



<http://dx.doi.org/10.11646/zootaxa.3821.1.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:0012C3A3-ACF5-44E1-9D4D-F427CEA3D0CC>

## Revision of the species of *Centris* (*Xanthemisia*) Moure, 1945 (Hymenoptera: Apidae: Centridini) from the Caribbean islands

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<sup>1</sup>Contribution number 7 from the *HYMN*

### Abstract

A revision of the species of *Centris* subgenus *Xanthemisia* Moure from the Caribbean islands is presented. The species identified are *C. aethiops* Cresson, *C. domingensis* Dalla Torre **nom. rev.** and *C. caymanensis*, a **new species** from the Cayman Islands, Lesser Antilles. Figures, morphological characters of both sexes and the description of the male of *C. domingensis* are given. New distribution records and an identification key for the three species of the subgenus that occur in the Caribbean islands are also provided.

**Key words:** Oil-bees, Taxonomy, West Indies, Neotropical Region.

### Introduction

The subgenus *Centris* (*Xanthemisia*) Moure, 1945 is a well-defined group of small/moderate-sized bees that occur throughout the Neotropics (Genaro, 2007, 2008; Moure *et al.*, 2007; Vivallo *et al.*, 2013). The species that belong to this subgenus are easily identified by two morphological synapomorphies related to females: mandibles with five teeth, one of them being on the inner surface at the base of the apical tooth, and the primary pygidial plate abruptly narrowed a short distance beyond the secondary plate (Moure, 1945; Silveira *et al.*, 2002; Michener, 2007; Vivallo *et al.*, 2013).

Despite containing a low number of species (Moure *et al.*, 2007; Vivallo *et al.*, 2013), *C.* (*Xanthemisia*) is widely distributed in the New World, being along with *Centris* (*Centris*) Fabricius, 1804, *C.* (*Hemisiella*) Moure, 1945, *C.* (*Heterocentris*) Cockerell, 1899, *C.* (*Melacentris*) Moure, 1995, *C.* (*Ptilotopus*) Klug, 1810 and *C.* (*Trachina*) Klug, 1807 one of the seven subgenera of Centridini that occur in the Caribbean islands (Moure *et al.*, 2007).

Notwithstanding its easy recognition and low species richness, *Centris* (*Xanthemisia*) has been only partially revised, with studies made in Argentina (Roig-Alsina, 2000), Colombia (Vivallo *et al.*, 2013), Central America and Mexico (Snelling, 1984), not existing additional regional nor a comprehensive revision of the subgenus.

To increase the knowledge of the species of *C.* (*Xanthemisia*), the species of this group that occur in the Caribbean islands are revised, providing a key, redescriptions based on type specimens, figures and new distributional records of the species that occur in this area, including the description of a new species from Grand Cayman, Cayman Islands, Lesser Antilles.

### Material and methods

The material studied is deposited in the following collections: Academy of Natural Sciences, Philadelphia, Pennsylvania, United States (ANSP), British Museum of Natural History, London, United Kingdom (BMNH), Claus Rasmussen Bee Collection (CRBC, University of Aarhus, Aarhus, Denmark), Coleção Entomológica Pe.

## Biogeography

The three species of *Centris* (*Xanthemisia*) that occur in the Caribbean islands are endemic to this area. This fact differs from the pattern observed in other species of Centridini such as *Centris* (*Centris*) *decolorata* Lepeletier, 1841 and *C. (Centris) smithii* Cresson, 1879 (Moure *et al.*, 2007), which are found in Central and South America and also have been collected on some islands of the West Indies (Moure *et al.*, 2007; Genaro, 2008; Bush & Madden, 2013).

According to current distribution records, *Centris caymanensis* **new species** and *C. domingensis*, two of the three species of *C. (Xanthemisia)* that occur in the Caribbean islands have a very restricted distribution, while the third, *C. aethiops*, has been collected on different islands relatively close to each other (Fig. 13).

