European Journal of Taxonomy 995: 1–75
https://doi.org/10.5852/ejt.2025.995.2913
ISSN 2118-9773
www.europeanjournaloftaxonomy.eu
2025 · Bartholomay P.R. *et al.*

Monograph

urn:lsid:zoobank.org:pub:C4276448-9E41-4428-B4E4-192C61A37A26

Revision of the *Traumatomutilla quadrinotata* species-group (Hymenoptera: Mutillidae, Sphaeropthalminae): new synonyms, sex associations, and a new species from the Brazilian Atlantic Forest

Pedro R. BARTHOLOMAY [1,*], Kevin A. WILLIAMS [2], Roberto A. CAMBRA [3], Vinícius M. LOPEZ [4] & Marcio L. OLIVEIRA [5]

[1] Instituto Nacional da Mata Atlântica, Av. José Ruschi, nº 4, Santa Teresa, Espírito Santo, Brazil.
[2] Plant Pest Diagnostics Center, California Department of Food & Agriculture, 3294 Meadowview Road, Sacramento CA 95832, USA.
[3] Museo de Invertebrados G.B. Fairchild, Estafeta Universitaria Apartado 00017, Universidad de Panamá, Panamá 0824, República de Panamá.
[4] Programa de Pós-Graduação em Entomologia, Departamento de Biologia, Universidade de São Paulo (USP), Ribeirão Preto 14040-901, Brazil.
[5] Instituto Nacional de Pesquisas da Amazônia, Programa de Pós-Graduação em Entomologia, Laboratório de Hymenoptera, Av. André Araújo, 2936, Manaus, Amazonas, Brazil.

[*] Corresponding author: pedroreck@gmail.com
[2] Email: Kevin.Williams@cdfa.ca.gov
[3] Email: cambramiup60@gmail.com
[4] Email: viniciuslopez@usp.br
[5] Email: mlolivei@inpa.gov.br

[1] urn:lsid:zoobank.org:author:E416B900-50F0-43CB-B15E-D493086BB47E
[2] urn:lsid:zoobank.org:author:AC0FFB4B-5F64-4A1C-9E3A-A7135C15A088
[3] urn:lsid:zoobank.org:author:B6546428-0032-472D-AF99-1F59F03AADE5
[4] urn:lsid:zoobank.org:author:56C44AC4-1A24-49AF-AB2B-BCA96FAB6767
[5] urn:lsid:zoobank.org:author:8CA6698D-8D35-493E-9AA7-62A6393B3B6C

Abstract. The *Traumatomutilla quadrinotata* species-group is reviewed, leaving it with six species known from both sexes, four known from females only and two known from males only. The following junior synonyms are proposed: *Traumatomutilla austera* (Gerstaecker, 1874) [= *Mutilla sigillata* Gerstaecker, 1874 syn. nov.]; *T. chrysozona* (Gerstaecker, 1874) [= *Mutilla lugubrina* Dalla Torre, 1897 syn. nov.; = *Ephuta dives* André, 1906 syn. nov.]; *T. quadripustulata* (Klug, 1821) [= *M. pruinosa* Smith, 1855 syn. nov.; = *M. maraca* Cresson, 1902 syn. nov.]; *T. sancta* (Gerstaecker, 1874) [= *M. solemnis* Cresson, 1902 syn. nov.]; *T. incerta* (Spinola, 1841) [= *M. dentata* Smith, 1879 syn. nov.; =*M. sodalicia* Kohl, 1882 syn. nov.; = *T. tabatinga* Casal, 1969 syn. nov.; = *T. dignitosa* Mickel, 1952 syn. nov.]; *T. pompiliformis* (Gerstaekcer, 1874) [= *M. serra* Cresson, 1902 syn. nov.]; *T. infernalis* (Gerstaecker, 1874) [= *M. floccosa* Gerstaecker, 1874 syn. nov.]. The hitherto undescribed males of *T. ameliae* Casal, 1969 and *T. quadrinotata* (Klug, 1821), are fully described and illustrated. A new species, *T. tetratrauma* Bartholomay & Williams sp. nov., is described based on couples from the Brazilian Atlantic Forest. All

previously described species are redescribed and illustrated. Identification keys for males, females, and known color forms are also provided.

Keywords. Neotropical, taxonomy, velvet ants, species-groups, Dasymutillini.

Bartholomay P.R., Williams K.A., Cambra R.A., Lopez V.M. & Oliveira M.L.2025. Revision of the *Traumatomutilla quadrinotata* species-group (Hymenoptera: Mutillidae, Sphaeropthalminae): new synonyms, sex associations, and a new species from the Brazilian Atlantic Forest. *European Journal of Taxonomy* 995: 1–75. https://doi.org/10.5852/ejt.2025.995.2913

Introduction

Williams *et al.* (2017) subdivided *Traumatomutilla* André, 1901 into 14 species-groups based on species known from females that shared unique characters or combinations of characters. Up to that point, *Traumatomutilla* had 183 valid species and subspecies ranging from Mexico to Argentina and, due to the extreme sexual dimorphism typical of velvet-ants, 133 of those species were known only from females, 48 only from males and only two were known from both sexes (Nonveiller 1990; Williams *et al.* 2017). The species-group construct allowed for the study of this diverse genus to be compartimentalized and resulted in a series of revisions that redescribed, synonymized and/or associated the sexes of more than half of the previously known species (i.e., Bartholomay *et al.* 2018, 2019a, 2019b, 2020, 2021, 2022).

Although body size can vary within most species of *Traumatomutilla* there is a size range that remains consistent for both sexes within species-groups. For example, females of the *T. gemella* species-group range from 9–13 mm while males range from 10–12.5 mm (Bartholomay *et al*. 2021). Comparatively, the larger-bodied females and males of the *T. juvenilis* species-group vary from 9–19 mm and 11–18 mm respectively (Bartholomay *et al*. 2020). The two remaining unrevised species-groups other than the *T. quadrinotata* (i.e., *T. inermis*, and *T. trochanterata* species-groups), have some of the smallest species within the genus (PRB & KAW pers. obs.). After the revision of the diverse, and mostly large-bodied, *Traumatomutilla indica* species-group (Bartholomay *et al.* 2022), the genus is left with only one species-group of consistently larged-bodied females (*Traumatomutilla quadrinotata* species-group) and a handful of males with similar size (PRB & KAW pers. obs.).

In the present study, we review the *Traumatomuitlla quadrinotata* species-group and associate these males with the females of said group resulting in 11 new synonyms, five sex associations, and one new species.

Material and methods

A total of 676 specimens were studied in the current work. Specimens housed at MNRJ were examined before the fire that destroyed most of the museum's collection in 2018 and were all likely lost in the event. The following codens are used for institutions housing the material discussed:

AMNH = American Museum of Natural History, New York, New York, USA
ANSP = Academy of Natural Sciences, Philadelphia, Pennsylvania, USA
CASC = Department of Entomology, California Academy of Sciences, San Francisco, California, USA
CM = Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA
CUIC = Cornell University Insect Collection, Department of Entomology, Ithaca, New York, USA
CZMA = Coleção Zoológica do Maranhão, Caxias, Maranhão, Brazil
DGMC = Donald G. Manley Collection, Florence, South Carolina, USA

DZUP = Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil
EMEC = Essig Museum of Entomology, Department of Entomological Sciences, University of California, Berkeley, California, USA
FMNH = Field Museum of Natural History, Chicago, Illinois, USA
FSCA = Florida State Collection of Arthropods, Gainesville, Florida, USA
HAMAB = Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá, Macapá, Amapá, Brazil
HNHM = Hungarian Natural History Museum, Budapest, Hungary
IAvH = Insituto Alexander von Humboldt, Villa de Leyva, Colombia
INPA = Coleção de Invertebrados do Instituto Nacional de Pesquisas da Amazônia, Manaus, Amazonas, Brazil
MBML = Museu de Biologia Professor Melo Leitão, Instituto Nacional da Mata Atlântica, Santa Teresa, Espírito Santo, Brazil
MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
MIUP = Museo de Invertebrados G.B. Fairchild, Universidad de Panamá, Panamá
MNCN = Museo Nacional de Ciencias Naturales, Madrid, Spain
MNHN = Muséum nationale d'Histoire naturelle, Paris, France
MNRJ = Museu Nacional do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil
MPEG = Museu Paraense Emílio Goeldi, Belém, Pará, Brazil
MSNT = Museo Regionale de Scienze Naturali, Torino, Italia
MZSP = Museu de Zoologia da Universidade de São Paulo, São Paulo, São Paulo, Brazil
NHMUK = British Museum of Natural History, London, England
NHMW = Naturhistorisches Museum Wien, Vienna, Austria
RBINS = Royal Belgian Institute of Natural Sciences, Brussels, Belgium
SDEI = Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
TAMUIC = Texas A & M University Insect Collection, College Station, Texas, USA
TANG = Universidade do Estado de Mato Grosso, Tangará da Serra, Mato Grosso, Brazil
UAIC = Univeristy of Arizona, Tucson, Arizona, USA
UCDC = The Bohart Museum of Entomology, University of California, Davis, California, USA
UEFS = Universidade Estadual de Feira de Santana, Feira de Santana, Bahia, Brazil
UFES = Universidade Federal do Espírito Santo, Vitória, Espírito Santo, Brazil
UMSP = University of Minnesota Insect Collection, St. Paul, Minnesota, USA
USNM = United States National Museum of Natural History, Smithsonian Institution, Washington D.C., USA
USU = Department of Biology Insect Collection, Utah State University, Logan, Utah, USA
ZMB = Museum für Naturkunde Berlin, Berlin, Germany
ZMUC = Zoological Museum University of Copenhagen, Denmark

General morphological terminology, definitions, abbreviations, and measurements followed that of Bartholomay *et al.* (2019a). In the description and redescription sections we refrain from mentioning coloration and setal patterns due to the highly variable nature of these characters in *Traumatomutilla*. Instead, we provide a separate section titled Coloration and variations, in which we provide an overall description of the known color and setae patterns for a particular species.

In the Material examined section, abbreviations, acronyms and additional or corrected data by the authors are given in brackets. The total number of males and females examined is provided in brackets at the beginning of the material examined section.

Results

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Superfamily Pompiloidea Latreille, 1804
Family Mutillidae Latreille, 1802
Subfamily Sphaeropthalminae Schuster, 1949 (1903)
Tribe Dasymutillini Brothers & Lelej, 2017

Genus ***Traumatomutilla*** André, 1901

Traumatomutilla André, 1901: 258, ♀, ♂ (as subgenus of *Mutilla* Linnaeus, 1758).
Traumatotilla Day, 1979: 49. Incorrect subsequent spelling of *Traumatomutilla* André, 1901, unavailable name (Article 33.3 of the Code (ICZN 1999)).

Traumatomutilla – André 1902: 53, ♀, ♂ (as subgenus of *Ephuta* Say, 1836); 1903: 451 (as subgenus of *Ephuta* Say, 1836); 1904: 40 (resurrected to generic status); 1907: 349 (as subgenus of *Ephuta* Say, 1836). — Ashmead 1904: 9 (junior subjective synonym of *Sphaeropthalma* Blake, 1871). — Mickel 1928: 37 (list of Mutillidae genera); 1952: 106 (key to known genera of Mutillidae from Guyana), 128 (key to known species from Guyana). — Casal 1969: 279 (proposal of *T. inermis* species-group). — Nonveiller 1990: 74 (Neotropical catalogue). — Cambra & Quintero 1992: 461 (key to known genera of Mutillidae from Panama), 476 (list of known species from Panama). — Quintero & Cambra 1996a: 341 (list of known species from Peru); 1996b: 13 (list of known species from Paraguay). — Brothers 2006a: 588 (key to Neotropical genera of Mutillidae); 2006b: 584 (key to Neotropical tribes and subtribes of Mutillidae). — Lelej & Brothers 2008: 62 (list of genus-group names for Mutillidae). — Williams *et al*. 2017: 1–33 (proposal of species-groups construct). — Bartholomay *et al*. 2018: 361–385 (revision of the *T. integella* and *T. tabapua* species-groups); 2019a: 1–34 (revision of the *T. americana* species-group); 2019b: 1–37 (revision of the *T. bifurca*, *T. diabolica*, *T. vitelligera*, and *T. bellica* species-groups and proposal of *T. pilkingtoni* species-group); 2020: 2639–2683 (revision of the *T. juvenilis* species-group); 2021: 1–28 (revision of the *T. gemella* species-group and new host records); 2022: 1–97 (revision of the *T. indica* species-group).

Type species

Mutilla indica Linnaeus, 1758, ♀, by subsequent designation of André 1902: 54.

Diagnosis

Female

Body setae simple, never plumose, brachyplumose or bristled; head always as wide as or narrower than mesosoma; mesosoma always wider anteriorly, at most with single lateral projection medially; scutellar scale usually present; T1 narrow and petiolate to subpetiolate; T2 disc usually marked with at least one pair of yellowish, reddish or orange integumental spots; pygidium well defined by lateral carinae and always reaching apical margin of T6.

Male

Body setae simple, never plumose, brachyplumose or bristled; head always as wide as or narrower than mesosoma; mandibles evenly curved and tapered apicad; axillae usually with dentate or truncate projections; S2 evenly convex throughout; S7 always longer than broad; pygidium well defined by lateral carinae; genitalia bearing simple setae only; paramere elongate and more or less straight throughout, at most slightly sinuous and/or upcurved apically.

Hosts

Stictia signata (Linnaeus, 1758) (Hymenoptera: Crabronidae; recorded by Callan (1990, 1991) in Trinidad). *Podium* sp. (Hymenoptera: Sphecidae; lab rearing in Panama recorded by Bartholomay *et al*. (2021)). *Trypoxylon* sp. (Hymenoptera: Crabronidae; trap nest rearing in Brazil recorded by Bartholomay *et al*. (2021)).

Remarks

Bartholomay *et al*. (2022) mentioned that *Traumatomutilla* formed a morphologically consistent group along with nine other New World Sphaeropthalminae genera (*Atlantilla* Williams & Bartholomay, 2020, *Cephalomutilla* André, 1909, *Dasymutilla* Ashmead, 1899, *Frigitilla* Williams, 2015, *Leucospilomutilla* Ashmead, 1903, *Quwitilla* Williams, Bartholomay & Cambra, 2019, *Reedomutilla* Mickel, 1964, *Suareztilla* Casal, 1968 and *Tobantilla* Casal, 1965). This was later to be considered the Dasymutillini sensu stricto in Waldren *et al*. (2023), even though *Atlantilla*, *Frigitilla*, *Leucospilomutilla*, and *Tobantilla* did not feature in their analysis. Literature with keys and diagnostic characters for distinguishing these genera as well as comments regarding the complicated relationship between *Traumatomutilla* and *Dasymutilla* have been given by Bartholomay *et al*. (2022).

Traumatomutilla quadrinotata species-group

Diagnosis

Female

Lateral margins of the mesonotum projected laterally into blunt tubercles; head unarmed on posterior margin of vertex; scutellar scale narrow, usually lacking anterolateral carinae; pygidial plate narrow, sides strongly convergent basad, subpyriform.

Male

Mesopleuron always tuberculate on dorsal half; axillar projections always truncate; S2 always lacking setae filled pit; hypoygium elongate, subrectangular, never defined by lateral carinae; cuspis slender, elongate, mostly asetose; paracuspis poorly developed, lobe-like.

Included taxa

Traumatomutilla ameliae Casal, 1969, *T. austera* (Gerstaecker, 1874), *T. chrysozona* (Gerstaecker, 1874), *T. funebris* (Gerstaecker, 1874), *T. incerta* (Spinola, 1841), *T. infernalis* (Gerstaecker, 1874), *T. pompiliformis* (Gerstaecker, 1874), *T. quadrinotata* (Klug, 1821), *T. quadripustulata* (Klug, 1821), *T. sancta* (Gerstaecker, 1874), *T. tetratrauma* Bartholomay & Williams sp. nov., and *T. ursina* (Gerstaecker, 1874).

Distribution

Widely distributed in South America from Colombia to Argentina, except Chile.

Remarks

The *T. quadrinotata* species-group is a more or less consistently large-bodied (>10 mm) group in both sexes. The anterolateral carinae in the scutellar area – albeit partially concealed by dense setation – and the dorsolaterally expanded occipital carina observed in *T. tetratrauma* sp. nov. were not included in the original diagnosis of the *T. quadrinotata* species-group by Williams *et al*. (2017). Apart from these two new characters, the remaining characters for the species-group are relatively consistent and non-variable for both sexes, most notably so for males, which apart from the length of certain genitalia setae and sculpture of the pronotal dorsum, can only be distinguished based on color and setae characters. The most conspicuous and reliable character for identifying females is the lateral expansion of the

mesonotum which varies slightly from broad and blunt (e.g., *T. funebris* and *T. quadrinotata*) to narrow and tuberculiform (e.g., *T. ameliae* and *T. sancta*). The post-mesonotal tubercle is a character that was first observed in *T. poranga* Bartholomay & Williams, 2018 and, though it can be found in four species of the *T. quadrinotata* species-group, it is most conspicuous in *T. quadripustulata*.

Key to females of the *T. quadrinotata* species-group

1. Lateral surface of metapleuron and propodeum almost entirely concealed by dense golden appressed setae (Figs 12B, 18B); sculpture sparsely foveolate-punctate with densely micropunctate intervals where visible; vertex always clothed with black setae (Figs 12A, 18A) (mostly restricted to the Atlantic Forest domain) 2
– Lateral face of metapleuron and propodeum generally smoother, at most with sparse erect silvery-white setae (e.g., Fig. 7C); sculpture entirely exposed, sparsely foveolate-punctate with smooth, shining unsculptured intervals (e.g., Figs 1C, 8B, 14B); vertex sometimes clothed with silvery-white setae (e.g., Fig. 8D) 3

2. Frons with patch of golden setae (Fig. 18B); occipital carina slighty swollen dorsolaterally; anterolateral carinae present in scutellar area; dorsal mesosomal setae, when present, more or less uniform in length (Fig. 18B) ..... ***T. tetratrauma*** Bartholomay & Williams sp. nov.
– Head setae entirely black (Fig. 12A–B); occipital carina equally wide throughout; anterolateral carinae absent in scutellar area; pronotum and anterior portion of mesonotum with numerous long erect setae when present (Fig. 12B) ..... ***T. quadrinotata*** (Klug, 1821)

3. T2 marked with two round orange to reddish integumental spots (Fig. 8A, D, F, H); mesonotum with transverse silvery band of setae, sometimes largely obliterated (Fig. 8A, D, F, H); occipital carina slightly swollen dorsolaterally (commonly found in the northern Amazon) .... ***T. incerta*** (Spinola, 1841)
– T2 generally with four yellow to red integumental spots (e.g., Figs 1A, 7A, 14A), anterior spots sometimes reduced or obliterated, posterior spots sometimes enlarged and confluent; mesonotum setae generally either entirely black (e.g., Fig 14A) or with lateral longitudinal stripes of silver to golden setae (e.g., Fig. 17A, D); occipital carina equally wide throughout 4

4. Head and mesosomal dorsum with setae entirely black, silvery-white setae greatly reduced on entire body, often completely absent (Figs 4A–B, 14A–B) 5
– Silvery-white setae always conspicusouly present at least on propodeal dorsum and/or vertex (e.g., Fig. 3E) 6

5. Post-mesonotal tubercle present, sometimes reduced but still conspicuous; lateral surface of propodeum usually with large, unsculptured smooth area posteriorly; silvery-white setae present, though greatly reduced, on different areas of T2–4, S1–4, and often on metapleuron (Fig. 14B) (mostly found in the southern Amazon) ..... ***T. quadripustulata*** (Klug, 1821)
– Post-mesonotal tubercle absent; lateral surface of propodeum usually uniformly and densely areaolate-punctate to foveolate-punctate; body setae almost all black (Fig. 4A–B); if different color setae present, then of a coppery-golden tone and reduced to inconspicuous patches on fringes of T2–4 medially and/or laterally (Fig. 5B) (mostly found in Cerrado areas) ..... ***T. chrysozona*** (Gerstaecker, 1874)

6. T2 virtually devoid of sculpture anterolaterally, smooth, shining and asetose (Fig. 20A, C); in addition to dense short black and silvery-white setae, entire body (except mandibles, antennae, and tarsi) clothed with dense conspicuously long brownish setae (known only from Cerrado areas so far) (Fig. 20A, C) ..... ***T. ursina*** (Gerstaecker, 1874)

– T2 at most with sparser sculpture and setation anterolaterally; body setae usually of equal length throughout, either black or silvery-white, never brownish (e.g., Fig. 1A–C) 7

7. Post-mesonotal tubercle absent, at most with slight swelling of lateral margin posterior to mesonotal projection; T2 with orange integumental spots which can sometimes be dulled in color (found only in Cerrado/Atlantic Forest transition zones so far) (Fig. 7A–C) ..... ***T. funebris*** (Gerstaecker, 1874)
– Post-mesonotal tubercle present, often reduced but still conspicuous; T2 integumental spots yellowish or reddish (e.g., Figs 3A, 17A) 8

8. Integumental spots of T2 with scatterd foveolations usually restricted to the edges (Fig. 17A); spots yellowish in color, often linear in shape (commonly found in Cerrado and Caatinga areas) (Fig. 17D) ..... ***T. sancta*** (Gerstaecker, 1874)
– Integumental spots of T2 with sparse foveolations throughout; spots reddish, always subquadrate or subrectangular (e.g., Figs 1A, 3E) 9

9. Lateral surface of propodeum densely areolate-punctate with smooth flat intervals; intervals conspicuously broader along posterior margin of lateral propodeal surface; vertex and mesonotum conspicuously clothed with silvery-white to silvery-golden appressed setae (known from Cerrado, Pampa and Atlantic Forest) (Fig. 3A, E) ..... ***T. austera*** (Gerstaecker, 1874)
– Lateral surface of propodeum densely areolate-punctate with sharp homogeneous intervals (Fig. 1C); vertex and mesonotum clothed with black setae only (common in Chaco, Pampa, and xeric regions of Argentina) (Fig. 1A) ..... ***T. ameliae*** Casal, 1969

Key to the known color forms of the *T. quadrinotata* species-group females

1. Mesonotum with transverse band of silvery or golden setae 2
– Mesonotum entirely black, with parallel longitudinal stripes of silvery setae, or with separated spots of silvery setae 7

2. T2 having four integumental spots 3
– T2 having two integumental spots 4

3. Head clothed entirely with black setae .....
..... ***T. quadrinotata*** (Klug, 1821) [nominotypical and only known color form]
– Frons clothed with golden setae .....
..... ***T. tetratrauma*** Bartholomay & Williams sp. nov. [nominotypical and only known color form]

4. Spots of T2 broadly confluent 5
– Spots of T2 widely separated 6

5. Vertex clothed with silvery-white setae .....
..... ***T. incerta*** (Spinola, 1841) [color form found in Peru, Huanuco province]
– Vertex clothed with black setae .....
.. ***T. incerta*** (Spinola, 1841) [color form found in southwestern Brazilian Amazon, Rondônia State]

6. Vertex clothed with silvery-white setae .....
..... ***T. incerta*** (Spinola, 1841) [formerly known as *T. weyrauchi* Mickel, 1952]
– Vertex clothed with black setae ..... ***T. incerta*** (Spinola, 1841) [nominotypical form]

7. Mesosomal dorsum clothed entirely with black setae 8
– Mesosomal dorsum having longitudinal white stripes at least on propodeum 9

8. Spots of T2 yellow; pleural setae white; T2–5 having white setae spots medially ..... ***T. quadripustulata*** (Klug, 1821) [nominotypical form]
– Spots of T2 red; pleural setae black; T2–5 clothed entirely with black setae ..... ***T. chrysozona*** (Gerstaecker, 1874) [formerly known as *T. lugubrina* (Dalla Torre, 1897)]

9. Mesosomal stripes of silvery-white setae restricted to propodeum 10
– Mesosomal stripes, even if absent from propodeum, extending at least onto mesonotum 11

10. Tibial spurs white ..... ***T. ameliae*** (Casal, 1969) [nominotypical and only known color form]
– Tibial spurs black ..... ***T. funebris*** (Gerstaecker, 1874) [nominotypical and only known color form]

11. Mesosomal stripes divided, mesonotum with broad spots of silvery-white setae; T2 with red integumental spots 12
– Meosomal stripes continuous; T2 with yellow integumental spots 13

12. Vertex with medial spots of silvery-white setae ..... ***T. austera*** (Gerstaecker, 1874) [nominotypical form]
– Vertex clothed with black setae only ..... ***T. austera*** (Gerstaecker, 1874) [formerly known as *T. sigillata* (Gerstaecker, 1874)]

13. Vertex with transverse band of silvery-white setae ..... ***T. sancta*** (Gerstaecker, 1874) [color form found in Bolivia, Paraguay, and Midwestern Brazil]
– Vertex clothed entirely with black setae 14

14. Stripes of mesosoma extending to pronotum; with long erect setae throughout body dorsum ..... ***T. ursina*** (Gerstaecker, 1874) [nominotypical and only known color form]
– Stripes of mesosoma terminating on mesonotum; all dorsal setae short and mostly appressed 15

15. Posterior integumental spots of T2 ovate or subquadrate, widely separated ..... ***T. sancta*** (Gerstaecker, 1874) [nominotypical form]
– Posterior integumental spots of T2 transversely linear, narrowly separated ..... ***T. sancta*** (Gerstaecker, 1874) [formerly known as *T. solemnis* (Cresson, 1902)]

Key to males of the *T. quadrinotata* species-group

1. Apex of cuspis with short setae (Figs 9E, 19E) 2
– Apex of cuspis with long setae 3

2. Pronotum sparsely and finely foveolate-punctate with micropunctate intervals, concealed by dense silvery-white setation (Fig. 9A) (predominantly found in the Amazon Forest areas) ..... ***T. incerta*** (Spinola 1841)
– Pronotum densely and finely foveolate-punctate without micropunctured intervals, sculpture mostly exposed, setae black (Fig. 19A) (predominantly found in Atlantic Forest areas) ..... ***T. tetratrauma*** Bartholomay & Williams sp. nov.

3. Lateral suface of propodeum and metapleuron clothed with dense appressed silvery-golden setae .. ***T. quadrinotata*** (Klug, 1821)
– Lateral surface of propodeum at most with sparse erect silvery-white setae; metapleuron at most with sparse appressed black or silvery-white setae 4

4. Body setae predominantly black with coppery-golden areas ..... ***T. chrysozona*** (Gerstaecker, 1874)
– Body setae predominantly black with silvery-white areas 5

5. Wings brown infuscated on apical third, hyaline-brown elsewhere; T2 clothed entirely with silvery-white setae ..... ***T. quadripustulata*** (Klug, 1821)
– Wings entirely dark brown with strong violaceous and blueish reflections; T2 almost entirely clothed with black setae or at most with silvery-white setae on anterior half 6

6. Silvery-white setae markings of propodeum and T2 dense, completely obscuring integument beneath ..... ***T. ameliae*** Casal, 1969
– Silvery-white setae markings of propodeum and T2 sparse, if apparently dense, then never completely obscuring integument beneath 7

7. Cuspis length approximately 0.65× paramere length; paracuspis relatively well developed, almost node-like (Fig. 11F, N); posterior margin of penis valve subtruncate; silvery-white setae present throughout propodeal dorsum ..... ***T. pompiliformis*** (Gerstaecker, 1874)
– Cuspis length approximately 0.85× paramere length; paracuspis poorly developed, lobe-like; posterior margin of penis valve evenly convex; silvery-white setae restricted to posterior half of propodeal dorsum ..... ***T. infernalis*** (Gerstaecker, 1874)

Key to the known color forms of the *T. quadrinotata* species-group males

1. Body with black and golden to cupreous setae 2
– Body with black and silvery-white setae 5

2. Wings with basal third hyaline-brown, conspicuously less infuscated than remainder of wing membrane ..... ***T. quadrinotata*** (Klug, 1821) [nominotypical and only known color form]
– Wings completely dark brown, without any conspicuously lighter areas 3

3. Lateral surface of propodeum clothed with golden setae only ..... ***T. tetratrauma*** Bartholomay & Williams sp. nov. [nominotypical and only known color form]
– Lateral surface of propodeum clothed with black setae only 4

4. Propodeum and base of T2 clothed with dense golden setae ..... ***T. chrysozona*** (Gerstaecker, 1874) [formerly known as *T. dives* (André, 1906)]
– Propodeum and base of T2 clothed having mostly black setae, at most having some scattered golden setae ..... ***T. chrysozona*** (Gerstaecker, 1874) [nominotypical form]

5. Pronotum densely clothed with silvery-white setae 6
– Pronotum clothed predominantly with black setae, if silvery-white setae present, then always sparse and mostly erect 9

6. Fringe of T2–3 clothed only with black setae medially ..... ***T. ameliae*** Casal, 1969 [nominotypical and only known color form]
– Fringe of T2–3 clothed with silvery-white setae throughout 7

7. Fringe of T4 clothed with silvery-white setae throughout ..... ***T. quadripustulata*** (Klug, 1821) [formerly known as *T. maraca* (Cresson, 1902)]
– Fringe of T4 clothed with black setae medially and silver-white setae laterally 8

8. S4 fringe with black setae ..... ***T. incerta*** (Spinola, 1841) [formerly known as *T. dentata* (Smith, 1879)]
– S4 fringe with silvery-white setae ..... ***T. incerta*** [formerly known as *T. dignitosa* Mickel, 1952]

9. T2 clothed almost entirely with silvery-white setae, more densely on anterior third .... ***T. quadripustulata*** (Klug, 1821) [formerly known as *Mutilla pruinosa* Smith, 1855]
– T2 clothed predominantly witth black setae, at most with patches of silvery-white setae on anterior third 10

10. Propodeal setae mostly black, silvery-white setae restricted to posterior surface of propodeum .... ***T. infernalis*** (Gerstaecker, 1874) [nominotypical form and formerly known as *T. floccos* (Gerstaecker, 1874),no discernible difference between holotypes]
– Silvery-white setae present throughout propodeal dorsum ..... ***T. pompiliformis*** (Gerstaecker, 1874) [nominotypical form and formerly known as *T. serra* (Cresson, 1902), no discernible difference between holotypes]

Traumatomutilla ameliae Casal, 1969
Figs 1–2

Traumatomutilla ameliae Casal, 1969: 291.

Diagnosis

Female

Occipital carinae equally wide throughout; anterolateral carinae absent in scutellar area; lateral surface of propodeum evenly and densely sculptured with sharp intervals; T2 with two pairs of red integumental spots; body setae silvery-white in color; setae markings of mesosomal dorsum restricted to propodeum.

Male

Apex of cuspis with long setae; body setae black and silvery-white in color; wings dark brown infuscated throughout with strong violaceous and blueish reflections; setae markings of propodeum and T2 dense, concealing integument beneath.

Type material

Holotype

ARGENTINA • ♀; Tucumán, S. [San] Pedro de Colalao; Jan. 1949; Arnau leg.; AMNH.

Other material examined (16 ♀♀, 5 ♂♂)

ARGENTINA – **Catamarca** • 1 ♂; Santa Maria; Jan. 1994; Fritz leg.; AMNH. – **Salta** • 1 ♀; La Viña; Dec. 1992; M.A. Fritz leg.; AMNH • 1 ♀; Jan. 1984; M.A. Fritz leg.; AMNH • 1 ♀; Feb. 1984; M.A. Fritz leg.; MIUP • 1 ♀; Jan. 1988; M.A. Fritz leg.; AMNH • 2 ♂♂; Dec. 1992; Fritz leg.; AMNH • 1 ♀; Rosario Lerme [Rosario de Lerma]; Feb. 1993; M.A. Fritz leg.; AMNH • 2 ♂♂; 21–23 Dec. 1983; M. Wasbauer leg.; UCDC • 1 ♂; El Carmen; Jan. 1983; Fritz leg.; AMNH • 1 ♀; Sumalao; Mar. 1991; Fritz leg.; USU • 1 ♀; Alemania; Feb. 1983; M.A. Fritz leg.; AMNH. – **Santiago del Estero** • 1 ♀; Chaco de Santiago del Estero, Rio Salado; MNCN.

BOLIVIA – **Santa Cruz** • 1 ♀; 12 km N [kilometers north of] Camiri; 19°56.67′ S, 63°31.34′ W; 27 Feb.–7 Mar. 1999; M.E. Irwin and F. Parker leg.; USU.

PARAGUAY – **Boquerón** • 1 ♀; E. [East] of La Patria; 30 Mar. 2006; U. Dreschel leg.; FSCA • 2 ♀♀; Filadelfia, Chaco; Jan. 1995; Arriagada leg.; AMNH • 1 ♀; Filadelfia; Jan. 1995; Arriagada leg.; USU • 2 ♀♀; Loma Plata; Jan. 1956; Gerlach leg.; AMNH. – **Presidente Hayes** • 1 ♀; Lolita, Yaragui, 390’; 23°06′ S, 59°38′ W; 23–27 Nov. 2007; U. Dreschel leg.; FSCA.

Description

Female

Body length. 13–21 mm.

Head. Posterior margin almost straight. Occipital carina evenly arched and equally wide throughout. Vertex width 0.75 × pronotal width. Eye almost circular, its length in frontal view slightly longer than distance from its ventral margin to mandibular condyle. Head densely and coarsely foveolate-punctate to areolate-punctate, less densely so on malar space. Genal carina well defined. Mandible oblique, tapering slightly towards apex with small subapical tooth. Dorsal scrobal carina present, well defined, narrowly disconnected from antennal tubercles, connected to lateral scrobal carina. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 1.9 × pedicel length; flagellomere 2 1.4 × pedicel length.

