS, St. M. (2002): Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) III: *Bickelomyia* gen. nov., with the definition of a new tribe Neurigonini. – *Studia dipterologica* **9**(1): 225–241; Halle (Saale).
- PHILIPPI, R. A. (1865): Aufzählung der chilenischen Dipteren. – Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien **15**: 595–782; Vienna.
- ROBINSON, H. (1970): Family Dolichopodidae. – In: PAPAVERO, N. (ed.): A catalogue of the Diptera of the Americas south of the United States **40**: 1–92. – Museu de Zoologia, Universidade de São Paulo; Brazil.
- ROBINSON, H. (1975): Bredin-Archbold-Smithsonian biological survey of Dominica. The family Dolichopodidae with some related Antillean and Panamanian species (Diptera). – *Smithsonian Contributions to Zoology* **185**: 1–141; Washington.
- VAN DER WULP, F. M. (1888): Nieuwe Argentijnsche Diptera van Wijlen Prof. H. WEYENBERGH Jr., beschreven door F. M. VAN DER WULP. – *Tijdschrift voor Entomologie* **31**: 359–376; 's Gravenhage.
- VAN DUZEE, M. C. (1913): A revision of the North American species of the dipterous genus *Neurigona* (Dolichopodidae). – *Annals of the Entomological Society of America* **6**: 22–61; Columbus, Ohio.
- VAN DUZEE, M. C. (1931): Dolichopodidae of the Canal Zone. – *Bulletin of the American Museum of Natural History* **61**: 161–205; New York.

## Author's address

Stefan M. NAGLIS  
 Institute of Plant Sciences  
 Applied Entomology  
 ETH Zentrum  
 Clausiusstrasse 25/NW  
 CH-8092 Zurich  
 Switzerland  
 E-mail: stefan.naglis@ipw.agrl.ethz.ch

The paper was accepted on 20 Juni 2002.  
**Editum: 15 April 2003.**