

Journal of Melittology

Bee Biology, Ecology, Evolution, & Systematics

The latest buzz in bee biology

No. 77, pp. 1–6

27 April 2018

BRIEF COMMUNICATION

Taxonomic note on the type species of *Centris* (*Melanocentris*) (Hymenoptera: Apidae)

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Abstract. *Centris* (*Melanocentris*) Friese is one of many subgenera that have been proposed throughout the taxonomic history of the bee genus *Centris* Fabricius. The lack of critical study of the type specimens of its type species, *Centris atra* Friese, resulted in the synonymy of *Melanocentris* with the subgenus *Ptilotopus* Klug. Subsequently, *Melacentris* Moure was described as a new subgenus to group the large number of species identified as *Melanocentris* before the synonymy was proposed. The study of the syntypes of *C. atra* and the designation of a lectotype (herein) leads to the revalidation of *Melanocentris* as a subgenus distinct from *Ptilotopus*, and necessitates the new synonymy of *Melacentris* with *Melanocentris*.

INTRODUCTION

Centris Fabricius, 1804 is one of the most speciose genera of solitary bees of the New World (Michener, 2007; Moure *et al.*, 2007; Rasmussen & Vivallo, 2014). The first division of *Centris* into multiple subgenera was by Friese (1901). All the supraspecific groups described by this author were created mainly using characteristics of coloration of the integument, which gave rise to artificial and extremely morphologically diverse groups (Michener, 1951). In addition to being defined artificially, none of Friese's subgenera had type species indicated in the original publications, these were designated later by Sandhouse (1943). These designations resulted in the synonymy of all Friese's subgenera with others previously proposed, with the exception of *Melanocentris* Friese.

Although the name *Melanocentris* remained valid, its original definition was completely altered after Sandhouse's (1943) designation of *Centris atra* Friese, 1899 as its type species, now not grouping only bees with a dark metasoma, but to a much more uniform group of species (see Michener, 1951, and Moure, 1950). The supraspecific

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doi: <http://dx.doi.org/10.17161/jom.v0i77.7100>

categories of *Centris* were studied again by Moure (1945, 1950) and Michener (1951), who both proposed new subgenera and new definitions of those already described. To facilitate the recognition of *Melanocentris*, Moure (1950) published a diagnosis based on females identified by him as *C. atra* collected in southern Brazil, along with males of *C. collaris* Lepeletier, 1841 and *C. dorsata* Lepeletier, 1841. In addition to the diagnosis, Moure (1950) provided a preliminary list of the species belonging to this subgenus and also indicated a possible synonymy between *C. atra*, *C. braccata* Packard, 1869, and *C. xylocopoides* Fox, 1899. The new interpretation of *Melanocentris* was followed by Michener (1951), who complemented Moure's (1950) species list, mentioning the similarity between these species with those of the subgenus *Ptilotopus* Klug, 1810.

In spite of the apparent taxonomic stability of *Melanocentris*, the real identity of its type species remained unclear since none of the authors who had cited it in their papers had studied the type series of *C. atra*. In the original description, Friese (1899) only mentioned that the species had a black coloration and pilosity, including the scopa, and a pair of humps on the mesoscutellum, basing his account on the study of a series of five females deposited at that time in his collection (two from Blumenau, Brazil), the Museum für Naturkunde der Humboldt-Universität (ZMB) (two from Colombia), and the Naturhistorisches Museum Wien (NMW) (one female without a locality indicated).

In 1995, Moure published an article on some species described by Friese deposited in ZMB, indicating that the type species designated by Sandhouse (1943) for *Melanocentris* corresponded to a member of *Ptilotopus*, an act that had two important consequences. On the one hand, it transformed *Melanocentris* into a junior synonym of *Ptilotopus* and, on the other, made necessary the creation of a new subgenus to group the numerous species that were up to then recognized as *Melanocentris* but which did not belong to *Ptilotopus*. For this, Moure (1995) described *Melacentris*, designating *C. dorsata* as its type species, the same taxon that he used years earlier for the diagnosis of *Melanocentris* (Moure, 1950). The designation of this species as type meant that the traditional interpretation of the subgenus was maintained, avoiding additional taxonomic confusion. Both of the supraspecific modifications proposed by Moure (1995) and the interpretation of the identity of *C. atra* were widely accepted and followed by all authors who worked with species of this group (see Michener, 2007; Moure *et al.*, 2007, and references therein). Moure (1995) also mentioned Friese's difficulty in identifying *C. atra*, evidenced in the diagnosis and in the key published in 1901 (Friese, 1901). This author concluded that this name should be applied to a species of *Ptilotopus* due to the pair of humps on the mesoscutellum mentioned in the original description and present in the female he received from ZMB identified as such, despite recognizing that the specimen was not one of the syntypes. Additionally, Moure (1995) indicated that the specimen from Blumenau (Brazil) identified by Friese as *C. atra* deposited at NMW corresponded to a melanic form of *C. dorsata*, not agreeing with the description of the species.

