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Research article

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The primary types of some species of *Centris* bees described by European entomologists in the 18th and 20th centuries (Hymenoptera: Apidae)

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Abstract. In this paper are presented notes on the primary types of some species of the oil-collecting bees of the genus *Centris* described by the European naturalists and entomologists Amédée Louis Michel Lepeletier de Saint-Fargeau, Anders Christian Jensen-Haarup, Arthur Louis Marie Joseph Vachal, Charles Émile Blanchard, Embrik Strand, Félix Édouard Guérin-Méneville, Guillaume-Antoine Olivier, Jean Guillaume Audinet-Serville, Jean Pérez, Johann Christoph Friedrich Klug, Johann Ludwig Christ, John Obadiah Westwood, Josef Anton Maximilian Perty, Jules Dominique, Karl Hermann Konrad Burmeister, Karl Wilhelm von Dalla Torre, Massimiliano Spinola, Peter Cameron, and Wilhelm Ferdinand Erichson. Information on the type status, type locality and depository are provided. In order to stabilize some names, lectotype designations were made for *Centris rhodophthalma*, *C. sponsa* var. *asuncionis*, *C. transversa*, *Hemisia byssina* and *Ptilotopus americanus*. *Centris sponsa* var. *asuncionis* is withdrawn from the synonymy of *C. sponsa*, revalidated and raised to species level. *Centris byssina* is proposed as nomen oblitum and as a new junior synonym of *C. trigonoides*, nomen protectum.

Keywords. Anthophila, biodiversity, oil-collecting bees, solitary bees, systematics.

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Introduction

Centris Fabricius, 1804 is one of the New World solitary bee lineages with the highest species richness and one of the largest distribution ranges (Moure *et al.* 2007). This great specific diversity results in a complex taxonomic history, both of its subgenera and of the species that have been described.

In recent years, a series of taxonomic works on the species of the genus have been published (Vivallo 2016, 2019a, 2019b, 2019c, 2020a, 2020c, 2020e, 2020f, 2020g, 2020h, 2020i, 2020j) which allowed the stabilization of the nomenclature of the group and the proposition of new synonyms and revalidations.

The vast majority of the species in this group was described by European entomologists, who had access to the material that was collected in America and taken to Europe through scientific expeditions or by private collectors who later marketed their specimens (Vivallo 2020c). This material was deposited in the most important museums of the continent, being available to specialists such as Frederick Smith (1805–1879), Amédée Louis Michel Lepeletier de Saint-Fargeau (1770–1845), Sándor Mocsáry (1841–1915), Heinrich Friese (1860–1948), Johan Christian Fabricius (1745–1808), Adolf Ducke (1876–1959), Giovanni Gribodo (1846–1924), Curt Schrottky (1874–1937), and Theodore Dru Alison Cockerell (1866–1948), among others. The primary types of *Centris* described by those authors were studied by Vivallo (2019a, 2019b, 2020a, 2020c, 2020e, 2020g, 2020h, 2020i, 2020j), providing taxonomic stability to the group.

Continuing this line, the primary types of the species described by the European entomologists Anders Christian Jensen-Haarup, Arthur Louis Marie Joseph Vachal, Charles Émile Blanchard, Embrik Strand, Félix Édouard Guérin-Méneville, Guillaume-Antoine Olivier, Jean Pérez, Johann Christoph Friedrich Klug, Johann Ludwig Christ, John Obadiah Westwood, Josef Anton Maximilian Perty, Jules Dominique, Karl Hermann Konrad Burmeister, Karl Wilhelm von Dalla Torre, Massimiliano Spinola, Peter Cameron, Wilhelm Ferdinand Erichson, and Jean Guillaume Audinet-Serville with his friend Amédée Louis Michel Lepeletier de Saint-Fargeau are here studied, providing notes on the type status and depository of the type material.

Material and methods

All labels are here considered whitish and rectangular and the data contained on them is black, handwritten or printed unless otherwise indicated. The specific features of the labels, like coloration or type of writing, are given in square brackets ([]). The backward slash (\) indicates other labels on the pin of the same specimen, and two backward slashes (\\) indicate the information on the reverse of the label, all quoted verbatim. As a result of aging, some originally white labels now have a slightly yellowish coloration. To differentiate them from current white labels, they are indicated as “yellowish white”. Photographs were enhanced and organized in plates using Photoshop (ver. CS2). The specimens cited are housed in the following collections:

MACN	=	Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina
MHNN	=	Muséum d'Histoire naturelle de Nantes, Nantes, France
MNHN	=	Muséum national d'histoire naturelle, Paris, France
MNRJ	=	Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil
MSNT	=	Museo Regionale di Scienze Naturali di Torino, Torino, Italy
NHMD	=	Natural History Museum of Denmark, Copenhagen, Denmark
NHMUK	=	Natural History Museum, London, United Kingdom
OUMNH	=	Oxford University Museum of Natural History, Oxford, United Kingdom
ZMB	=	Museum für Naturkunde, Berlin, Germany
ZSM	=	Zoologische Staatssammlung München, Munich, Germany.

In most cases the authors cited here did not explicitly indicate how many specimens they used in the species descriptions and this cannot be inferred objectively from the original descriptions. Following the recommendation 73F of the International Code of Zoological Nomenclature (1999, ICZN henceforth), I have considered all specimens as from a syntype series, even if only a single exemplar was found in the collections studied. Exemplars designated lectotypes will be properly labeled as such, as well as eventual paralectotypes.

Results

Recognition of the type specimens

The primary types of the species studied were recognized following the information indicated in their respective original descriptions, place of deposit, as well as the data on labels of the specimens. Both

pieces of information were contrasted in order to verify the existence of inconsistencies that could interfere in the recognition of the primary types.

Charles Émile Blanchard

Charles Émile Blanchard (1819–1900) was one of the most famous French zoologists and entomologists of the 19th century. In 1833, when he was only 13 years old, Blanchard began to frequent the laboratory of the MNHN, thanks to the help of the famous French naturalist and entomologist Jean Victoire Audouin (1797–1841), who taught entomology at that institution. At the Museum, Blanchard became technician in 1838, and a few years later assistant-naturalist. He published valuable works in various zoological groups, which allowed him to occupy the chair of natural history of crustaceans, arachnids and insects. In 1860, he began to lose his sight and became blind in 1890. During this period, he gradually restricted access to the collections to amateurs, triggering a general decline in the museum's activities and, simultaneously, the dispersion of the collections. Blanchard died in Paris at the age of 80.