Mesosoma. Length 0.85 × width. Mesosomal dorsum mostly concealed by dense setation, densely and coarsely areolate-punctate with apparent sharp to scabrous intervals where visible. Anterior surface of propodeum defined, short, slightly shorter than pronotal collar, coarsely striated longitudinally throughout with dense coarse punctures dorsomedially; dorsal surface rounded into anterior surface in lateral view. Humeral carina well defined, projected dorsally, broadly separated from conspicuously projected angulate epaulet; anterolateral corners of pronotum sharply angulate in dorsal view. Pronotal spiracle strongly projected from lateral margin of pronotum, rounded, bulging. Lateral surface of pronotum sparsely punctate with dense micropunctures except at smooth conspicuous subacute tubercle anterior to pronotal spiracle; mesopleuron densely micropunctate anteriorly, densely and coarsely foveolate-punctate to areolate-punctate ventrad on mesopleural ridge; metapleuron unsculptured, smooth and shining on dorsal third, densely, coarsely and confusedly areolate on basal third, and concealed by dense setation elsewhere. Lateral surface of propodeum densely and coarsely areolate-punctate throughout with sharp intervals. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 70 : 83 : 87 : 60 : 60. Lateral margin of mesonotum conspicuously constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into sharp process; with very small conspicuous blunt post-mesonotal tubercle. Propodeal spiracle strongly projected from lateral margin of mesosoma; post-spiracular area vestigial. Scutellar scale present, reduced, as narrow as surrounding sculpture; anterolateral carinae absent; scabrous intervals absent on scutellar area. Propodeum somewhat gibbose, dorsal surface shorter than and poorly distinguished from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 28 : 64 : 67. Disc of T2 mostly concealed by dense setation, densely and coarsely foveolate-punctate to punctate with dense, interspersed micropunctures where visible; foveolations sparser and micropunctures absent laterally and over integumental spots. T3–5 sculpture predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible; T6, except pygidial plate, densely foveolate-punctate. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, slightly higher medially. S2 densely and coarsely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold vestigial. S3–4 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S4 densely foveolate-punctate; S6 sparsely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical third of plate; surface irregularly rugose; interstice apparently granulose.

Male (hitherto unknown)

Body length. 13–18 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; lateral margins of head convergent immediately behind eyes, contiguous with eye outline in dorsal view. Width 0.8 ×

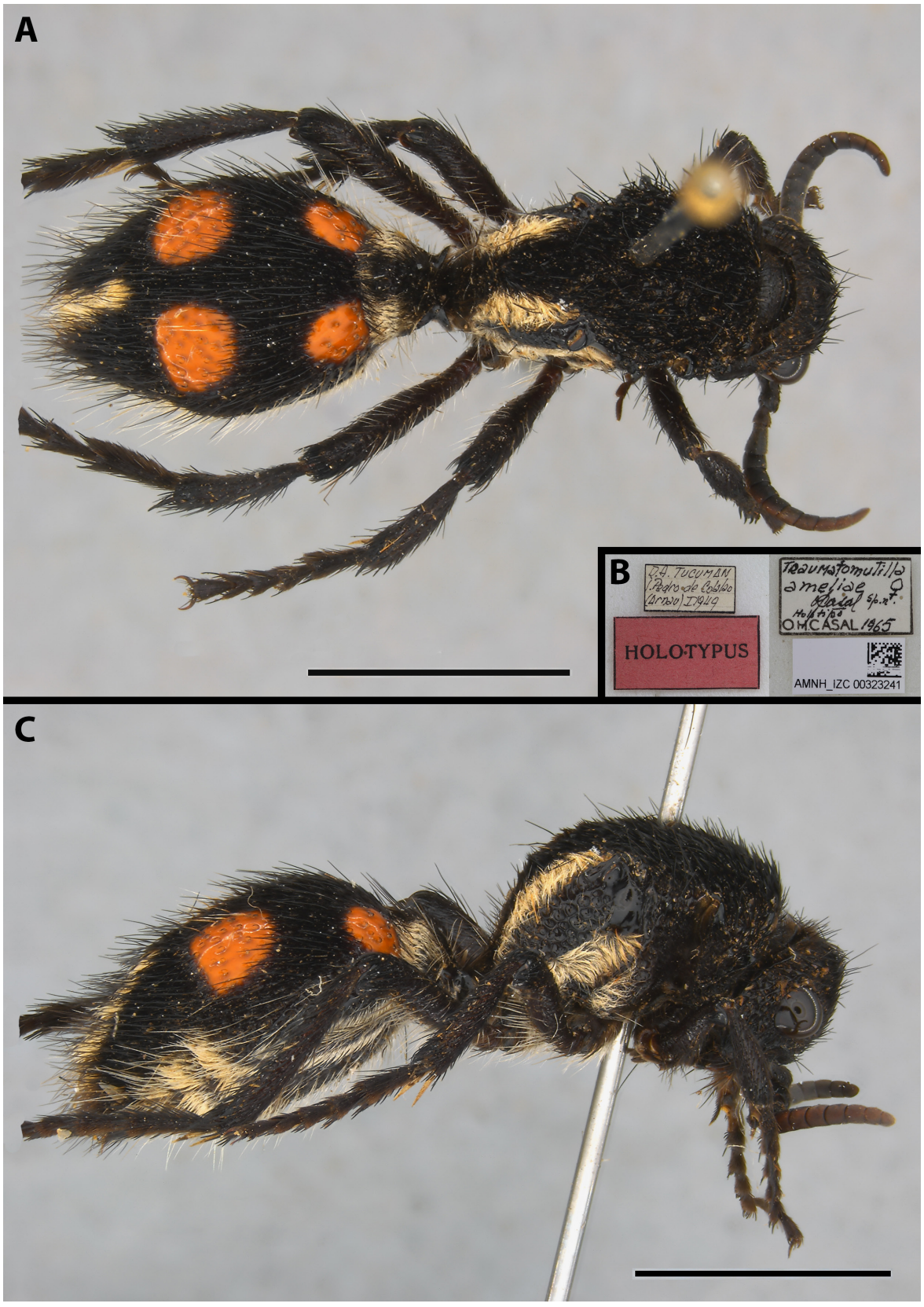

Fig. 1. *Traumatomutilla ameliae* Casal, 1969, holotype, ♀ (AMNH). **A**. Dorsal habitus. **B**. Type labels. **C**. Lateral habitus. Scale bars = 5 mm.

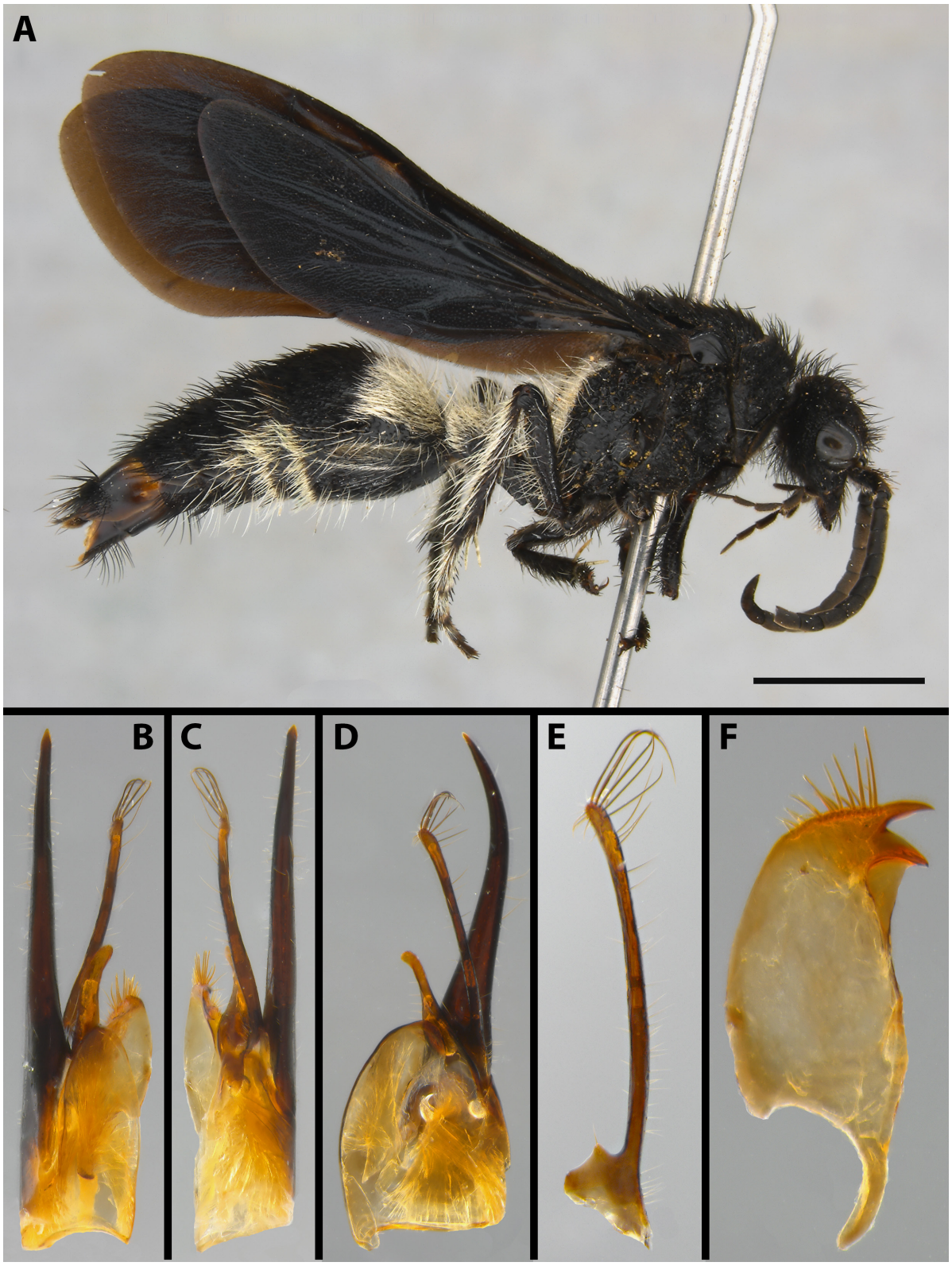

Fig. 2. *Traumatomutilla ameliae* Casal, 1969, ♂ (non-type specimen). **A**. Lateral habitus. **B**. Genitalia (halved), dorsal view. **C**. Genitalia (halved), ventral view. **D**. Genitalia (halved, penis valve removed), lateral/inner view. **E**. Cuspis (removed, not to scale), lateral/inner view. **F**. Penis valve (removed, not to scale), lateral/outer view. Scale bar = 3 mm.

pronotal width. Eye almost circular. Ocelli small; OOD 4.4× DLO, IOD 1.4× DLO. Occipital carina distinct. Head surface sparsely and finely punctate, with sparse interspersed micropunctures along posterior margin of vertex; sculpture sparser and finer posterad. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; sculpture concealed by dense setation; apical/ventral margin with a pair of medial short subacute free teeth. Scape bicarinate. Flagellomere 1 1.9× pedicel length; flagellomere 2 2.3× pedicel length. Mandible obliquely tridentate apically, medial tooth smaller than inner tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets well defined, subangulately projected from anterior margin of pronotum, separated from well-defined pronounced humeral carina, anterolateral corners of pronotum angulate. Anterior surface of pronotum, with sparse fine to dense coarse punctures laterad, mostly unsculptured mediad; with medial longitudinal slightly concave smooth area. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures along inner and anterior margin. Dorsum of pronotum densely and coarsely foveolate-punctate to pucntate. Mesoscutum densely and finely foveolate-punctate, parapsis and notaulus reduced to posterior half of mesoscutum; with medial longitudinal carina on posterior half. Mesoscutellum somewhat gibbose, densely and coarsely areolate-punctate to foveolate-punctate, with well-defined dorsal and posterior surfaces; dorsal surface as broad as long, with intervals aligned basally so as to form irregular longitudinal carina restricted to dorsal surface. Axilla produced posterolaterally as obliquely truncate projection, with inner margin straigth; projection coarsely and densely foveolate-punctate except at unsculptured apical third. Metanotum wider laterally, its surface obscured by dense setation. Propodeal dorsum convex, mostly concealed by dense setation, densely areolate where visible; sculpture of lateral surface absent along anterior margin; dorsal surface indistinguishable from posterior surface. Lateral surface of pronotum sparsely and vestigially punctate with sparse interspersed micropunctures; mesopleura with conspicuous acute spine-like projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron micropunctate throughout, except basal third densely and coarsely areolate.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins.

Metasoma. T1 0.5× as wide as T2. T2 0.9× as long as wide. Dorsal metasomal sculpture, except pygidium, partially concealed by dense setation, densely and finely punctate with dense, interspersed micropunctures where visible; sculpture sparser and less defined in apical segments; pygidial plate slightly broader than long, weakly defined by somewhat arched carinae laterally; surface irregularly granulose to rugose with interspersed coarse punctures apicad. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina. S2 sparsely and finely foveolate-punctate to punctate; sculpture sparser mediad; anteromedial crest-fold present, sternal pit absent. S3–7 sparsely and finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe not at all pronounced posteriorly, subacute. Ratios of free length of paramere, cuspis and digitus, 83 : 58 : 22. Paramere almost straight in dorsal view, upcurved posteriorly in lateral view; almost asetose except for sparse scattered inconspicuous setae throughout. Cuspis narrow, elongate, almost straight and slightly sinuous throughout in dorsal view, upcurved and slightly wider posterad in lateral view, with conspicuous tuft of long setae at apex, inconspicuous short setae elsewhere. Paracuspis poorly developed, sessile, lobe-like, slightly longer than wide, with subacute projection posteroventrally on posterior margin, projection with single setae, otherwise asetose. Digitus slightly incurved in dorsal view and upcurved in lateral view, apex subcapitate in lateral view, with short inconspicuous setae on

dorsal surface. Penis valve strongly concave on inner surface, with well-defined pair of acute teeth posteroventrally, without defined lateral pocket on outer margin, apical distance between teeth 0.1 × length of valve, dense setae present along convex posterior margin and inconspicuous setae present at base of anterior tooth on outer margin, setae longer ventrad, posterior margin sloping dorsad.

Coloration and variations

Female

Integument black, except mandible and antennal flagellomeres partially reddish-brown, and T2 with four large reddish integumental spots. Body setae predominantly black varying in density, except the following areas with silvery-white setae varying in density: coxae, ventral surface of meso and metafemora, mesopleuron posteroventrally, metapleuron, propodeal dorsum laterally, and lateral surface of propodeum; T1 entirely, integumental spots, lateral areas, lateral felt line and lateral margins of T2, fringe of T2– 4 medially and laterally, fringe of T5, and T6, except pygidial plate medially; S1–4, and fringes of S2–3.

Male

Integument black, except antennal flagellomeres partially reddish-brown. Body setae predominantly black varying in density except the following areas with silvery-white setae varying in density: propodeum, legs predominantly; T1, anterior half to anterior third of T2, lateral felt lines and lateral margins of T2, fringe of T2–5 medially and laterally (vestigial medially on T2–5 and laterally on T5); S1–5, except fringe of T5.

Distribution

Bolivia (Santa Cruz), Paraguay (Boquerón and Presidente Hayes), and Argentina (Salta, Santiago del Estero, Tucumán and Catamarca).

Remarks

The sex association of *T. ameliae* was based on distribution since both sexes were the southernmost records of the *T. quadrinotata* species-group and have been collected in the same areas across Argentina. Both sexes have consistent and apparently unvariable color and setae characters, typical of northern Argentinean mutillids. Based on structure, especially the lateral propodeal surface sculpture and lateral mesonotal expansions, females of *T. ameliae* are similar to *T. sancta*.

Traumatomutilla austera (Gerstaecker, 1874)
Fig. 3

Mutilla austera Gerstaecker, 1874: 70.
Mutilla sigillata Gerstaecker, 1874: 70. **Syn. nov.**

Ephuta (*Traumatomutilla*) *austera* – André 1902: 54.
Ephuta (*Traumatomutilla*) *sigillata* – André 1902; 56.
Traumatomutilla austera – André 1904: 40.
Traumatomutilla sigillata – André 1904: 40.

Diagnosis

Female

Occipital carina equally wide throughout; anterolateral carinae absent in scutellar area; body setae black and silvery-white in color; lateral surface of propodeum densely but unevenly sculptured, with conspicuous unsculptured areas; T2 with two pairs of reddish integumental spots; mesonotum with a pair of posterolateral oblique dense setae patches.

Male
Unknown.

Type material

Lectotype of *Mutilla austera*
URUGUAY • ♀; [Salto], Salto Grande [Salto]; Sello S. leg.; ZMB.

Holotype of *Mutilla sigillata*
BRAZIL • ♀; [Rio Grande do Sul], Casapava [Caçapava do Sul]; Sello S. leg.; ZMB.

Other material examined (40 ♀♀)

BRAZIL – **Distrito Federal** • 1 ♀; MZSP • 1 ♀; Bráulio Dias leg.; AMNH. – **Goiás** • 4 ♀♀; MZSP • 1 ♀; Goyasz [Goiás]; n.o proc. [número de procedência] 18/242; MNRJ • 1 ♀; [unintelligible label]; MNHN • 1 ♀; Leopoldo Bulhões; Dec. 1939; Spitz leg.; MNCN • 1 ♀; Trindade; 1952; MNHN • 1 ♀; Goiânia; Dec. 1942; Gonçalvez leg.; AMNH. – **Minas Gerais** • 1 ♀; MZSP • 1 ♀; Reinhardt leg.; UMSP • 2 ♀♀; Reinhardt leg.; ZMUC • 1 ♀; Campos Gerais; MNHN • 1 ♀; Sertão de Diamantina, Fazenda das Melancias; 10 Nov. 1902; E. Gounelle leg.; MNCN • 1 ♀; Sete Lagoas; Reinhardt leg.; ZMUC • 2 ♀♀; Uberaba; SDEI • 1 ♀; E. Le Moult leg.; MNCN • 1 ♀; Ibiá; 1965; C. Elias leg.; DZUP • 1 ♀; Passos; 16–22 Jan. 1963; C. Elias leg.; DZUP. – **Paraná** • 1 ♀; MZSP • 1 ♀; Carambehy [Carambeí]; 27 Jun. 1937; Westerman leg.; MZSP • 1 ♀; Ponta Grossa; Mar. 1946; Justus leg.; DZUP • 1 ♀; Parque Estadual da Vila Velha; 3 Mar. 2012; L.P. Amaral-Neto leg.; DZUP. – **São Paulo** • 2 ♀♀; MZSP • 2 ♀♀; Nov. 1900; A. Hembel leg.; UMSP • 1 ♀; Campinas; Feb. 1924; F.X. Williams leg.; UMSP • 2 ♀♀; [unintelligible label]; 1914; MNHN • 2 ♀♀; Jundiaí; 15 Dec. 1960; MNRJ • 1 ♀; Iperó [sic], George Oeterer [sic]; 22 Nov. 1961; F. Grossmann leg.; MNCN • 1 ♀; São Paulo, Ipiranga [bairro Ipiranga]; Fev. 1910; H. Luederwaldt leg.; MZSP • 1 ♀; Corumbai; Sep. 1963; DZUP. – **Locality unknown** • 1 ♀; ZMUC.

Description

Female
Body length. 14–16 mm.

Head. Posterior margin almost straight. Occipital carina evenly wide throughout. Vertex width 0.8× pronotal width. Eye almost circular, its length in frontal view 1.1× the distance from its ventral margin to mandibular condyle. Head densely and coarsely foveolate-punctate; sculpture sparser on gena and malar space. Genal carina present. Mandible oblique, tapering slightly towards apex, with small subapical tooth, unarmed ventrally. Dorsal scrobal carina well defined, reaching antennal tubercles and narrowly separated from lateral scrobal carinae. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 2.2× pedicel length; flagellomere 2 1.75× pedicel length.

Mesosoma. Mesosoma 0.9× as long as wide. Mesosomal dorsum densely and coarsely areolate-punctate with irregular intervals. Anterior surface of propodeum defined, short, slightly shorter than pronotal collar, coarsely striated longitudinally basad with dense coarse punctures dorsad; dorsal surface rounded into anterior surface in lateral view. Humeral carina well defined, projected dorsally, broadly separated from slightly projected rounded epaulet; anterolateral corners of pronotum angulate in dorsal view. Pronotal spiracle slightly projected from lateral margins of pronotum, rounded. Lateral surface of pronotum densely foveolate-punctate with micropunctures, except low blunt tubercle anteroventral in relation to pronotal spiracle; mesopleuron mostly concealed by dense setation, densely micropunctate anteriorly, and densely and coarsely foveolate-punctate to areolate-punctate on mesopleural ridge where visible; metapleuron completely concealed by dense setation, except dorsal fourth unsculptured, smooth and shining. Lateral surface of propodeum densely and coarsely areolate-punctate throughout with dull

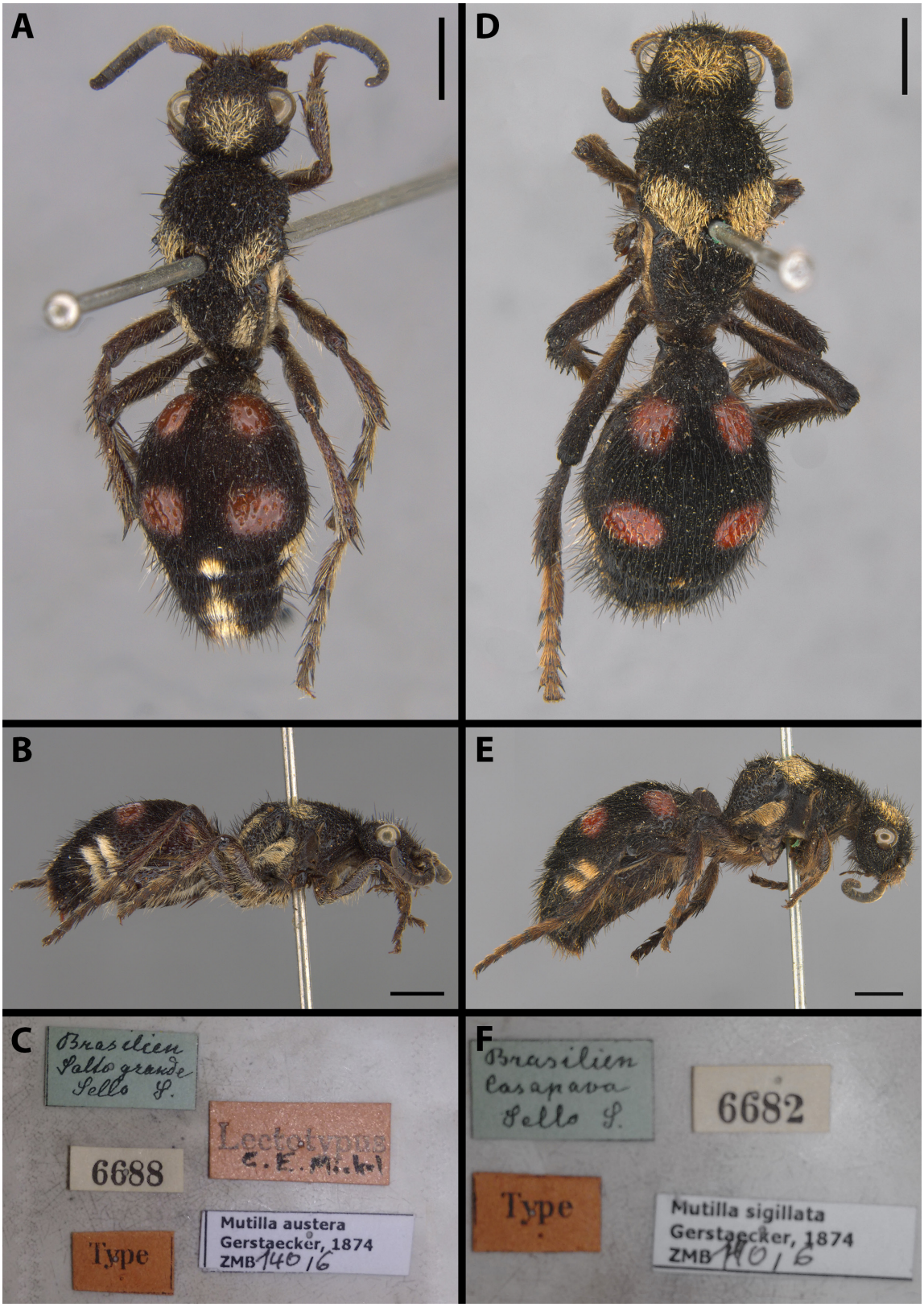

Fig. 3. A–C. *Traumatomutilla austera* (Gerstaecker, 1874), lectotype, ♀ (ZMB). **A**. Dorsal habitus. **B**. Lateral habitus. **C**. Type labels. **D–F**. *Traumatomutilla sigillata* (Gerstaecker, 1874), holotype, ♀ (ZMB). **D**. Dorsal habitus. **E**. Lateral habitus. **F**. Type labels. Scale bars = 2 mm.

intervals. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 68 : 76 : 84 : 57 : 60. Lateral margin of mesonotum strongly constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt process; post-mesonotal tubercle present, inconspicuous. Propodeal spiracle strongly projected from side of mesosoma. Post-spiracular area absent. Scutellar scale present, greatly reduced, as narrow as surrounding sculpture; anterolateral carinae absent. Propodeum gibbose in lateral view, surdorsal surface shorter than and poorly distinguished from posterior face.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 35 : 79 : 78. Disc of T2 mostly concealed by dense setation, densely and coarsely foveolate-punctate to punctate with dense, interspersed coarse micropunctures where visible; sculpture sparser and micropunctures absent laterally and over integumental spots. T3–5 sculpture predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible; T6, except pygidial plate, almost concealed by dense setation, densely foveolate-punctate where visible. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, equally high throughout. S2 densely and coarsely foveolate-punctate, sculpture conspicuously sparser mediad; anteromedial crest-fold present. S3–5 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S6 sparsely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical fourth of plate; surface irregularly rugose; interstice apparently granulose.

Coloration and variations

Female

Integument black, except mandibles partially and antennal flagellomeres ventrally reddish-brown, and T2 with four reddish to orange integumental spots. Body setae predominantly silverygolden, except the following areas with black setae varying in density: malar space, gena, vertex posterolaterally, ventral surface of head; pronotum, mesonotum anteromedially, mesopleuron anteriorly, scutellar area, propodeal dorsum medially; T1 medially, disc of T2 (except integumental spots), fringe of T2–4 sublaterally, fringe of T5 medially, T6 medially, fringe of S4, and S5–6. Some specimens have the silvery-golden marking of the mesonotum larger, nearly confluent medially; silvery-golden setae greatly reduced on propodeal dorsum, nearly absent; venter of metasoma completely clothed with black to brownish-black setae, T6 completely clothed with black to brownish-black setae; medial marking of silvery-golden setae on T3 greatly reduced, nearly absent.

Male

Unknown.

Distribution

Brazil (Goiás, Distrito Federal, Minas Gerais, São Paulo, Paraná, and Rio Grande do Sul) and Uruguay (Salto).

Remarks

Traumatomutilla austera has a distinct color pattern (Fig. 3A–B, E–F) that varies slightly in the mesosomal dorsum but has no intermediate forms with other known patterns. Certain specimens have patches of somewhat dense appressed silvery-white setae on the lateral surface of the propodeum that are also found in *T. funebris* and, more notably, in the Atlantic Forest species (*T. quadrinotata* and *T. tetratrauma* sp. nov.). The structure of *T. austera*, however, is different from these species, being finer and homogeneous as opposed to the overall coarser sculpture of most species within the *T. quadrinotata*

species-group. Based on distribution, *T. austera* is one of four possible candidates for association with *T. infernalis* or *T. pompiliformis*.

Traumatomutilla chrysozona (Gerstaecker, 1874)
Figs 4–6

Mutilla lugubris Burmeister, 1854: 8 (nec Fabricius, 1804; ♀ nec ♂).
Mutilla chrysozona Gerstaecker, 1874: 315.
Mutilla burmeisteri Gerstaecker, 1874: 316. **Syn. nov.**
Mutilla lugubrina Dalla Torre, 1897: 55. **Syn. nov.**
Ephuta (*Traumatomutilla*) *dives* André, 1906: 66. **Syn. nov.**

Ephuta (*Traumatomutilla*) *burmeisteri* – André 1902: 54.
Ephuta (*Traumatomutilla*) *chrysogona* – André 1902: 54 (misspelling).
Ephuta (*Traumatomutilla*) *lugubris* – André 1902: 55 (misspelling).
Traumatomutilla burmeisteri – André 1904: 40.
Traumatomutilla chrysozona – André 1904: 40.
Traumatomutilla lugubrina – André 1904: 40.
Traumatomutilla dives – Nonveiller 1990: 77.

Diagnosis

Female
Occipital carina equally wide throughout; anterolateral carinae absent in scutellar area; body setae almost entirely black, at most with vestigial coppery setae in some metasomal fringes; T2 with two pairs of dark red integumental spots.

Male
Apex of cuspis with long setae; body setae black with conspicuous coppery areas.

Type material

Lectotype of *Mutilla chrysozona*
BRAZIL • ♂; S. Paul [São Paulo]; Sello S. leg.; ZMB.

Lectotype of *Mutilla dives*
BRAZIL • ♂; Piauhy [Piauí]; HNHM.

Other material examined (37 ♀♀, 23 ♂♂)

BRAZIL • **Minas Gerais** • 1 ♀; Lavras Novas, Ouro Preto; 4 Dec. 1995; A.M. Daniel leg.; MIUP • 2 ♂♂; Passa Quatro, 915 m [above sea level]; 27 Feb. 1922; J. Zikán leg.; MZSP • 1 ♂; Poços de Caldas; Nov. 1961; C. Elias leg.; DZUP • 1 ♀; 29 Dec. 1969; MNRJ • 1 ♀; Campo do Saco; 12 Dec. 1967; MNRJ • 1 ♀; Seminario; 10 Dec. 1967; MNRJ • 1 ♀; Mo S [Serra de Santo] Domingos; 18 Dec. 1967; MNRJ • 2 ♂♂; Serra do Caraça; MZSP • 1 ♂; 1880 m [above sea leve]; MZSP • 2 ♂♂, 27 Nov.–5 Dec. 1972; Exp. Mus. Zool. [Expedição Museu de Zoologia] leg.; MZSP • 1 ♂; 1880 m a.s.l.; Nov. 1961; Kloss, Lenko, Martins and Silva leg.; MZSP • 1 ♂; Jan. 1970; F.M. Oliviera leg.; AEIC • 1 ♀; Barbacena; 15 Dec. 1905; Ducke leg.; MNHN • 1 ♂; 6 km NE [kilometers northeast] of Careacu; 10 Dec. 2012; G.A.R. Melo and P. Grossi; DZUP. – **Piauí** • 1 ♀; Piauí; Mocszary leg.; MNHN. – **São Paulo** • 4 ♂♂; UMSP • 18 ♀♀; MZSP • 1 ♀;SDEI • 1 ♀; 1 Nov. 1920; SDEI • 1 ♀; San Pablo [sic!]; AMNH • 1 ♂; Ipiranga; MZSP • 1 ♂; Nov. 1919; MZSP • 1 ♂; 30 Mar. 1936; CASC • 1 ♀; 31 May 1950; R. Spitz leg.; MNCN • 1 ♀; Jan. 1907; S.M. Torres leg.; MZSP • 1 ♂; Santo Amaro; Jan. 1949; J. Lane leg.; MZSP • 1 ♀; Jun. 1932; Lane leg.; MNCN • 1 ♂; MZSP • 1 ♂; Jundiaí; 12 Dec. 1899; Schrottky

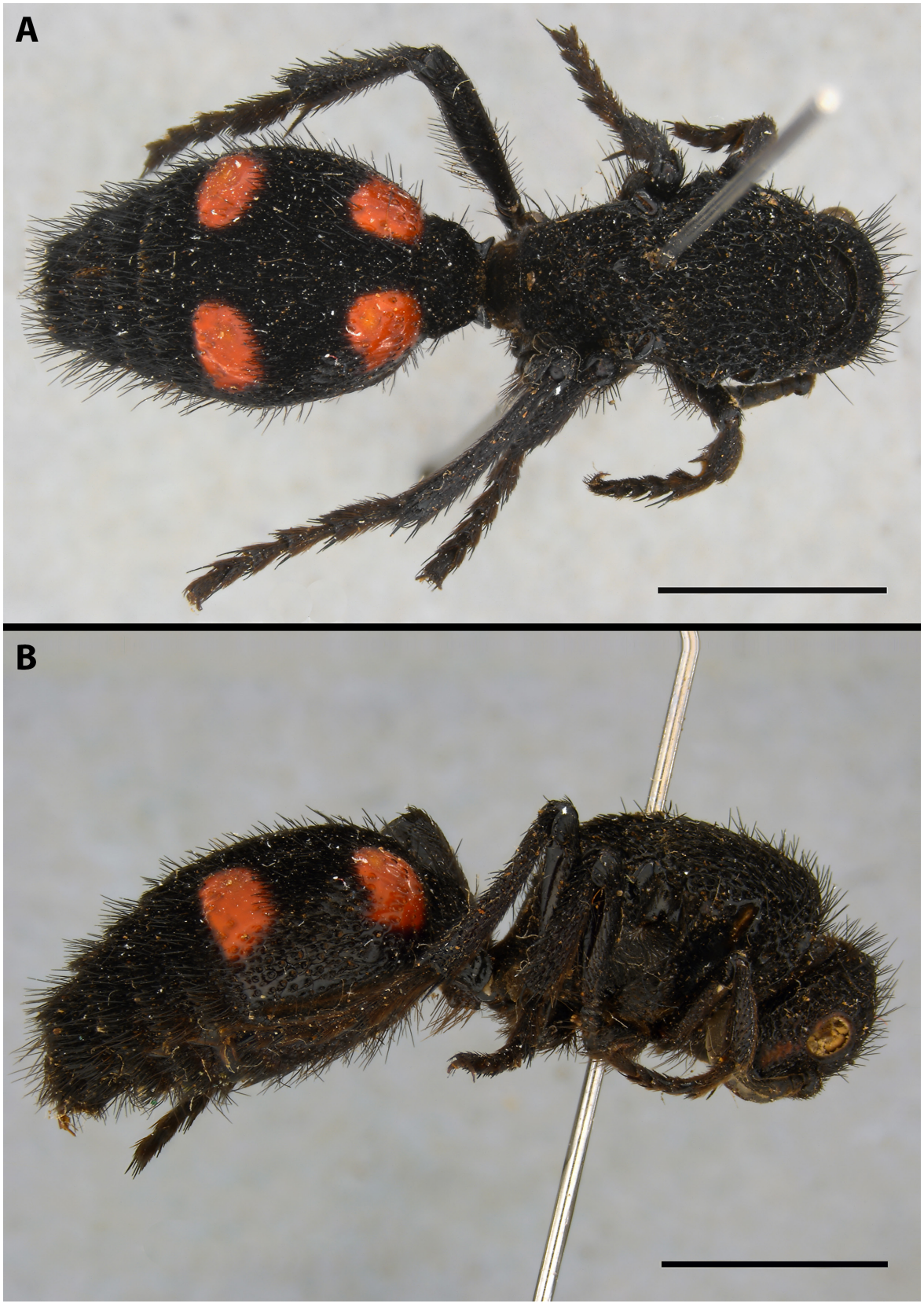

Fig. 4. *Traumatomutilla chrysozona* (Gerstaecker, 1874), ♀ (non-type specimen). **A**. Dorsal habitus. **B**. Lateral habitus. Scale bars = 5 mm.