Despite the importance of this species for the supraspecific taxonomy of the genus, the actual type series of *C. atra* had not been studied, and it is necessary to designate a lectotype to resolve the true identity of this species and the higher taxon based upon it.

SYSTEMATICS

Recognition of the Type Specimens

Contrary to Moure's (1995) interpretation, the specimen identified as *C. atra* collected in Blumenau housed at NMW is not a melanic form of *C. dorsata*. Rather, it is a

different species, corresponding to one of the syntypes of *C. atra* mentioned by Friese (1899). Another female collected at the same locality and with similar labels to those of the syntype is in the Magyar Természettudományi Múzeum (HNHM, Budapest, Hungary), and also belongs to the type series. A third syntype female collected in Colombia and with Friese's original label of 1898 was found at ZMB. A fourth syntype female with a similar Friese label but without information on its provenance was found at the NMW. These latter two females are conspecific, but they correspond to a different unidentified species from those specimens from Blumenau. Considering the integrity of the specimen, the Brazilian syntype deposited at NMW is here designated as lectotype, definitively fixing the identity of the species.

Centris atra Friese

(Figs. 1–3)

Centris atra Friese, 1899: 41.

TYPE MATERIAL: Lectotype ♀, here designated with the following data label: Brasil Blumenau 1897 Virgil \ *Centris atra* n.sp. det. Friese, 1898 ♀ \ Lectotype *Centris atra* Friese, 1899 Des. F. Vivallo, 2017 (NMW) (Fig. 4). Paralectotypes: 1♀, Brasil Blumenau 1897 Virgil \ *Centris atra* type! Fr. ♀ 1900 Friese, det. (HNHM); 1♀, Columbien \ 19761 \ *Centris atra* ♀ det. Friese 1898 (ZMB); 1♀, [indecipherable handwriting] \ *Centris atra* n.sp. det. Friese 1898 (NMW).

Moure *et al.* (2007) mentioned São Paulo (Brazil) as one of the type localities, but that information does not agree with that provided in the original description of the species (Friese, 1899).

In order to facilitate the recognition of *C. atra*, a redescription of the species based on the lectotype is presented here, following the morphological terminology used by Vivallo (2016) and as originally proposed by Michener (2007) and Neff & Simpson (1981). The abbreviations T and S are used for metasomal terga and sterna, respectively. The morphological structures and the characters of coloration and surface sculpture mentioned below are those useful to identify this species and that vary between the species of *Melanocentris*.

DIAGNOSIS: This species can be recognized by the following combination of characters: Integument dark brown to black (Figs. 1–2). Labrum with punctuation denser towards the basal margin and on middle longitudinal line. Basitibial plates slightly lanceolate (Fig. 3). Fore elaiospathe with anterior secondary comb formed by five giant, apically curved setae.

DESCRIPTION: ♀: **Measurements (mm).** Total approximate length: 20.4. Head width: 6.47. Forewing length: 17.2. **Coloration.** Integument dark brown to black (Figs. 1–3). Distal margins of terga and sterna, except T6 and S6, dark brown, slightly translucent. Wings dark brown with greenish iridescence. **Sculpture.** Clypeus finely areolate with coarse and fine punctuation intermixed, denser towards sides; central longitudinal surface only with fine and very scattered punctures and very narrow, impunctate, longitudinal, slightly raised line not reaching epistomal sulcus. Labrum with coarse and fine punctuation intermixed, denser towards basal margin and on middle longitudinal line. Metasomal terga finely areolate, with fine and dense punctuation, coarser towards apex of metasoma, all terga except T6 with smooth distal margins. **Pubescence.** Dark brown to blackish (Figs. 1, 2). T1 and anterior surface of T2 with plumose hairs, T3–T6 with mostly simple and short pubescence, with some long hairs intermixed, longer on



Figures 1–4. Lectotype female of *Centris atra* Friese. 1. Head, frontal view (scale bar = 2 mm). 2. Habitus, lateral view (scale bar = 5 mm). 3. Basitibial plates (scale bar = 0.6 mm). 4. Labels of lectotype designated herein.