Blanchard's *Centris* bee

Blanchard described only one taxon in the genus *Centris*, the species *C. langsdorffii* Blanchard, 1840 in homage to the German naturalist, explorer and Russian diplomat Georg Heinrich von Langsdorff (1774–1852). Blanchard did not indicate the sex or the number of specimens studied for the description of this species, although based on the data mentioned, they must correspond to one or more females collected in Brazil. The specific locality where the material came from, as well as its collector, are unknown. It is possible that it was collected by Langsdorff himself during his stay as a Russian consul in Rio de Janeiro, Brazil. From there, he organized expeditions to Minas Gerais State, between 1813 and 1820, and to the Amazon between 1825 and 1829. Considering the current known distribution range of this species, its type material was probably collected during the first expedition in southeastern Brazil.

Unfortunately, the current whereabouts of the type material of *C. langsdorffii* are unknown. Possibly, it was lost during the dispersal of the collections of the MNHN between 1860 and 1892.

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Family Apidae Latreille, 1802
Genus *Centris* Fabricius, 1804

***Centris langsdorffii* Blanchard, 1840**

Centris langsdorffii Blanchard, 1840: 405 (spelled *langsdorsii* [sic] in the text and *langsdorffii* in the figure legend).

Type data

Syntypes female, whereabouts unknown.

Type locality

Brazil.

Karl Hermann Konrad Burmeister

Karl Hermann Konrad Burmeister (1807–1892) was a German naturalist, zoologist, entomologist, herpetologist, botanist and geologist. He was nationalized Argentinean and developed most of his career in that country. In 1850, Burmeister traveled to Brazil, visiting Rio de Janeiro and Minas Gerais states.

In the latter, he went to Lagoa Santa spending a season in company of the Danish naturalist and father of Brazilian paleontology and archeology Peter Wilhelm Lund (1801–1880).

From 1862 to 1892, Burmeister was director of the Argentinean Museum of Natural Sciences, currently known as Museo Argentino de Ciencias Naturales (MACN). He died in Buenos Aires in 1892, at the age of 85.

Burmeister's *Centris* bees

Burmeister described numerous species of flora and fauna from Argentina, four of them being bees of the genus *Centris*. Three of these species were described based on series of specimens of both sexes collected mainly in Mendoza and Buenos Aires. Although Burmeister did not indicate the name of the collector of those specimens, it is very likely that they were collected by him during his many trips into the interior of the country.

Some specimens of the primary series bear labels of holotype, paratype or allotype. However, they were labeled as such after the description of the species and not by Burmeister, since the handwriting is different, and mainly because the concept of paratype and allotype was not established in Burmeister's time. All type specimens are housed in the MACN.

Centris muralis Burmeister, 1876

Centris muralis Burmeister, 1876: 162–163.

Type data

This species was described based on specimens of both sexes collected in Mendoza and Rio Negro, Argentina. The lectotype male was designated by Moure (1960a) and it has the following data label: [light green label] Carm. Patag. [printed] \ [red-rimmed white yellowish label] 223 [handwritten] \ [light blue label] 100 [printed] \ [black-rimmed pink label] *Centris* [handwritten] HOLOTYPUS [printed] *muralis* Burm [handwritten] \ [white yellowish label] lectotipo desig Moure, 1960 [handwritten in blue] (MACN).

Paralectotype female with the following data label: [red-rimmed white yellowish label] 223 [handwritten] \ [light green label] Mendo-za. [printed] \ [black-rimmed white yellowish label] *muralis* Burm. Mendozae [handwritten] \ [black-rimmed pink label] *Centris* [handwritten] ALLOTYPUS [printed] *muralis* Burm [handwritten] (MACN).

In the MACN there is a conspecific (metander) male without collection locality but with the same number “223” present in the lectotype and the paralectotype specimens. This possible additional paralectotype has the following data label: [red-rimmed white yellowish label] 223 [handwritten] \ [black-rimmed light yellowish orange label] *Centris* [handwritten] PARATYPUS [printed] *muralis* Burm. [handwritten] (MACN).

Type locality

Argentina: Buenos Aires Province, Carmen de Patagones.

Centris nigriventris Burmeister, 1876

Centris nigriventris Burmeister, 1876: 165.

Type data

This species was proposed based on an undetermined number of specimens of both sexes collected in Mendoza and Buenos Aires. Two males and one female belonging to the type series were examined, the latter being here designated as lectotype. The chosen specimen has the following data label: [red-rimmed white yellowish label] 224 [handwritten] \ [light green label] Buen. Ayres. [printed] \ [black-rimmed white yellowish label] nigriventris Burm. Rep. Arg. [handwritten] \ [black-rimmed pink label] *Centris* [handwritten] ALLOTYPUS [printed] *nigriventris* Burm. [handwritten] (MACN).

Paralectotype male with the following data label: [red-rimmed white yellowish label] 224. [handwritten] \ [light green label] Mendo-za. [printed] \ [black-rimmed pink label] *Centris* [handwritten] HOLOTYPUS [printed] *nigriventris* Burm. [handwritten] (MACN).

Paralectotype male with the following data label: [red-rimmed white yellowish label] 224. [handwritten] \ [light green label] Mendo-za. [printed] \ [black-rimmed light yellowish orange label] *Centris* [handwritten] PARATYPUS [printed] *nigriventris* Burm. [handwritten] (MACN).

Type locality

Argentina: Buenos Aires Province, Buenos Aires.

Centris pectoralis Burmeister, 1876

Centris pectoralis Burmeister, 1876: 161–162 (junior synonym of *C. obsoleta* Lepelletier, 1841).

Type data

This species was described apparently based on a single female collected in Corrientes Province, Argentina. The holotype bears the following data label: [red-rimmed white yellowish label] 221. [handwritten] \ [light green label] Döcong [undecipherable handwriting] \ [black-rimmed white yellowish label] pectoralis Burm. Corrient. [handwritten] \ [black-rimmed pink label] *Centris* [handwritten] HOLOTYPUS [printed] *pectoralis* Burm [handwritten] (MACN).