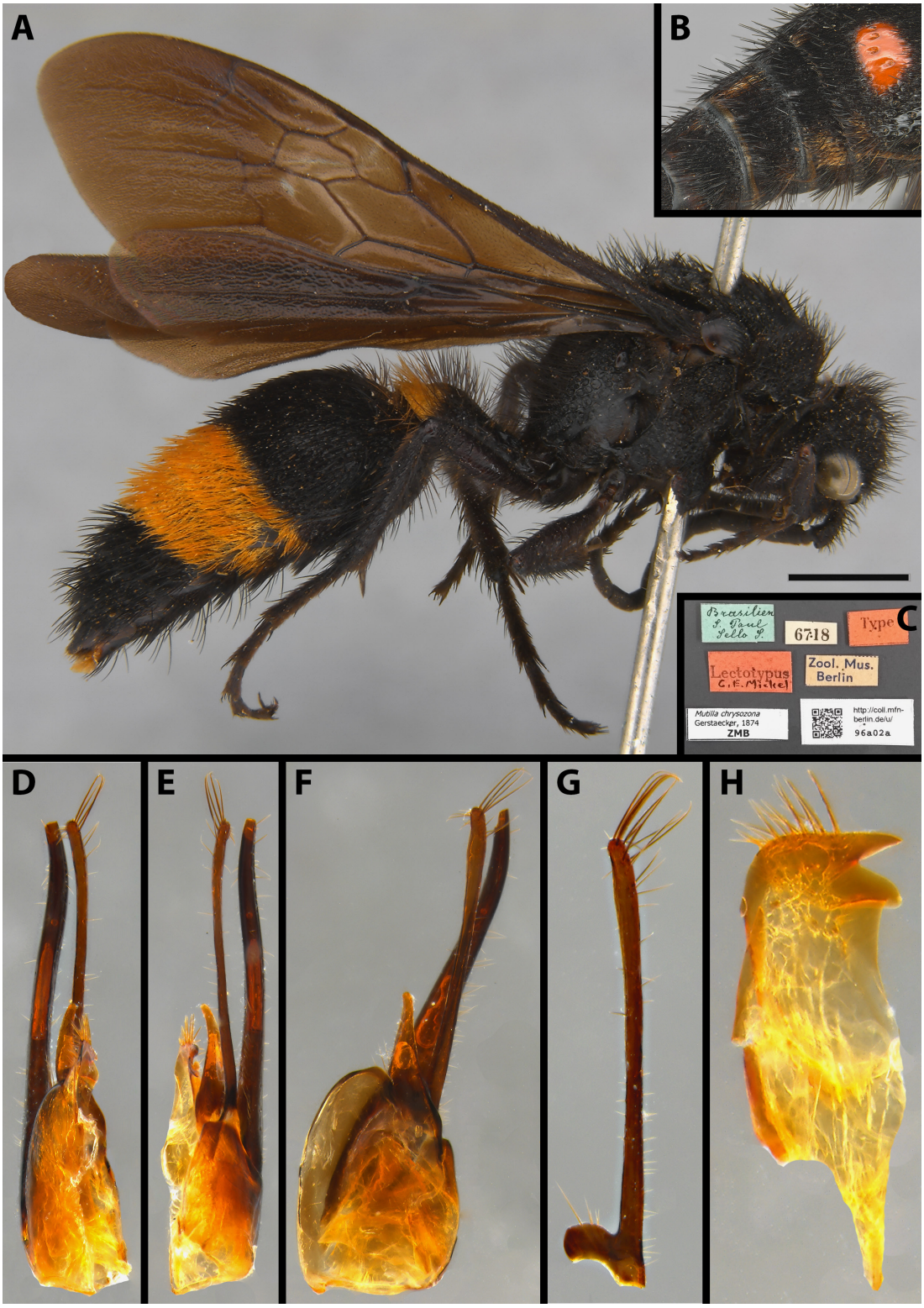

Fig. 5. *Traumatomutilla chrysozona* (Gerstaecker, 1874), lectotype, ♂ (ZMB). **A**. Lateral habitus. **B**. Vestigial coppery setae on female metasoma, lateral view. **C**. Type labels. **D**. Genitalia (halved), dorsal view. **E**. Genitalia (halved), ventral view. **F**. Genitalia (halved, penis valve removed), lateral/inner view. **G**. Cuspis (removed, not to scale), lateral/inner view. **H**. Penis valve (removed, not to scale), lateral/outer view. Scale bar = 2 mm.

leg.; MNHN • 1 ♂; 15 Dec. 1899; Schrottky leg.; MNHN • 1 ♀; Barueri; 28 Dec. 1965; K. Lenko leg.; MZSP • 1 ♀; Cotia; SDEI • 1 ♀; Capital [São Paulo]; 20 May 1956; L. Tzarasios and P. Nogueira leg.; CASC. – **Locality unknown** • 2 ♀♀; SDEI • 1 ♀; Alto da Serra [sic!]; Feb. 1929; F. Spitz leg.; MZSP.

Description

Female

Body length. 15 mm.

Head. Posterior margin almost straight. Occipital carina evenly arched and slightly swollen laterally. Vertex width 0.75× pronotal width. Eye almost circular, its length in frontal view almost equal to distance from its ventral margin to mandibular condyle. Head densely and coarsely foveolate-punctate to areolate-punctate, less densely so on malar space. Genal carina well defined. Mandible oblique, tapering slightly towards apex with small subapical tooth. Dorsal scrobal carina present, well defined, narrowly disconnected from antennal tubercles. Lateral scrobal carina almost absent. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 2.6× pedicel length; flagellomere 2 1.9× pedicel length.

Mesosoma. Length 0.8× width. Mesosomal dorsum mostly concealed by dense setation, densely and coarsely areolate-punctate with apparent sharp to scabrous intervals where visible. Anterior surface of propodeum defined, short, slightly shorter than pronotal collar, coarsely striated longitudinally throughout with dense coarse punctures dorsad; dorsal surface rounded into anterior surface in lateral view. Humeral carina well defined, slightly projected dorsally, broadly separated from conspicuously projected 195 angulate epaulet; anterolateral corners of pronotum sharply angulate in dorsal view. Pronotal spiracle slightly projected from lateral margin of pronotum, rounded, bulging. Lateral surface of pronotum sparsely punctate with dense micropunctures except at smooth conspicuous subacute tubercle anterior to pronotal spiracle, distance between tubercles wider than distance between pronotal spiracles; mesopleuron mostly concealed by dense setation, densely micropunctate anteriorly, and densely and coarsely foveolate-punctate to areolate-punctate on mesopleural ridge where visible; metapleuron completely concealed by dense setation, except small posterior area on dorsal fourth unsculptured, smooth and shining. Lateral surface of propodeum mostly concealed by dense setation, densely and coarsely areolate-punctate throughout with interspersed micropunctures where visible; intervals dull and blunt where visible. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 70 : 83 : 87 : 60 : 60. Lateral margin of mesonotum conspicuously constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt process; post-mesonotal tubercle absent. Propodeal spiracle strongly projected from lateral margin of mesosoma; postspiracular area indistinguishable. Scutellar scale present, as wide or wider than surrounding sculpture; anterolateral carinae present, approximately twice as wide as scutellar scale; scabrous intervals vestigial on scutellar area. Propodeum simply convex, dorsal surface indistinguishable from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 28 : 64 : 67. Disc of T2 mostly concealed by dense setation, densely and coarsely foveolate-punctate to punctate with dense, interspersed coarse micropunctures where visible; sculpture sparser and micropunctures absent laterally and over integumental spots. T3–5 sculpture predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible; T6, except pygidial plate, almost concealed by dense setation, densely foveolate-punctate where visible. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, slightly higher medially. S2 densely and coarsely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold present. S3–5 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S6 sparsely

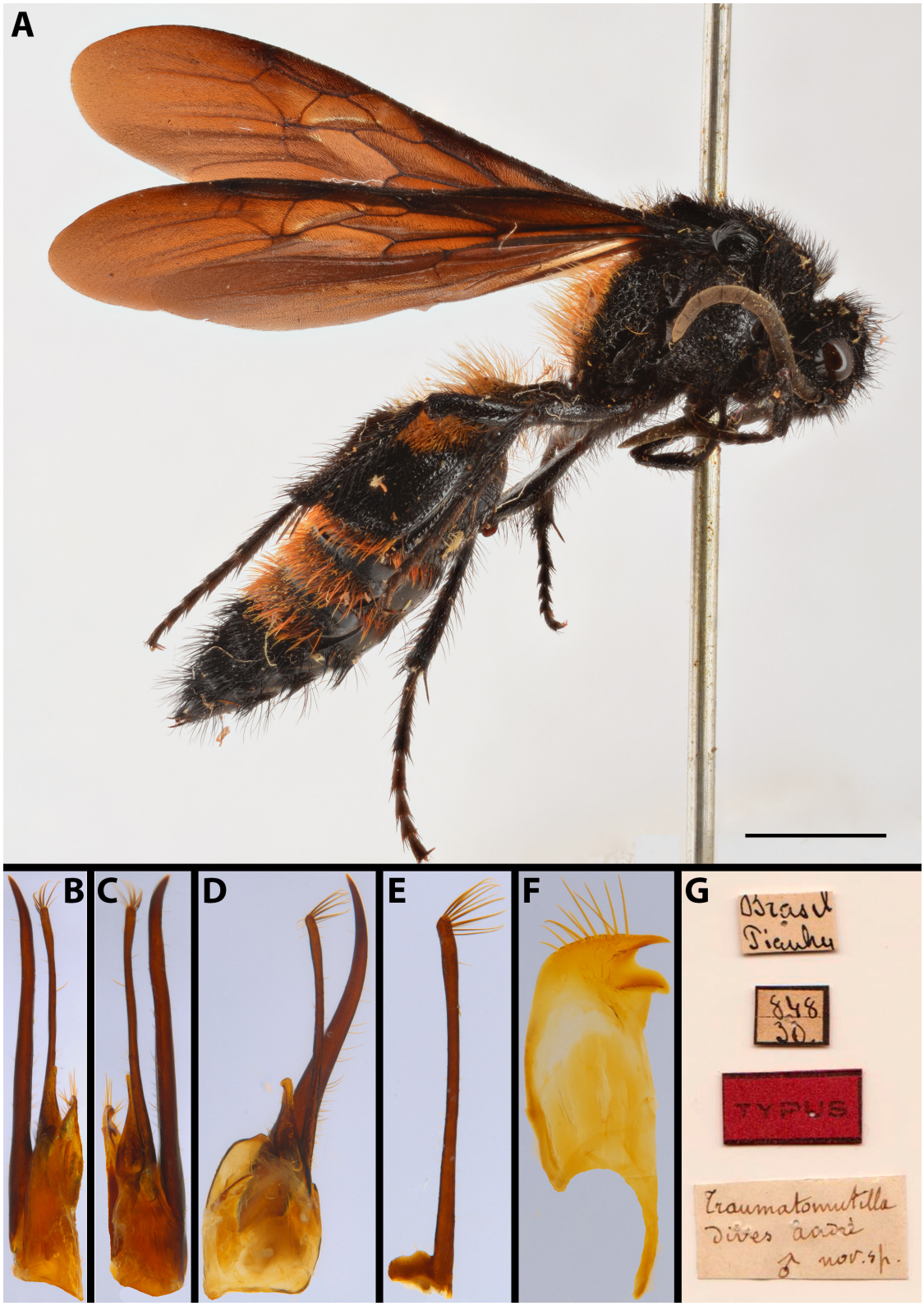

Fig. 6. *Traumatomutilla dives* (André, 1906), lectotype, ♂ (HNHM). **A**. Lateral habitus. **B**. Genitalia (halved), dorsal view. **C**. Genitalia, (halved), ventral view. **D**. Genitalia (halved, penis valve removed), lateral/inner view. **E**. Cuspis (removed, not to scale), lateral/inner view. **F**. Penis valve (removed, not to scale), lateral/outer view. **G**. Type labels. Scale bar = 2 mm.

foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical fourth of plate; surface irregularly rugose; interstice apparently granulose.

Male

Body length. 14–16 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; lateral margins of head convergent immediately behind eyes, but not contiguous with eye outline in dorsal view. Width 0.85× pronotal width. Eye almost circular. Ocelli small; OOD 4.3× DLO, IOD 1.0× DLO. Occipital carina distinct. Head surface sparsely and finely punctate; sculpture sparser and finer posterad. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; densely and coarsely foveolate-punctate medially and along apical/ventral margin laterally; apical/ventral margin with a pair of medial short subacute free teeth medially. Scape bicarinate. Flagellomere 1 2.1× pedicel length; flagellomere 2 2.9× pedicel length. Mandible obliquely tridentate apically, medial tooth smaller than inner tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets well defined, sharply projected from anterior margin of pronotum, separated from well-defined humeral carina, anterolateral corners of pronotum not angulate. Anterior surface of pronotum, with sparse fine punctures laterad with interspersed micropunctures, mostly unsculptured mediad; with medial longitudinal slightly concave smooth area. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures along inner and anterior margin. Dorsum of pronotum densely and coarsely foveolate-punctate to areolate-punctate with somewhat sharp intervals. Mesoscutum densely and finely foveolate-punctate, parapsis reduced to posterior half of mesoscutum, notaulus absent. Scutellum sloping throughout, somewhat depressed medially, without defined dorsal and posterior surfaces, densely and coarsely areolate-punctate to foveolate-punctate; anterior intervals somewhat aligned so as to form vestigial irregular longitudinal carina medially. Axilla produced posterolaterally as obliquely truncate projection, with inner margin slightly curved inward apicad in dorsal view; projection coarsely foveolate-punctate basad, unsculptured, smooth, shining apicad. Metanotum slightly wider laterad, its surface obscured by dense setation. Propodeal dorsum convex, mostly concealed, densely areolate; sculpture of lateral surface absent along most of anterior margin; dorsal surface indistinguishable from posterior surface. Lateral surface of pronotum sparsely and vestigially punctate with sparse interspersed micropunctures; mesopleura with conspicuous blunt projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron partially concealed by dense setation, micropunctate where visible, except basal third densely and coarsely areolate.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins.

Metasoma. T1 0.5× as wide as T2. T2 0.9× as long as wide. Dorsal metasomal sculpture, except pygidial plate, partially concealed by dense setation, densely and finely punctate with sparse interspersed micropunctures where visible; sculpture sparser and less defined in apical segments; pygidial plate slightly broader than long, weakly defined by parallel carinae laterally; surface densely micropunctate throughout. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina. S2 sparsely and finely foveolate-punctate to punctate; sculpture sparser mediad; anteromedial crest-fold present, sternal pit absent. S3–7 sparsely and finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe not at all pronounced posteriorly, subacute. Ratios of free length of paramere, cuspis and digitus, 96 : 83 : 22. Paramere almost straight with slightly outcurved apex in dorsal view, upcurved posteriorly in lateral view; almost asetose except for sparse scattered inconspicuous setae throughout, setae more evident in lateral view. Cuspis narrow, elongate, almost straight throughout and slightly wider posterad in dorsal view, almost straight and slightly wider posterad in lateral view, with conspicuous tuft of long setae at apex, inconspicuous short setae elsewhere. Paracuspis poorly developed, sessile, lobe-like, broader than long, posterior margin simply convex, with inconspicuous sparse setae. Digitus slightly incurved in dorsal view and upcurved in lateral view, soncpisuously narrower posterad in lateral view, apex subcapitate, with short inconspicuous setae on dorsal surface. Penis valve strongly concave on inner surface, with well-defined pair of teeth posteroventrally, posteriormost tooth acute, anterior tooth subacute to blunt, with poorly defined lateral pocket on outer margin, apical distance between teeth 0.1 × length of valve, dense setae present along truncate posterior margin and inconspicuous setae present at base of anterior tooth on outer margin, posterior margin setae longer ventrad.

Coloration and variations

Female

Integument black, except mandibles and antennal flagellomeres partially reddish-brown, and T2 with four large dark-orange to dark-red integumental spots. Body setae almost entirely black varying in density, except the following areas with vestigial traces of coppery-golden to silvery-golden setae: lateral margin of T2, fringe of T2 medially and laterally, fringe of T3 laterally, fringe of S3 laterally, fringe of T4 medially and laterally.

Male

Integument black to brownish-black. Body setae predominantly black varying in density, except the following areas with coppery-golden setae: posterior half of T1, anterior margin of T2, fringe of T2–4, fringe of S2–3, and fringe of S4 laterally. Certain specimens may have coppery-golden setae on posterior half of scutellum and covering dorsal surface of propodeum, T1, and anterior third of T2 entirely.

Distribution

Brazil (Piauí, Minas Gerais, and São Paulo).

Remarks

The association and synonymy of *T. chrysozona* with *T. lugubrina* was initially confusing, as the females (*T. lugubrina*) usually have exclusively black setae, while the males are extensively covered with brilliant coppery setae. Many females in São Paulo, however, have traces of coppery setae that are the same tint as seen in males from São Paulo, and differ from the setal markings of other members of the *T. quadrinotata* species-group. One additional male, *T. dives* from Piaui and Minas Gerais, is identical to the type of *T. chrysozona* in every aspect except it has the propodeal dorsum clothed with dense coppery setae. Though we haven't seen any intermediate forms between *T. chrysozona* and *T. dives*, we consider *T. dives* to be conspecific with *T. chrysozona*, as their external morphology and genitalia are indistinguishable. Further, although females of *T. lugubrina* are known from Minas Gerais, males of the typical form are apparently restricted to São Paulo. We therefore hypothesize that *T. dives* is a northern color variant of *T. chrysozona*.

Burmeister (1854) described both sexes of *Mutilla lugubris* based on at least two specimens from Queluz (present day Conselheiro Lafaiete) and Ouro Preto in Minas Gerais. Gerstaecker (1874) stated that he was unable to locate the male specimen of *M. lugubris*, considered both sexes as distinct species, and described the male as a new species, *M. burmeisteri*, without actually seeing the specimen. The original description of the male of *M. lugubris* in Burmeister (1854) mentioned that the male has a narrow

reddish band on the abdomen (meaning metasoma), and Gerstaecker (1874) placed *M. burmeisteri* in a subcategory that included only males with black spurs and reddish markings on the metasoma, probably based on Burmeister's original description of the reddish band. The black spurs are evident in *T. chrysozona* and it's very likely that the narrow reddish band mentioned by Burmeister (1854) is in fact his interpretation on the coppery setae clothing the fringe of T2–3, especially since he used the same word "rubra" to define the coppery metasomal marking of *Hoplocrates cephalotes* (Swederus, 1787). Based on this, we place *T. burmeisteri* as a junior synonym of *T. chrysozona*.

Traumatomutilla funebris Gerstaecker, 1874
Fig. 7

Mutilla funebris Gerstaecker, 1874: 75.

Ephuta (*Traumatomutilla*) *funebris* – André 1902: 55.
Traumatomutilla funebris – André 1904: 40.

Diagnosis

Female
Occipital carinae equally wide throughout; anterolateral carinae lacking in scutellar area; post mesonotal tubercle absent; lateral surface of propodeum densely but not evenly sculptured, with conspicuously wide intervals; body setae pattern black and silvery-white in color, restricted to propodeum on mesosomal dorsum.

Male
Unknown.

Type material

Holotype
BRAZIL • ♀; Minas Gerais; S.v. Langsdorf leg.; ZMB.

Other material examined (4 ♀♀)

BRAZIL • **Minas Gerais** • 1 ♀; Serra do Caraça; 1380 m [above sea leve]; Nov. 1961; Kloss, Lenko, Martins and Silva leg.; MNCN • 1 ♀; Serra do Cipó, Monte Ribeiro; 6 Feb. 1939; Lopes and Tupinambá leg.; MNCN. – **Locality unknown** • 2 ♀♀; MNHN.

Description

Female
Body length. 15–17 mm.

Head. Posterior margin straight, with occipital equally wide throughout. Vertex width 0.8× pronotal width. Eye almost circular, its length in frontal view almost equal to the distance from its ventral margin to mandibular condyle. Front, vertex, and gena densely and coarsely foveolate-punctate with irregular intervals; sculpture sparser on malar space. Genal carina present. Mandible oblique, tapering slightly towards apex with small subapical tooth, unarmed ventrally. Dorsal scrobal carinae well defined, narrowly separated from antennal tubercles, connected to well-defined lateral scrobal carina. Antennal tubercle coarsely punctate to irregularly rugose. Flagellomere 1 2.0× pedicel length; flagellomere 2 1.5× pedicel length.

Mesosoma. Mesosomal length 1.5× width; pronotum 0.85× as wide as mesothorax. Mesosomal dorsum densely and coarsely areolate-reticulate with sharp irregular intervals. Humeral carina well developed,

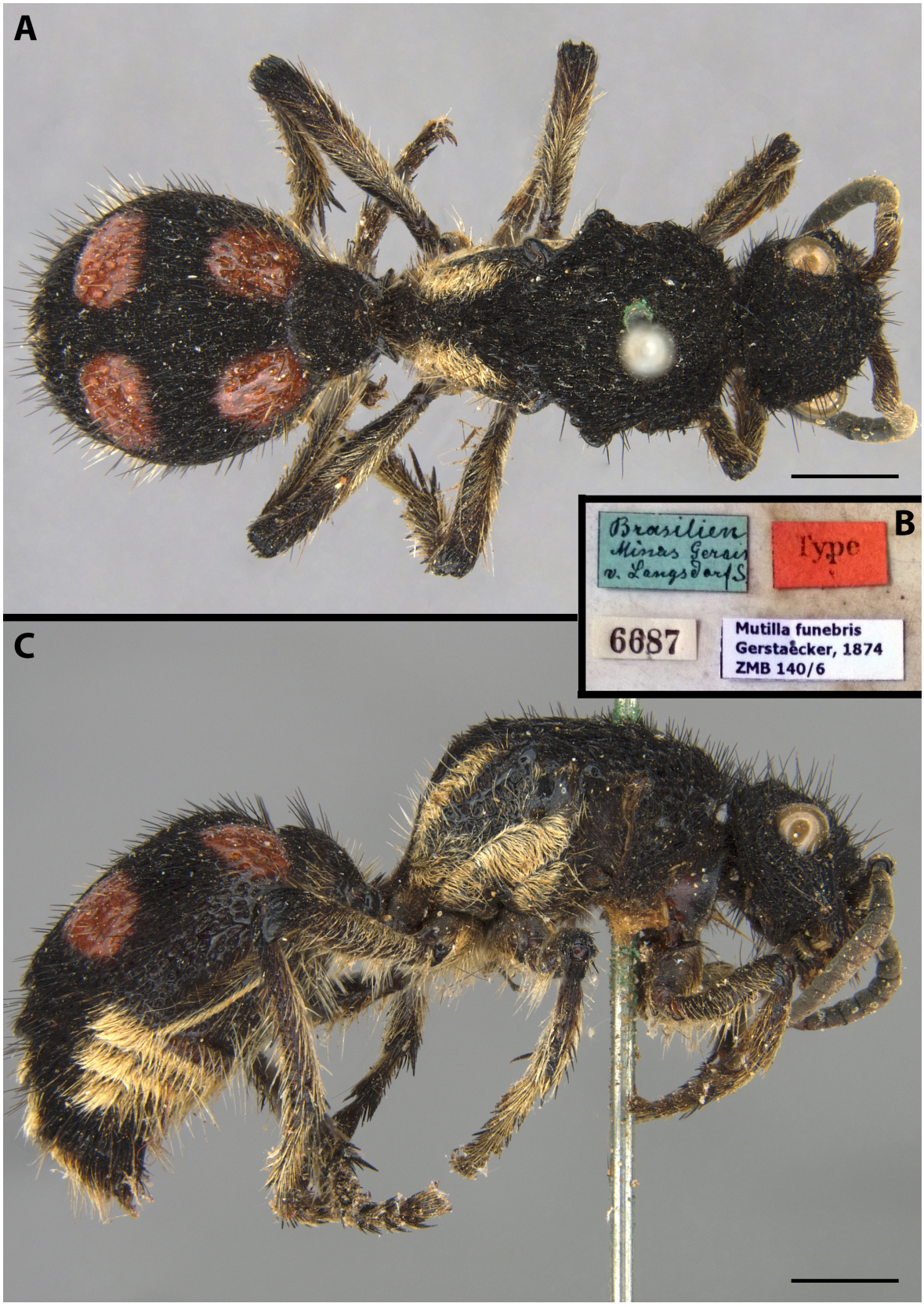

Fig. 7. *Traumatomutilla funebris* (Gerstaecker, 1874), holotype, ♀ (ZMB). **A**. Dorsal habitus. **B**. Type labels. **C**. Lateral habitus. Scale bars = 2 mm.

slightly projected apically, separated from projected subangulate epaulet; anterolateral corners of pronotum angulate in dorsal view. Pronotal spiracle almost flat against lateral margin of pronotum. Anterior surface of pronotum coarsely punctate dorsad to vestigially, coarsely and longitudinally striate ventrad. Lateral surface of pronotum sparsely and coarsely punctured, with dense micropunctures and conspicuous blunt tubercle anteroventral in relation to pronotal spiracle. Mesopleuron partially concealed by dense setation, micropunctate anteriorly and densely coarsely foveolate-punctate along mesopleural margin where visible. Metapleuron partially concealed by dense setation, except at dorsal fourth unsculptured and smooth. Lateral surface of propodeum partially concealed by dense setation, densely and coarsely areolate-punctate, with vestigially rugose intervals. Post-spiracular area absent. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 66 : 76 : 86 : 58 : 56. Lateral margin of mesonotum strongly constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt tooth-like process; with small inconspicuous tubercle posterior to lateral process. Propodeal spiracle strongly projected from lateral margin of propodeum; post-spiracular area absent. Scutellar scale present, reduced, as narrow as surrounding sculpture; anterolateral carinae absent; intervals irregular on scutellar area, not scabrous. Propodeum gibbose, dorsal surface much shorter than and poorly distinguished from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 33 : 75 : 78. Disc of T2 densely and coarsely foveolate-punctate to punctate with dense, interspersed micropunctures; foveolations sparser and micropunctures absent laterally and over integumental spots. T3–5 predominantly concealed by dense setation, densely and coarsely foveolate-punctate to 198 simply punctate with interspersed micropunctures where visible; T6 sculpture, except pygidial plate, predominantly concealed by dense setation, densely and coarsely foveolate-punctate. S1 sparsely, coarsely and confusedly foveolate-punctate, longitudinally convex (wedge-like), ending in short blunt longitudinal carina, equally high throughout. S2 densely and coarsely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold present, reduced. S3–5 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S6 densely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical fourth of plate; surface irregularly rugose; interstice apparently granulose.

Coloration and variations

Female

Integument black except for mandibles and antennal flagellomeres partially reddish-brown, and T2 with two pairs of subovate (anterior pair) and subquadrate (posterior pair) orange integumental spots; older or poorly conserved specimens may have the spots with darker more reddish tones.

Male

Unknown.

Distribution

Brazil (Minas Gerais).

Remarks

All specimens examined are from higher altitude areas (1300–1700 m a.s.l.) transitioning between Cerrado and Atlantic Forest in Minas Gerais State, Brazil. Although the holotype has no indication of the specific location in which it was collected, it is also from Minas Gerais. This high-altitude distribution could be purely coincidental, but it is worth pointing out that Minas Gerais is one of the most relatively well-sampled areas in Brazil for velvet ants and no specimens of *T. funebris* were recorded in lower

altitude areas so far. The large orange spots on T2 (darkened by age on the holotype) and indistinct appressed silvery-golden setae on the lateral propodeal surface of *T. funebris* are reminiscent of the pattern observed in *T. quadrinotata*. Both species are nonetheless distinct structurally, especially on the sculpture of the lateral propodeal surface and shape of the lateral mesonotal projections. Similar resemblances and differences can be observed between *Hoplomutilla spinosa* (Swederus, 1787) and *Hoplomutilla serena* (Mickel, 1939) which occur in Atlantic Forest and Cerrado/Atlantic Forest areas respectively (PRB pers. obs.). Further collecting in higher altitude areas of Minas Gerais may reveal the male of this rare species.

Traumatomutilla incerta (Spinola, 1841)
Figs 8–9

Mutilla incerta Spinola, 1841: 93.
Mutilla dentata Smith, 1879: 219. **Syn. nov.**
Mutilla sodalicia Kohl, 1882: 490. **Syn. nov.**
Traumatomutilla weyrauchi Mickel, 1945: 30.
Traumatomutilla dignitosa Mickel, 1952: 131. **Syn. nov.**
Traumatomutilla tabatinga Casal, 1969: 287. **Syn. nov.**

Ephuta (*Traumatomutilla*) *sodalicia* – André 1902: 56.
Traumatomutilla sodalicia – André 1902: 40.
Mutilla incerta – André 1902: 73 (incertae sedis).
Traumatomutilla incerta – Mickel 1937: 196.
Traumatomutilla dentata – Nonveiller 1990: 77.

Diagnosis

Female

Occipital carina slightly but conspicuously swollen dorsolaterally; anterolateral carinae present in scutellar area, partially obscured by dense setation; lateral surface of propodeum predominantly smooth and shining, sculpture sparse; mesonotum with transverse band of silvery-white setae on posterior half; T2 with a pair of reddish to orange integumental spots.

Male

Apex of cuspis with short setae; pronotum densely clothed with appressed silvery-white setae; pronotal sculpture with dense micropunctures.

Type material

Lectotype of *Mutilla incerta*
[FRENCH GUYANA] • ♀; Cayenne; D. Lebas leg.; MSNT.

Holotype of *Mutilla dentata*
BRAZIL • ♂; [Amazonas], St Paul [São Paulo de Olivença]; NHMUK.

Holotype of *Mutilla sodalicia*
BRAZIL • ♀; Amaz. [sic]; NHMW.

Holotype of *Traumatomutilla dignitosa*
GUIANA • ♂; Bartica, Bartica District; Wm. Beebe leg.; UMSP.

Holotype of *Traumatomutilla tabatinga*
BRAZIL • ♀; Amazonas, Tabatinga; Nov. 1958; F.M. Oliveira leg.; AMNH.

Other material examined (68 ♀♀, 36 ♂♂)

BOLIVIA – **Beni** • 1 ♀; Dpto. [Department], 5 km NW of Rurenabaque; 18 Sep. 1994; D. Roubik leg.; MIUP. – **Cochabamba** • 1 ♀; Region Chapare, 400 m [above sea level]; 20 Mar. 1907; Zischka; MNCN. – **La Paz** • 2 ♀♀; Yungas de Coroico; 1914; MNHN. – **Locality unknown** • 1 ♀; Tumupasu; 1921; W.M. Mann leg.; USNM.

BRAZIL – **Amapá** • 1 ♀; Oiapoque, (Retiro) Ambiente de mata; 23 Oct. 2001; J. Madson leg.; HAMAB • 1 ♀; Serra Lombard, Limão; 26 Aug. 1961; J. and B. Bechyné leg.; MPEG. – **Amazonas** • 4 ♀♀; Manaus; RBINS • 1 ♀; Jul. 1962; F.M. Oliveira leg.; DZUP • 1 ♀; Manaus, Bairro Flores; 13–20 Apr. 2009; D. Storck-Tonon leg.; INPA • 1 ♀; Manaus, INPA 1 [Campus 1], Bosque da Ciência; 3°05′50″ S, 59°59′16″ W; 10 Jun. 2017; M.A. Bento leg.; INPA • 1 ♀; Manaus, Reserva Ducke, Trilha principal; 3 Oct. 2016; G. Amora leg.; INPA • 1 ♀; Manaus, Reserva Ducke; 2.93308° S, 58.97116° W; 19 May 2012; Medeiros leg.; INPA • 1 ♀; Manaus, Reserva Ducke; 2°55′48″ S, 59°58′31″ W; 8 Jun. 2013; J.F. Saraiva leg.; INPA • 1 ♀; Teffe [Tefé]; 5 Feb. 1920; H.S. Parish leg.; FMNH • 1 ♂; Tefé; 9 Sep. 1909; Ducke leg.; MNHN • 2 ♀♀; Tonantins, Amazon River; Jul. 1923; S.M. Klages leg.; CM • 2 ♀♀; Aug. 1923; S.M. Klages leg.; CM • 1 ♀; Manacapuru, Amazon River; Sep. 1923; S.M. Klages leg.; CM • 1 ♀; Estinao [Estirão do] Equador, Rio Javari; M. Alvarenga leg.; AMNH. – **Mato Grosso** • 1 ♂; Sinop; 12°31′ S, 55°37′ W; Oct. 1975; F.M. Oliveira leg.; USU. – **Pará** • 3 ♀♀; MZSP • 1 ♀; Óbidos; Dec. 1965; Maller, A. leg.; DZUP • 1 ♀; Mar. 1958; USNM • 1 ♀; USNM • 1 ♀; Jul. 1959; MNRJ • 2 ♀♀; Santarém; RBINS • 1 ♂; MNHN • 1 ♀; 1923; SDEI • 1 ♂; Altér do Chão; 12–13 Sep. 1991; J. Vidal leg.; INPA • 1 ♀; Oriximiná; 2 Sep. 1919; H.S. Parish leg.; FMNH • 2 ♂♂; Jacareacanga; Dec. 1968; M. Alvarenga leg.; AEIC • 8 ♂♂; Tucurui; Jan. 1979; M. Alvarenga leg.; AEIC. – **Rondônia** • 1 ♀; 62 km SE [kilometers southeast of] Ariquemes; 17–24 Mar. 1989; W.J. Hanson leg.; USU • 1 ♀; same data as for preceding; 5–16 Nov. 1996; W.J. Hanson leg.; USU • 1 ♂; Ouro Preto d'Oeste; 20 Sep. 1987; Elias, C. leg.; DZUP.