Biogeographically, *Centris caymanensis* **new species** appears to be endemic to the Cayman Islands province (Grand Cayman) (Morrone, 2001a, b), which is characterized by the presence of dry forests and scrub vegetation (Dinerstein *et al.*, 1995). According to Rauchenberger (1988), this province is related to Cuba province (Morrone, 2001a, b), which, in turn, is related to Bahamas, Hispaniola, Jamaica and Puerto Rico provinces (Hamilton, 1988; Rauchenberger, 1988; Crother & Guyer, 1996; Morrone, 2001a, b).

*Centris domingensis* is reported only from Hispaniola (Dominican Republic), in the homonym biogeographic province (Morrone, 2001b), characterized by coniferous, rain and dry forests (Dinerstein *et al.*, 1995).

Finally, *Centris aethiops* is the species with the largest distribution range of the group, being present in the biogeographical provinces of Jamaica, dominated by rain and dry forests (Dinerstein *et al.*, 1995), Bahamas, with conifers and dry forests (Dinerstein *et al.*, 1995) and Cuba, with rain, dry and coniferous forests, scrub and swamps (Dinerstein *et al.*, 1995).

## Acknowledgments

I want to thank Jason Weintraub (ANSP), Claus Rasmussen (University of Aarhus, Denmark), Gabriel A. R. Melo (DZUP), Ana DalMolin, Ed Riley (TAMU), Frank Koch (ZMB) and Danny Vélez (Grupo de Insectos de Colombia, Universidad Nacional de Colombia) for the loan of specimens and/or for the information provided about some specimens deposited in their collections. I am grateful to David Notton for his help during my visit to BMNH, and to Vitor Nardino (Taxonline) for taking the pictures of the specimens studied here. I also want to thank Julio A. Genaro and the anonymous reviewers for comments and suggestions that helped to improve this article. Financial support was provided by Fundação de Apoio à Pesquisa do Estado do Rio de Janeiro, Brazil (FAPERJ, grant E-26/110.416/2014). This paper is part of the SIGMA project N°21565 MN/ UFRJ.

## References

- Ashmead, W.M.H. (1900) Report upon the Aculeate Hymenoptera of the islands of St. Vincent and Grenada, with additions to the parasitic Hymenoptera and a list of the described Hymenoptera of the West Indies. *Transactions of the Entomological Society of London*, 2, 207–367.  
<http://dx.doi.org/10.1111/j.1365-2311.1900.tb02379.x>
- Alayo, P. (1973) *Catálogo de los himenópteros de Cuba*. Editorial Pueblo y Educación, Havana city, 218 pp.
- Askew, R.R. (1994) Insects of the Cayman Islands. In: Brunt, M.A. & Davies, J.E. (Eds), *The Cayman Islands: Natural History and Biogeography*. Kluger Academic Publishers, pp. 333–356.
- Bush, S.P. & Madden, H. (2013) Preliminary checklist of the bees of St. Eustatius, Lesser Antilles (Hymenoptera: Apoidea: Anthophila). *Insecta Mundi*, 0298, 1–3.
- Cockerell, T.D.A. (1899) Notes on the nomenclature of some Hymenoptera. *The Entomologist*, 32, 14.
- Cockerell, T.D.A. (1906) The North American bees of the family Anthophoridae. *Transactions of the American Entomological Society*, 32, 63–116.
- Cresson, E.T. (1865) On the Hymenoptera of Cuba. *Proceedings of the Entomological Society of Philadelphia*, 4, 1–200.
- Cresson, E.T. (1869) Notes on Cuban Hymenoptera, with descriptions of new species. *Transactions of the American Entomological Society*, 2, 293–298.
- Cresson, E.T. (1879) Catalogue of North American Apidae. *Transactions of the American Entomological Society*, 7, 215–232.
- Cresson, E.T. (1916) The Cresson types of Hymenoptera. *Memoirs of the American Entomological Society*, 1, 1–141.
- Crother, B.I. & Guyer, C. (1996) Caribbean historical biogeography: Was the dispersal-vicariance debate eliminated by an