Type locality

Argentina: Corrientes Province, Río Guayquiraró.

Centris vulpecula Burmeister, 1876

Centris vulpecula Burmeister, 1876: 164.

Type data

This species was described based on a series composed of specimens of both sexes collected in Uruguay, Brazil and in the Argentinean cities of Mendoza and Paraná. According to Roig-Alsina (2000), the specimen from Brazil corresponds to *C. tarsata* Smith, 1874 and those from Uruguay and Paraná to *C. trigonoides* Lepelletier, 1841. The male from Mendoza was designated by him as lectotype. The specimen has the following data label: [red-rimmed white yellowish label] 231. [handwritten] \ [light green label] Mendo-za. [printed] \ *vulpecula* Nobis [handwritten] \ [black-rimmed pink label] *Centris vulpecula* Burm. ♂ [handwritten] LECTOTYPUS [printed] A. Roig Alsina 2000 [handwritten] (MACN). The paralectotypes are also housed in the same collection.

Type locality

Argentina: Mendoza Province, Mendoza.

Peter Cameron

Peter Cameron (1847–1912) was a very enthusiastic English amateur entomologist and specialist of Hymenoptera. He was a very prolific, and by some considered chaotic, descriptor of species (Morley 1913). His collection is currently housed at NHMUK; his type specimens are also deposited in this collection, as well as at OUMNH. Cameron died in New Mills, England, aged 65.

Cameron's *Centris* bee

Cameron described only one species of *Centris* under the name *Paracentris fulvohirta* Cameron, 1903. The description was based on an undetermined number of males, collected by the English mountaineer, explorer and illustrator Edward Whymper (1840–1911). In 1880, Whymper organized an expedition to Ecuador, designed primarily to collect data for the study of altitude sickness and the effect of reduced pressure on the human body (Chisholm 1911). The results of his journey were published in 1892, in a volume entitled “*Travels amongst the Great Andes of the Equator*” (Bonney 1892). During his travel, Whymper made a collection of amphibians and reptiles that he handed over to the Belgian-British zoologist George Albert Boulenger (1858–1937) at the British Museum (Boulenger 1882). He also made a very large collection of insects that were housed in the same institution and later studied by Cameron.

Centris fulvohirta (Cameron, 1903)

Paracentris fulvohirta Cameron, 1903: 236 (junior synonym of *Centris caelebs* Friese, 1899).

Type data

Lectotype male (NHMUK, revised). Subsequent designation: Moure (1999). Data label: [light yellow label] *Paracentris fulvohirta* Cam. Type Ecuador [handwritten] \ [red-rimmed circular label] Type [printed] \ B.M. TYPE HYM. [printed] 17B.907. [handwritten] \ Cameron Coll. 1904–29. [printed] \ Michachi Ecuador 9–10,000 feet. Ed. Whymper. [printed] \ [black-rimmed] Lectotype *fulvohirta* Cm. [handwritten] Det. J.S. Moure 19 [printed] 57 [handwritten] \ [black-rimmed] *Centris (Paracentris) caelebs* Friese, 1900 F. Zanella det., 1998 [printed] (NHMUK).

Paralectotype with the following data label: *Paracentris fulvohirta* Cam. Type Ecuador [handwritten] \ [red-rimmed circular label] Type [printed] \ B.M. TYPE HYM. [printed] 17B.907. [handwritten] \ Cameron Coll. 1904–29. [printed] \ Quito [handwritten] Ecuador [printed] 9000 [handwritten] feet. Ed. Whymper. [printed] \ *C. fulvo-hirta*- paratype in the collection [handwritten] \ [white label with yellow lateral margins] PARALECTOTYPE [printed] *Paracentris fulvohirta* Cameron, 1903 [handwritten] (NHMUK).

Type locality

Ecuador: Pichincha Province, Machachi (9–10 000 feet).

Johann Ludwig Christ

Johann Ludwig Christ (1739–1813) was a German naturalist, gardener and pastor. Despite being a specialist in Hymenoptera, he also became interested in fruit growing, agriculture and beekeeping while he was a pastor, first in Wetterau and later in Kronberg, Germany (Wilhelm 1957). Christ died in his country of origin, aged 74.

Christ's *Centris* bee

Christ only contributed to the knowledge of *Centris* describing a variety of *C. flavifrons* (Fabricius, 1775) from Brazil. Currently, it is considered a junior synonym of that species.

Centris flavifrons brasiliانا (Christ, 1791)

Apis flavifrons brasiliانا Christ, 1791: 140 (junior synonym of *C. flavifrons*).

Type data

This variety was proposed based on an undetermined number of females collected in Brazil. Unfortunately, the whereabouts of the type material are currently unknown.

Type locality

Brazil.

Karl Wilhelm von Dalla Torre

Karl Wilhelm von Dalla Torre (1850–1928) was an Austrian naturalist. He studied mathematics and natural sciences at the Universität Innsbruck, where he was later hired as professor of zoology (Clément 1928). He studied actively the taxonomy of Hymenoptera, where he published several classic works on specific groups as well as the first catalogues of the order. Dalla Torre died in Innsbruck, aged 77.

Dalla Torre's *Centris* bee

Dalla Torre did not describe any species of *Centris*, but instead proposed a new name for *C. thoracica* Smith, 1874, a junior homonym of a species previously described by Lepeletier (1841). The primary type of *C. thoracica* Smith is currently housed at NHMUK and it bears the following data label: [red-rimmed circular label] Type H.T. [printed] B.M. TYPE HYM. [printed] 17B.904. [handwritten] St. Dom. 55.1. [printed] *Centris thoracica* Smith (Type) [handwritten] NHMUK 01081396 [QR code] (NHMUK).

Centris domingensis Dalla Torre, 1896

Centris domingensis Dalla Torre, 1896: 304 (nom. nov. for *C. thoracica* Smith, 1874).

Centris thoracica – Smith 1874: 370 (junior primary homonym of *C. thoracica* Lepeletier, 1841).