COLOMBIA – **Caquetá** • 1 ♂; PNN [Parque Nacional Natural] Chiribiquete, Río Cuñare; 0°30′ N, 72°37′ W; 300 m [above sea leve]; 1–5 Jun. 2000; E. González and M. Ospina leg.; FSCA • 1 ♂; Río Cuñare-Amu; 0°13′ N, 72°25′ W; 300 m [above sea level]; 28 Feb.–3 Mar. 2001; M. Ospina and E. González leg.; USU. – **Meta** • 1 ♂; PNN [Parque Nacional Natural] Tinigua, Vda. [sic] Bajo Raudal; 2°16′ N, 73°48′ W; 460 m [above sea level]; 1–15 Mar. 2003; C. Sánchez leg.; IAvH. – **Putumayo** • 1 ♂; Mocoa; 4 Jul. 1978; M. Cooper leg.; NHMUK • 1 ♂; Santa Rosa, Kofan Indian village; 10 Oct. 1970; B. Malkin leg.; FMNH • 1 ♂; PNN [Parque Nacional Natural] La Paya, Resguardo Cecílio Cocha; 0°11′ S, 74°55′ W; 200 m [above sea level; 20–24 Jan. 2003; C. Sarmiento leg.; IAvH. – **Locality unknown** – 2 ♂♂; IAvH • 1 ♀; Rio Negro [sic], Ost Columb. [western Colombia]; MNCN

ECUADOR – **El Oro** • 1 ♀; 21–25 km E [east of] Atahualpa; 27–31 Sep. 1997; F.T. Hovore leg.; UCDC • 1 ♀; 25 km E [east of] Atahualpa; 1°00′ S, 78°00′ W; 1–6 Oct. 1997; F.T. Hovore leg.; USU. – **Morona Santiago** • 1 ♀; Santiago; Feb. 1986; L. Coloma leg.; MIUP. – **Napo** • 1 ♀; Tiputini Biodiversity Station; 20 Jul. 1999; M.J. Miller leg.; UAIC • 1 ♀; Archidona; R. Haensch leg.; MNCN • 1 ♀; Misahualli, nr. [near] Tena; 10 Jan. 1989; B.J. Nichols leg.; UMRM • 1 ♀; Misahualli, nr. [near] Tena; 13–20 Jun. 1998; C. and K. Messenger leg.; UNSM • 1 ♀; same data as for preceding; 6–19 Oct. 2001; C. Brammer leg.; USU • 1 ♀; Río Aguarico; Mar. 1992; E.S. Ross leg.; CASC. – **Sucumbios** • 1 ♂; Sucumbios River, Sacha Lodge; 3–23 Jun. 1994; USU • 1 ♂; Río Napo, Sacha Lodge; 00°30′ S, 76°30′ W; 220–230 m [above sea level]; 27 Aug.–10 Sep. 1994; P. Hibbs leg.; USU • 1 ♂; same data as for preceding; 13 Jul. 1994; P. Hibbs leg.; USU • 1 ♂; same data as for preceding; 270 m [above sea leve]; 13–25 Feb. 1994; P. Hibbs leg.; USU. – **Locality unknown** • 2 ♀♀; MNCN.

FRENCH GUIANA – **Cayenne** • 1 ♀; ZMUC • 1 ♀; Chavrein; 1914; R. Benoist leg.; MNHN • 1 ♀; Gourdonville; 1914; R. Benoist leg.; MNHN. – **Saint-Laurent-du-Maroni** • 1 ♀; Maroni, St [Saint] Laurent du Maroni; E. Le Moult; MNCN.

GUYANA – **Cuyuni-Mazaruni** • 1 ♂; Bartica: 1 Jun. 1924; AMNH • 1 ♀; Kartabo; Jul–Aug. 1920; W.M. Wheeler; MCZ • 1 ♀; jct. [juncture] Cuyani/Mazaruni, Essequibo Rivers; 1927; R.E. Fuglestad leg.; EMEC.

PERU – **Huánuco** • 1 ♀; Tingo Maria; 3 Jan. 1970; J.C. Schuster leg.; FSCA • 2 ♂♂; 23 Oct. 1946; Pallister *et al*. leg.; AMNH • 1 ♀; vic. [vicinity] Tingo Maria; 1–5 Jun. 1999; W. Hanson and S. Keller leg.; USU • 2 ♂♂; Monson [Monzón] Valley; 16 Nov. 1954; USU. – **Junín** • 1 ♀; Satipo; 18 Jul. 1939; W.F. Walsh Jr leg.; MCZ. – **Lima** • 1 ♀; Valle Chanchamayo; 1939; P. Vaquero leg.; UMSP • 2 ♀♀; 1914; MNHN • 2 ♀♀; S. Thamm leg.; ZMB • 1 ♂; 21 Jul. 1949; J.M. Schunke leg.; NHMUK. – **Loreto** • 1 ♀; Amazon Camp, Río Momón, nr [near] Iquitos; 1–10 Dec. 1982; E.S. Ross leg.; CASC. – **Madre de Dios** • 1 ♀; Pakitza; 23–28 Feb. 1992; B.V. Brown leg.; USNM • 2 ♀♀; Pakitza; Feb. 1992; R. Cambra leg.; MIUP • 1 ♀, 1 ♂; Pakitza; 30 Jun.–4 Jul. 1993; R. Cambra leg.; MIUP. – **Piura** • 1 ♀; Santo Domingo; NHMUK.

SURINAME – **Brokopondo** • 1 ♂; Brownsberg Nature Park, Irene Val Trail; 4°95′ N, 55°18′ W; 400 m [above sea level]; 25 Aug.–2 Sep. 2007; G. Kung and A. Kreuter leg.; USU.

VENEZUELA – **Amazonas** • 1 ♀; Alto Río Sialba; 1°43′10″ N, 64°31′50″ W; 24–25 Feb. 1989; 510 m [above sea level]; T. Lattke leg.; FSCA.

Description

Female

Body length. 13–20 mm.

Head. Posterior margin almost straight. Occipital slightly but conspicuously swollen dorsolaterally. Vertex width 0.8× pronotal width. Eye almost circular, its length in frontal view almost equal to distance from its ventral margin to mandibular condyle. Head sculpture partially concealed by dense setation, densely and finely foveolate-punctate with sharp intervals where visible. Genal carina well defined. Mandible oblique, tapering slightly towards apex with small subapical tooth. Dorsal scrobal carina present, well defined, narrowly separated from antennal tubercles and lateral scrobal carina. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 2.6× pedicel length; flagellomere 2 1.9× pedicel length.

Mesosoma. Dorsal thoracic length 0.75× maximum dorsal thoracic width. Mesosomal dorsum partially concealed by dense setation, densely and finely foveolate-punctate with sharp intervals where visible. Anterior surface of propodeum defined, short, almost as long as pronotal collar, finely striated longitudinally throughout with sparse interspersed fine punctures dorsad; dorsal surface rounded into anterior surface in lateral view. Humeral carina well defined, strongly projected dorsally, narrowly connected to conspicuously projected angulate epaulet; anterolateral corners of pronotum sharply angulate in dorsal view. Pronotal spiracle slightly projected from lateral margin of pronotum. Lateral surface of pronotum with sparse scattered punctures and dense micropunctures except at smooth conspicuous acute tubercle anteroventral in relation to pronotal spiracle; mesopleuron partially concealed by dense setation, densely micropunctate anteriorly, densely and coarsely foveolate-punctate on mesopleural ridge where visible; metapleuron completely concealed by dense setation, except small dorsal fourth unsculptured, smooth and shining. Lateral face of propodeum predominantly unsculptured, smooth and shining, with sparse scattered punctures. Ratios of width of humeral angles, pronotal spiracles, widest

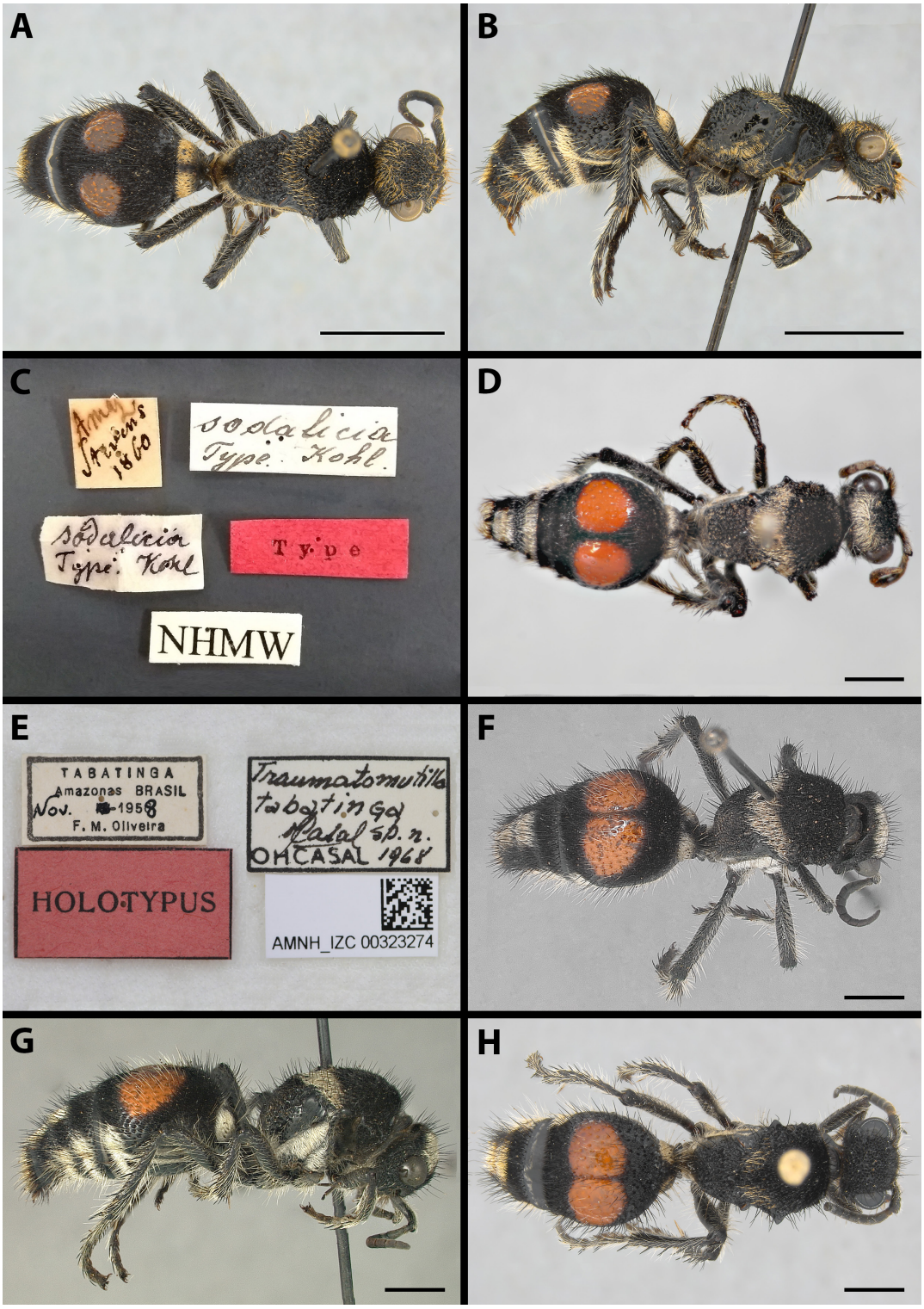

Fig. 8. A–C. *Traumatomutilla sodalicia* (Kohl, 1882), holotype, ♀ (NHMW). **A**. Dorsal habitus. **B**. Lateral habitus. **C**. Type labels. **D–E**. *Traumatomutilla tabatinga* Casal, 1969, holotype, ♀ (AMNH). **D**. Dorsal habitus. **E**. Type labels. **F–G**. *Traumatomutilla incerta* (Spinola, 1841), ♀ (non-type specimen), most common color form. **F**. Dorsal habitus. **G**. Lateral habitus. **H**. *Traumatomutilla incerta* (Spinola, 1841), ♀ (non-type specimen), color form with reduced silvery-white setae on head and mesosoma, dorsal habitus. Scale bars: A–B = 5 mm; D, F–H = 2 mm.

point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 57 : 84 : 74 : 57 : 58. Lateral margin of mesonotum conspicuously constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt process; post-mesonotal tubercle absent. Propodeal spiracle strongly projected from lateral margin of mesosoma; post-spiracular area indistinguishable. Scutellar scale present, as wide or wider than surrounding sculpture; anterolateral carinae present, vestigial, approximately twice as wide as scutellar scale; scutellar area with irregular intervals, not scabrous. Propodeum convex in lateral view, dorsal surface indistinguishable from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 34 : 73 : 66. Disc of T2 mostly concealed by dense setation, densely and coarsely foveolate-punctate to punctate with dense, interspersed coarse micropunctures where visible; sculpture sparser and micropunctures absent laterally and over integumental spots. T3–5 sculpture predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible; micropunctures sparser on T4 and absent on T5; T6, except pygidial plate, almost concealed by dense setation, densely foveolate-punctate where visible. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, slightly higher medially. S2 densely and coarsely foveolate-punctate, sculpture conspicuously sparser and smaller anteromediad; anteromedial crest-fold vestigial. S3–5 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S6 sparsely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical third of plate; surface densely and irregularly rugose; interstice apparently granulose.

Male

Body length. 14–18 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; lateral margins of head convergent immediately behind eyes, but not contiguous with eye outline in dorsal view. Vertex width 0.8× pronotal width. Eye almost circular. Ocelli small; OOD 3.6× DLO, IOD almost equal to DLO. Occipital carina distinct. Head surface sparsely and finely punctate; sculpture dense and coarser on frons. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; densely and coarsely foveolate-punctate medially and along apical/ventral margin laterally; apical/ventral margin with a pair of medial short subacute teeth medially. Scape bicarinate. Flagellomere 1 1.7× pedicel length; flagellomere 2 2.1× pedicel length. Mandible obliquely tridentate apically, inner tooth larger than medial tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets well defined, slightly projected from anterior margin of pronotum, separated from well-defined humeral carina, anterolateral corners of pronotum subrounded. Anterior surface of pronotum, sparsely and finely punctate with sparse micropunctures, except medioventrally smooth and shining; evenly flat throughout. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures along inner and anterior margin. Dorsum of pronotum predominantly concealed by dense setation, densely and coarsely foveolate-punctate with interspersed micropuncutres where visible. Mesoscutum densely and finely foveolate-punctate, parapsis and notaulus present, reduced to posterior half of mesoscutum. Scutellum subquadrate to subglobose, with well-defined dorsal and posterior surfaces, elevated medially into longitudinal crest extending from anterior margin of dorsal fface to posterior surface, densely and coarsely areolate-punctate to foveolate-punctate. Axilla strongly produced transversely truncate projection, with inner margin slightly curved inward apicad in dorsal view; projection coarsely foveolate-punctate basad, unsculptured, smooth, shining apicad. Metanotum slightly wider laterad, its surface obscured by dense setation. Propodeal dorsum convex, sculpture of

dorsal surface concealed by dense setation, posterior surface densely areolate; lateral surface densely areolate along posterior margin and dorsal third, almost unsculptured, smooth and shining elsewhere. Lateral surface of pronotum sparsely and vestigially punctate with sparse interspersed micropunctures; mesopleura with conspicuous blunt projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron partially mostly

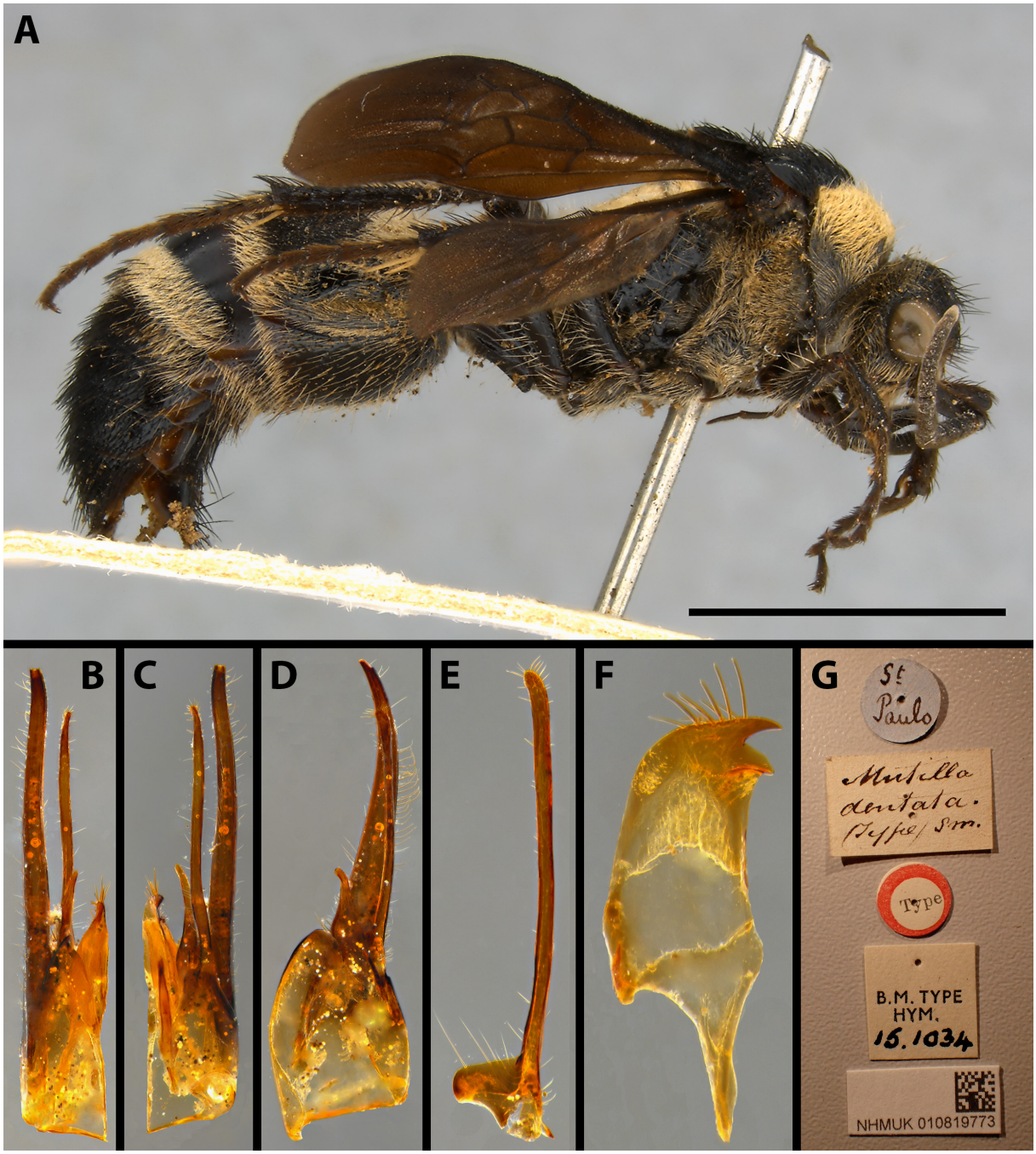

Fig. 9. *Traumatomutilla dentata* (Smith, 1879), holotype, ♂ (NHMUK). **A**. Lateral habitus. **B**. Genitalia (halved), dorsal view. **C**. Genitalia (halved), ventral view. **D**. Genitalia (halved, penis valve removed), lateral/inner view. **E**. Cuspis (removed, not to scale), lateral/inner view. **F**. Penis valve (removed, not to scale), lateral/outer view. **G**. Type labels. Scale bar = 2 mm.

unsculptured, smooth and shining, except for vestigial rugosities on dorsal fifth and coarse areolateion on ventral fourth.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins.

Metasoma. T1 0.5× as wide as T2. T2 0.8× as long as wide. Dorsal metasomal sculpture, except pygidial plate, partially concealed by dense setation, densely and finely punctate with sparse interspersed micropunctures where visible; sculpture sparser and less defined in apical segments, denser posteromediad onT2; pygidial plate slightly longer than broad, weakly defined by parallel carinae apicolaterally; surface vestigially rugose, appearing smooth and sinning, except apical margin densely punctate and setose. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina. S2 sparsely and finely foveolate-punctate to punctate; anteromedial crest-fold and sternal pit absent. S3–7 sparsely and finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe not at all pronounced apically, subacute. Ratios of free length of paramere, cuspis and digitus, 63 : 51 : 19. Paramere slightly sinuous and posteriorly outcurved in dorsal view, upcurved apically in lateral view, with inconspicuous sparse setae throughout, setae more evident on ventral surface. Cuspis elongate, slender, almost straight and conspicuously tapered posterad in dorsal view, slightly upcurved apically and equally wide throughout in lateral view, with short sparse inconspicuous setae apically, almost astose elsewhere. Paracuspis poorly developed, sessile, lobe-like, wider than long with flat dorsally sloping posterior margin, with sparse setae on posterior margin, setae as long as or longer than paracuspis length. Digitus slightly incurved in dorsal view and upcurved in lateral view, conspicuously narrower posterad in lateral view, with short inconspicuous setae on dorsal surface. Penis valve strongly concave on inner surface, with well-defined pair of acute teeth posteroventrally, with poorly-defined lateral pocket on outer margin, apical distance between teeth 0.1× length of valve, dense setae present along truncate posterior margin and inconspicuous setae present at base of anterior tooth on outer margin, setae on posterior margin longer ventrad, posterior margin sloping dorsad.

Coloration and variations

Female

Integument black, except mandibles and antennal flagellomeres partially reddish-brown, and T2 with two orange to reddish integumental spots. Spots vary in size and slightly in shape, from small (separated by half spot width) to large (almost confluent medially), and from almost perfectly circular to subcircular. Body setae predominantly silvery-white varying in density except the following areas usually with black setae varyin in density: ventral half of frons, gena, malar space, pronotum, anterior half of mesonotum, propodeum, T1 medially, disc of T2 (except over integumental spots), fringe of T2–3 medially, fringe of T4–5 sublaterally, T6 laterally, fringe of S5, and S6. Head setae varying from vestigial medial spot of silvery-white setae to entire head clothed with silvery-white setae. Some specimens may have the fringe of T3 entirely clothed with silvery-white setae and/or vestigial and scattered silvery-white setae on lateral margins of propodeal dorsum.

Male

Integument black to brownish-black. Body setae predominantly silvery-white varying in density except for the following areas with black setae varying in density: ventral hald of frons (interspersed with silvery-white), mesoscutum, axillar projection, dorsal surface of scutellum, disc of T2 (except anterior third), fringe of T2–3 medially, T4–7 (except pygidial plate and vestigial silvery-white setae laterally on

T4–6), fringe of S5, and S6–7. Some specimens have the silvery-white setae areas conspicuously denser and usually the fringe of T2–3 entirely clothed with dense silvery-white setae. Wings dark brown with strong violaceous and blueish reflections. Tibial spurs yellowish-white.

Distribution

Colombia (Putumayo, Caquetá and Meta), Venezuela (Amazonas), Surinam (Brokopondo), Guyana (Cuyuní-Mazaruní), French Guiana (Cayenne and Saint-Laurent-du-Maroni), Brazil (Pará, Amapá, Amazonas, Rondônia, and Mato Grosso), Ecuador (El Oro, Napo, Morona Santiago, and Sucumbios), Peru (Madre de Dios, Loreto, Junín, Lima, Piura, and Huánuco) and Bolivia (Beni, La Paz, and Cochabamba).

Remarks

The sex association between *T. incerta* and *T. dentata* is evidenced by the distribution of both species which, to the best of our knowledge, are the sole representatives of the *T. quadrinotata* species-group in the northwestern Amazon Forest. Even though we were unable to access the lectotype of *T. incerta*, numerous specimens examined were identified as this species and compared with the type by Mickel who designated the lectotype (Mickel 1937). The lectotype designation was later confirmed by Pagliano (2005), who also officially designated the paralectotypes for *T. incerta* and provided a photograph of said type. Close examination of *T. dentata* and *T. dignitosa* revealed that the difference between the axillar projections (Mickel 1952) is not consistent; this, coupled with their almost identical genitalia characters, and only marginally different setal characters, is sufficient basis for synonymizing these males. Casal (1969) stated that *T. tabatinga* differed from *T. weyrauchi* (then a valid species) by having transverse irregular rugosities on the pygidial plate, which was the main difference between *T. incerta* and *T. weyrauchi* mentioned by Mickel (1945). Quintero & Cambra (1996a) studied a paratype of *T. weyrauchi* and concluded that it could not be distinguished from *T. incerta*. Therefore, the pygidial sculpture was shown to be inadequate for differentiating species. After examining the types of *T. tabatinga* and *T. sodalicia*, we conclude that these species are also synonymous with *T. incerta* and *T. weyrauchi*. They are all basically identical in structure, differing only in the size of the T2 integumental spots and the presence or absence of silvery-white setae on the head, with numerous intermediate specimens found between each form.

Traumatomutilla infernalis (Gerstaecker, 1874)
Fig. 10

Mutilla infernalis Gerstaecker, 1874: 318.
Mutilla floccosa Gerstaecker, 1874: 314. **Syn. nov.**

Ephuta (*Traumatomutilla*) *infernalis* – André 1902: 55.
Ephuta (*Traumatomutilla*) *floccosa* – André 1902: 55.
Traumatomutilla infernalis – André 1904: 40.
Traumatomutilla floccosa – André 1904: 40.

Diagnosis

Female

Unknown.

Male

Cuspis with long setae apically; cuspis length 0.85 × length of paramere; posterior margin of penis valve evenly convex; lateral surface of propodeum with sparse erect silvery-white seta; metapleuron setae

black; wings strongly dark brown infuscated throughout, with strong violaceous and blueish reflections; propodeum and metasoma silvery-white setae sparse, never obscuring integument completely.

Type material

Lectotype of *Mutilla infernalis*
BRAZIL • ♂; S. Brasilien [Southern Brazil]; Sello S. leg.; ZMB.

Holotype of *Mutilla floccosa*
BRAZIL • ♂; Brazil; S. Sello leg.; ZMB.

Other material examined (8 ♂♂)

BOLIVIA • 3 ♂♂; Pando, Guayaramerín; Dec. 1956; Fritz leg.; AMNH.

BRAZIL • 1 ♂; Mato Grosso do Sul, Tres Lagoas, Horto Rio Verde; 19 Jul. 1994; Fletchmann leg.; FEIS.

PARAGUAY – **San Pedro** • 1 ♂; Río Ypané, Cororo; 5–9 Dec. 1983; M. Wasbauer leg.; UCDC • 1 ♂; Río Ypané; Nov. 1979; Fritz leg.; AMNH.

Description

Female
Unknown.

Male
Body length. 12 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; lateral margins of head convergent immediately behind eyes. Vertex width 0.86 × pronotal width. Eye almost circular. Ocelli small; OOD 4.3 × DLO, IOD 1.0 × DLO. Occipital carina distinct. Head surface punctate; sculpture sparser and finer posterad. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; densely and coarsely foveolate-punctate, coarser mediad; apical/ventral margin with a pair of medial short subacute free teeth medially. Scape bicarinate. Flagellomere 1 2.1 × pedicel length; flagellomere 2 2.6 × pedicel length. Mandible obliquely tridentate apically, medial tooth smaller than inner tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets moderate, connected to well-defined humeral carina by feeble interrupted carina, anterolateral corners of pronotum subangulate. Anterior surface of pronotum, with coarse dense punctures laterally, micropunctures sublaterally, and medial longitudinal, slightly concave, smooth, unsculptured area. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures along inner and anterior margin. Dorsum of pronotum densely and coarsely foveolate-punctate mediad to areolate-punctate laterad with somewhat sharp intervals. Mesoscutum densely and finely foveolate-punctate, parapsis and notaulus reduced to posterior half of mesoscutum. Mesoscutellum 'box-like', with conspicuously horizontal dorsal surface roundly angulate into nearly vertical posterior surface; dorsal surface shorter than posterior surface; sculpture densely and coarsely areolatepunctate to foveolate-punctate. Axilla produced posterolaterally as obliquely truncate projection in dorsal view; projection coarsely foveolate-punctate basad, unsculptured, smooth, shining apicad. Metanotum slightly wider laterad, its surface obscured by dense setation. Propodeal dorsum convex, slightly depressed sublaterally, mostly concealed by dense setation, densely areolate where visible; sculpture of lateral surface absent along most of anterior margin; dorsal surface indistinguishable from posterior surface. Lateral surface of pronotum sparsely obscurely punctate with sparse interspersed micropunctures;

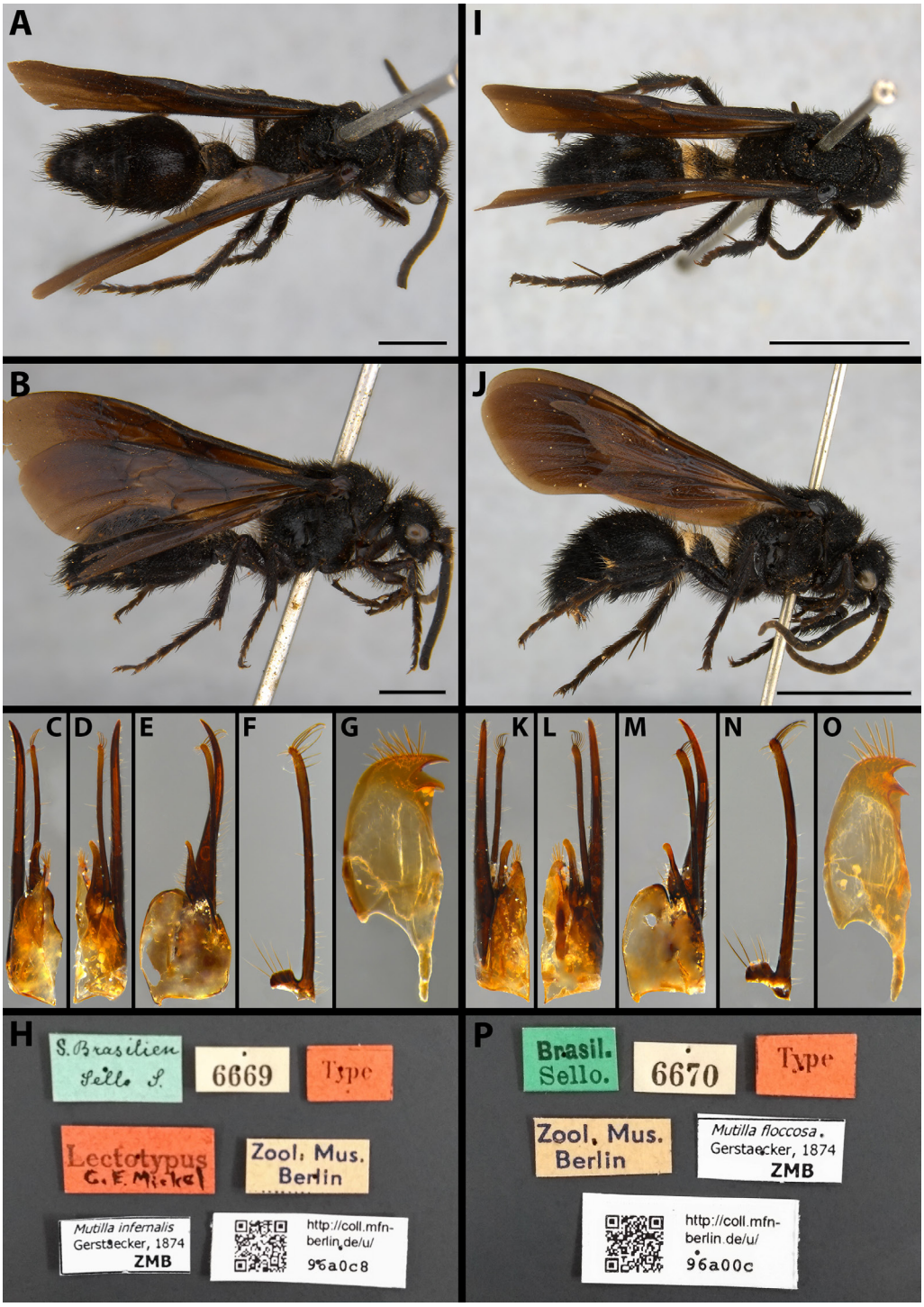

Fig. 10. A–H *Traumatomutilla infernalis* (Gerstaecker, 1874), holotype, ♂ (ZMB). **A**. Dorsal habitus. **B**. Lateral habitus. **C**. Genitalia (halved), dorsal view. **D**. Genitalia, (halved), ventral view. **E**. Genitalia (halved, penis valve removed), lateral/inner view. **F**. Cuspis (removed, not to scale), lateral/inner view. **G**. Penis valve (removed, not to scale), lateral/outer view. **H**. Type labels. **I–P**. *Traumatomutilla floccosa* (Gerstaecker, 1874), holotype, ♂ (ZMB). **I**. Dorsal habitus. **J**. Lateral habitus. **K**. Genitalia (halved), dorsal view. **L**. Genitalia, (halved), ventral view. **M**. Genitalia (halved, penis valve removed), lateral/inner view. **N**. Cuspis (removed, not to scale), lateral/inner view. **O**. Penis valve (removed, not to scale), lateral/outer view. **P**. Type labels. Scale bars: A–B = 2 mm; I–J = 5 mm.

mesopleura with conspicuous blunt projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron micropunctate, except basal third densely and coarsely areolate.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins.

Metasoma. T1 0.45× as wide as T2. T2 0.85× as long as wide. Dorsal metasomal sculpture, except pygidial plate, partially concealed by dense setation, sparsely and finely punctate with sparse interspersed micropunctures where visible; sculpture sparser and less defined in apical segments; pygidial plate slightly broader than long, weakly defined by parallel carinae laterally; surface densely micropunctate throughout. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina, carina slightly higher posteriorly. S2 sparsely and finely foveolate-punctate to punctate with few scattered micropunctures laterally; sculpture sparser mediad; anteromedial crest-fold present, sternal pit absent. S3–7 sparsely and finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe not at all pronounced posteriorly, subacute. Ratios of free length of paramere, cuspis and digitus, 118 : 101 : 33. Paramere almost straight in dorsal view, apex slightly curved outward, slighlty narrower posterad, upcurved posteriorly in lateral view, almost asetose except for sparse scattered inconspicuous setae throughout, setae more evident on ventral surface. Cuspis slender, elongate, slightly curved outward and tapered posterad in dorsal view, upcurved posterad and slightly wider apically in lateral view, with tuft of conspicuous long setae at apex and sparser scattered inconspicuous short setae elsewhere. Paracuspis poorly developed, sessile, lobe-like, wider than long with slightly flattened sparsely setose posterior margin, setae longer than paracuspis. Digitus short, slightly curved inward in dorsal view, strongly tapered posterad and with apex slightly upcurved in lateral view, setose anterodorsally. Penis valve strongly concave on inner surface, with well-defined pair of short acute teeth posteroventrally, lateral pocket on outer margin greatly reduced, apical distance between teeth 0.1× length of valve, dense setae present along convex posterior margin and inconspicuous setae present at base of anterior tooth on outer surface.

Coloration and variations

Female

Unknown.