- extraterrestrial bolide?. *Herpetologica*, 52, 440–465.
- Dalla Torre, C.G. (1896) *Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus*. Lipsiae: Guilelmi Engelmann, 643 pp.
- Dinerstein, E., Olson, D.M., Graham, D.J., Webster, A.L., Primm, S.A., Bookbinder, M.P. & Ledec, G. (1995) *Una evaluación del estado de conservación de las ecorregiones terrestres de América Latina y el Caribe*. Banco Internacional de Reconstrucción y Fomento/ Banco Mundial, Washington, D.C., 135 pp.
- Fabricius, J.C. (1804) *Systema Piezatorum secundum ordines, genera, species, adjectis synonymis, locis, observationibus, descriptionibus*. Reichard, Brunsvigae, 439 pp.
- Friese, H. (1900) Monographie der Bienengattung *Centris* (s. lat.). *Annalen des K. K. Naturhistorischen Hofmuseums (Wien)*, 15, 236–350.
- Friese, H. (1902) Beitrag zur Apidenfauna der grossen Antillen. (Hym). *Zeitschrift für Systematische Hymenopterologie und Dipterologie*, 2, 196–201.
- Genaro, J.A. (2007) Las abejas (Hymenoptera: Apoidea: Anthophila) de La Hispaniola, Antillas. *Boletín de la Sociedad Entomológica Aragonesa*, 40, 247–254.
- Genaro, J.A. (2008) Origins, composition and distribution of the bees of Cuba (Hymenoptera, Apoidea, Anthophila). *Insecta Mundi*, 52, 1–16.
- Gerstaecker, A. (1867) Bericht über die wissenschaftlicher Leistungen im Gebiete der Entomologie während der Jahre 1865–66. *Archiv für Naturgeschichte*, 33, 305–533.
- Hamilton, S.W. (1988) Historical biogeography of two groups of Caribbean *Polycentropus* (Trichoptera: Polycentropidae). In: Liebherr, J.K. (Ed.), *Zoogeography of Caribbean insects*. Cornell University Press, Ithaca & Londres, pp. 153–182.
- Hedges, S.B. (2001) Biogeography of the West Indies: an overview. In: Woods, C.A. & Sergile, F.E. (Eds.), *Biogeography of the West Indies: Patterns and perspectives*. CRC Press, Boca Raton, pp. 15–33.
- Iturralde-Vinent, M.A. & MacPhee, R.D.E. (1999) Paleogeography of the Caribbean region: Implications for Cenozoic biogeography. *Bulletin of the American Museum of Natural History*, 238, 1–95.
- Klug, J.C.F. (1807) Kritische Revision der Bienengattungen in Fabricius neuem Piezatenysteme mit Berücksichtigung der Kirbyschen Bienefamilien und Illiger's Bemerkunde zu Kirbys Monographie. *Magazin für Insektenkunde*, 6, 200–228.
- Klug, J.C.F. (1810) Einige neue Piezantengattungen. *Magazin des Gesellschaft naturforschender Freunde*, 4, 31–45.
- Lepeletier, A.L.M. (1841) *Histoire naturelle des insectes - Hyménoptères II*. Librairie Encyclopédique de Roret (Paris), pp. 455–460.
- Lutz, F.E. & Cockerell, T.D.A. (1920) Notes on distribution and bibliography of North American bees of the families Apidae, Meliponidae, Bombidae, Euglossidae, and Anthophoridae. *Bulletin of the American Museum of Natural History*, 42, 491–641.
- Michener, C.D. (2007) *The Bees of the World*. 2<sup>nd</sup> Edition. Johns Hopkins University Press, Baltimore, Maryland, 992 pp.
- Michener, C.D. & Fraser, A. (1978) A comparative anatomical study of mandibular structure in bees. *The University of Kansas Science Bulletin*, 51, 463–482.
- Morrone, J.J. (2001a) Toward a cladistic model of the Caribbean: Delimitation of areas of endemism. *Caldasia*, 23, 43–76.
- Morrone, J.J. (2001b) *Biogeografía de América Latina y el Caribe*. M & T - Manuales y Tesis SEA, Zaragoza, 148 pp.
- Morrone, J.J. (2011) América do Sul e geografia da vida: comparação de algumas propostas de regionalização. In: Carvalho, C.J.B. & Almeida, E.A.B. (Orgs.), *Biogeografia da América do Sul Padrões e Processos*. Editora Roca, São Paulo, pp. 14–40.
- Moure, J.S. (1945) Apoidea da Coleção do Conde Amadeu Barbiellini II. (Hym. Apoidea). *Revista de Entomologia (Rio de Janeiro)*, 16, 394–414.
- 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, 939–951.  
<http://dx.doi.org/10.1590/s0101-81751995000400021>
- Moure, J.S., Melo, G.A.R. & Vivallo, F. (2007) Centridini Cockerell & Cockerell, 1901. In: Moure, J.S., Urban, D. & Melo, G.A.R. (Orgs.), *Catalogue of bees (Hymenoptera, Apoidea) in the Neotropical Region*. Sociedade Brasileira de Entomologia, Curitiba, pp. 83–142.
- Neff, J.L. & Simpson, B.B. (1981) Oil-collecting structures in the Anthophoridae (Hymenoptera): morphology, function and use in systematics. *Journal of the Kansas Entomological Society*, 54, 95–123.
- Pérez-Gelabert, D.E. (2008) Arthropods of Hispaniola (Dominican Republic and Haiti). *Zootaxa*, 1831, 1–530.
- Rauchenberger, M. (1988) Historical biogeography of Poeciliid fishes in the Caribbean. *Systematic Zoology*, 37, 356–365.  
<http://dx.doi.org/10.2307/2992198>
- Rodríguez-Durán, A. & Kunz, T.H. (2001) Biogeography of West Indian bats: an ecological perspective. In: Woods, C.A. & Sergile, F.E. (Eds.), *Biogeography of the West Indies: Patterns and perspectives*. CRC Press, Boca Raton, pp. 355–368.
- Roig-Alsina, A. (2000) Claves para las especies argentinas de *Centris* (Hymenoptera, Apidae), con descripción de nuevas especies y notas sobre distribución. *Revista del Museo Argentino de Ciencias Naturales*, 2, 171–193.
- Silveira, F.A., Melo, G.A.R. & Almeida, E.A.B. (2002) *Abelhas brasileiras Sistemática e Identificação*. Fundação Araucária, Belo Horizonte, 254 pp.
- Smith, F. (1874) A revision of the genera *Epicharis*, *Centris*, *Eulema*, and *Euglossa* belonging to the family Apidae, section Scopulipedes. *Annals and Magazine of Natural History*, 13, 357–373.