Jules Dominique

Jules Dominique (1838–1902) was a French abbé and naturalist, specialist of lichens and insects. He was in charge of organizing the entomological collection of Nantes, France, which houses a large part of his collection (Bureau 1903). Dominique died in his country of origin, aged 64.

Dominique's *Centris* bees

Dominique described three species in *Centris*, unfortunately, all currently considered junior synonyms. The specimens he studied were collected along the Maroni River by the family of Constant Bar (1817–1884) a French entomologist who lived in French Guiana.

Centris debilis Dominique, 1898

Fig. 1A

Centris debilis Dominique, 1898: 59 (junior synonym of *C. analis* (Fabricius, 1804)).

Type data

This species was proposed based on an unknown number of males. The lectotype was designated by Rasmussen *et al.* (2007) and it bears the following data label: [black-rimmed white yellowish label] Maroni Guyane-Française legs E. Bar [printed] \ Centris (Heterocentris) analis Fabricius, 1804 Det. Rasmussen & Mahé [printed] \ [red label] LECOTYPE Centris debilis Dominique, 1898 Des. Rasmussen, 2006 [printed] (MHNN) (Fig. 1A).

Type locality

French Guiana: Maroni River.

Centris dominiquella Dominique, 1898

Fig. 1B

Centris dominiquella Dominique, 1898: 59 (junior synonym of *C. nitens* Lepeletier, 1841).

Type data

This species was described based on an undetermined number of females. The lectotype was designated by Rasmussen *et al.* (2007) and it has the following data label: [black-rimmed white yellowish label] Maroni Guyane-Française legs. E. Bar [printed] \ Centris (C.) nitens Lepeletier de S.F., 1841 Det. Rasmussen & Mahé [printed] \ [red label] LECOTYPE Centris dominiquella Dominique, 1898 Des. Rasmussen, 2006 [printed] (MHNN) (Fig. 1B).

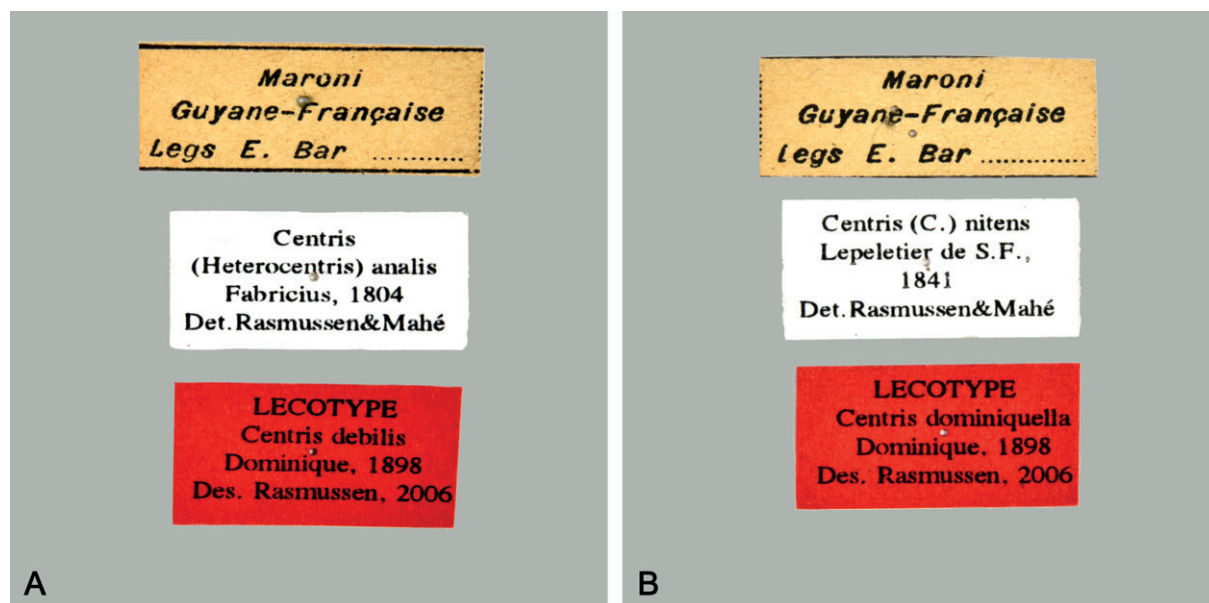


Fig. 1. Data labels. A. *Centris debilis* Dominique, 1898 (lectotype ♂). B. *Centris dominiquella* Dominique, 1898 (lectotype ♀).

Type locality

French Guiana: Maroni River.

Centris zonalis Dominique, 1898

Fig. 2A

Centris zonalis Dominique, 1898: 59 (junior synonym of *C. laticincta* (Spinola, 1841)).

Type data

Dominique described this species using an undetermined number of female specimens. The lectotype was designated by Rasmussen *et al.* (2007) and it has the following data label: [black-rimmed white yellowish label] Maroni Guyane-Française [printed] \ Centris (Melacentris) insignis Smith, 1854 Det. Rasmussen & Mahé [printed] \ [red label] LECTOTYPE *Centris zonalis* Dominique, 1898 Des. Rasmussen, 2006 [printed] (MHNN) (Fig. 2 A). Paralectotype female with the following data label: [black-rimmed white yellowish label] Maroni Guyane-Française [printed] \ Centris (Melacentris) insignis Smith, 1854 Det. Rasmussen & Mahé [printed] \ [yellow label] PARALECTOTYPE *Centris zonalis* Dominique, 1898 Des. Rasmussen, 2006 [printed] (MHNN).

Type locality

French Guiana: Maroni River.

Wilhelm Ferdinand Erichson

Wilhelm Ferdinand Erichson (1809–1848) was a German doctor and entomologist. He worked actively in different areas of zoology, mainly with beetles, which led him to be appointed curator of the Coleoptera collection of the ZMB (Klug 1850). Erichson died very young, only 39 years old.

Erichson's *Centris* bee

Erichson described several new species of insects, but only two in *Centris*. When he proposed them, *Hemisia* Klug, 1807 was considered the valid name of the genus, so he placed his species in it. Later, the genus name was updated to *Centris*.

Centris clitelligera (Erichson, 1848)

Hemisia clitelligera Erichson, 1848: 591 (junior synonym of *C. flavifrons*).