Male

Integument black. Body setae predominantly black varying in density, except the following areas with silvery-white setae varying in density: posterior half of propodeal dorsum, T1, fringe of T2 laterally, and anterior third of S2.

Distribution

Brazil (Mato Grosso do Sul), Bolivia (Pando), and Paraguay (San Pedro).

Remarks

Traumatomutilla infernalis is almost indistinguishable from *T. pompiliformis* apart from the length of the cuspis in relation to the length of the paramere and minor characters of the penis valve and setae pattern. Based on distribution this could be a putative male for *T. sancta*. A female of *T. sancta* and a male with an intermediate color pattern between *T. infernalis* and *T. pompiliformis* were collected in the

same pitfall trap in a Cerrado area in Mato Grosso State, Brazil (PRB pers. obs.). This could mean that *T. sancta*, *T. infernalis* and *T. pompiliformis* are all a single moderately variable species. However, we refrain from formally synonymizing all of these species without further intermediate forms between the males, more distribution data and/or molecular data supporting the sex association.

Traumatomutilla pompiliformis (Gerstaecker, 1874)
Fig. 11

Mutilla pompiliformis Gerstaecker, 1874: 314.
Mutilla serra Cresson, 1902: 77. **Syn. nov.**

Ephuta (*Traumatomutilla*) *pompiliformis* – André 1902: 55.
Ephuta (*Traumatomutilla*) *serra* – André 1902: 56.
Traumatomutilla pompiliformis – André 1904: 40.
Traumatomutilla serra – André 1904: 40.

Diagnosis

Female
Unknown.

Male
Apex of cuspis with long setae, approximately 0.65× length of paramere; posterior margin of penis valve truncate; lateral surface of propodeum with sparse erect silvery-white seta; metapleuron setae black; silvery-white setae present throughout propodeal dorsum; wings strongly dark brown infuscated throughout, with strong violaceous and blueish reflections.

Type material

Holotype of *Mutilla pompiliformis*
BRAZIL • ♂; Brasil; Sello S. leg.; ZMB.

Holotype of *Mutilla serra*
BRAZIL • ♂; [Mato Grosso], Chapada [dos Guimarães]; CM.

Additional material examined (31 ♂♂)

BOLIVIA – **Beni** • 1 ♂; Romanos, 1 km N [north of junction of] Río Iténez and Río Paragua; 30 Jul. 1964; Bouseman and Lussenhop leg.; AMNH. – **Santa Cruz** • 1 ♂; Buena Vista; 17°27′58″ S, 63°39′63″ W; 20 Feb. 1999; L.A. Stange leg.; FSCA • 2 ♂♂; Gral. [General] Saavedra Est. [Estación] Experimental; Dec. 1973; Porter and Stange leg.; FSCA • 1 ♂; Buena Vista; 1928; Steinbach leg.; CUIC • 1 ♂; 3 km N [north of] Brazilio, 1750' [sic]; 18°06.82′ S, 63°10.51′ W; 27 Feb.–8 Mar. 1999; Irwin and Parker leg.; USU.

BRAZIL – **Bahia** • 2 ♂♂; Cerrado near Lençóis; 15 Dec. 2009; UEFS. – **Mato Grosso** • 2 ♂♂; Chapada dos Parecis; 1 Dec. 2001; A. Foucart leg.; USU • 1 ♂; Sinop; 12°31′ S, 55°37′ W; Dec. 1974; M. Alvarenga leg.; AEIC • 1 ♂; Andradinha; Aug. 1971; F.M. Oliveira leg.; DZUP • 1 ♂; Cáceres; 10 Mar. 1985; C. Elias leg.; DZUP • 1 ♂; Chapada dos Guimarães; 12–18 Nov. 2013; G.A.R. Melo, D.R. Luz and K.A. Williams leg.; DZUP • 1 ♂; 30 km N [north of] Uirapuru, Usine Alcomat; 14°15′50.80″ S, 59°14′02.05″ W; 1–15 Dec. 2002; A. Foucart leg.; USU. – **Minas Gerais** • 2 ♂♂; Berizal, Faz. [Fazenda] Veredão; 15°39′54″ S, 41°39′56″ W; 850 m [above sea level]; 12 Dec. 2012; Arm. [Armadilha] Malaise; J.A. Rafael and E.J. Grossi leg.; INPA • 1 ♂; Pedra Azul, 800 m [above sea level]; Nov. 1972; Alvarenga and Seabra leg.; AEIC • 1 ♂; 12 km a N de [north of] Aguas Vermelhas,

Faz. [Fazenda] Faceiro; 14 Dec. 2012; G.A.R. Melo leg.; DZUP. – **Rondônia** • 1 ♂; Vilhena; 19 Nov. 1986; C. Elias leg.; DZUP • 1 ♂; Vilhena; 4 Nov. 1986; C. Elias leg.; DZUP.

PARAGUAY – **Amambay** • 1 ♂; estancia Aka Moroti; 22°38′ S, 56°28′ W; 4–8 Oct. 2005; B. Garcete leg.; MIUP • 1 ♂; estancia La Niña, Reserva Arroyo Blanco; 22°28′ S, 56°07′ W; 18–19 Feb. 2002; B. Garcete leg.; MIUP. – **Concepción** • 3 ♂♂; estancia Santa Herminia; 23°24′ S, 56°30′ W; 7 Dec. 2003–7 Feb. 2004; B. Garcete leg.; MIUP • 1 ♂; estancia Don Carlos; 16–20 Dec. 2004; B. Garcete leg.; MIUP.

Description

Female

Unknown.

Male

Body length. 19 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; lateral margins of head convergent immediately behind eyes. Vertex width 0.8× pronotal width. Eye almost circular. Ocelli small; OOD 3.4× DLO, IOD 0.8× DLO. Occipital carina distinct. Head surface sparsely and finely punctate; sculpture sparser and finer posterad. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; densely and coarsely foveolate-punctate, coarser mediad; apical/ventral margin with a pair of medial short subacute free teeth medially. Scape bicarinate. Flagellomere 1 2.0× pedicel length; flagellomere 2 2.6× pedicel length. Mandible obliquely tridentate apically, medial tooth smaller than inner tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets well defined, sharply projected from anterior margin of pronotum, separated from well-defined humeral carina, anterolateral corners of pronotum subangulate. Anterior surface of pronotum, with coarse dense punctures laterally, micropunctures sublaterally, and medial longitudinal, slightly concave, smooth, unsculptured area. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures along inner and anterior margin. Dorsum of pronotum densely and coarsely foveolate-punctate mediad to areolate-punctate laterad with somewhat sharp intervals. Mesoscutum densely and finely foveolate-punctate, parapsis and notaulus reduced to posterior half of mesoscutum. Scutellum ‘box-like’, with conspicuously horizontal dorsal surface roundly angulate into nearly vertical posterior surface; dorsal surface shorter than posterior surface; sculpture densely and coarsely areolate-punctate to foveolate-punctate. Axilla produced posterolaterally as obliquely truncate projection in dorsal view; projection coarsely foveolate-punctate basad, unsculptured, smooth, shining apicad. Metanotum slightly wider laterad, its surface obscured by dense setation. Propodeal dorsum convex, slightly depressed sublaterally, mostly concealed by dense setation, densely areolate where visible; sculpture of lateral surface absent along most of anterior margin; dorsal surface indistinguishable from posterior surface. Lateral surface of pronotum sparsely and vestigially punctate with sparse interspersed micropunctures; mesopleura with conspicuous blunt projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron micropunctate, except basal third densely and coarsely areolate.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins.

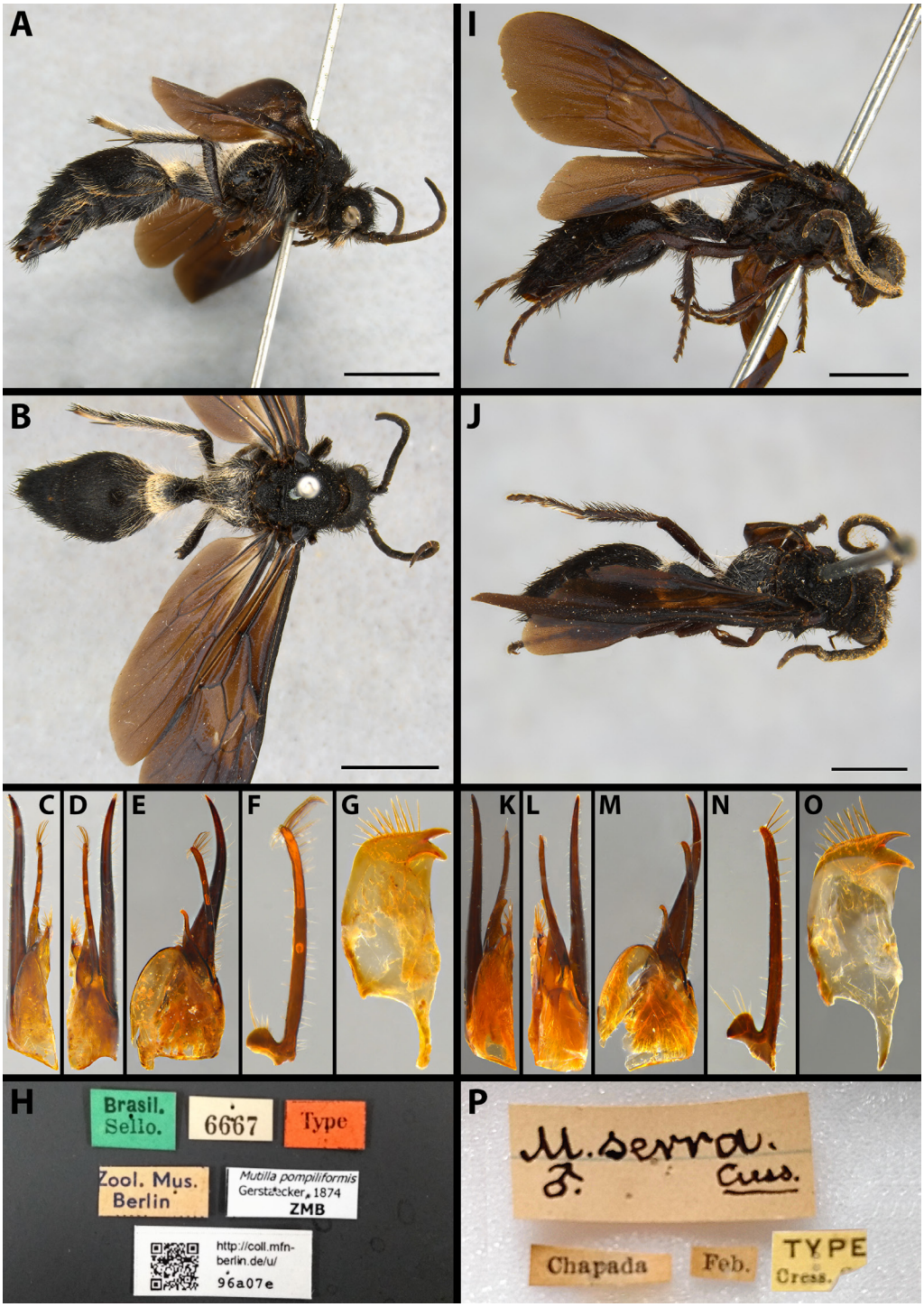

Fig. 11. A–H. *Traumatomutilla pompiliformis* (Gerstaecker, 1874), lectotype, ♂ (ZMB). **A**. Dorsal habitus. **B**. Lateral habitus. **C**. Genitalia (halved), dorsal view. **D**. Genitalia, (halved), ventral view. **E**. Genitalia (halved, penis valve removed), lateral/inner view. **F**. Cuspis (removed, not to scale), lateral/inner view. **G**. Penis valve (removed, not to scale), lateral/outer view. **H**. Type labels. **I–P**. *Traumatomutilla serra* (Cresson, 1902), holotype, ♂ (CM). **I**. Dorsal habitus. **J**. Lateral habitus. **K**. Genitalia (halved), dorsal view. **L**. Genitalia, (halved), ventral view. **M**. Genitalia (halved, penis valve removed), lateral/inner view. **N**. Cuspis (removed, not to scale), lateral/inner view. **O**. Penis valve (removed, not to scale), lateral/outer view. **P**. Type labels. Scale bars: A–B = 5 mm; I–J = 2 mm.

Metasoma. T1 0.5 × as wide as T2. T2 0.9 × as long as wide. Dorsal metasomal sculpture, except pygidial plate, partially concealed by dense setation, sparsely and finely punctate with sparse interspersed micropunctures where visible; sculpture sparser and less defined in apical segments; pygidial plate slightly broader than long, weakly defined by parallel carinae laterally; surface densely micropunctate throughout. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina, carina slightly higher posteriorly. S2 sparsely and finely foveolate-punctate to punctate with few scattered micropunctures laterally; sculpture sparser mediad; anteromedial crest-fold present, sternal pit absent. S3–7 sparsely and finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe not at all pronounced posteriorly, subacute. Ratios of free length of paramere, cuspis and digitus, 77 : 52 : 18. Paramere almost straight in dorsal view, apex slightly curved outward, slighlty narrower posterad, upcurved posteriorly in lateral view, almost asetose except for sparse scattered inconspicous setae throughout, setae more evident on ventral surface. Cuspis slender, elongate, slightly curved inward and tapered posterad in dorsal view, upcurved posterad and almost straight throughout in lateral view, with tuft of conspicuous long setae at apex and sparser scattered inconspicuous short setae elsewhere. Paracuspis poorly developed, sessile, lobe-like, wider than long with rounded and setose posterior margin, setae shorter than or longer than paracuspis. Digitus short, slightly curved inward in dorsal view, strongly tapered posterad and with apex abruptly curved dorsally in lateral view, setose anterodorsally. Penis valve strongly concave on inner surface, with well-defined pair of short acute teeth posteroventrally, with well-defined lateral pocket on outer margin, apical distance between teeth 0.1 × length of valve, dense setae present along truncate posterior margin and inconspicuous setae present at base of anterior tooth on outer surface.

Coloration and variations

Integument black. Body setae predominantly black varying in density, except the following areas with silvery-white setae varying in density: anterior/ventral margin of clypeus; metanotum, prodeal dorsum; legs predominantly (occasionally all black); T1, anterior third, lateral areas, lateral felt lines, and lateral margins of T2; fringe of T2 laterally, fringe of T3 medially and laterally, fringe of T4–5 laterally, and S1–4. Wings dark brown throughout with strong violaceous and blueish reflections.

Distribution

Brazil (Rondônia, Bahia, Mato Grosso, and Minas Gerais), Paraguay (Amambay and Concepción) and Bolivia (Santa Cruz and Beni).

Remarks

This species can only be separated from *T. infernalis* on certain genitalia and setae pattern characters. Likewise, it can be a candidate for a sex association with *T. sancta* based on its known distribution (also see remarks of *T. infernalis*).

Traumatomutilla quadrinotata (Klug, 1821)
Figs 12–13

Mutilla quadrinotata Klug, 1821: 31, pl. 23 fig. 3.
Mutilla micans Lepeletier, 1845: 622 [synonymized by Mickel (1937)].

Ephuta (*Traumatomutilla*) *quadrinotata* – André 1902: 55.
Traumatomutilla quadrinotata – André 1904: 40.

Diagnosis

Female

Occipital carina equally wide throughout, anterolateral carinae absent in scutellar area; lateral surface of propodeum and metapleuron completely cover with dense appressed golden setae; pronotal setae usually conspicuously denser and longer than remainder of mesosoma.

Male

Apex of cuspis with longe setae; body setae black and silvery-golden; lateral surface of propodeum and metapleuron with conspicuous patches of sparse appressed golden setae.

Type material

Holotype of *Mutilla quadrinotata*

BRAZIL • ♀; Bahia; ZMB.

Additional material examined (152 ♀♀, 38 ♂♂)

BRAZIL – **Bahia** • 1 ♀; CPDC • 1 ♀; S.[erra] Grande; 21 Dec. 1993; J. Delabie leg.; MIUP • 1 ♀; Barra do Choca; 17 Jan. 2001; J.R. Maia leg.; CPDC • 1 ♀; Barrolandia; Mar. 2005; J.R.M. Santos leg.; CPDC • 1 ♀; Boa Nova; 28 Jan. 2004; E. Mariano leg.; CPDC • 2 ♀♀; Itamarajó; 11 Nov. 2004; Valmir Paulino leg.; CPDC • 1 ♂; Encruzilhada; 980 m [above sea level]; Nov. 1974; M. Alvarenga leg.; TAMUIC • 1 ♀; Santa Terezinha, Serra da Jibóia; 8 Jun. 2001; M.F. Soares leg.; CPDC • 2 ♀♀; Serra das Lonas; Mar. 2009; A. Camacho leg.; MZSP • 2 ♀♀; Cachimbo; 1890; SDEI. – **Espírito Santo** • 5 ♀♀; MZSP • 1 ♀; MNCN • 1 ♀; Santa Teresa; 3 Jun. 2004; E. Mariano leg.; CPDC • 1 ♀; Santa Teresa; 7 Dec. 1964; C. Elias leg.; DZUP • 1 ♂; Santa Teresa; 13 Jan. 1970; C. Elias leg.; DZUP • 1 ♀; Linhares; 6 Jan. 1971; C. Elias leg.; DZUP • 1 ♂, Linhares; Oct. 1972; M. Alvarenga leg.; CM • 1 ♀; Linhares; May 1973; MZSP • 1 ♂; Linhares; Dec. 1975; C. Elias leg.; DZUP • 7 ♀♀; Linhares, Parque Sooretama; MNRJ • 1 ♀; Linhares; Nov. 1967; F.M. Oliveira leg.; DZUP • 1 ♀; Conceição da Barra; 4 Sep. 1969; C. Elias leg.; DZUP • 1 ♀; Colatina; 13 Dec. 1967; C.T. Elias leg.; DZUP • 1 ♀; Colatina; Dec. 1954; MNRJ • 3 ♂♂; Cachoeiro de Itapemirim, Faz. [Fazenda] Usina Paineiras, P1 [sic]; 20°56′29″ S, 41°03′06″ W; 19–26 Nov. 2010; M.T. Tavares e eq. [equipe] leg.; UFES • 2 ♂♂; Pinheiros, Res. [Reserva] Biol. [Biológica] Córrego do Veado, Água Limpa; 18°21′ S, 40°09′ W; 27 Nov.–6 Dec. 2011; M.T. Tavares e eq. [equipe] leg.; UFES • 14 ♂♂; Laranja da Terra, Joatuba, Faz. [Fazenda] Betzel; 19°50′25″ S, 40°49′40″ W; 280–430 [sic]; 5–12 Oct. 2012; M.T. Tavares e eq. [equipe] leg.; UFES • 1 ♀; Conceição da Barra; Jul. 1969; MZSP • 1 ♀; Conceição da Barra, FLONA [Floresta Nacional] Rio Preto; 21–25 Mar. 2005; UFES • 1 ♀; D. [Domingos] Martins; Jan. 1962; C. Elias leg.; DZUP • 1 ♀; D. [Domingos] Martins; Zona Rural; Dec. 1999; UFES • 1 ♀; Corrego do Ita; Nov. 1957; MNRJ • 1 ♀; [Alfredo] Chaves; 11 Sep. 1963; J. Baskin leg.; USNM • 1 ♀; Aracruz; 15 Sep. 2000; UFES • 1 ♂; Vila Valério, Sítio Benincá; 18°56′ S, 40°27′ W; 14–28 Sep. 2011; C.O. Azevedo e eq. [equipe] leg.; UFES • 1 ♀; Cariacica, Reserva Biol. [Biológica] Duas Bocas; 21 Jul. 2001; UFES. – **Mato Grosso do Sul** • 1 ♀; Dourados; Jan. 1976; Lorenzoni leg.; DZUP. – **Minas Gerais** • 1 ♀; MNCN • 1 ♀; Reinhardt leg.; ZMUC • 1 ♀; Ipanema, Faz. [Fazenda] Montes Claros; 30 Jun. 1998; DZUP • 1 ♀; Paineiras; n.o proc 10/963 [sic]; Oct. 1963; MNRJ • 1 ♂; Belo Horizonte; 2–9 Nov. 1999; R. Martins leg.; MIUP • 1 ♀; Viçosa; 1931; E.C. VanDyke leg.; CASC • 1 ♀; Viçosa; 1931; Y. Mexia leg.; CASC • 1 ♀; Mar de Espanha; 4 Oct. 1905; MNCN • 2 ♀♀; Mar de Espanha; 20 Nov. 1892; SDEI. – **Pernambuco** • 1 ♀; San Sabrador [sic]; ANSP • 4 ♂♂; Caruaru; May 1972; J.M. Lima leg.; DZUP. – **Rio de Janeiro** • 1 ♀; Grotão de Independencia [sic]; 1935; MNRJ • 30 ♀♀; Rio de Janeiro; MZSP • 1 ♀; Rio de Janeiro; 15 Nov. 1926; MNCN • 1 ♀; Rio de Janeiro; ZMUC • 1 ♂; Rio de Janeiro; 6 Mar. 1932; MNRJ • 2 ♂♂; Rio de Janeiro; 30 Feb. 1940; MNRJ • 1 ♀; Rio de Janeiro; 25 Dec. [sic]; A.F. Porter leg.; FMNH • 1 ♀; Dist. Federal [Rio de Janeiro city], n.o. proc. 10/954; Oct. 1954; MNRJ • 1 ♀; Rio de Janeiro; Mar. 1937; R.C. Shannon leg.; USNM • 2 ♀♀; [Rio de Janeiro], Floresta do Tijuca; MNRJ • 1 ♀; [Rio

de Janeiro], Floresta do Tijuca; Mar. 1963; C.A. Campos Seabra leg.; AMNH • 1 ♀; [Rio de Janeiro], Floresta do Tijuca; Mar. 1951; C.A. Campos Seabra leg.; USNM • 1 ♀; [Rio de Janeiro], Floresta do Tijuca; Jun. 1951; C.A. Campos Seabra leg.; USNM • 1 ♀; Est. Guanabara [Rio de Janeiro], Corcovado; 27 Jan. 1906; H. Luederwaldt leg.; MZSP • 1 ♂; Rio de Janeiro; Feb. 1962; Alvarenga and Seabra leg.; DZUP • 1 ♀; Rio de Janeiro; Mar. 1959; Alvarenga and Seabra leg.; DZUP • 1 ♀; Rio de Janeiro; Mar. 1934; MNRJ • 1 ♀; [Bom Jardim], Represa Rio Grande; Oct. 1960; MNRJ • 1 ♀; Rio de Janeiro; 5 Feb. 1967; F.M. Oliveira leg.; DZUP • 2 ♀♀; Rio de Janeiro; 30 Jun. 1967; F.M. Oliveira leg.; DZUP • 1 ♀; Rio de Janeiro; 5 Oct. 1960; F.M. Oliveira leg.; DZUP • 1 ♀; [Rio de Janeiro]; M. [Morro] Sta. [Santa] Barbara; 16 Mar. 1952; MNRJ • 1 ♀; [Rio de Janeiro]; Horto do J. [Jardim] Bot. [Botânico]; 12 Feb. 1984; MNRJ • 1 ♀; Itatiaia; 17 Jan. 1924; J.F. Zikan leg.; CASC • 1 ♀; Itatiaia; 20 Jul. 1944; J.F. Zikan leg.; CASC • 1 ♀; Itatiaia; 21 Feb. 1926; J.F. Zikan leg.; CASC • 1 ♀; Itatiaia; 7 Mar. 1948; J.F. Zikán leg.; MZSP • 1 ♀; Petrópolis; Jun. 1952; C. Novais leg.; USNM • 1 ♀; Petrópolis; 1938; MNRJ • 1 ♀; Petrópolis; Mar. 1952; MNRJ • 1 ♀; [Angra dos Reis], Ilha Grande; 1944; MNRJ • 1 ♀; [Angra dos Reis], Ilha Grande; 17 Feb. 2003; D.J. Souza leg.; CPDC • 1 ♀; Angra dos Reis; 11 Nov. 1972; MNRJ • 1 ♀; Angra dos Reis, Jabuhyba [Jabuíba]; Oct. 1936; MNRJ • 2 ♀♀; [Angra dos Reis], Jussaral [Train Station]; Jun. 1934; MNRJ • 1 ♀; Oct. 1934; MNRJ • 1 ♀; Mendes; 1917; MNCN • 1 ♀; [Teresópolis], Serra dos Orgaos; Nov. 1940; MNRJ • 1 ♀; Rio de Janeiro, Estr. [Estrada de] Sumaré; 7 Feb. 1955; MNRJ • 1 ♀; Rio de Janeiro, Floresta do Macaco; Nov. 1960; MNRJ • 1 ♀; Mendes, "Sitio las Luas" cua formiguero de "Saríva", Parada de Mendes [sic]; 24 Jan. 1936; MNRJ. – **Santa Catarina** • 2 ♀♀; MZSP • 1 ♀; MNCN • 1 ♀; S. [São] Bento; Feb. 1952; A. Maller leg.; USNM • 2 ♀♀; Mafra; Apr. 1942; A. Maller leg.; AMNH • 1 ♀; Corupá; May 1940; A. Maller leg.; AMNH • 1 ♀; Corupá; Apr. 1941; A. Maller leg.; AMNH • 1 ♀; Corupá; Nov. 1942; A. Maller leg.; AMNH • 1 ♀; Corupá; Mar. 1941; A. Maller leg.; AMNH • 2 ♀♀; Rio Vermelho; MZSP. – **São Paulo** • 5 ♀♀; MZSP • 1 ♀; T. [Teodoro] Sampaio, Pq. [Parque] Est. [Estadual] Morro do Diablo; 6 Dec. 2010; G.A.R. Melo and D. Luz leg.; DZUP • 1 ♀; Caraguatatuba, Res. [Reserva] Flor. [Florestal], 40 m a.s.l.; 2 Jun. 1962; MNCN • 1 ♀; Guarujá, Ilha de Santo Amaro; 20 Jun. 1961; MNCN • 1 ♂; Ubatuba, PESM-Nucl. [Parque Estadual Serra do Mar – Núcleo] Picinguaba, ponto 2; 23°20′01″ S, 44°49′57″ W; 18 Apr. 2010; N.W. Perioto leg.; MZSP • 1 ♂; same data as for preceding; 18 Feb. 2010; N.W. Perioto leg.; MZSP • 1 ♂; same data as for preceding; 18 Dec. 2009; N.W. Perioto leg.; MZSP • 1 ♂; Piraquara, Mananciais da Serra; 10 Feb. 2006; L.C. Rocha-Filho leg.; DZUP • 1 ♀; Piraquara, Mananciais da Serra; 10 Jan. 2003; G.A.R. Melo and M. Costa leg.; DZUP • 1 ♀; same data as for preceding; 2 Feb. 2003; E.Q. Garcia leg.; DZUP • 1 ♀; Antonina, Reserva Cachoeira; 1 Dec. 2006; C. Maia leg.; DZUP • 1 ♀; Campo Largo; 10 Apr. 2005; G.A.R. Melo and A. Aguiar leg.; DZUP. – **Locality unknown** • 1 ♀; SDEI • 1 ♀; MNCN • 1 ♀; ANSP • 5 ♀♀; ZMUC • 1 ♂; MNRJ.

Description

Female

Body length. 16–20 mm.

Head. Posterior margin slightly and angularly concave. Occipital carina evenly arched and equally wide throughout. Vertex width 0.8× pronotal width. Eye almost circular, its length in frontal view almost equal to distance from its ventral margin to mandibular condyle. Head densely, coarsely and confusedly foveolate-punctate to areolate-punctate with sharp irregular intervals. Genal carina present, well defined. Mandible oblique, tapering slightly apicad with small subapical tooth. Dorsal scrobal carina present, reaching antennal tubercles and narrowly disconnected from lateral scrobal carina. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 2.0× pedicel length; flagellomere 2 1.5× pedicel length.

Mesosoma. Length 0.8× width. Mesosomal dorsum densely, coarsely and confusedly areolate-punctate to foveolate-punctate throughout, with sharp and irregular intervals; sculpture smaller, denser and more confused on pronotum; mesonotum with medial intervals align so as to form vestigial and irregular

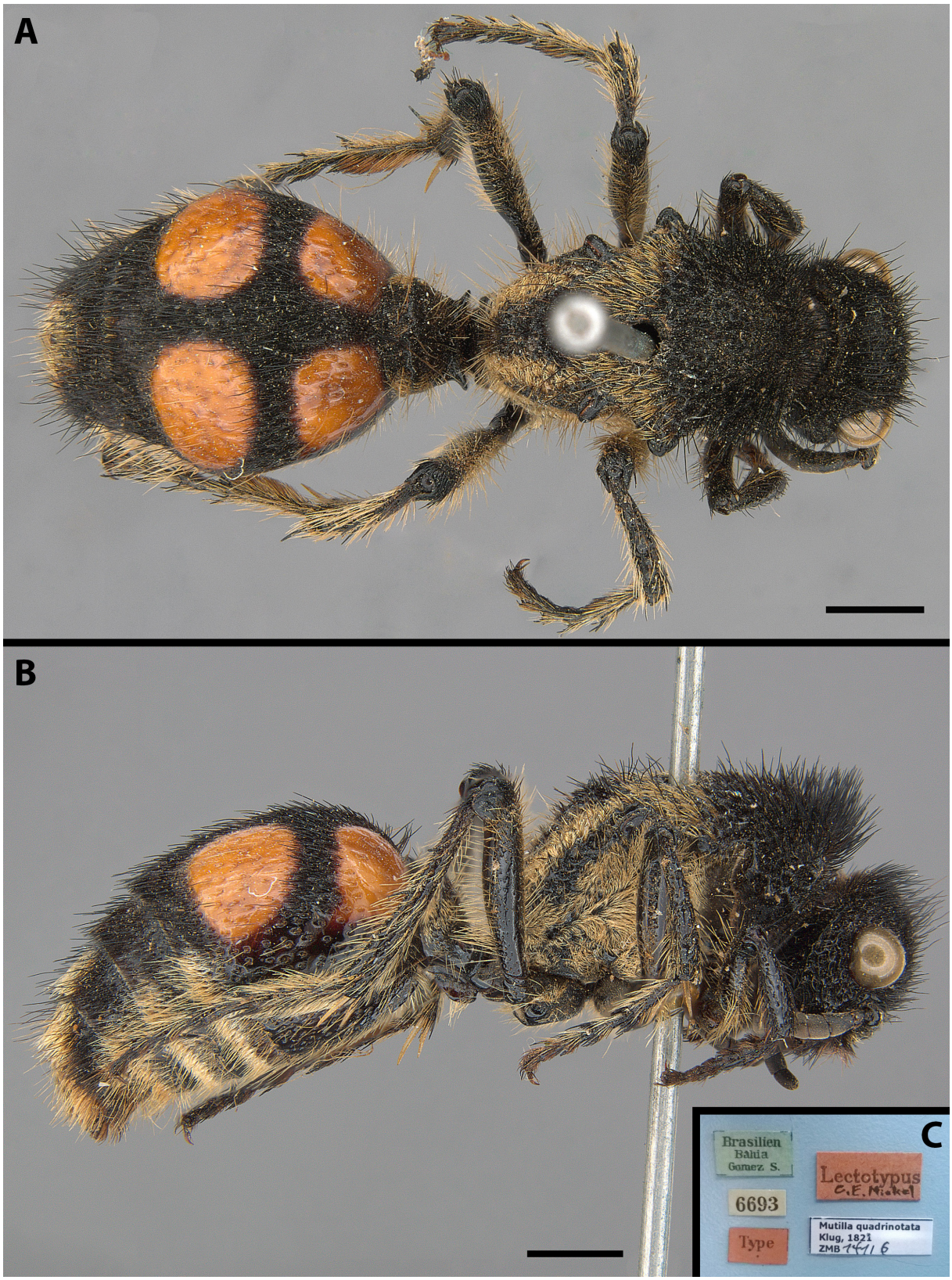

Fig. 12. *Traumatomutilla quadrinotata* (Klug, 1821), lectotype, ♀ (ZMB). **A**. Dorsal habitus. **B**. Lateral habitus. **C**. Type labels. Scale bars = 2 mm.

