



Corrections on the biology of *Traumatotutilla* André, 1901 (Hymenoptera: Mutillidae)

PEDRO R. BARTHOLOMAY^{1,4}, KEVIN A. WILLIAMS², GEORGE C. WALDREN³ & MARCIO L. DE OLIVEIRA¹

¹Instituto Nacional de Pesquisas da Amazônia, Programa de Pós-Graduação em Entomologia, Laboratório de Hymenoptera, Av. André Araújo, 2936, Manaus, Amazonas, Brazil

²Florida State Collection of Arthropods, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, 1911 SW 34th St., Gainesville, FL 32608, USA

³Utah State University, Department of Biology, Logan, Utah 84322, USA

⁴Corresponding author: E-mail: pedroreck@gmail.com

Most velvet ants (Mutillidae) are solitary ectoparasitoids of the enclosed immatures of other insects: Hymenoptera, Diptera, Lepidoptera, Coleoptera, and Blattodea (Brothers *et al.* 2000, Amini *et al.* 2014). The genus *Traumatotutilla* André, 1901, of the subfamily Sphaerophthalminae, tribe Sphaerophthalmini (Sphaerophthalmina sensu Brothers), is one of the most diverse groups of this family in the New World tropics, with 175 species (Nonveiller 1990). The biology and behavior of its species, however, are virtually unknown and the only information regarding host associations for *Traumatotutilla* is either the result of misidentification or has been erroneously referenced.

The most recent account of the biology of *Traumatotutilla* was provided by Brothers (2006b), who reports Crabronidae and Apidae (Tapinotaspidini) species as known hosts of *Traumatotutilla*, with reference to da Cunha and Blochtein (2003). The latter paper refers to the parasitism of Apidae. The papers of Callan (1990, 1991) and Nonveiller (1990), which were not cited in Brothers (2006b), refer to *Stictia signata* (Linnaeus) (Crabronidae: Bembicinae, Bembicini, Bembicina) as host of *Traumatotutilla spegea* (Fabricius). The mutillid species was identified by D. Brothers (Callan 1990).

Da Cunha and Blochtein (2003) claim to have made the first host record for *Traumatotutilla* in South America, based on three males and one female that emerged from nests of *Monoeca xanthopyga* Harter-Marques, Cunha & Moure (Apidae: Apinae: Tapinotaspidini). Da Cunha (2004) repeated the same data as da Cunha & Blochtein (2003), but provided more detailed information regarding the methods in which the host/parasite relationship was established and the general behavior of the male and female Mutillidae on the study site. The same author also provided a picture of a female and male of the alleged *Traumatotutilla* species reared from *Monoeca xanthopyga* nest (Fig. 1), which despite its low resolution, allows for a clear observation of the main characteristics of the genus in question. The species pictured is actually a member of *Pseudomethoca* Ashmead, specifically *Pseudomethoca spixi* (Diller) (Fig. 2), a genus whose females can be recognized by having the head wider than the mesosoma and the first metasomal tergum sessile (Brothers 2006a). In contrast, *Traumatotutilla* females have the head as wide as or narrower than the mesosoma and the first metasomal tergum petiolate (Fig. 3) (Brothers 2006a). In light of this misidentification, the only reliable host association record for *Traumatotutilla* is the parasitism of *Stictia signata* from Crabronidae reported by Callan (1990, 1991).

By examining the morphology of *Traumatotutilla*, it is possible to infer the kind of hosts parasitized by the genus. According to Pitts & Manley (2004) and Williams *et al.* (2011), mutillid females with a well-defined pygidial plate, such as *Traumatotutilla*, generally parasitize ground-nesting hosts, while females with an undefined pygidial plate usually parasitize arboreal or twig-nesting hosts. Additionally, mutillid species that parasitize ground nesting hosts typically have the fore-tarsal rake and apical spines on the external margin of the basal tarsi conspicuously longer than those of the internal margin, while species that parasitize arboreal or twig-nesting hosts have the fore-tarsal rake reduced and the apical spines of the tarsi the same length on both the internal and external margins (Williams *et al.* 2011).

The phylogenetic position of *Traumatotutilla* and its tremendous diversity and morphological variability may also shed light on their host preferences. The genera *Traumatotutilla* André and *Dasymutilla* Ashmead are very similar and even placed in the same couplet by Brothers (2006a). Like *Traumatotutilla*, *Dasymutilla* is a large genus that includes around 200 species (Williams 2012), being one of the most commonly studied mutillid genera, with valid hosts recorded for twenty-seven genera in seven families. The majority of host records for *Dasymutilla* are from Apoidea: Apidae