Type data

This species was proposed based on an undetermined number of females collected in Guyana. Unfortunately, the whereabouts of the syntypes are unknown.

Type locality

Guyana.

Centris varia (Erichson, 1848)

Hemisia varia Erichson, 1848: 591.

Type data

As the previous species, Erichson described this new taxon based on an undetermined number of females. The whereabouts of the syntypes are unknown.

Type locality

Guyana.

Félix Édouard Guérin-Méneville

Félix Édouard Guérin-Méneville (1799–1874) was a French entomologist, famous for his work “*Iconographie du Règne Animal de G. Cuvier*”, a complement to the work published by the French zoologists Georges Cuvier (1769–1832) and Pierre André Latreille (1762–1833). Guérin-Méneville founded several magazines of zoology and he was an active member of the Société Entomologique de France. He passed away in Paris, aged 74.

Guérin-Méneville’s *Centris* bee

Guérin-Méneville described a variety in the genus *Anthophora* Latreille, 1803 that actually belongs to *Centris*. Unfortunately, his contribution was unsuccessful, since the variety he proposed corresponds to a species previously described by Lepeletier in 1841.

***Centris versicolor apicalis* (Guérin-Méneville, 1844)**

Anthophora versicolor apicalis Guérin-Méneville, 1844: 455 (junior synonym of *C. poecila* Lepeletier, 1841).

Type data

This variety was described based on an undetermined number of females collected in Cuba. The whereabouts of the syntypes are unknown.

Type locality

Cuba.

Anders Christian Jensen-Haarup

Anders Christian Jensen-Haarup (1863–1934) was a Danish entomologist specialized in Hymenoptera. In 1904, he traveled to Argentina on an insect collecting expedition and spent most of his time in the province of Mendoza. In 1906, he returned to Argentina accompanied by his compatriot, colleague and friend Peter Jörgensen (1870–1937). Both naturalists made extensive collections of insects, which they had to sell to cover travel costs or send to specialists for identification (Rasmussen 2007). The specimens of his collection that were not sold or retained by some of their colleagues are currently housed at NHMD. Jensen-Haarup died in Denmark, aged 71.

Jensen-Haarup’s *Centris* bee

During his stay in Mendoza, Jensen-Haarup collected some specimens including a new species of *Centris* that he dedicated to Laureano Lyngbye, his host in the city. Although he did not indicate the date of collection, the specimens were probably collected during his second visit to Argentina.

Centris lyngbyei Jensen-Haarup, 1908

Fig. 2B

Centris lyngbyei Jensen-Haarup, 1908: 107–108.

Type data

To describe this species, Jensen-Haarup mentioned that he studied four females collected in Chacras de Coria, Argentina. However, the characters cited in the description belong to males, not females. The lectotype specimen was designated by Zanella (2002) and it bears the following data label: [black-rimmed] *Centris lyngbyei* n. sp. J.- Hrp [handwritten] Jensen-Haarup det. [printed] \ [black-rimmed] Chacr. de Coria Prov. de Mendoza Rep. Argentina Jensen-Haarup [handwritten] \ [black-rimmed] Type Coll. J = Hrp. [handwritten] \ [red label] Holo [handwritten] TYPE [printed] \ [white label with black discontinuous strokes] *Centris tricolor* ♀ [handwritten] 1907 Friese det. [printed] Fr. [handwritten] \ [pink label] LECTOTYPE *Centris lyngbyei* Jensen-Haarup, 1908 F. Zanella, 1999 [printed] \ ZMUC 00240257 [printed] (NHMD) (Fig. 2B).

Type locality

Argentina: Mendoza Province, Chacras de Coria.

Johann Christoph Friedrich Klug

Johann Christoph Friedrich Klug (1775–1856) was a German entomologist. He taught medicine and entomology at the Universität zu Berlin (currently the Humboldt-Universität zu Berlin) where he also worked as curator of the insect collection (Gerstaecker 1856). He died in Berlin, aged 80.

Klug's *Centris* bees

In 1810, Klug proposed *Ptilotopus* as a new genus, including in it a single species that he described simultaneously. The species is currently considered valid, but the genus was later downgraded and included as a subgenus of *Centris*.

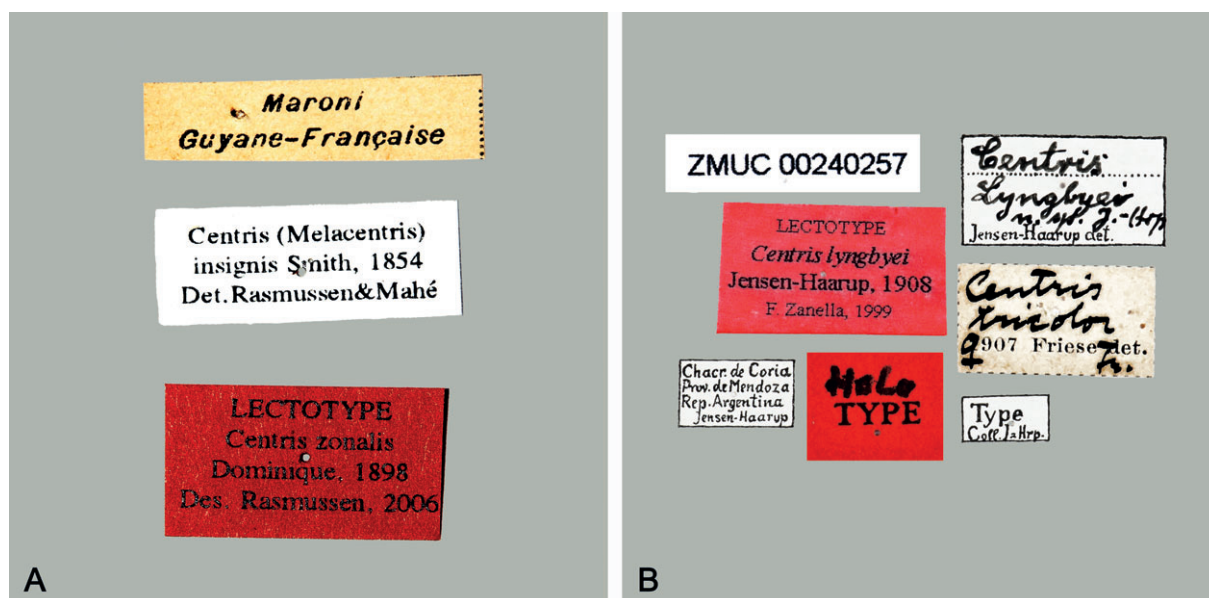


Fig 2. Data labels. A. *Centris zonalis* Dominique, 1898 (lectotype ♀). B. *Centris lyngbyei* Jensen-Haarup, 1908 (lectotype ♂).