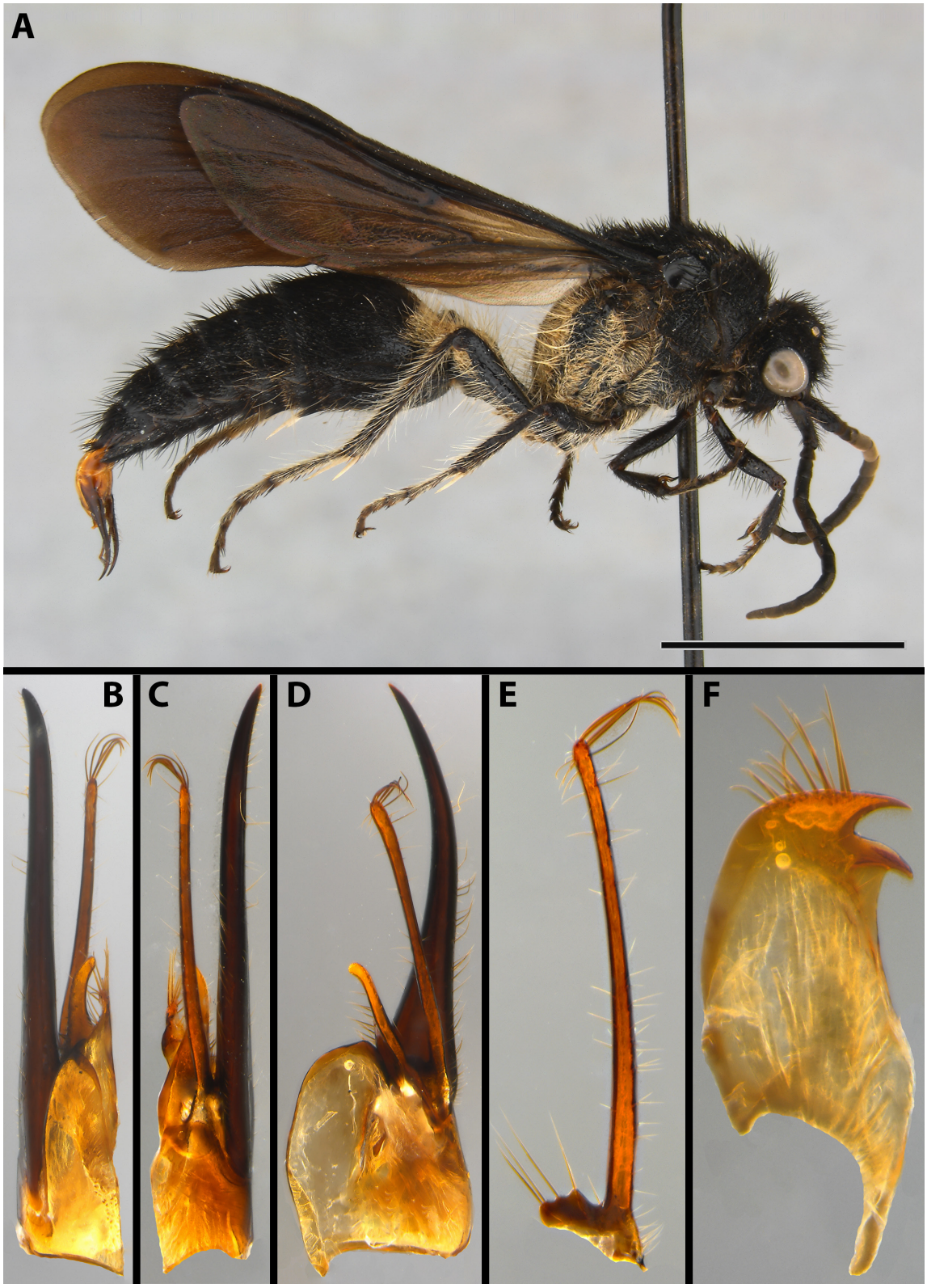

Fig. 13. *Traumatomutilla quadrinotata* (Klug, 1821), ♂ (non-type specimen). **A**. Lateral habitus. **B**. Lateral habitus. **C**. Genitalia (halved), dorsal view. **D**. Genitalia, (halved), ventral view. **E**. Genitalia (halved, penis valve removed), lateral/inner view. **F**. Cuspis (removed, not to scale), lateral/inner view. **G**. Penis valve (removed, not to scale), lateral/outer view. Scale bar = 5 mm.

longitudinal carina. Anterior surface of propodeum defined, almost as long as pronotal collar, with vestigial coarse longitudinal striae basally and dense coarse punctures dorsally; dorsal surface rounded into anterior surface in lateral view. Humeral carina well defined, projected dorsally, narrowly separated from conspicuously projected subangulate epaulet, anterolateral corners of pronotum angulate in dorsal view. Pronotal spiracle almost flat against lateral margin of pronotum. Lateral surface of pronotum sparsely punctate to foveolate-punctate with dense, interspersed micropunctures except at conspicuous subacute tubercle anteroventral in relation to pronotal spiracle; mesopleuron, metapleuron and lateral surface of propodeum completely concealed by dense setation. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 60 : 68 : 83 : 54 : 53. Lateral margin of mesonotum strongly constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt tooth-like process; with small inconspicuous tubercle posterior to lateral process. Propodeal spiracle strongly projected from lateral margin of mesosoma; post-spiracular area vestigial. Scutellar scale present, reduced, as narrow as surrounding sculpture; anterolateral carinae absent; intervals irregular on scutellar area, not scabrous. Propodeum gibbose/convex, dorsal surface slightly shorter than and poorly distinguished from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 38 : 94 : 87. Disc of T2 densely and coarsely foveolate-punctate to punctate with dense, interspersed micropunctures; foveolations sparser and micropunctures absent laterally and over integumental spots. T3–5 predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible; T6 sculpture, except pygidial plate, predominantly concealed by dense setation, densely and coarsely foveolate-punctate where visible. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, equally high throughout. S2 sparsely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold well defined. S3–5 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S6 densely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical third of plate; surface irregularly rugose; interstice apparently granulose.

Male (hitherto unknown)

Body length. 13–17 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; convergent immediately behind eyes. Width 0.85× pronotal width. Eye almost circular. Ocelli small; OOD 4.9× DLO, IOD 1.2× DLO. Occipital carina distinct. Head surface sparsely and coarsely punctate, with sparse interspersed micropunctures along posterior margin of vertex; sculpture sparser and finer posterad, denser and coarser anterad. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; sculpture concealed by dense setation; apical/ventral margin with a pair of medial short subacute free teeth. Scape bicarinate. Flagellomere 1 2.0× pedicel length; flagellomere 2 2.3× pedicel length. Mandible obliquely tridentate apically, medial tooth smaller than inner tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets well defined, subangulately projected from anterior margin of pronotum, separated from well-defined pronounced humeral carina, anterolateral angles of pronotum subrounded. Anterior surface of pronotum coarsely punctate laterally, micropunctate sublaterally, and mostly unsculptured with slightly concave longitudinal area medially. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures on along inner and anterior margin. Dorsum of pronotum densely and coarsely foveolate-punctate laterad, sculpture sparser and finer mediad. Mesoscutum densely and finely foveolate-punctate, parapsis vestigial, notaulus absent; with vestigial medial longitudinal carina.

Scutellum globose to gibbose, densely and coarsely areolate-punctate to foveolate-punctate, with well-defined dorsal and posterior faces; both surfaces slightly convex; dorsal surface, with intervals aligned so as to form irregular longitudinal carina extending medially from anterior margin of dorsal surface into middle of posterior surface. Axilla produced posterolaterally as obliquely truncate projection coarsely and densely foveolate-punctate except at apical third unsculptured. Metanotum wider laterally, its surface obscured by dense setation. Propodeal dorsum evenly convex, surface mostly concealed by dense setation, densely areolate-puncticulate where visible; sculpture of lateral surface mostly concealed by dense setation and gradually less defined to vestigial anteroventrad; dorsal surface indistinguishable from posterior surface. Lateral surface of pronotum sparsely finely punctate with sparse interspersed micropunctures; mesopleura with conspicuous blunt projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron mostly concealed by dense setation sparsely micropunctate to smooth throughout where visible, except basal third densely and coarsely areolate.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins.

Metasoma. T1 0.5× as wide as T2. T2 almost as long as wide. Dorsal metasomal sculpture, except pygidium, partially concealed by dense setation, sparsely and finely punctate with dense, interspersed micropunctures where visible; sculpture sparser and less defined in apical segments; pygidial plate slightly broader than long, weakly defined by somewhat arched carinae laterally; surface irregularly micropunctate, somewhat granulose, sculpture coarser apicad. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina terminating. S2 sparsely and finely foveolate-punctate to punctate; sculpture slightly sparser mediad; S2 with reduced anteromedial crest-fold, sternal pit absent. S3–7 sparsely and finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe not at all pronounced apically, subacute. Ratios of free length of paramere, cuspis and digitus, 70 : 53 : 17. Paramere almost straight in dorsal view, apex slightly curved outward, upcurved posteriorly in lateral view, almost asetose except for sparse scattered inconspicuous setae throughout, setae more evident on ventral surface. Cuspis slender, elongate, slightly curved inward and almost straight throughout in dorsal view, upcurved posterad and slightly broader posterad in lateral view, with tuft of conspicuous long setae at apex and sparse scattered inconspicuous short setae elsewhere. Paracuspis poorly developed, sessile, lobe-like, wider than long with irregular almost serrate and setose posterior margin, setae longer than paracuspis. Digitus short, strongly curved inward in dorsal view, somewhat dorsoventrally flattened, evenly upcurved in lateral view, apex more abruptly curved and subcapitate, setose anterodorsally. Penis valve strongly concave on inner surface, with well-defined pair of short acute teeth posteroventrally, without well-defined lateral pocket on outer margin, apical distance between teeth 0.1 × length of valve, dense setae present along convex posterior margin and inconspicuous setae present at base of anterior tooth on outer surface, setae on posterior margin longer ventrad.

Colorations and variations

Female

Integument black, except mandibles and antennal flagellomeres reddish-brown ventrally, and T2 with four large orange integumental spots. Body setae predominantly golden, except following areas with black to brownish-black setae varying in density and length: head; procoxae; pronotum; mesonotum anteriorly; propodeal dorsum medially; T1 medially; disc of T2 (except integumental spots); fringe of T2 medially; fringe of T3–5 sublaterally; S6.

Male

Head and mesosomal integument black to brownish-black, except antennal flagellomeres and mandibles partially reddish-brown. Body setae predominantly golden varying in density, except following areas with black to brownish-black setae varying in density: head, dorsum of foretibae and femora, pronotum, mesopleuron anteriorly, mesoscutum, axillar projections, dorsal surface of scutellum, posterior two thirds of T2, fringe of T2–3 medially, T4–7, fringe of S2–6, and S5–7. Wings dark brown except at basal third hyaline-brown. Tibial spurs yellowish-white.

Distribution

Brazil (Pernambuco, Bahia, Espírito Santo, Minas Gerais, Mato Grosso do Sul, Rio de Janeiro, São Paulo, and Santa Catarina).

Remarks

Traumatomutilla quadrinotata is perhaps one of the most common and easily identifiable species in the Brazilian Atlantic Forest. The sex association was based on the reliable color pattern of males and females of the Atlantic Forest species, which has been used as a basis for sex association in various species in the region (e.g., Bartholomay *et al*. 2020, 2021). The males of *T. quadrinotata* and *T. tetratrauma* sp. nov. are remarkably similar in coloration and external morphology, differing only in the length of the setae at the apex of the cuspis. Therefore, associating sexes for *T. quadrinotata* was only possible after the discovery of *T. tetratrauma* and its similarities with *T. incerta* (detailed in the remarks of *T. tetratrauma*). Although it is common for some specimens to completely or partially lose some of the body setae, the conspicuously long erect pronotal setae on the females of *T. quadrinotata* seems to be a consistent and exclusive character for this species (PRB & KAW pers. obs.). The males here associated with *T. quadrinotata* have been frequently misidentified as *T. infernalis* in the past, but true *T. infernalis* are absent from the Atlantic Rainforest region and differ from the male here associated with *T. quadrinotata* by many characters, most notably the lateral propodeal setae (dense and golden in *T. quadinotata*, sparse and black in *T. infernalis*).

Traumatomutilla quadripustulata (Klug, 1821)
Figs 14–16

Mutilla quadripustulata Klug, 1821: 316, pl. 23 fig. 2.
Mutilla pruinosa Smith, 1855: 43. **Syn. nov.**
Mutilla maraca Cresson, 1902: 78. **Syn. nov.**

Ephuta (*Traumatomutilla*) *quadripustulata* – André 1902: 55.
Ephuta (*Traumatomutilla*) *maraca* – André 1902: 55.
Mutilla pruinosa – André 1902: 74.
Traumatomutilla quadripustula – André 1904: 40.
Traumatomutilla maraca – André 1904: 40.

Diagnosis

Female

Occiptial carina equally wide throughout; anterolateral carinae absent on scutellar scale; postmesonotal tubercle conspicuously; body setae predominantly black with inconspicuous silvery-white areas on metasoma; T2 usually with two pairs of small yellowish integumental spots.

Male

Apex of cuspis with longe setae; pronotal sculpture not at all concealed by dense setation; T2 entirely covered with silvery-white setae, less densely so on posterior half.

Type material

Lectotype of *Mutilla quadripustulata*
BRAZIL • ♀; Para [Pará]; ZMB.

Holotype of *Mutilla pruinosa*
BRAZIL • ♂; Para [Pará]; NHMUK.

Lectotype of *Mutilla maraca*
BRAZIL • ♂; [Pará], Santarém; CM.

Additional material examined (46 ♀♀, 48 ♂♂)

BOLIVIA • 1 ♀; Chuquisaca, 5 mi S [miles south of] Camarga; 19 Feb. 1951; AMNH.

BRAZIL – **Maranhão** • 1 ♀; Bom Jardim, Reserva Biológica do Gurupi; 17–27 Jan. 2010; CZMA. – **Mato Grosso** • 5 ♂♂; Sinop; Feb. 1976; M. Alvarenga leg.; AEIC • 1 ♂; Sinop; 12°31′ S, 55°37′ W; Oct. 1974; M. Alvarenga leg.; USU • 2 specs; Tangará da Serra, Fazenda Promissão; 14°30′01″ S, 57°17′30″ W; 346 m a.s.l. [above sea level]; 1 Oct. 2017; J.V.A. Ferreira leg.; floresta semidecidual; TANG. – **Pará** • 1 ♀; Medicilândia; 5–11 Aug. 1992; A. Argolo leg.; MIUP • 4 ♀♀; MZSP • 1 ♀; 24 Oct. 1901; MPEG • 1 ♀; 13 Jan. 1902; MPEG • 1 ♀; 16 Aug. 1900; MPEG • 1 ♀; BR 014, Km 92; Dec. 1960; MNCN • 4 ♀♀, 1 ♂; Santarém; ANSP • 1 ♀; FSCA • 3 ♀♀; CM • 4 ♀♀; Jun. 1919; S.M. Klages leg.; CM • 1 ♀; Amazonas drainage; CSCA • 1 ♀; Fazenda Taperinha; 1–11 Feb. 1968; MPEG • 2 ♀♀; Mararu; CM • 2 ♀♀; Mangabaira, Mocajuba; Aug. 1953; O. Rego leg.; AMNH • 1 ♀; Mangabaira, Mocajuba; Mar. 1953; O. Rego leg.; LACM • 3 ♀♀; Mangabaira, Mocajuba; Oct. 1953; O. Rego leg.; USNM • 1 ♀; Mangabaira, Mocajuba; Aug. 1953; MNCN • 1 ♀; Mangabaira, Mocajuba; Nov. 1952; O. Rego leg.; FSCA • 5 ♀♀; Mangabaira, Mocajuba; MNRJ • 1 ♀; Benevides; PA-408 Km 6; 26 Jul. 1982; MPEG • 1 ♂; Benevides, Fazenda Morelândia; 2 Jul. 1988; F.F. Ramos leg.; MPEG • 1 ♂; Benevides, Fazenda Morelândia; 11 Dec. 1983; Jarbas leg.; MPEG • 1 ♂; Benevides, Fazenda Morelândia; 20 Jun.–2 Jul. 1988; F.F. Ramos leg.; MPEG • 1 ♂; Benevides, Fazenda Morelândia; 4–6 Aug. 1988; F.F. Ramos leg.; MPEG • 1 ♂; Benevides, Fazenda Morelândia; 30 Jun.–2 Jul. 1988; F.F. Ramos leg.; MPEG • 1 ♂; Benevides; CPDC • 1 ♂; 11 Aug. 1994; J.A. Pena leg.; MPEG • 1 ♀; Melgaço, ECFPn [Estação Científica Ferreira Pena] Caxiuanã; 24 Apr. 1995; MPEG • 1 ♀; SMC1 [sic], Ig. [Igarapé] Curuazinho; 28 Mar. 1998; MPEG • 1 ♂; Melgaço, ECFPn [Estação Científica Ferreira Pena] Caxiuanã, Mata da Sede; 16 Nov. 1998; O. Silveira and J. Pena leg.; MPEG • 1 ♂; Melgaço, ECFPn [Estação Científica Ferreira Pena] Caxiuanã, Percurso; 26 Apr. 1999; O. Silveira and J. Dias leg.; MPEG • 1 ♂; FLONA [Floresta Nacional] Tapajós; 11–14 Sep. 1997; M. Henriques leg.; MPEG • 1 ♂; 2–5 Sep. 1997; M. Henriques leg.; MPEG • 1 ♂; Juruti, Alcoa, Área beneficiamento bauxite; 2°29′32.10″ S, 56°9′20.04″ W; 21–24 Jun. 2008; E. Monteiro-Santos, R.L. Trindade, Domingos Guimarães and L.A. Quaresma leg.; MPEG • 1 ♂; same data as for preceding; 9–13 Dec. 2007; MPEG • 1 ♂; Jaratuba, Rio Mamuru, Área 2; 3°11′32,6″ S, 56°34′51,4″ W; 29 Sep. 2009; O.T. Silveira, S.S. Silva and J. Pena leg.; MPEG • 1 ♂; Mosqueiro; 12 Dec. 1988; L.B. Albuquerque leg.; MPEG • 1 ♂; same data as for preceding; 17 Dec. 1983; MPEG • 1 ♂; Serra Norte, Est. [Estrada] Manganês; 10 Jun. 1983; F.F. Ramos leg.; MPEG • 1 ♂; same data as for preceding; 8 Jun. 1983; MPEG • 1 ♂; same data as for preceding; 9–12 Sep. 1985; MPEG • 1 ♂; same data as for preceding; 6–9 Sep. 1985; W. França leg.; MPEG • 1 ♂; Serra Norte, Est. [Estrada] Manganês, N1 Mata [sic]; 3–5 Nov. 1985; J. Dias leg.; MPEG • 1 ♀; Carajás, Est. [Estrada] Manganês; 24 Apr. 1983; MPEG • 1 ♀; Pedras, Rio Cuminá; 1 Nov. 1969; MPEG • 1 ♂; Marabá; Oct. 1974; J.F. Reinert leg.; FSCA • 1 ♂; Belém, Parque Ambiental, Sede; 14–18 Jun. 2004; A.L. Nunes e equipe leg.; MPEG • 1 ♂; Bujaru; 27 Dec. 1985; MPEG • 1 ♂; Paragominas, Fazenda Cachoeira do Rio Vermelho; 15–18 Jan. 1991; R.B. Neto leg.; MPEG • 1 ♂; Vitória do Xingú, Margem direita Rio Xingú; 22–24 Nov. 2000; R. Santos and J. Dias leg.; MPEG • 1 ♂; Pacoval; 7–17 Dec. 2008; USU • 1 ♂; Jacareacanga; Nov. 1968; Moacir Alvarenga leg.; USU • 1 ♂; Mutum; 1–6 Dec. 2008; USU • 1 ♂;

Tucuruí; Jan. 1979; M. Alvarenga leg.; USU. – **Rondônia** • 1 ♀; RBINS • 1 ♂; Ouro Preto D'Oeste, Linha 62, Km 16.11; 13 Nov. 1984; F.F. Ramos leg.; MPEG • 1 ♂; 62 km SE [southeast of] Ariquemes; 8 Nov. 1994; W.J. Hanson leg.; USU • 1 ♂; Vilhena; 22 Dec. 1986; C. Elias leg.; DZUP • 1 ♂; same data as for preceding; 27 Dec. 1986; DZUP • 2 ♂; same data as for preceding; 4 Nov. 1986; DZUP • 1 ♂; same data as for preceding; 27 Nov. 1986; DZUP • 1 ♂; same data as for preceding; 17 Dec. 1986; DZUP • 1 ♂; same data as for preceding; 22 Dec. 1986; DZUP.

Description

Female

Body length. 16–18 mm.

Head. Posterior margin slightly and angularly concave. Occipital carina evenly arched and equally wide throughout. Vertex width 0.8× pronotal width. Eye almost circular, its length in frontal view 1.3× the distance from its ventral margin to mandibular condyle. Head densely and coarsely foveolate-punctate to areolate-punctate. Genal carina present, well defined. Mandible oblique, tapering slightly towards with small subapical tooth. Dorsal scrobal carina present, reaching antennal tubercles and disconnected from lateral scrobal carina. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 1.9× pedicel length; flagellomere 2 1.6× pedicel length.

Mesosoma. Length 0.85× width. Mesosomal dorsum densely and coarsely areolate-punctate throughout, intervals sharper posteromediad and blunt laterad; with vestigial irregular longitudinal carina anteromedially. Anterior surface of propodeum defined, short, slightly shorter than pronotal collar, vestigial coarse striae longitudinally basomedially, and sparse coarse punctures dorsomedially; micropunctate anterior to epaulets; dorsal surface roundly angulate into anterior surface in lateral view. Humeral carina well defined, slightly projected dorsally, broadly separated from conspicuously projected subangulate epaulet, anterolateral corners of pronotum sharply angulate in dorsal view. Pronotal spiracle slightly projected from lateral margin of pronotum, rounded, bulging. Lateral surface of pronotum sparsely punctate with dense, interspersed micropunctures except at smooth conspicuous subacute tubercle anterior to pronotal spiracle; mesopleuron densely micropunctate anteriorly, sparsely punctate to foveolate-punctate to areolate-punctate ventrad on mesopleural ridge; metapleuron unsculptured, smooth shining on dorsal fourth, densely and coarsely areolate on basal fourth, and with dense micropunctures elsewhere. Lateral surface of propodeum densely and coarsely foveolate-punctate anterad; sparsely foveolate-punctate posterad; conspicuous smooth shining, somewhat granulose areas along posterior margin. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 69 : 79 : 83 : 60 : 61. Lateral margin of mesonotum conspicuously constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt tooth-like process; with very small conspicuous tubercle posterior to lateral process. Propodeal spiracle strongly projected from lateral margin of mesosoma; post-spiracular area vestigial. Scutellar scale present, reduced, as narrow as surrounding sculpture; anterolateral carinae absent; scabrous intervals vestigial on scutellar area. Propodeum gibbose, dorsal surface much shorter than and poorly distinguished from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 42 : 99 : 98. Disc of T2 densely and coarsely foveolate-punctate to punctate with dense, interspersed micropunctures; foveolations sparser and micropunctures absent laterally and over integumental spots. T3–6 sculpture, except pygidial plate, predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, slightly higher medially. S2 sparsely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold vestigial. S3–4 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with

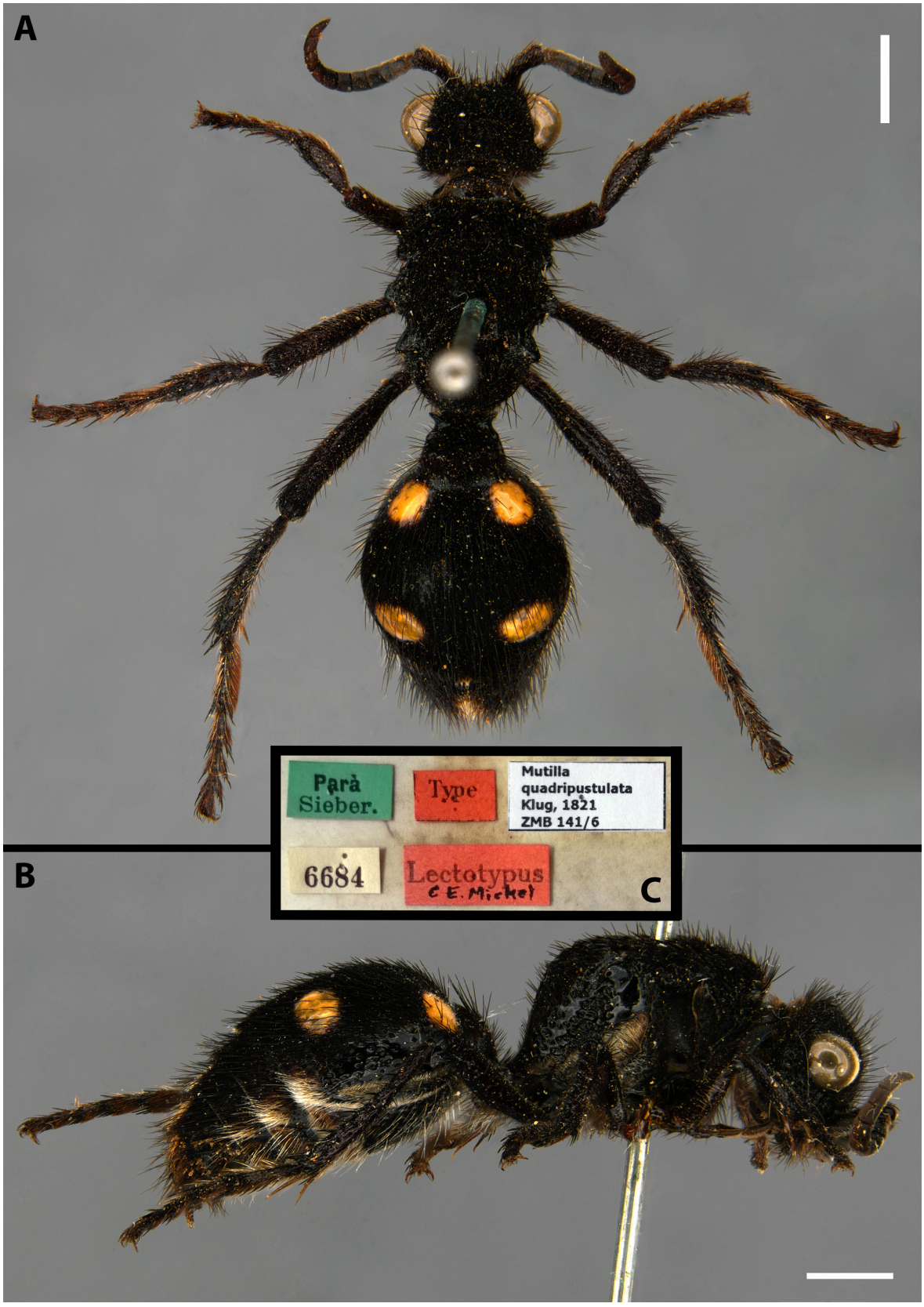

Fig. 14. *Traumatomutilla quadripustulata* (Klug, 1821), lectotype, ♀ (ZMB). **A**. Dorsal habitus. **B**. Type labels. **C**. Lateral habitus. Scale bars = 2 mm.

sparse micropunctures where visible; S4 densely foveolate-punctate; S6 sparsely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical fourth of plate; surface irregularly rugose; interstice apparently granulose; rugae vestigial to absent apicad.

Male

Body length. 9–15 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; convergent immediately behind eyes. Width 0.9× pronotal width. Eye almost circular. Ocelli small; OOD 3.6× DLO, IOD 1.25× DLO. Occipital carina distinct. Head surface sparsely and finely punctate, with sparse interspersed micropunctures along posterior margin of vertex; sculpture sparser and finer posterad, denser and coarser anterad. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; sculpture concealed by dense setation; apical/ventral margin with a pair of medial short subacute free teeth. Scape bicarinate. Flagellomere 1 1.7× pedicel length; flagellomere 2 2.1× pedicel length. Mandible obliquely tridentate apically, medial tooth smaller than inner tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets well defined, subangulately projected from anterior margin of pronotum, separated from well-defined pronounced humeral carina, anterolateral angles of pronotum angulate. Anterior surface of pronotum mostly unsculptured, with sparse punctures and interspersed micropunctures laterally. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures on along inner and anterior margin. Dorsum of pronotum densely and coarsely foveolate-punctate. Mesoscutum densely and finely foveolate-punctate, parapsis practically absent, notaulus reduced to posterior half of scutum; with medial longitudinal carina on posterior half. Scutellum globose to gibbose, densely and coarsely areolate-punctate to foveolate-punctate, with well-defined dorsal and posterior surfaces; dorsal surface broader than long, with intervals aligned so as to form irregular longitudinal carina extending medially from anterior margin of dorsal surface into middle of posterior surface. Axilla produced posterolaterally as obliquely truncate projection, with inner margin conspicuously curve inward apically; projection coarsely and densely foveolate-punctate except at apical third unsculptured. Metanotum wider laterally, its surface obscured by dense setation. Propodeal dorsum convex, slightly depressed dorsolaterally, surface mostly concealed by dense setation, densely areolate where visible; sculpture of lateral face gradually less defined to vestigial anteroventrad; dorsal surface indistinguishable from posterior surface. Lateral surface of pronotum sparsely finely punctate with sparse interspersed micropunctures; mesopleura with conspicuous subacute spine-like projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron sparsely micropunctate to smooth throughout, except basal third densely and coarsely areolate.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins. Metasoma. T1 0.5× as wide as T2. T2 almost as long as wide. Dorsal metasomal sculpture, except pygidium, partially concealed by dense setation, densely and finely punctate with dense, interspersed micropunctures where visible; sculpture sparser and less defined in apical segments; pygidial plate slightly broader than long, weakly defined by somewhat arched carinae laterally; surface irregularly micropunctate, somewhat granulose, sculpture coarser apicad. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina terminating. S2 sparsely and finely foveolate-punctate to punctate; sculpture slightly sparser mediad; S2 with reduced anteromedial crest-fold, sternal pit absent. S3–7 sparsely and

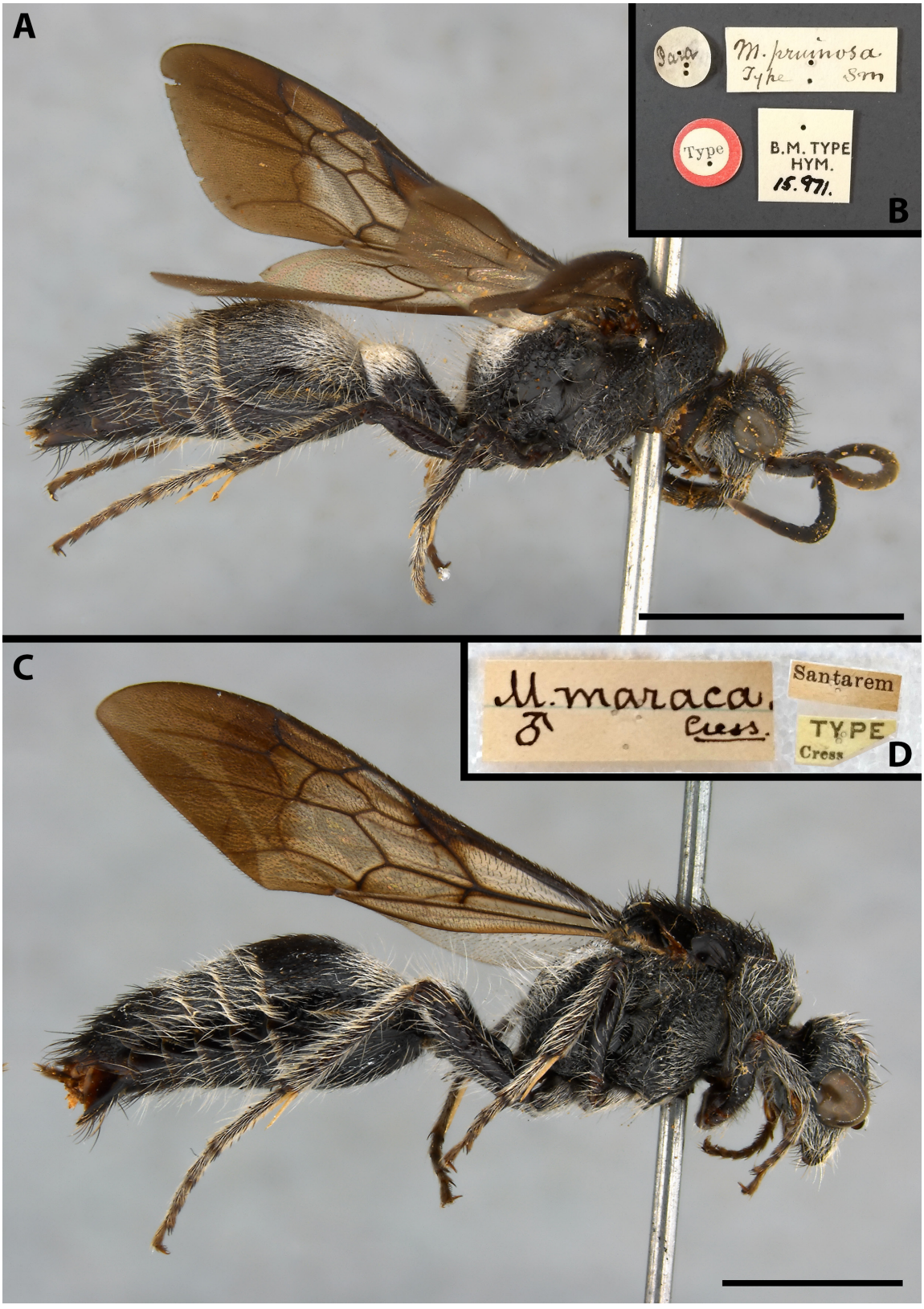

Fig. 15. A–B. *Mutilla pruinosa* (Smith, 1879), holotype, ♂ (NHMUK). **A**. Lateral habitus. **B**. Type labels. **C–D**. *Traumatomutilla maraca* (Cresson, 1902), holotype, ♂ (CM). **C**. Lateral habitus. **D**. Type labels. Scale bars: A = 5 mm; C = 3 mm.

finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe not at all pronounced apically, subacute. Ratios of free length of paramere, cuspis and digitus, 69 : 48 : 20. Paramere almost straight in dorsal view, upcurved posteriorly in lateral view, almost asetose except for sparse scattered inconspicuous setae throughout, setae more evident on ventral surface. Cuspis slender, elongate, slightly curved inward and tapered posterad in dorsal view, upcurved posterad and slightly broader posterad in lateral view, with tuft of conspicuous long setae at apex and sparse scattered inconspicuous short setae elsewhere. Paracuspis poorly developed, sessile, lobe-like, wider than long with subangulately concave and vestigially setose posterior margin, setae shorter than paracuspis. Digitus short, strongly curved inward in dorsal view, somewhat dorsoventrally flattened, evenly upcurved in lateral view, apex more abruptly curved and subcapitate, setose anterodorsally. Penis valve strongly concave on inner surface, with well-defined pair of short acute teeth posteroventrally, without well-defined lateral pocket on outer margin, apical distance between teeth 0.1 × length of valve, dense setae present along convex posterior margin and inconspicuous setae present at base of anterior tooth on outer surface, setae on posterior margin longer ventrad.

Colorations and variations

Female

Integument black except for mandibles and antennal flagellomeres partially reddish-brown, and T2 with four usually small and yellowish integumental spots. Spots of T2 highly variable in size, shape and color: separated by more than spots width to separated by hald a spot width; subcircular to subquadrate; yellowish to orange or reddish. Body setae almost exclusively black, except for the following areas vestigially and sparsely clothed with silvery-white setae often with interspersed black setae: mesopleuron posteromedially, coxae, ventral surface of femora and tibiae, inner surface of basitari, lateral areas of T2, lateral felt lines of T2, lateral margins of T2, fringe of T2–5 medially and laterally (usually absent medially on fringe of T3), T6 medially (except pygidial plate), and S1–5. Tibial spurs reddish-brown.

Male

Head and mesosomal integument black; legs and metasoma brownish-black; antennae and mandibles partially reddish-brown. Body setae predominantly silvery-white varying in density, except following areas predominantly or with interspersed black to brownish-black setae: vertex and front partially, dorsum of pronotum, mesonotum, axillar projections, scutellum, fringe of T3 medially, T4–7, fringe of S5–6, and S7. Wings hyaline-brown, slightly infuscated on apical third and small costal patch basal in relation to pterostigma. Certain specimens might have the pronotal dorsum completely black or with interspersed black and silvery-white setae and/or the posterior half of T2 with sparse black setae. Wings infuscated-brown on apical third, hyaline-brown elsewhere, without any noticeable reflections. Tibial spurs white.

Distribution

Brazil (Pará, Maranhão, Rondônia, and Mato Grosso) and Bolivia (Chuquisaca).