T4 and T5. **Structure.** Flabellum circular, slightly projected forward. Maxillary palpus with four palpomeres (relative lengths: $2^{\text{nd}} > 3^{\text{rd}} > 1^{\text{st}} > 4^{\text{th}}$). Mandible strongly curved apically with four teeth each with acute apex, except fourth truncate and broader than others. Clypeus convex, slightly flat on lower half (lateral view), lower margin concave (frontal view). Labrum triangular with rounded apex. Vertex above upper inter-orbital tangent (Fig. 1). Inner orbits of compound eyes relatively parallel (Fig. 1). Fore elaiospathe with anterior secondary comb formed by five giant apically curved setae. Mesoscutellum with two poorly developed protuberances. Basitibial plate elliptical, slightly lanceolate (Fig. 3). Secondary plate projected backwards (Fig. 3). Pygidial plate with truncate apex and secondary plate. Pretarsal claws with preapical tooth, except hind leg.

COMMENTS: The information of the labels on locality and collector of the specimen here designated as lectotype corresponds exactly to that cited by Friese (1899). In 1901, this author published additional information on the morphology of this species, along with doubtful distribution records taken from a miscellaneous series of misidentified specimens. In that article (Friese, 1901), the year of the collection of the specimens from Blumenau (1898) differs from that contained on the label (1897). The Brazilian specimens, as well as the one from Colombia cited above, agree with the original description, and are superficially similar to each other, all belonging to the same subgenus. Morphological characteristics shared by these females include the shape of the mandibles, and the basitibial and pygidial plates. This would imply no difference in

the higher level classification if the Colombian syntype had been chosen as the lectotype. As mentioned above, even though Friese (1899) cited five specimens forming the type series, only four of them were found. The depository and the current condition of the missing syntype remain unknown.

It is not clear how and when the specimens from Blumenau were deposited at NMW and HNHM. According to Rasmussen & Ascher (2008) there are other primary types of bees described by Friese in these institutions.

The identity of the specimen from Colombia is unclear. There are some undescribed species from northern South America that look superficially similar to *C. atra*, so that specimen could belong to one of them or to an already described species such as *C. braccata* or *C. xylocopoides* whose type specimens have not yet been studied in detail.

The motive that led Moure (1995) to identify the specimen housed at NMW as a melanic form of *C. dorsata* and not as one of the syntypes of *C. atra* is unknown. Both species have different morphological characteristics, like the apex of the fourth mandibular tooth (truncated in *C. atra* and concave in *C. dorsata*), the pubescence on the mesoscutum (dark brown to black in *C. atra* and yellowish in *C. dorsata*) and on T5 (blackish in *C. atra* and yellowish in *C. dorsata*), the coloration of T6 (dark brown to black in *C. atra* and yellowish in *C. dorsata*), the areolation of the clypeal disc (present in *C. atra* and absent in *C. dorsata*), the shape of the lower margin of the secondary basitibial plate (slightly angulate in *C. atra* and convex in *C. dorsata*), and the punctation pattern on the labrum (denser on basal margin and on central longitudinal area in *C. atra* and uniformly distributed in *C. dorsata*). All of these characters make both species unmistakable. On the other hand, the recognition of *C. atra* as a member of *Ptilotopus* was probably due to the erroneous interpretation of the information cited by Friese (1899, 1901) concerning the two protuberances on the mesoscutellum. The presence of protuberances is not exclusive to *Ptilotopus*, but is also observed in species of other subgenera, although with different shapes and sizes.

The presence of a secondary basitibial plate (Fig. 3), the lack of a strong tubercle on the anterior lower part of the hypoepimeral area, and the absence of well-defined glabrous areas on the mesoscutum and mesoscutellum indicate that *C. atra* does not belong to the subgenus *Ptilotopus*, but to *Melacentris sensu* Moure (1995). By designating this species as the type of *Melanocentris*, Sandhouse's (1943) decision requires that this name be revalidated, withdrawing it from synonymy of *Ptilotopus* and maintaining its traditional conception. Consequently, *Melacentris* is proposed as a new junior synonym of *Melanocentris*.

Genus *Centris* Fabricius

Subgenus *Melanocentris* Friese, **status revised**

Centris (*Melanocentris*) Friese, 1901: 244. Type species: *Centris atra* Friese, 1899, by subsequent designation of Sandhouse (1943: 569).

Centris (*Melacentris*) Moure, 1995: 947. Type species: *Centris dorsata* Lepelletier, 1841, by original designation. **New synonymy.**

COMMENT: A complete list of the species belonging to *Melanocentris* can be found in Moure *et al.* (2007) under the subgeneric name *Melacentris*.

ACKNOWLEDGEMENTS

I thank Michael Ohl (ZMB), Zoltán Vas (HNHM), Dominique Zimmermann, and Manuela Vizek (NMW) for allowing me to study the specimens housed in their collections. I also thank Paulina Mena (Central College of Pella, Iowa, USA), Claus Rasmussen (Aarhus University, Aarhus, Denmark), Jonathan Ross, and the anonymous reviewers for their help. Financial support was provided by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, grant 444320/2014-8), Brazil. This paper is part of the SIGMA project N°21565 MN/UFRJ and contribution number 19 from the HYMN.