A couple of years before that publication, Klug (1808) published an article on sexual dimorphism in Hymenoptera, citing some examples in several genera of wasps, ants and bees. Among his comments on species of *Centris*, he cited “*byssina*”, a species of *Hemisia* that had previously been named by the German entomologist and zoologist Johann Karl Wilhelm Illiger (1775–1813) but that he never formally described. Klug provided some morphological features that allow the identification of this species and the sex of the specimens he studied, resulting in its formal description. The species remained unnoticed during all these years, until a visit to the ZMB where I studied the specimens described by Klug, which had previously been recognized as such by another entomologist. The researcher designated one of the specimens as lectotype, but unfortunately, the nomenclatural act was never published. To formalize this action and avoid future taxonomic problems, this designation is published here, acknowledging the previous work carried out by him.

Centris americana (Klug, 1810)

Ptilotopus americanus Klug, 1810: 31.

Type data

This species was described based on an undetermined number of males from an unknown locality, according to Moure *et al.* (2007), “America”. A male studied by Klug from Cayenne was found at ZMB being here designated lectotype. The specimen bears the following data label: [green label] Cajen. Dy [handwritten] \ [red label] Type [printed] \ *Centris americana* [handwritten] 1907 Friese det. [printed] \ [white label with lateral red margins] LECTOTYPE [printed] *Ptilotopus americanus* Klug, 1810 [handwritten] desig. Melo, 2016 [printed] \ <http://coll.mfn-berlin.de/u/58fa3d> [QR code] (ZMB). As can be seen, this specimen was already labeled as lectotype, however, this designation has remained unpublished until now.

Type locality

French Guiana: Cayenne.

Centris byssina (Klug, 1808)

Fig. 3

Megilla byssina Illiger, 1806: 142 (nom. nud.).

Hemisia byssina Klug, 1808: 57 (nomen oblitum, new junior synonym of *C. trigonoides* Lepelletier, 1841 (nomen protectum)).

Type data

This species was described based on an undetermined number of males. At least part of the type series is housed at ZMB. The lectotype is here designated bearing the following data label (Fig. 3): [green label with black lower margin] Bah. Gom [handwritten] \ [white yellowish label] 1600 [printed] \ [white yellowish label] Zool. Mus. Berlin [printed in blue ink] \ [white label with red lateral margins] LECTOTYPE [printed] *Hemisia byssina* Klug, 1808 [handwritten] desig. Melo, 2016 [printed] \ <http://coll.mfn-berlin.de/u/58fa36> [QR code] (ZMB).

Type locality

Brazil.

Comment

This species was described several years earlier than *Centris trigonoides*. However, in this case the priority principle applies (ICZN 1999: article 23.9.1). This allows for prevailing usage of names when the “senior synonym has not been used as a valid name after 1899” (condition 23.9.1.1) and the junior synonym has been used “in at least 25 works, published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years” (condition 23.9.1.2). Under this circumstance, both conditions are met because the name ‘*byssina*’ was cited only once by Illiger (1906) as “*Megilla byssina*” (nom. nud.) and then it was completely forgotten, while *C. trigonoides* is by far one of the most cited Centridine bees (Vivallo 2019a). Considering this, and according to the article 23.9, *C. trigonoides* must be considered the valid name of the species (nomen protectum), and *C. byssina* one of its junior synonyms (nomen oblitum).



Fig. 3. *Hemisia byssina* Klug, 1808 (lectotype ♂). **A.** Frontal view. **B.** Habitus, lateral view. Scale bars: A = 0.5 mm; B = 2 mm.

Amédée Louis Michel Lepeletier de Saint-Fargeau and Jean Guillaume Audinet-Serville

Amédée Louis Michel Lepeletier de Saint-Fargeau (1770–1845) was a famous French entomologist, specialist of Hymenoptera and one of the pioneers in the study of *Centris* bees (Vivallo 2019a). After his death in 1845, his collection began to be fragmented (Casolari & Casolari Moreno 1980). One part was sent to the MNHN, and the other one was split and subsequently absorbed by the collections of the English entomologist and archaeologist John Obadiah Westwood (1805–1893) in the United Kingdom, and of the French-Italian entomologist and naturalist Massimiliano Spinola (1780–1857) in Italy (Baker 1994). Lepeletier died in France, aged 74.

Jean Guillaume Audinet-Serville (1775–1858) was a French entomologist and specialist of Orthoptera. Audinet-Serville was a friend of Lepeletier and they both contributed in the publication of the “*Encyclopédie Méthodique. Histoire Naturelle. Entomologie, ou Histoire Naturelle des Crustacés, des Arachnides et des Insectes*”. He passed away in France, aged 82.

Lepeletier & Serville's *Centris* bee

Although Lepeletier described several dozen species of *Centris*, only one of them was done in partnership with Serville. They included their new species in *Ptilotopus*, considered at that time to be a different group from *Centris* and not one of its subgenera as it is today.

***Centris americanorum* (Lepeletier & Serville, 1825)**

Ptilotopus americanorum Lepeletier & Serville, 1825: 239 (junior synonym of *C. americana*).

Type data

This species was proposed based on at least two males collected at an undetermined locality. Moure & Seabra (1960) found two of those specimens in the Spinola collection at MSNT, designating one of them as lectotype, but without providing additional information about its data labels. Unfortunately, the primary type of this species was not available during the preparation of this research.

Type locality

Unknown.

Guillaume-Antoine Olivier

Guillaume-Antoine Olivier was a French naturalist and entomologist. He was a very active collector and made a lot of expeditions, he was a very close friend of the Danish naturalist Johan Christian Fabricius, who in 1804 described the genus *Centris*. Olivier died in France, aged 58.