Remarks

After the sex association and synonymies of *T. incerta* were recognized, the only species found in the Amazon, particularly the Southeastern Amazonian areas were *T. quadripustulata*, *Mutilla pruinosa* and *T. maraca*. The types of *M. pruinosa* and *T. maraca* are identical in external and genitalic morphology. They have been repeatedly collected in the same areas as females of *T. quadripustulata*.

As the two largest *Traumatomutilla* females with almost entirely black setal coloration, *T. chrysozona* (formerly *T. lugubrina*) and *T. quadripustulata* were easily mistaken for one another. Previous researchers

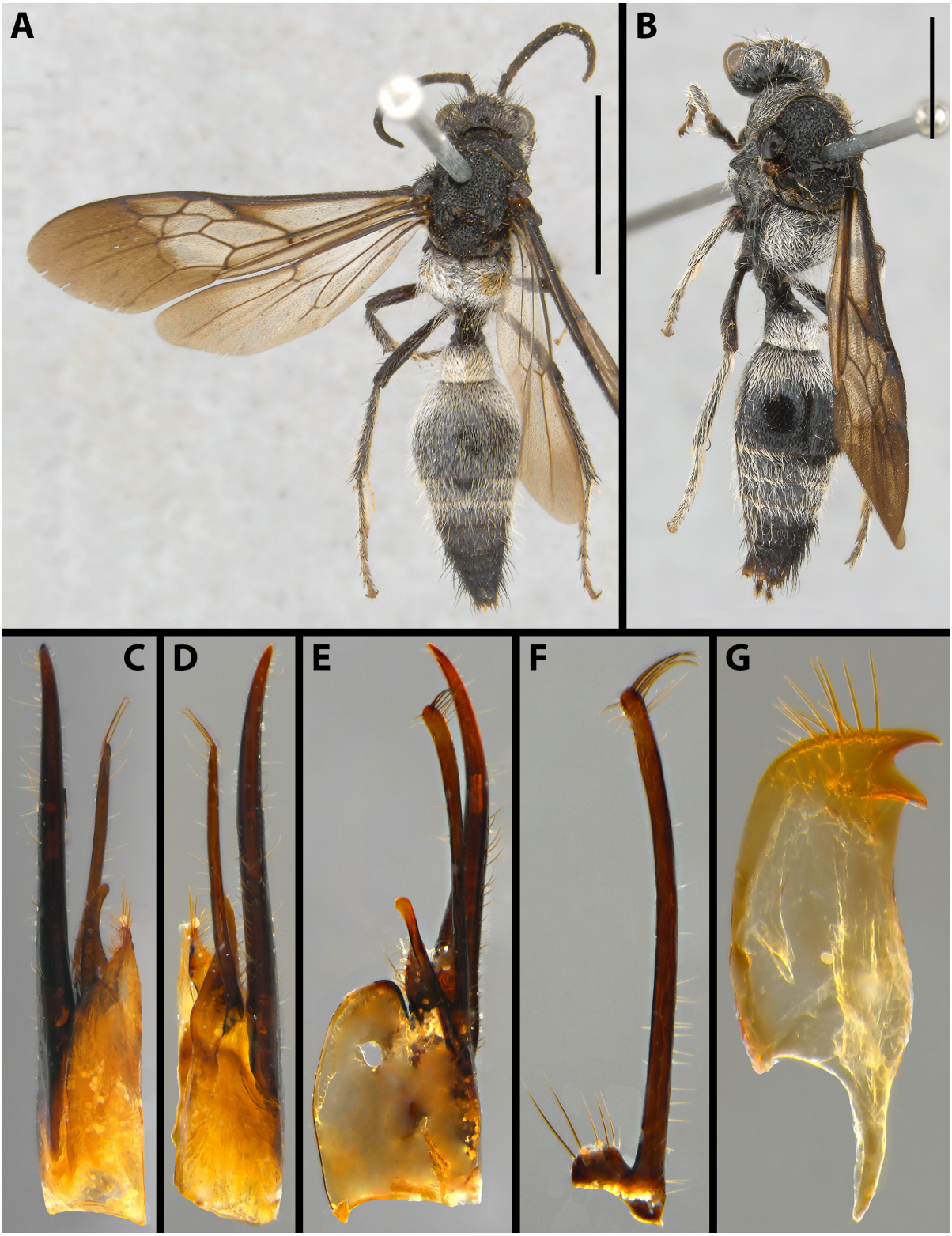

Fig. 16. A. *Mutilla pruinosa* (Smith, 1879), holotype, ♂ (NHMUK), dorsal habitus. **B**. *Traumatomutilla maraca* (Cresson, 1902), holotype, ♂ (CM), dorsal habitus. **C–G**. *Mutilla pruinosa* (Smith, 1879), holotype, ♂ (NHMUK), genitalia. **C**. Dorsal view (halved). **D**. Ventral view (halved). **E**. Lateral view (halved, penis valve removed). **F**. Cuspis (removed, not to scale), lateral/inner view. **G**. Penis valve (removed, not to scale), lateral/outer view. Scale bars: A = 5 mm; B = 3 m.

separated *T. chrysozona* from *T. quadripustulata* mainly using T2 spot color: yellow in *T. quadripustulata* and reddish in *T. chrysozona*. The T2 integumental spots in *T. quadripustulata*, however, vary greatly in size and color. Various easily overlooked features are now recognized to differentiate these forms. First, *T. quadripustulata* females have a post-mesonotal tubercle that is usually associated with a slenderer and more elongate mesosoma than females of *T. chrysozona*. The most consistent setal features are the always present, though often inconspicuous, silvery-white setae patches on the metasoma of *T. quadripustulata*, compared against the rarely present and usually reduced coppery setae patches on the fringes of T2–3 in *T. chrysozona*. Finally, true *T. quadripustulata* specimens have been found only in southeastern Amazonian areas, while *T. chrysozona* has a more southern distribution predominantly in eastern Cerrado areas of Brazil.

In both of these species, *T. chrysozona* and *T. quadripustulata*, females are much darker in coloration than males, and they possess fewer pale setal markings than any other females in the *T. quadrinotata* species-group. Counter-intuitively, males of these species often have more extensive and distinct pale colored species than most other males in this species-group, with some males of *T. quadripustulata* almost completely lacking any black setae on the body. Sexual dimorphism in setal color patterns is common in velvet ants but, in most cases, the female pattern is the one with more extensive pale setal markings.

Traumatomutilla sancta (Gerstaecker, 1874)
Fig. 17

Mutilla parallela Burmeister, 1854: 24 (nec Klug, 1821)
Mutilla sancta Gerstaecker, 1874: 303.
Mutilla solemnis Cresson, 1902: 49. **Syn. nov.**
Mutilla sodalis Cresson, 1902: 52.

Ephuta (*Traumatomutilla*) *sancta* – André 1902: 55.
Ephuta (*Traumatomutilla*) *solemnis* – André 1902: 56.
Traumatomutilla sancta – André 1904: 40.
Traumatomutilla solemnis – André 1904: 40.

Diagnosis

Female

Occipital carina equally wide throughout; anterolateral carinae absent in scutellar area; lateral surface of propodeum densely but unevenly sculptured, with conspicuous unsculptured areas; T2 with four pairs of linear to subrectangular narrow yellowish integumental spots.

Female

Unknown.

Type material

Holotype of *Mutilla sancta*

BRAZIL • ♀; [Minas Gerais], Lagoa Santa; ZMB.

Holotype of *Mutilla solemnis*

BRAZIL • ♀; Minas [Minas Gerais] Car. [sic]; CM.

Lectotype of *Mutilla sodalis*

BRAZIL • ♀; [Mato Grosso], Chapada [dos Guimarães]; CM.

Additional material examined (109 ♀♀)

BOLIVIA – **Beni** • 1 ♀; Cavinas; Jan. 1922; W.M. Mann leg.; USNM • 1 ♀; Guayaramerín; Dec. 1956; M.A. Fritz leg.; AMNH. – **Santa Cruz** • 4 ♀♀; Buena Vista; 1928; J. Steinbach leg.; CUIC • 1 ♀; Provincia Chiquitos, Santiago; Dec. 1959; MIUP • 2 ♀♀; La Junta; Feb. 1947; Peredo leg.; USNM.

BRAZIL • **Bahia** • 1 ♀; R. [Rio] de Contos [Contas]; 1 May 1993; A.J.S: Argolo leg.; CPDC • 2 ♀♀; Encruzilhada; 12 Dec. 2007; Grossi, Rafael and Parizotto leg.; DZUP • 1 ♀; Lençois; 28 Feb. 2001; J.R. Maia leg.; CPDC. – **Goiás** • 2 ♀♀; 1914; MNHN • 3 ♀♀; MZSP • 1 ♀; Jataí; 1914; MNHN • 3 ♀♀; Serra da Mesa, Campinaçu; 13°52′ S, 48°23′ W; 18 Feb.–2 Mar. 1996; Silvestre, Brandão and Yamamoto leg.; MZSP. – **Maranhão** • 1 ♀; Mirador, Parque Estadual do Mirador, Base da Geraldina; 27 Oct.–1 Nov. 2008; M.B. Aguiar-Neto and A.L. Costa leg.; CZMA • 1 ♀; Mirador, E14 [sic]; INPA • 1 ♀; Codó, E13 [sic]; INPA. – **Mato Grosso** • 1 ♀; 1886; P. Germain leg.; MNHN • 1 ♀; Diamantina; Nov.–Dec. 1973; MZSP • 1 ♀; Chapada dos Guimarães; 8 Feb. 1986; Exp. Dept. Zoo. [Expedição Departamento de Zoologia] UFPR [Univerisdade Federal do Paraná]; DZUP • 1 ♀; Chapada dos Guimarães; 26 Mar. 2001; W.O. Sousa leg.; DZUP • 1 ♀; Chapada dos Guimarães; 18 Nov. 2013; G.A.R. Melo, D.R. Luz and K.A. Williams leg.; DZUP • 1 ♀; Chapada dos Guimarães; Oct.; ANSP • 1 ♀; Chapada dos Guimarães; Nov.; ANSP • 1 ♀; Chapada dos Guimarães; Jan.; ANSP • 4 ♀♀; P.N. [Parque Nacional] do Xingu, Jacaré; 30 Feb. 1965; Alvarenga and Werne leg.; DZUP • 1 ♀; P.N. [Parque Nacional] do Xingu, Jacaré; Nov. 1961; Alvarenga and Werner leg.; MPEG • 1 ♀; same data as for preceding; MNCN • 1 ♀; Cáceres; 27 Mar. 1985; C. Elias leg.; DZUP • 5 ♀♀; Utiariti; MZSP • 1 ♀; Rio Papagaios, Utiariti; 1–12 Nov. 1966; Lenko and Pereira leg.; MZSP • 3 ♀♀; Rosario Oeste; MZSP • 1 ♀; Andradinha; Aug. 1971; F.M. Oliveira leg.; DZUP • 1 ♀; 30 km N [north of] Uirapuru, Usine Alcomat, Chapada dos Parecis; 14°15′50.80″ S, 59°14′02.05″ W; 1–15 Dec. 2002; A. Foucart leg.; USU. – **Minas Gerais** • 2 ♀♀; MZSP • 1 ♀; ZMUC • 1 ♀; Pirapora; Nov. 1975; MNRJ • 1 ♀; Lagoa Santa; Reinhardt leg.; ZMUC • 3 ♀♀; 15 km SE [sudeste] de Riacho dos Machados; 12 Apr. 1998; G.A.R. Melo leg.; DZUP • 1 ♀; Rio Pardo de Minas; 10 Jan. 1952; MNRJ • 2 ♀♀; Pedra Azul, 700 m [above sea level]; Nov. 1972; MNRJ • 1 ♀; Barro Alto; Nov. 1931; DGMC • 1 ♀; Lassance; Mar. 1935; D.M. Cochran leg.; USNM • 1 ♀; Ponto dos Volantes, 14 km S [sul] of Ponto dos Volantes; 12 Feb. 2010; G.A.R. Melo, D. Parizotto and P. Grossi leg.; DZUP • 1 ♀; Sertão de Diamantina, Fazenda das Melancias; Oct.–Nov. 1902; E. Gounelle leg.; MNCN • 3 ♀♀; Três Lagôas; MZSP. – **Rio de Janeiro** • 1 ♀; Reinhardt leg.; ZMUC. – **Rondônia** • 5 ♀♀; MZSP. – **São Paulo** • 13 ♀♀; MZSP • 1 ♀; Ainores [sic]; Oct. 1947; J. Bras leg.; AMNH • 1 ♀; Rio Claro; Feb. 1971; B. Dias leg.; AMNH. – **Locality unknown** • 1 ♀; ANSP.

PARAGUAY – **Amambay** • 1 ♀; Parque Nacional Cerro Corá; 4 Feb. 2006; B. Garcete leg.; MIUP. – **Boquerón** • 1 ♀; El Solitario; 22°50′ S, 61°59′ W; 10 Nov. 2002; U. Dreschel leg.; FSCA • 1 ♀; El Solitario; 22°50′ S, 61°59′ W; 10 Nov. 2002; U. Dreschel leg.; FSCA. – **Concepción** • 2 ♀♀; Cororo; Feb. 1993; L.K. Arriagada leg.; AMNH • 4 ♀♀; Cororo; 25 Feb.–1 Mar. 1997; B. Garcete leg.; MIUP. – **Cordillera** • 1 ♀; San Bernardino; May 1918; K. Fiebrig S.V. leg.; ZMB. – **Paraguarí** • 1 ♀; 3–8 Feb. 1996; B. Garcete leg.; MIUP. – **Presidente Hayes** • 1 ♀; Lolita, Yaragui; 10 Jan. 2002; U. Dreschel leg.; FSCA • 1 ♀; Lolita, Yaragui; 25 Jan. 2005; U. Dreschel leg.; FSCA. – **San Pedro** • 1 ♀; Río Ypane, Cororo; Feb. 1991; Arriagada leg.; USU • 1 ♀; 26 Jan. 1965; Williner leg.; AMNH • 1 ♀; Río Ypane, Cororo; Nov. 1983; M.A. Fritz leg.; AMNH • 1 ♀; Río Ypane, Cororo; Feb. 1991; Arriagada leg.; AMNH.

VENEZUELA • 1 ♀; Baixo Sarare [sic], 33 96 [sic]; F. Gray leg.; MNHN.

Description

Female

Body length. 21–23 mm.

Head. Posterior margin almost straight. Occipital carina evenly arched and equally wide throughout. Vertex width 0.8 × pronotal width. Eye almost circular, its length in frontal view 1.1 × the distance from its ventral margin to mandibular condyle. Head densely and coarsely foveolate-punctate to areolate-punctate. Genal carina well defined. Mandible oblique, tapering slightly towards apex with small subapical tooth. Dorsal scrobal carina present, well defined, separated from antennal tubercles, narrowly connected to lateral scrobal carina. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 1.9 × pedicel length; flagellomere 2 1.4 × pedicel length.

Mesosoma. Dorsal thoracic length 0.85 × its width. Mesosomal dorsum mostly concealed by dense setation, densely and coarsely areolate-punctate with apparent sharp to scabrous intervals where visible. Anterior surface of propodeum defined, as long as than pronotal collar, coarsely striated longitudinally throughout with dense coarse punctures dorsomedially; dorsal surface rounded into anterior surface in lateral view. Humeral carina well defined, projected dorsally, broadly separated from conspicuously projected angulate epaulet; anterolateral corners of pronotum sharply angulate in dorsal view. Pronotal spiracle projected from lateral margin of pronotum, bulging. Lateral surface of pronotum sparsely punctate with dense micropunctures except at smooth, conspicuous, subacute tubercle anteroventral in relation to pronotal spiracle; mesopleuron partially concealed by dense setation, densely micropunctate anteriorly, and dense vestigial foveolate-punctate on mesopleural ridge; metapleuron unsculptured, smooth shining on dorsal fourth, densely, coarsely and confusedly areolate-punctate on basal fourth, and concealed by dense setation elsewhere. Lateral surface of propodeum densely and coarsely areolate-punctate throughout with blunt vestigially rugose intervals. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 52 : 59 : 63 : 46 : 45. Lateral margin of mesonotum conspicuously constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt process; with small conspicuous blunt post-mesonotal tubercle. Propodeal spiracle strongly projected from lateral margin of mesosoma; post-spiracular area absent. Scutellar scale present, reduced, as narrow as surrounding sculpture; anterolateral carinae absent; scabrous intervals present on scutellar area. Propodeum convex, dorsal surface shorter than and poorly distinguished from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 34 : 75 : 76. Disc of T2 mostly concealed by dense setation, densely and coarsely foveolate-punctate to punctate with dense, interspersed micropunctures where visible; foveolations sparser and micropunctures absent laterally and over integumental spots. T3–5 sculpture predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible; T6, except pygidial plate, densely foveolate-punctate. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, with equally high irregular edges; S2 densely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold present. S3–4 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S5–6 densely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical fourth of plate; surface irregularly rugose; interstice apparently granulose.

Coloration and variations

Female

Integument black, except mandible and antennal flagellomeres partially reddish-brown, and T2 with four large yellow integumental spots; anterior pair always longitudinal linear, posterior pair transverse subrectangular and broadly separated to transverse linear narrowly interrupted medially. Body setae predominantly silvery-white varying in density, except the following areas with black setae varying in density: head, except vertex frequently with transverse line of silvery-white setae which can be absent or reduced to few scattered setae; pronotum, mesopleuron anteriorly, anterior half of mesoscutum, posterior half of mesoscutum medially, lateral surface of propodeum partially, propodeal dorsum medially; legs,

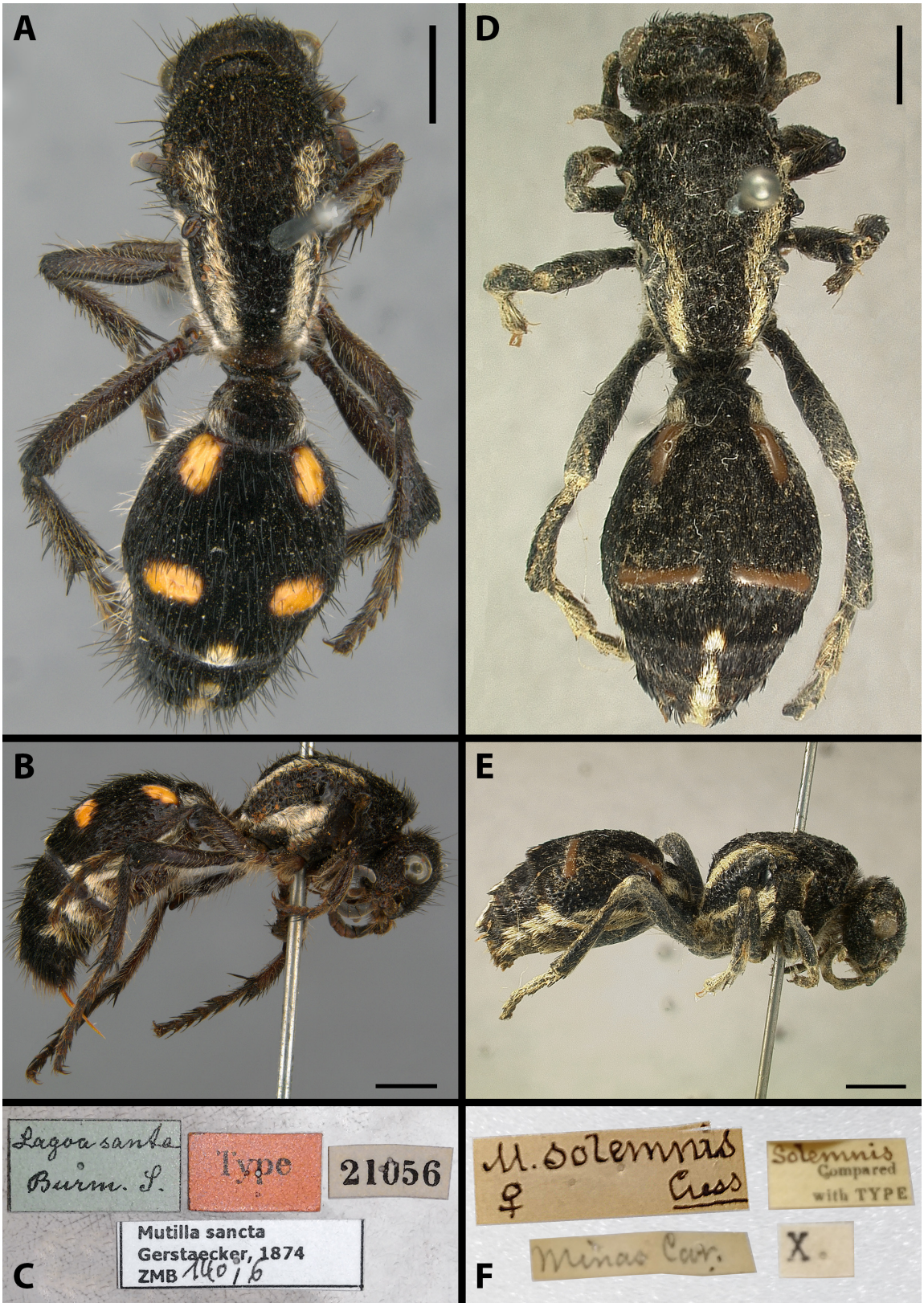

Fig. 17. A–C. *Traumatomutilla sancta* (Gerstaecker, 1874), holotype, ♀ (ZMB). **A**. Dorsal habitus. **B**. Lateral habitus. **C**. Type labels. **D–F**. *Traumatomutilla solemnis* (Cresson, 1902), holotype, ♀ (CM). **D**. Dorsal habiuts. **E**. Lateral habitus. **F**. Type labels. Scale bars = 2 mm.

except dorsal surface of tibiae and apicodorsal surface of femora; T1 and disc of T2 medially (except integumental spots), fringe of T2–5 sublaterally, T6 laterally (except pygidial plate), Fringe of S5, and S6.

Male

Unknown.

Distribution

Venezuela (Apure?), Brazil (Maranhão, Rondônia, Bahia, Goiás. Mato Grosso, Minas Gerais, São Paulo, and Rio de Janeiro), Bolivia (Santa Cruz and Beni), and Paraguay (Boquerón, Presidente Hayes, San Pedro, Concepción, Amambay, Paraguarí, and Cordillera).

Remarks

Based on distribution *T. sancta* is another species that could potentially be associated with *T. pompiliformis* or *T. infernalis*, though we refrain from doing so at this point due to the lack of any other putative males for *T. austera*, *T. funebris*, or *T. ursina* (see also remarks of *T. infernalis*). These also partly overlap in distribution with *T. pompiliformis*. The color pattern and distribution of *T. sancta* is typical of the dry savannah like areas of Cerrado and Caatinga in Midwestern and Northeastern Brazil, which is why the record from Venezuela is likely to be mislabeled. Aside from the integumental spots of T2, there are no differences between *T. sancta* and *T. solemnis*. There are, however, no obvious intermediate forms between the relatively short and subrectangular spots of *T. sancta* and the elongate linear spots of *T. solemnis*. We have, however, seen examples of similar patterns forming a continuum between various species of *Traumatomutilla*, such as *T. parallela* (Klug, 1821) from the *T. indica* species-group (PRB & KAW pers. obs.).

Traumatomutilla tetratrauma Bartholomay & Williams sp. nov.
urn:lsid:zoobank.org:act:9F4A0B0E-1F68-4C95-BE39-BBBFC766CF01
Figs 18–19

Diagnosis

Female

Occipital carinae slightly swollen dorsolaterally; anterolateral carinae present on scutellar area; lateral surface of propodeum with dense micropunctures in between sparse foveolations; frons clothed with golden setae.

Male

Apex of cuspis with short setae; lateral surface of propodeum and metapleuron with conspicuous patches of appressed golden setae.

Etymology

From the greek '*tetra*' 'four' and '*trauma*' 'wounded', in reference to the four large orange spots on T2 of this species and the fact it has basically the same color pattern as *T. quadrinotata* but differs in structure.

Type material

Holotype

BRAZIL • ♀; Espírito Santo, Linhares; Apr. 1973; P.C. Elias leg.; MZSP.

Allotype

BRAZIL • ♂; Espírito Santo, Linhares; Oct. 1972; M. Alvarenga leg.; CM.

Paratypes (15 ♀♀)
BRAZIL • **Bahia** • 1 ♀; Padro, Cumuruxatiba; 20 Mar. 1985; N.A. Menezez leg.; MZSP. – **Espírito Santo** • 1 ♀; Conc. [Conceição da] Barra; Jul. 1969; P.C. Elias leg.; MZSP • 1 ♀; Aracruz, Comboios, mata; Jun. 1993; M.M.A. de Oliveira leg.; MZSP • 1 ♀; Linhares; Mar. 1973; P.C. Elias leg.; MZSP • 1 ♀; Linhares, A1 estrada solo arenoso; Apr. 2022; R.E. Vicente leg.; MBML, MBML-INV 4983 • 1 ♀; São Roque do Canãa; Aug. 2023; F.G. Chaves leg.; coleta manual; MBML MBML-INV 4932. – **Minas Gerais** • 1 ♀; MG [Minas Gerais], Ataleia; 27 Jan. 1994; I. Cardoso leg.; MIUP. – **Pernambuco** • 1 spec.; Recife, Parque dos Dois Irmãos; 8°00′33″ S, 34°56′31″ W; 21 Jul. 2002; STP Amarante e eq. [equipe] leg.; MZSP. – **Rio de Janeiro** • 1 ♀; Distrito Federal [Rio de Janeiro]; Sep. 1928; MZSP • 1 ♀; Nova Iguaçu, Reserva Biológica do Tinguá; 22°34′43″ S, 43°26′08″ W; 9–12 Mar. 2002; S.T.P. Amarante e eq [equipe] leg.; MZSP. – **São Paulo** • 1 ♀; Ilha São Sebastião; 31 Aug. 1963; H. Hzban leg.; MZSP • 3 ♀♀; Caraguatatuba, R. Flo [Reserva Florestal]; Jul. 1962; Exp. Dep. Zoo. [Expedição do Departamento de Zoologia]; MZSP • 1 ♀; Jan. 1938; "E. schw." leg.; MZSP.

Description

Female

Body length. 15 mm.

Head. Posterior margin almost straight. Occipital carina evenly arched and slightly swollen laterally. Vertex width 0.75× pronotal width. Eye almost circular, its length in frontal view almost equal to distance from its ventral margin to mandibular condyle. Head densely and coarsely foveolate-punctate to areolate-punctate, less densely so on malar space. Genal carina well defined. Mandible oblique, tapering slightly towards apex with small subapical tooth. Dorsal scrobal carina present, well defined, narrowly disconnected from antennal tubercles. Lateral scrobal carina absent. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 2.6× pedicel length; flagellomere 2 1.9× pedicel length.

Mesosoma. Length 0.8× width. Mesosomal dorsum mostly concealed by dense setation, densely and coarsely areolate-punctate with apparent sharp to scabrous intervals where visible. Anterior surface of propodeum defined, short, slightly shorter than pronotal collar, coarsely striated longitudinally throughout with dense coarse punctures dorsad; dorsal surface rounded into anterior surface in lateral view. Humeral carina well defined, slightly projected dorsally, broadly separated from conspicuously projected angulate epaulet; anterolateral corners of pronotum sharply angulate in dorsal view. Pronotal spiracle slightly projected from lateral margin of pronotum, rounded, bulging. Lateral surface of pronotum sparsely punctate with dense micropunctures except at smooth conspicuous subacute tubercle anterior to pronotal spiracle, distance between tubercles wider than distance between pronotal spiracles; mesopleuron mostly concealed by dense setation, densely micropunctate anteriorly, and densely and coarsely foveolate-punctate to areolate-punctate on mesopleural ridge where visible; metapleuron completely concealed by dense setation, except small posterior area on dorsal fourth unsculptured, smooth and shining. Lateral surface of propodeum mostly concealed by dense setation, densely and coarsely areolate-punctate throughout with interspersed micropunctures where visible; intervals dull and blunt where visible. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 70 : 83 : 87 : 60 : 60. Lateral margin of mesonotum conspicuously constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into blunt process; post-mesonotal tubercle absent. Propodeal spiracle strongly projected from lateral margin of mesosoma; postspiracular area indistinguishable. Scutellar scale present, as wide or wider than surrounding sculpture; anterolateral carinae present, approximately twice as wide as scutellar scale; scabrous intervals vestigial on scutellar area. Propodeum simply convex, dorsal surface indistinguishable from posterior surface.

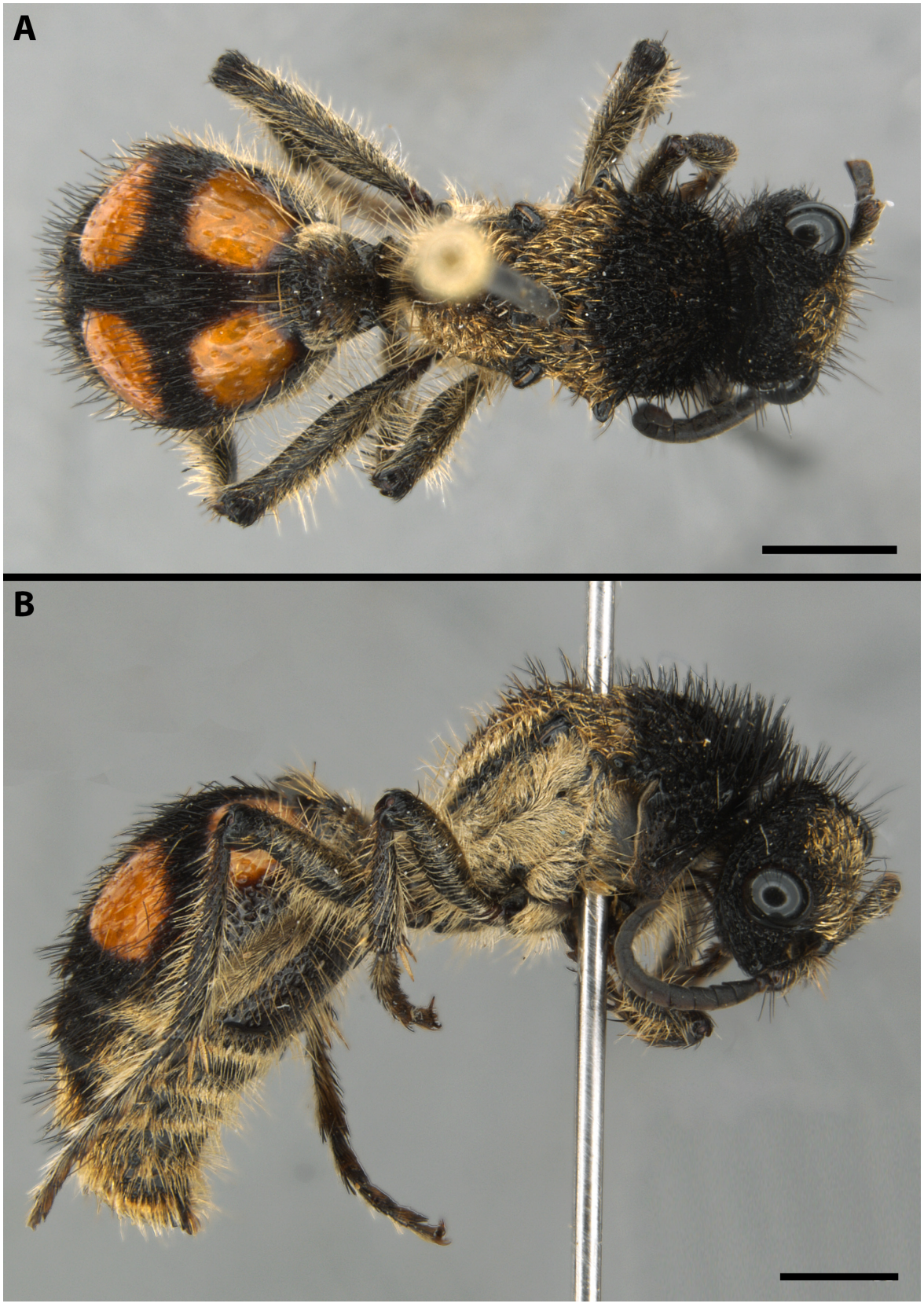

Fig. 18. *Traumatomutilla tetratrauma* Bartholomay & Williams sp. nov., holotype, ♀ (MZSP). **A**. Dorsal habitus. **B**. Lateral habitus. Scale bars = 2 mm.