<http://dx.doi.org/10.1080/00222937408680879>

- Snelling, R.R. (1966) The taxonomy and nomenclature of some North American bees of the genus *Centris* with descriptions of new species (Hymenoptera: Anthophoridae). *Contributions in Science, Natural History Museum Los Angeles County*, 112, 1–33.
- Snelling, R.R. (1974) Notes on the distribution and taxonomy of some North American *Centris* (Hymenoptera: Anthophoridae). *Contributions in Science, Natural History Museum Los Angeles County*, 259, 1–41.
- Snelling, R.R. (1984) Studies on the taxonomy and distribution of American Centridine bees (Hymenoptera: Anthophoridae). *Contributions in Science, Los Angeles County Museum of Natural History*, 347, 1–69.
- Vélez, D. & Vivallo, F. (2012) A new South American species of *Centris* (*Heterocentris*) Cockerell, 1899 with a key to the species with horn-like projections on the clypeus (Hymenoptera: Apidae: Centridini). *Zootaxa*, 3357, 49–55.
- Vivallo, F. & Zanella, F.C.V. (2012) A new species of *Centris* (*Paracentris*) Cameron, 1903 from northeastern Brazil, with a key for the *Centris* species of the Caatinga region (Hymenoptera: Apidae). *Zootaxa*, 3298, 1–16.
- Vivallo, F., Vélez, D. & Fernández, F. (2013) A new species of *Centris* (*Xanthemisia*) Moure, 1945 from South America with a synopsis of the known species of the subgenus in Colombia (Hymenoptera: Apidae: Centridini). *Zootaxa*, 3694 (1), 81–91.
- <http://dx.doi.org/10.11646/zootaxa.3694.1.7>
- Vogel, S. (1974) Ölblumen und ölsammelnde Bienen. *Tropische und Subtropische Pflanzenwelt*, 7, 1–267.
- Woods, C.A. & Sergile, F.E. (2001) Biogeography of the West Indies: patterns and perspectives. Gainesville, FL: Sandhill Crane Press, 608 pp.