Olivier's *Centris* bee

Olivier proposed several new species of bees, but only one in *Centris*. The identity of this species was misunderstood, and it was only fixed recently by Vivallo (2016).

***Centris dimidiata* (Olivier, 1789)**

Apis dimidiata Olivier, 1789: 64.

Type data

Olivier described this species based on an undetermined number of females collected in French Guiana. The material studied by him is currently lost; therefore Vivallo (2016) designated a neotype in order to resolve taxonomic issues related to a couple of species that were proposed as junior synonyms. Unfortunately, the neotype female was subsequently destroyed. It had the following data label: HYMNRJ 000312 [printed] \ [black-rimmed white yellowish label] COLEÇÃO CAMPOS SEABRA [printed] \ [black-rimmed white yellowish label] PORTO VELHO Guaporé BRASIL XI-1954 M. Alvarenga, Dente, Pereira e Werner [printed] \ [red label] Neotype *Apis dimidiata* Olivier, 1789 F. Vivallo des., 2016 [printed] (MNRJ†).

Type localities

Original type locality: French Guiana, Cayenne. Neotype locality: Brazil, Rondônia State, Porto Velho.

Jean Pérez

Jean Pérez (1833–1914) was a French zoologist and entomologist. He worked as professor of zoology at the Faculty of Sciences of the University of Bordeaux, France, and was honorary member of the Société

entomologique de France (Anonymous 1916). During his professional career, he focused on the study of solitary and social bees. Pérez passed away in France, aged 80.

Pérez's *Centris* bees

Pérez published more than 100 articles and notes, two of them containing *Centris* bees. The first paper was published in 1905 and it contained the description of two new species from Mexico. The second article was published in 1911 and contained the description of a new species from northern Chile.

***Centris confinis* Pérez, 1905**

Centris confinis Pérez, 1905: 40 (junior synonym of *C. nitida* Smith, 1874).

Type data

This species was described based on an undetermined number of females. A single specimen of the type series was found at MNHN that was interpreted as “type” by Snelling (1984). This assumption can be considered a valid lectotype designation (ICZN 1999: article 74.6). The specimen bears the following data label: TYPE [printed in red] \ *Centris confinis* J. P. [handwritten] \ Type [handwritten with blue ink] (MNHN).

Type locality

“Mexique?”.

***Centris rhodophthalma* Pérez, 1911**

Centris rhodophthalma Pérez, 1911: 55–59.

Type data

This species was described based on an undetermined number of females collected in Chañarcillo, northern Chile by the Chilean naturalist Carlos Emilio Porter (1867–1942). A single female was found at MNHN that was cited by Moure *et al.* (2007) as holotype. However, I here consider it as syntype, following the recommendation 73F of the ICZN (1999). This specimen is here designated lectotype, and it bears the following data label: Chañarcillo [handwritten] \ TYPE [printed in red] \ *Centris rhodophthalma* J P [handwritten] (MNHN) (Fig. 4A).

Type locality

Chile: Atacama Region, Chañarcillo.

***Centris transversa* Pérez, 1905**

Fig. 4B

Centris transversa Pérez, 1905: 39–40.

Type data

This species was proposed based on specimens of both sexes collected by the French naturalist Léon Diguët (1859–1926) in Tehuacán, Puebla State, Mexico. Diguët traveled to Mexico where he worked as a chemical engineer. During this stay, as well as following six trips he made to this country, he collected specimens for the MNHN. One male and two females of the type series are found in that collection being

one of these latter designated here lectotype. The female has the following data label: [black-rimmed light green label] MUSEUM PARIS MEXIQUE ÉTAT DE PUEBLA ENV. DE TEHUACAN L. DIGUET 1903 [printed] \ [black-rimmed] *Centris* [printed] (*Hemisiella*) *transversa* Pérez ♀ [handwritten] det. Snelling [printed] '83 [handwritten] \ [light blue label] LECTOTYPE *Centris transversa* Pérez, 1905 des. F. Vivallo, 2017 [printed] (MNHN) (Fig. 4 B).

Paralectotype female with the following data label: [black-rimmed light green label] MUSEUM PARIS MEXIQUE ÉTAT DE PUEBLA ENV. DE TEHUACAN L. DIGUET 1903 [printed] \ *Centris transversa* Typus Perez [handwritten] \ *Centris nitida* Sm. R. du Burpron det. [handwritten] \ TYPE [printed in red] (MNHN).

Paralectotype male with the following data label: [black-rimmed light green label] MUSEUM PARIS MEXIQUE ÉTAT DE PUEBLA ENV. DE TEHUACAN L. DIGUET 1903 [printed] \ [black-rimmed] *Centris* [printed] (*Hemisiella*) *transversa* Pérez ♂ [handwritten] det. Snelling [printed] '83 [handwritten] \ [light blue label] PARALECTOTYPE *Centris transversa* Pérez, 1905 des. F. Vivallo, 2017 [printed] (MNHN).

At NHMUK was found a female which apparently belonged to the type species of this species. However, it was collected in 1904 and not in 1903, as Pérez cited explicitly the year of collection of his specimens; therefore, here it is not interpreted as a syntype. That exemplar has the following data label: Mexique, Tehuacan L. Diguets 1904 [handwritten] \ Schulz Coll. 1908-157. [printed] \ *Centris transversa* Typus ♀ Pérez [handwritten] \ [black-rimmed red label] spec. typ. [printed] \ [red-rimmed circular label] Type [printed] \ B.M. TYPE HYM. [printed] 17B905 [handwritten] (NHMUK).