REFERENCES

- Fabricius, J.C. 1804. *Systema Piezatorum secundum ordines, genera, species, adiectis synonymis, locis, observationibus, descriptionibus*. Reichard; Braunschweig [Braunschweig], Germany; 439+30 pp.
- Fox, W.J. 1899. Synopsis of the United States species of the hymenopterous genus *Centris* Fabr. with description of a new species from Trinidad. *Proceedings of the Academy of Natural Sciences of Philadelphia* 51: 63–70.
- Friese, H. 1899 [1900]. Neue Arten der Bienengattungen *Epicharis* Klug und *Centris* Fabr. *Természetráji Füzetek* 23: 39–48.
- Friese, H. 1901 [1900]. Monographie der Bienengattung *Centris* (s. lat). *Annalen des Kaiserlich-königlichen Naturhistorischen Hofmuseums, Wien* 15(3–4): 237–350.
- Klug, J. 1810. Einige neue Piezatengattungen. *Gesellschaft Naturforschender Freunde zu Berlin, Magazin für neuesten Entdeckungen in der gesammten Naturkunde* 4: 31–45, +1 pl.
- Lepelletier de Saint Fargeau, A.L.M. 1841. *Histoire Naturelle des Insectes – Hyménoptères* [tome II]. Librairie Encyclopédique de Roret; Paris, France; 680 pp.
- Michener, C.D. 1951. Subgeneric groups of *Hemisia* (Hymenoptera, Apoidea). *Journal of the Kansas Entomological Society* 24(1): 1–11.
- Michener, C.D. 2007. *The Bees of the World* [2nd Edition]. Johns Hopkins University Press; Baltimore, MD; xvi+[i]+953 pp., +20 pls.
- Moure, J.S. 1945. Apoidea da coleção do Conde Amadeu A. Barbiellini. II. (Hym. Apoidea). *Revista de Entomologia* 16(3): 394–414.
- Moure, J.S. 1950. Alguns agrupamentos novos de abelhas neotropicais (Hymenopt.-Apoidea). *Dusenía* 1(6): 385–394.
- Moure, J.S. 1995. Reestudo de alguns tipos de abelhas neotropicais descritos por Friese e conservados no Museu de Berlim (Apoidea, Colletidae, Anthophoridae). *Revista Brasileira de Zoologia* 12(4): 939–951.
- Moure, J.S., G.A.R. Melo, & F. Vivallo. 2007. Centridini Cockerell & Cockerell, 1901. In: Moure, J.S., D. Urban, & G.A.R. Melo (Eds.), *Catalogue of Bees (Hymenoptera, Apoidea) in the Neotropical Region*: 83–142. Sociedade Brasileira de Entomologia; Curitiba, Brazil; xiv+1058 pp.
- Neff, J.L., & B.B. Simpson. 1981. Oil-collecting structures in the Anthophoridae (Hymenoptera): Morphology, function, and use in systematics. *Journal of the Kansas Entomological Society* 54(1): 95–123.
- Packard, A.S. 1869. List of hymenopterous and lepidopterous insects collected by the Smithsonian expedition to South America, under Prof. James Orton [Appendix to the report on articulates]. *Annual Report of the Trustees of the Peabody Academy of Science* 1: 56–69.
- Rasmussen, C., & J.S. Ascher. 2008. Heinrich Friese (1860–1948): Names proposed and notes on a pioneer melittologist (Hymenoptera, Anthophila). *Zootaxa* 1833: 1–118.
- Rasmussen, C., & F. Vivallo. 2014. Lectotype designations and new synonymies in the Neotropical bee genus *Centris* Fabricius, 1804 (Hymenoptera: Apidae). *Zootaxa* 3856(4): 585–594.
- Sandhouse, G.A. 1943. The type species of the genera and subgenera of bees. *Proceedings of the United States National Museum* 92(3156): 519–619.
- Vivallo, F. 2016. Taxonomic note on the oil-collecting bee *Centris dimidiata* (Olivier, 1789) (Hymenoptera: Apidae: Centridini). *Zootaxa* 4162(3): 519–534.



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The *Journal of Melittology* was established at the University of Kansas through the efforts of Michael S. Engel, Victor H. Gonzalez, Ismael A. Hinojosa-Díaz, and Charles D. Michener in 2013 and each article is published as its own number, with issues appearing online as soon as they are ready. Papers are composed using Microsoft Word® and Adobe InDesign® in Lawrence, Kansas, USA.

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ISSN 2325-4467