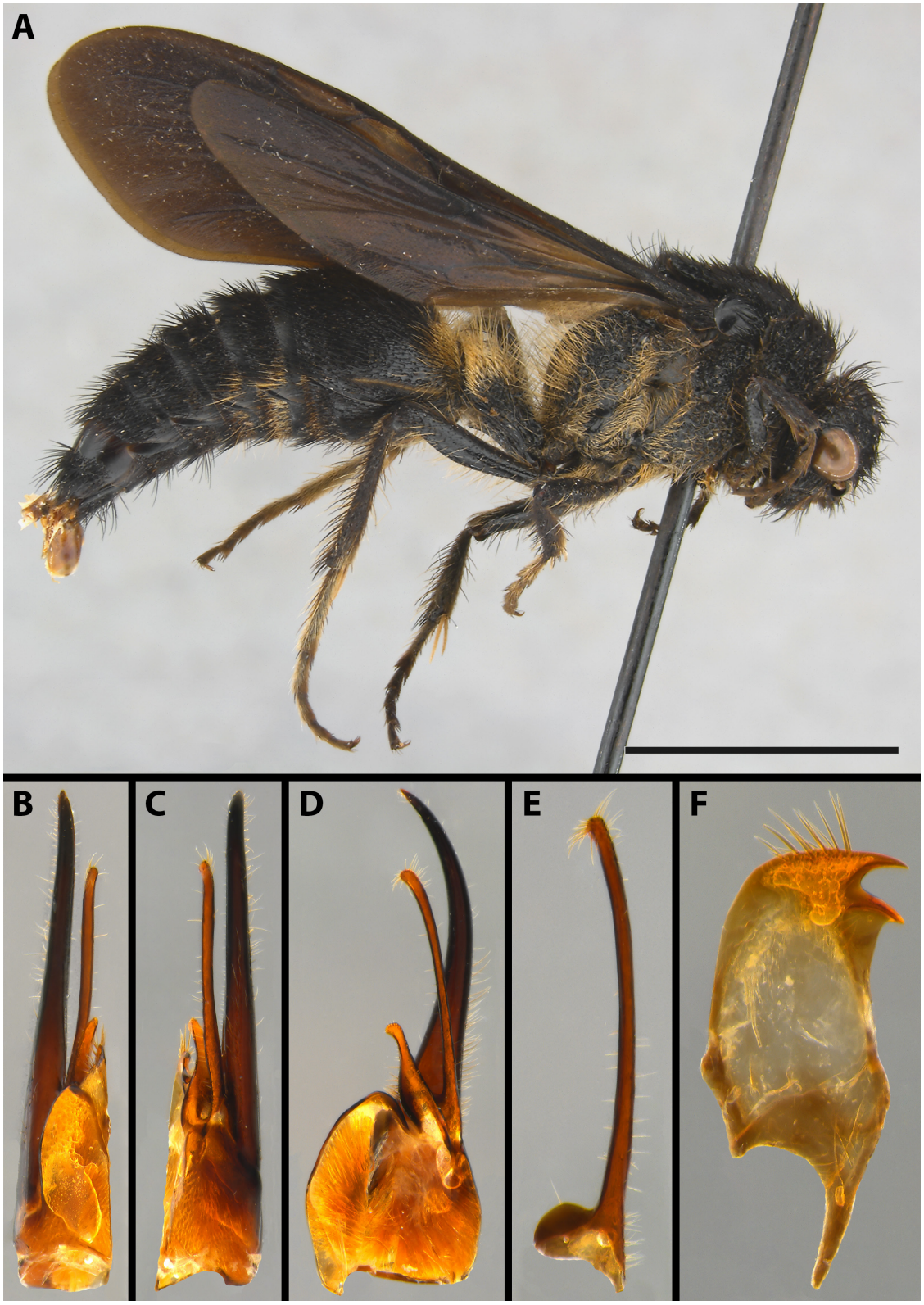

Fig. 19. *Traumatomutilla tetratrauma* Bartholomay & Williams sp. nov., allotype, ♂ (MZSP). **A**. Lateral habitus. **B**. Genitalia (halved), dorsal view. **C**. Genitalia, (halved), ventral view. **D**. Genitalia (halved, penis valve removed), lateral/inner view. **E**. Cuspis (removed, not to scale), lateral/inner view. **F**. Penis valve (removed, not to scale), lateral/outer view. Scale bar = 2 mm.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 28 : 64 : 67. Disc of T2 mostly concealed by dense setation, densely and coarsely foveolate-punctate to punctate with dense, interspersed coarse micropunctures where visible; sculpture sparser and micropunctures absent laterally and over integumental spots. T3–5 sculpture predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible; T6, except pygidial plate, almost concealed by dense setation, densely foveolate-punctate where visible. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, slightly higher medially. S2 densely and coarsely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold present. S3–5 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S6 sparsely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical fourth of plate; surface irregularly rugose; interstice apparently granulose.

Female

Body length. 14–16 mm.

Head. Transversely subrectangular with posterolateral angles rounded in dorsal view; lateral margins of head convergent immediately behind eyes, but not contiguous with eye outline in dorsal view. Vertex width 0.8 × pronotal width. Eye almost circular. Ocelli small; OOD 5.3 × DLO, IOD 1.0 × DLO. Occipital carina distinct. Head surface sparsely and finely punctate; sculpture sparser and finer posterad. Gena ecarinate. Antennal scrobe concave to eye margin, with well-defined transverse dorsal scrobal carina. Clypeus concave laterally immediately below antennal insertion, conspicuously convex medially; densely and coarsely foveolate-punctate medially and along apical/ventral margin laterally; apical/ventral margin with a pair of medial short subacute free teeth medially. Scape bicarinate. Flagellomere 1 1.95 × pedicel length; flagellomere 2 2.6 × pedicel length. Mandible obliquely tridentate apically, medial tooth smaller than inner tooth; lacking dorsal or ventral projections.

Mesosoma. Epaulets well defined, sharply projected from anterior margin of pronotum, separated from well-defined humeral carina, anterolateral corners of pronotum not angulate. Anterior surface of pronotum, with sparse fine punctures laterad with interspersed micropunctures, mostly unsculptured mediad; with medial longitudinal slightly concave smooth area. Tegula convex, mostly glabrous and impunctate except for dense coarse punctures along inner and anterior margin. Dorsum of pronotum densely and coarsely foveolate-punctate to areolate-punctate with somewhat sharp intervals. Mesoscutum densely and finely foveolate-punctate, parapsis reduced to posterior half of mesoscutum, notaulus absent. Scutellum sloping throughout, somewhat depressed medially, without defined dorsal and posterior surfaces, densely and coarsely areolate-punctate to foveolate-punctate; anterior intervals somewhat aligned so as to form vestigial irregular longitudinal carina medially. Axilla produced posterolaterally as obliquely truncate projection, with inner margin slightly curved inward apicad in dorsal view; projection coarsely foveolate-punctate basad, unsculptured, smooth, shining apicad. Metanotum slightly wider laterad, its surface obscured by dense setation. Propodeal dorsum convex, mostly concealed, densely areolate; sculpture of lateral surface absent along most of anterior margin; dorsal surface indistinguishable from posterior surface. Lateral surface of pronotum sparsely and vestigially punctate with sparse interspersed micropunctures; mesopleura with conspicuous blunt projection on dorsal half; sculpture densely and coarsely areolate with interspersed micropunctures to simply micropunctate anterad. Metapleuron partially concealed by dense setation, micropunctate where visible, except basal third densely and coarsely areolate.

Wings. Forewing with elongate sclerotized pterostigma; marginal cell elongated, roundly truncate apically; three submarginal cells.

Legs. Simply setose, no strong spines discernible dorsally; spurs finely serrate on margins.

Metasoma. T1 0.5× as wide as T2. T2 0.9× as long as wide. Dorsal metasomal sculpture, except pygidial plate, partially concealed by dense setation, densely and finely punctate with sparse interspersed micropunctures where visible; sculpture sparser and less defined in apical segments; pygidial plate slightly broader than long, weakly defined by parallel carinae laterally; surface densely micropunctate throughout. S1 longitudinally elevated medially, terminating in slightly concave low longitudinal carina. S2 sparsely and finely foveolate-punctate to punctate; sculpture sparser mediad; anteromedial crest-fold present, sternal pit absent. S3–7 sparsely and finely foveolate-punctate to punctate; S7 longer than broad, posterior margin projected medially into closely bidentate apex.

Genitalia. Parapenial lobe slightly pronounced posteriorl, acute. Ratios of free length of paramere, cuspis and digitus, 83 : 58 : 18. Paramere almost straight in dorsal view, upcurved posteriorly in lateral view, asetose except for sparse scattered inconspicuous setae throughout, setae more evident on ventral surface. Cuspis slender, elongate, almost straight and equally wide throughout in dorsal view, slightly upcurved posterad and somewhat subcaptitate on apex, with inconspicuous short setae on apex, scattered inconspicuous short setae elsewhere. Paracuspis poorly developed, sessile, lobe-like, wider than long with almost flate and asetose posterior margin. Digitus short, slightly curved inward in dorsal view, evenly upcurved and tapered posterad in lateral view, apex more abruptly curved and subcapitate, setose anterodorsally. Penis valve strongly concave on inner surface, with well-defined pair of short acute teeth posteroventrally, with poorly-defined lateral pocket on outer margin, apical distance between teeth 0.1 × length of valve, dense setae present along flat posterior margin and inconspicuous setae present at base of anterior tooth on outer surface, setae on posterior margin longer ventrad, posterior margin slightly sloping dorsad.

Coloration and variations

Female

Integument black to brownish black, except mandibles and antennal flagellomeres partially reddish-brown, and T2 with four large orange integumental spots. Body setae predominantly golden varying in density, except the following areas with black setae varying in density: vertex, gena, malar space, and ventral surface of head; dorsum of propodeum, anterior half of mesoscutum, and propodeal dorsum medially; T1 medially, disc of T2 medially (except integumental spots), fringe of T2–3 sublaterally.

Male

Integument black. Body setae predominantly black varying in density, except the following areas with golden setae: antennal tubercles, lateral surface of pronotum, mesosomal pleurae, metanotum, propodeum, and legs; T1, posterior two thirds of T2, fringe of T2–3 laterally, S1–4, and fringe of S2–4. Wings dark brown throughout. Tibial spurs yellowish-white.

Distribution

Brazil (Pernambuco, Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo).

Remarks

Initially, *T. quadrinotata* appeared to be an easily recognizable, but variable species. It was originally known from females only and there seemed to be variation in the head setae color and mesosomal setal length. The male was also apparently easily recognized, based on its large body size, overlapping distribution, and parallel coloration with the female and other Atlantic Forest species. After careful examination of numerous suspected *T. quadrinotata* males, however, we discovered that there were two species with identical coloration and remarkably similar external morphology, but distinct genitalia (Figs 13A–F, 19A–F). Since there were two distinct species among the putative males of *T. quadrinotata*,

we re-evaluated the species limits of the females. Those individuals with golden setae on the frons and uniformly short mesosomal setae were found to differ from the typical *T. quadrinotata* by structural features as well, namely the occipital carina was swollen, the scutellar area was armed with distinct anterolateral transverse carinae, and T1 was slightly broader and shorter. We therefore recognized these females as belonging to a distinct new species, named here as *T. tetratrauma* sp. nov. The next step was to determine which of the males (short cuspis setae or long cuspis setae) belonged to each species. Both of these males and females overlap in distribution in the Atlantic Forest, so distribution couldn't solve the association. Among the members of the species-group, only two males have short cuspis setae: *T. incerta* and one of these males. Therefore, the female of the short cuspis male should be similar to *T. incerta*. *Traumatomutilla incerta* and *T. tetratrauma* are the only species in this group with the occipital carina swollen and T1 comparatively short and broad. We therefore hypothesize that the male of *T. tetratrauma* is the one with short cuspis setae. The male with longer cuspis setae is associated with *T. quadrinotata*.

Given the similarities between these two species, various collections will likely have numerous specimens of *T. tetratrauma* sp. nov. misidentified as *T. quadrinotata*. Perhaps when these specimens are re-evaluated, patterns about their distribution will become clearer. At this moment, it appears that *T. tetratrauma* is a Northern species, with most records focused in Espírito Santo State. Conversely, *T. quadrinotata* seems more widespread with many records from São Paulo and Santa Catarina states.

Traumatomutilla ursina (Gerstaecker, 1874)
Fig. 20

Mutilla ursina Gerstaecker, 1874: 74.

Ephuta (*Traumatomutilla*) *ursina* – André 1902: 56.
Traumatomutilla ursina – André 1904: 40.

Diagnosis

Female

In addition to the structural characters referenced in the species groups diagnosis, *T. ursina* can be defined by three unique features, body almost entirely covered by dense, long, brownish-black setae; lateral tubercles of mesonotum greatly reduced, as far apart as pronotal spiracles; and anterolateral corners of T2 devoid of sculpture and setae, smooth, shining.

Type material

Holotype

BRAZIL • ♀; ZMB.

Other material examined (3 ♀♀)

BRAZIL – **Mato Grosso** • 1 ♀; Vaccaria; Nov. 1922; ZMB. – **Minas Gerais** • 1 ♀; Corumbai [sic]; Nov. 1963; DZUP • 1 ♀; Araxá; 5 May 1965; C. Elias leg.; DZUP.

Description

Female

Body length. 16–17 mm.

Head. Posterior margin almost straight. Occipital carina evenly arched and equally wide throughout. Vertex width 0.8 × pronotal width. Eye almost circular, its length in frontal view 0.9 × distance from its ventral margin to mandibular condyle. Head densely and coarsely foveolate-punctate to areolate-punctate.

Fig. 20. *Traumatomutilla ursina* (Gerstaecker, 1874), holotype, ♀ (ZMB). **A**. Dorsal habitus. **B**. Type labels. **C**. Lateral habitus. Scale bars = 2 mm.

Genal carina poorly defined, nearly vestigial. Mandible elongate, oblique, tapering slightly towards with small subapical tooth. Dorsal scrobal carina present, well defined, disconnected from antennal tubercles and lateral scrobal carina. Antennal tubercle coarsely and irregularly rugose. Flagellomere 1 3.1 × pedicel length; flagellomere 2 2.0 × pedicel length.

Mesosoma. Length 0.9 × width. Mesosomal dorsum mostly concealed by dense setation, densely and coarsely areolate-punctate with apparent scabrous intervals medially where visible. Anterior surface of propodeum defined, short, slightly shorter than pronotal collar, coarsely striated longitudinally throughout with dense coarse punctures dorsomedially; dorsal surface rounded into anterior surface in lateral view. Humeral carina welldefined, projected dorsally, broadly separated from conspicuously projected angulate epaulet; anterolateral corners of pronotum sharply angulate in dorsal view. Pronotal spiracle slightly projected from lateral margin of pronotum, rounded, bulging. Lateral surface of pronotum sparsely punctate with dense micropunctures except at smooth conspicuous subacute tubercle anterior to pronotal spiracle; mesopleuron densely micropunctate anteriorly, sparsely and vestigially punctate to foveolate-punctate to areolate-punctate ventrad on mesopleural ridge; dorsal half of mesopleural ridge simply micropunctate; metapleuron unsculptured, smooth shining on dorsal fourth, densely, coarsely and confusedly areolate on basal fourth, and with concealed by dense setation elsewhere. Lateral surface of propodeum sparsely and coarsely foveolate-punctate posterad; smooth and shining anterad; with vestigially rugose intervals posterad. Ratios of width of humeral angles, pronotal spiracles, widest point of mesonotum, narrowest point of mesonotum and propodeum posterior to propodeal spiracles, 70 : 77 : 77 : 56 : 53. Lateral margin of mesonotum 217 conspicuously constricted anterior to propodeal spiracle, strongly diverging anterad, medially projected, into short, inconspicuous blunt process; with very small conspicuous tubercle posterior to lateral process. Propodeal spiracle strongly projected from lateral margin of mesosoma; post-spiracular area vestigial. Scutellar scale present, reduced, as narrow as surrounding sculpture; anterolateral carinae absent; scabrous intervals present on scutellar area. Propodeum slightly elongate, dorsal surface longer than and poorly distinguished from posterior surface.

Metasoma. Ratios of width of T1, width of T2 and length of T2, 41 : 84 : 84. Disc of T2 mostly concealed by dense setation, densely and coarsely foveolate-punctate to punctate with dense, interspersed micropunctures where visible; foveolations sparser and micropunctures absent laterally and over integumental spots; anterolateral corners of T2 devoid of setae and sculpture, smooth, shining. T3–6 sculpture, except pygidial plate, predominantly concealed by dense setation, densely and coarsely foveolate-punctate to simply punctate with interspersed micropunctures where visible. S1 sparsely, coarsely and confusedly foveolate-punctate, surface cuneiform, ending in short blunt longitudinal carina, slightly higher medially. S2 sparsely foveolate-punctate, sculpture conspicuously sparser posteromediad; anteromedial crest-fold vestigial. S3–4 sculpture mostly concealed by dense setation, densely and finely foveolate-punctate with sparse micropunctures where visible; S4 densely foveolate-punctate; S6 sparsely foveolate-punctate. Pygidial plate subpyriform, defined by lateral carinae at apical fourth of plate; surface irregularly rugose; interstice apparently granulose.

Coloration and variations

Integument black, except antennal flagellomeres and mandibles partially reddish-brown. Body setae predominantly and very densely black to brownish-black, except the following areas with silvery-white to silvery-golden setae varying in density: mesonotum, scutellar area, and propodeal dorsum laterally; mesopleuron, metapleuron, and lateral surface of propodeum; T1 laterally, lateral felt lines of T2, lateral margins of T2, lateral areas of T2 disc, fringe of T2–4, fringe of T5 medially, S1–3, and fringe of S2–3.

Distribution

Brazil (Minas Gerais, Mato Grosso).

Remarks

Traumatomutilla ursina is unusual, especially due to the conspicuously long brownish dorsal setae and the asetose and unsculptured anterolateral portion of T2. Both these characters are unprecedented in South American Dasymutillini. Additionally, the head in frontal view seems to be wider than most *Traumatomutilla* species, especially related to how protuberant the eyes appear to be in frontal view. No structural or color variations were observed in the few specimens available for study, which, save for the specimen from Araxá (DZUP), have no other indication of locality except country and/or state. As mentioned before, *T. ursina* is one of four putative females that may be associated with either *T. infernalis* or *T. pompiliformis*.

Discussion

Species from the *T. quadrinotata* species-group were apparently defined by more consistent diagnostic color patterns than those seen in other groups, such as the *T. indica* and *T. juvenilis* species-groups. Apparently, the only species with conspicuous color variations are *T. austera* (mesosomal setal pattern) and *T. quadripustulata* (T2 spot color and mesosomal setal pattern). With the synonyms proposed herein, *T. sancta* and *T. incerta* also have color pattern variations in setal distribution and size of T2 integumental spots. Perhaps these relatively stable color forms and generally homogeneous structural characters are the main reason there are still four unassociated females and two unassociated males left in the group. On the other hand, the relatively small number of specimens examined may have prevented us from finding intermediate color forms or being able to confidently establish the minor structural differences as solid bases for differentiating species. Therefore, even though various studies have proposed that setae and color characters alone are inadequate for species delimitation in Mutillidae (Williams *et al*. 2011, 2012; Bartholomay *et al*. 2018, 2019a, 2020, 2022; Cambra *et al*. 2022, 2024), these characters seem to be more stable in the *T. quadrinotata* species-group than in other groups.

Females of the *T. quadrinotata* species-group are unique for their lateral mesonotal tubercles, but some of the included species bear traits that are apparently diagnostic for other species-groups. Some species have an indistinct medial longitudinal carina of the mesonotum, the main female character in the *T. indica* species-group. In the case of *T. incerta* and *T. tetratrauma* sp. nov., the dorsolaterally slightly swollen occipital carina of the females is reminiscent of that observed in females of the *T. juvenilis* species-group. In fact, the external morphology of the males of the *T. quadrinotata* species-group is nearly identical to that of the *T. juvenilis* species-group males, differing only by having an elongate hypopygium and lacking the setae-filled pit on S2. The male genitalia of the *T. quadrinotata* species-group, however, are similar to those of the *T. indica* species-group males, except for the usually lobe-like paracuspis and convex posterior margin of the penis valve. Additionally, *T. pompiliformis* has the paracupsis slightly node-like as in most species of the *T. indica* species-group, and there are several species within the *T. indica* species-group that have the posterior margin of the penis valve simply convex. These similarities between both species-groups are an indication that they are more closely related to each other than to the remaining species-groups of *Traumatomutilla* and were further discussed by Bartholomay *et al*. (2022).

Acknowledgments

We are grateful for the collection managers and curators that provided specimens for this study, including: Christine LeBeau (AMNH), Robert Zuparko (CASC), Andreas Köhler (CESC), John Rawlins (CM), Stephan Blank (SDEI), Gabriel Melo (DZUP), James Pitts (USU), Mercedes París (MNCN), Agniéle Touret-Alby (MNHN), Felipe Vivallo (MNRJ), Orlando Silveira (MPEG), Kelli Ramos (MZSP), Fernando Silvestre (MuBio-UFGD), Gavin Broad (NHMUK), Lynn Kimsey (UCDC), Fernando Silveira (UFMG), Robin Thomson (UMSP), Brian Harris (USNM), Michael Ohl, Viola Richter and Lukas Kirscher (ZMB), Lars Vilhelmsen (ZMUC), Denis Brothers (DJBC), Donald Manley (DGMC), and

Wouter Dekoninck (RBINS). This project was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001, Programa de Pós-Graduação em Entomologia do Instituto Nacional de Pesquisas da Amazônia (PPG-ENT), Project PRJ 12.10 Entomologia na Amazônia - Diversidade de Insetos of the Conselho Nacional de Pesquisas (CNPq). PRB was supported by the CNPq grant n°141158/2017-4 and CAPES PDSE grant n°88881.187031/2018-01. KAW was supported by CNPq's Sciences Without Borders program (Complexos miméticos em vespas da família Mutillidae (Insecta, Hymenoptera): padrões de mimetismo e diversidade nos biomas brasileiros: Proceso 370106/2013-0). MLO is thankful for the CNPq productivity bursary, Brazil (306100/2016–9).

References

André E. 1901. Descriptions de quelques espèces et variétés nouvelles de mutilles d'Amérique appartenant au Musée Civique de Gênes. *Zeitschrift für Systematische Hymenopterologie und Dipterologie* 1: 257–264. Available from https://www.biodiversitylibrary.org/page/13367701 [accessed 16 Apr. 2025].

André E. 1902. Fam. Mutillidae. *In*: Wytsman P. (ed.) *Genera Insectorum Fasc. 11*. V. Verteneuil & L. Desmet, Bruxelles. Available from https://www.biodiversitylibrary.org/page/34623842 [accessed 16 Apr. 2025].

André E. 1903. Mutillides nouveaux ou imparfaitement connus de divers pays. *Annales de la Sociétè entomologique de France* 72: 417–459.
Available from https://www.biodiversitylibrary.org/page/8248305 [accessed 16 Apr. 2025].

André E. 1904. Examen critique d'une nouvelle classification proposée par M. le Dr. W.H. Ashmead pour le famille des Mutillidae. *Revue d'Entomologie* 23 (1): 27–41.
Available from https://www.biodiversitylibrary.org/page/12062989 [accessed 16 Apr. 2025].

André E. 1906. Nouvelles espèces de mutillides d'Amérique. *Zeitschrift für Systematische Hymenopterologie und Dipterologie* 6: 33–48, 65–80, 161–169.
Available from https://www.biodiversitylibrary.org/page/33765591 [accessed 16 Apr. 2025].

André E. 1907. Descrition d'espèces nouvelles de mutillides appartenant au Muséum d'Histoire naturelle de Paris (Hym.). *Zeitschrift für Systematische Hymenopterologie und Dipterologie* 7: 337–352.
Available from https://www.biodiversitylibrary.org/page/12637865 [accessed 16 Apr. 2025].

Ashmead W.H. 1904. Classification of the fossorial, predaceous and parasitic wasps, or the superfamily Vespoidea. *The Canadian Entomologist* 36: 3–9. https://doi.org/10.4039/Ent365-1

Bartholomay P.R., Williams K.A., Luz D.R. & Oliveira M.L. 2018. New species of *Traumatomutilla* André in the *T. tabapua* and *T. integella* species-groups (Hymenoptera, Mutillidae). *Zootaxa* 4433 (2): 361–385. https://doi.org/10.11646/zootaxa.4433.2.7

Bartholomay P.R., Williams K.A., Lopez V.M. & Oliveira M.L. 2019a. Revision of the *Traumatomutilla americana* species-group (Hymenoptera: Mutillidae). *Zootaxa* 4608 (1): 1–34.
https://doi.org/10.11646/zootaxa.4608.1.1

Bartholomay P.R., Williams K.A., Luz D.R., Cambra R.A. & Oliveira M.L. 2019b. *Traumatomutilla* André miscellanea: Revision of the *bellica*, *bifurca*, *diabolica*, and *vitelligera* species groups, and a new group for the new species *T. pilkingtoni* Bartholomay & Williams (Hymenoptera: Mutillidae: Sphaeropthalminae: Dasymutillini). *Insecta Mundi* 709: 1–37.
Available from https://journals.flvc.org/mundi/article/view/115068 [accessed 16 Apr. 2025].

Bartholomay P.R., Williams K.A., Cambra R.A. & Oliveira M.L. 2020. Revision of the *Traumatomutilla juvenilis* species group (Hymenoptera, Mutillidae). *Journal of Natural History* 53: 2639–2683.
https://doi.org/10.1080/00222933.2020.1715501

Bartholomay P.R., Williams K.A., Cambra R.A. & Oliveira M.L. 2021. Revision of the *Traumatomutilla gemella* species-group (Hymenotera: Mutillidae) with the description of its hitherto unknown males. *Zoosystema* 43 (1): 1–28. https://doi.org/10.5252/zoosystema2021v43a1

Bartholomay P.R., Williams K.A., Cambra R.A. & Oliveira M.L. 2022. Revision of the *Traumatomutilla indica* species-group (Hymenoptera: Mutillidae). *Zootaxa* 5108 (1): 1–97. https://doi.org/10.11646/zootaxa.5108.1.1

Blake C.A. 1871. Synopsis of the Mutillidae of North America. *Transactions of the American Entomological Society* 3: 217–265. https://doi.org/10.2307/25076249

Brothers D.J. 2006a. Familia Mutillidae. *In*: Fernández F. & Sharkey M.J. (eds) *Introducción a los Hymenoptera de la Región Neotropical*. Sociedad Colombiana de Entomología y Universidad Nacional de Colombia, Bogotá D.C., Colombia.

Brothers D.J. 2006b. Familia Mutillidae. *In*: Hanson P.E. & Gauld I.D. (eds) *Hymenoptera de la Región Neotropical*. The American Entomological Institute, Gainesville, Florida, USA.

Brothers D.J. & Lelej A.S. 2017. Phylogeny and higher classification of Mutillidae (Hymenoptera) based on morphological reanalyses. *Journal of Hymenoptera Research* 60: 1–97. https://doi.org/10.3897/jhr.60.20091

Burmeister H.C.C. 1854. Uebersicht der brasilianischen Mutillen. *Abhandlungen der Naturforschenden Gesellschaft zu Halle* 2: 19–29. Available from https://www.biodiversitylibrary.org/page/11814199 [accessed 16 Apr. 2025].

Callan E.McC. 1990. Mutillidae of Trinidad. *Sphecos* 19: 21–22.

Callan E.McC. 1991. Nesting behavior and prey of sand wasps in Trinidad (Hymenoptera: Sphecidae: Nyssoninae). *The Entomologist* 110 (3): 134–138.

Cambra R.A. & Quintero D.A. 1992. Velvet ants of Panama: distribution and systematics (Hymenoptera: Mutillidae). *In*: Quintero D.A. & Aiello A. (eds) *Insects of Panama and Mesoamerica: Selected Studies*. Oxford University Press, Oxford, England. https://doi.org/10.1093/oso/9780198540182.003.0029

Cambra R.A., Williams K.A. & Bartholomay P.R. 2022. Two new species of *Horcomutilla* Casal, 1962 (Hymenoptera: Mutillidae), description of hitherto unknown males, and an illustrated key to all known species in the genus. *Neotropical Entomology* 51 (3): 427–446. https://doi.org/10.1007/s13744-022-00957-8

Cambra R.A., Bartholomay P.R., Williams K.A., Trindade-Santos M.E., Ramos R.L. & Oliveira F.F. 2024. Taxonomic notes on *Pertyella* Mickel, 1952 (Hymenoptera: Mutillidae): morphological characters rediscussion, new species, new combinations, new records, and species grouping. *Revista peruana de Biología* 31 (2): e26220. https://doi.org/10.15381/rpb.v31i2.26220

Casal O.H. 1969. Sobre *Traumatomutilla* André (Hymenoptera, Mutillidae). *Physis* 28 (77): 279–298.

Cresson E.T. 1902. Descriptions of some *Mutilla* from Brazil. *Transactions of the American Entomological Society* 28: 1–82. Available from https://www.biodiversitylibrary.org/page/7525740 [accessed 16 Apr. 2025].

Dalla Torre C.G. de 1897. *Catalogus Hymenopterorum hucusque Descriptorum Systematicus et Synonimicus. Vol. VIII: Fossores (Sphegidae)*. Guilelmi Engelmann, Leipzig [Lipsiae]. https://doi.org/10.5962/bhl.title.10348

Day M.C. 1979. The species of Hymenoptera described by Linnaeus in the genera *Sphex*, *Chrysis*, *Vespa*, *Apis* and *Mutilla*. *Biological Journal of the Linnean Society* 12: 45–84. https://doi.org/10.1111/j.1095-8312.1979.tb00049.x

Fabricius J.C. 1804. *Systema Piezatorum secundum Ordines, Genera, Species adjectis Synonymis, Locis, Observationibus, Descriptionibus*. Carolum Reichard, Braunschweig [Brunsvigae]. https://doi.org/10.5962/bhl.title.10490

Gerstaecker A. 1874. Mutillarum Americae meridionalis indigenarum synopsis systematica et synonymica. *Archiv für Naturgeschichte* 40: 41–77, 299–328.
Available from https://www.biodiversitylibrary.org/page/6185211 [accessed 16 Apr. 2025].

ICZN 1999. *International Code of Zoological Nomenclature. Fourth Edition*. The International Trust for Zoological Nomenclature, London. Available from https://www.iczn.org/the-code/the-code-online/ [accessed 16 Apr. 2025].

Klug J.C.F. 1821. Entomologiae brasilianae specimen. *Nova Acta physico-medica Academiae Caesareae Leopoldino-Carolinae Naturae Curiosorum* 10 (2): 305–324.
Available from https://www.biodiversitylibrary.org/page/37020787 [accessed 16 Apr. 2025].

Kohl F.F. 1882. Neue Hymenopteren in den Sammlungen des k. k. Hof Cabinetes zu Wien. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesselschaft in Wien* 32: 475–498. Available from https://www.biodiversitylibrary.org/page/14199702 [accessed 16 Apr. 2025].

Latreille P.A. 1802. *Histoire naturelle, générale et particulière, des Crustacés et des Insectes. Vol. 3*. F. Dufart, Paris. https://doi.org/10.5962/bhl.title.15764

Latreille P.A. 1804. Tableau méthodique des insectes. *In*: *Nouveau Dictionnaire d'Histoire naturelle, appliquée aux Arts, principalement à l'Agriculture et à l'Économie rurale et domestique: par une Société de Naturalistes et d'Agriculteurs: avec des Figures tirées des Trois Règnes de la Nature. Tome XXIV.* Déterville, Paris.

Lelej A.S. & Brothers D.J. 2008. The genus-group names of Mutillidae (Hymenoptera) and their type species, with a new genus, new name, new synonymies, new combinations and lectotypifications. *Zootaxa* 1889: 1–79. https://doi.org/10.11646/zootaxa.1889.1.1

Lepeletier de Saint-Fargeau A. 1845. *Histoire naturelle des Insectes. Hyménoptères. Tome Troisième.* Roret, Paris. https://doi.org/10.5962/bhl.title.9005

Linnaeus C. 1758. *Systema Naturae per Regna Tria Naturae, secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio Decima Reformata.* Laurentii Salvii, Stockholm [Holmiae]. https://doi.org/10.5962/bhl.title.542

Mickel C.E. 1928. Biological and taxonomic investigations on the mutillid wasps. *United States National Museum, Bulletin* 143: 1–351. https://doi.org/10.5479/si.03629236.143.1

Mickel C.E. 1937. New World Mutillidae in the Spinola collection at Torino, Italy (Hymenoptera). *Revista de Entomologia, Rio de Janeiro* 7: 165–207.

Mickel C.E. 1945. Three new species of Mutillidae from Peru and Bolivia (Hymenoptera: Mutillidae). *Annals of the Entomological Society of America* 38: 38–44. https://doi.org/10.1093/aesa/38.1.38

Mickel C.E. 1952. The Mutillidae (wasps) of British Guiana. *Zoologica*, *New York* 37 (3): 105–150. https://doi.org/10.5962/p.184691

Nonveiller G. 1990. *Catalogue of the Mutillidae, Myrmosidae and Bradynobaenidae of the Neotropical Region including Mexico (Insecta, Hymenoptera)*. Hymenopterorum Catalogus (Nova Editio) pars 18. SPB Academic Publishing, Den Haag.

Pagliano G. 2005. I Mutillidae della collezione Spinola (Hymenoptera). *Bollettino del Museo regionale di Scienze naturali di Torino* 23 (1): 267–322.

Quintero D.A. & Cambra R.A. 1996a. Contribución a la sistemática de las mutílidas (Hymenoptera) del Perú, en especial las de la Estación Biológica BIOLAT, Río Manu, Pakitza. *In*: Wilson D.E. & Sandoval A. (eds.) *MANU: the Biodiversity of Southeastern Peru*: 327–357. Editorial Horizonte, Lima.

Quintero D.A. & Cambra R.A. 1996b. Mutillidae of Paraguay. *Sphecos* 30: 11–14.

Say T. 1836. Descriptions of new species of North American Hymenoptera, and observation on some already described. *Boston Journal of Natural History* 1 (3): 209–305.
Available from https://www.biodiversitylibrary.org/page/32413933 [accessed 16 Apr. 2025].

Schuster R.M. 1949. Contribution towards a monograph of the Mutillidae of the Neotropical region. III. A key to the subfamilies represented and descriptions of several new genera (Hymenoptera). *Entomologica Americana (N.S.)* 29 (3–4): 59–140.

Smith F. 1855. *Catalogue of Hymenopterous Insects in the Collection of the British Museum. Part III. Mutillidae and Pompilidae.* Trustees of the British Museum, London.
https://doi.org/10.5962/bhl.title.20858

Smith F. 1879. *Descriptions of New Species of Hymenoptera in the Collection of the British Museum*. Printed by order of the Trustees, London. https://doi.org/10.5962/bhl.title.60089

Spinola M. 1841. Hyménoptères recueillis à Cayenne en 1839 par M. Leprieur. *Annales de la Société entomologique de France* 10: 85–98. Available from https://www.biodiversitylibrary.org/page/8257887 [accessed 16 Apr. 2025].

Waldren G.C, Sadler E.A., Murray E.A., Bossert S., Danforth B.N. & Pitts J.P. 2023. Phylogenomic inference of the higher classification of velvet ants (Hymenoptera: Mutillidae). *Systematic Entomology* 48 (3): 463–487. https://doi.org/10.1111/syen.12588

Williams K.A., Manley D.G., Pilgrim E.M., Von Dohlen C. & Pitts J.P. 2011. Multifaceted assessment of species validity in the *Dasymutilla bioculata* species group (Hymenoptera: Mutillidae). *Systematic Entomology* 36: 180–191. https://doi.org/10.1111/j.1365-3113.2010.00555.x

Williams K.A., Manley D.G., Deyrup M., Von Dohlen K. & Pitts J.P. 2012. Systematic review of the *Dasymutilla monticola* species-group (Hymenoptera: Mutillidae): using phylogenetics to address species-group placement and sex associations. *Zootaxa* 3554: 1–29. https://doi.org/10.11646/zootaxa.3554.1.1

Williams K.A., Bartholomay P.R. & Oliveira M.L. 2017. Species groups of *Traumatomutilla* André (Hymenoptera: Mutillidae). *Insecta Mundi* 533: 1–33.

Manuscript received: 12 June 2024
Manuscript accepted: 28 January 2025
Published on: 29 May 2025
Topic editor: Tony Robillard
Section editor: Gavin Broad
Desk editor: Pepe Fernández