(*Anthophora* Latreille, *Centris* Fabricius, *Diadasia* Patton, *Melissodes* Latreille, *Melitoma* Lepeletier & Serville, *Ptilothrix* Smith), Halictidae (*Lasioglossum* Curtis), Megachilidae (*Dianthidium* Cockerell, *Megachile* Latreille, *Nomia* Latreille, *Paranthidium* Cockerell & Cockerell), Crabronidae (*Bembix* Fabricius, *Bembecinus* A. Costa, *Cerceris* Latreille, *Clypeadon* Patton, *Glenostictia* Gillaspay, *Hoplisoides* Gribodo, *Microbembex* Patton, *Philanthus* Fabricius, *Sphecius* Dahlbom, *Steniolia* Say, *Stictia* Illinger, *Trypoxylon* Latreille), Sphecidae (*Chalybion* Dahlbom, *Sceliphron* Klug, *Sphex* Linnaeus) the genus *Myzinum* Latreille (Tiphidae) is the only non-apoid genus currently known as a valid host of *Dasymutilla*, specifically *D. quadriguttata* (Say). Doubtful host records for *Dasymutilla* are *Bombus* Latreille (Apidae) and *Polistes* Latreille (Vespidae), which were published by Fattig (1943) and reevaluated by Brothers *et al.* (2000). Because of their broad distribution, structural features, morphological variability, and similarity to *Dasymutilla*, we anticipate that future studies will reveal a wide range of hosts in Apoidea for *Traumatomutilla*.



FIGURES 1–3. 1. Female mutillid reared from nests of *Monoeca xanthopyga*, dorsal view, modified from da Cunha (2004). 2. *Pseudomethoca spixi* (Diller), ♀; dorsal view. 3. *Traumatomutilla lineifera* André, ♀, dorsal view.

Acknowledgements

We are grateful to A. Lelej for his help in editing and publishing this paper.

References

- Amini, A., Lelej, A.S., Sadeghi, H. & Karimi, J. (2014) First record of the velvet ants (Hymenoptera: Mutillidae) reared from puparia of the ber fruit fly *Carpomya vesuviana* Costa (Diptera: Tephritidae) in Iran. *Zootaxa*, 3861 (6), 585–590.
<http://dx.doi.org/10.11646/zootaxa.3861.6.5>
- 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.
- Brothers, D.J. (2006a) Capítulo 54: Familia Mutillidae. In: Fernandez, F. & Sharkey, M.J. (Eds.), *Introducción a los Hymenoptera de la Región Neotropical*. Sociedad Colombiana de Entomología & Universidad Nacional de Colombia, Bogotá D.C., pp. 577–594.
- Brothers, D.J. (2006b) Capítulo 14.4. Familia Mutillidae. In: Hanson, P.E. & Gauld, I.D. (Eds.), *Hymenoptera de la Región Neotropical*. The American Entomological Institute, Gainesville, FL, pp. 586–593.
- Brothers, D.J., Tschuch, G. & Burger, F. (2000) Associations of mutillid wasps (Hymenoptera, Mutillidae) with eusocial insects. *Insectes Sociaux*, 47, 201–211.
<http://dx.doi.org/10.1007/pl00001704>

- Callan, E. McC. (1990) (Jan. 31) 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.
- da Cunha, R. (2004) *Monoeca xanthopyga* (Hymenoptera, Apoidea, Tapinotaspidini), primeiro registro de hospedeiro para parasitoide do gênero *Traumatomutilla* (Hymenoptera: Mutillidae) na Serra Geral do Rio Grande do Sul. *Acta Scientiae*, 6 (2), 35–40.
- da Cunha, R. & Blochtein, B. (2003) Bionomia de *Monoeca xanthopyga* Harter-Marques, Cunha & Moure (Hymenoptera, Apidae, Tapinotaspidini) no Planalto das Araucárias, Rio Grande do Sul, Brasil. *Revista Brasileira de Zoologia*, 20 (1), 107–113.
<http://dx.doi.org/10.1590/s0101-81752003000100013>
- Fattig, P.W. (1943) The Mutillidae or velvet ants of Georgia. *Emory University Museum Bulletin*, 1, 1–24.
- Nonveiller, G. (1990) (Dec. 31) *Catalogue of the Mutillidae, Myrmosidae and Bradynobaenidae of the Neotropical Region including Mexico (Insecta, Hymenoptera)*. *Hymenopterorum Catalogus (Nova Editio)*, 18. SPB Academic Publishing, Den Haag, 150 pp.
- Pitts, J.P. & Manley, D.G. (2004) Review of *Lomachaeta* Mickel (Hymenoptera: Mutillidae) of North and Central America. *Zootaxa*, 474, 1–27.
- Williams, K.A. (2012) Systematics of Mutillidae (Hymenoptera) With Special Emphasis on *Dasymutilla* and Their Allies. – *All Graduate Theses and Dissertations*, Paper 1200. Available from: <http://digitalcommons.usu.edu/etd/1200> (accessed 26 November 2014)
- Williams, K.A., Brothers, D.J. & Pitts, J.P. (2011) New species of *Tobantilla* Casal, 1965 and a new genus and species, *Gogoltilla chichikovi* gen. et sp. nov., from Argentina (Hymenoptera: Mutillidae). *Zootaxa*, 3064, 41–68.