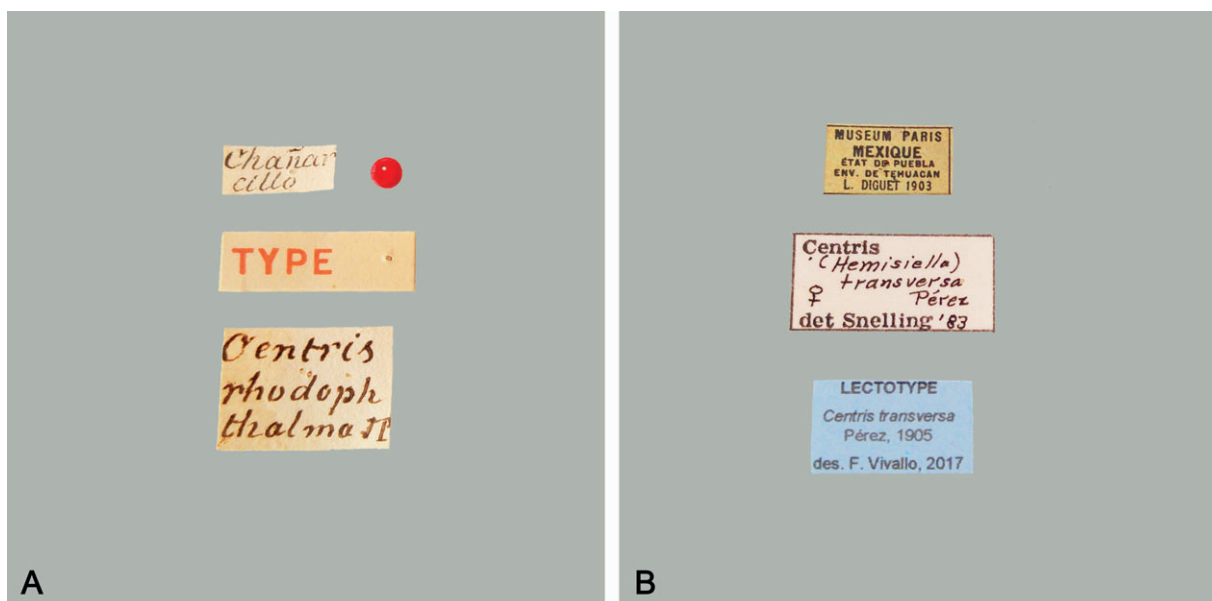


Fig. 4. Data labels. **A.** *Centris rhodophthalma* Pérez, 1911 (lectotype ♀). **B.** *Centris transversa* Pérez, 1905 (lectotype ♀).

Type locality

Mexico: Puebla State, Tehuacán.

Josef Anton Maximilian Perty

Josef Anton Maximilian Perty (1804–1884) was a German naturalist and entomologist. He was a professor of zoology at Ludwig-Maximilian-Universität München, and at Universität Bern, Switzerland (Hess 1887). Throughout his professional life, Perty published numerous articles on a wide variety of topics. All of them testify of a strictly scientific education, a wide knowledge of literature and a keen capacity for observation; but unfortunately, especially in his later years, also of a tendency towards miraculous and spiritualistic visions (Hess 1887). Perty passed away in Bern, aged 80.

Perty's *Centris* bees

Perty described a single species in *Centris* that was later transferred to *Eufriesea* Cockerell, 1908 (Apidae: Euglossini), and three species in *Xylocopa* Latreille, 1802 (Apidae: Xylocopini) that were later transferred to *Centris*. The type specimens of these species were collected by the German naturalist Johann Baptist von Spix (1781–1826) and the German doctor, botanist and anthropologist Carl Friedrich Philipp von Martius (1794–1868) during an expedition to Brazil.

***Centris flavicrus* (Perty, 1833)**

Xylocopa flavicrus Perty, 1833: 150 (junior synonym of *C. xanthocnemis*).

Type data

Perty described this species based on an unknown number of specimens of an undetermined sex. The type material of this species, which corresponds to females, is currently lost.

Type locality

Brazil: Piauí State.

***Centris moerens* (Perty, 1833)**

Xylocopa moerens Perty, 1833: 150.

Type data

As in the previous case, Perty did not indicate how many specimens he studied to describe this species. The lectotype female was designated by Moure (1960b, by inference of a holotype, ICZN 1999: article 74.6) and it has the following data label: [black-rimmed green label] Brasilien Coll. Perty [handwritten] [green-rimmed white yellowish label with green horizontal lines] 4. Brasil. *X. moerens* Perty [handwritten] [pink label] Holotypus [printed] *Xylocopa moerens* Perty ♀ Diller 1989 [handwritten] Zoologische Staatssammig. München [printed] (ZSM) (Fig. 4 A).

Type locality

Brazil: Minas Gerais State.

***Centris xanthocnemis* (Perty, 1833)**

Xylocopa xanthocnemis Perty, 1833: 150.

Type data

This species was proposed based on an undetermined number of males collected in Piauí State. The lectotype was designated by Moure (1960b, by inference of a holotype, ICZN 1999: article 74.6) and it bears the following data label: [black-rimmed green label] Piauí. Brasilien. Coll. Perty. [handwritten] [green-rimmed white yellowish label with green horizontal lines] 5. Bras. Piauí X. *xanthocnemis* Pty. [handwritten] [pink label] Lectotypus [printed] *Xylocopa xanthocnemis* Perty ♀ Diller 1989 [handwritten] Zoologische Staatssammlg. München [printed] (ZSM) (Fig. 4B).

Type locality

Brazil: Piauí State.

Massimiliano Spinola

Massimiliano Spinola was a French-Italian doctor, naturalist and entomologist. He descended from a rich and powerful family from Italy, with lands in Europe and South America, from which he received many insects. Thanks to his wealth, Spinola made extensive purchases of insect collections (Gestro 1915), which allowed him to make important contributions to the taxonomy of the orders Coleoptera, Hemiptera and Hymenoptera. He passed away in Tassarolo, Italy, aged 77.

Spinola's *Centris* bees

Spinola proposed six new species in *Hemisia*, at that time considered the valid name for *Centris*. According to Moure *et al.* (2007) the primary types of four of those species are housed at MSNT, but unfortunately, they were not available during the preparation of this article.

Centris bombiformis (Spinola, 1841)

Hemisia bombiformis Spinola, 1841: 148–149 (junior synonym of *C. americana*).

Type data

This species was described based on a female specimen. Moure & Seabra (1960) mentioned a male from Pará State, Brazil, housed at MNHN as the probable type of this species, which disagrees with the information provided by Spinola. However, that specimen was not found at MNHN, despite active search. The current condition and depository of the primary type is unknown.

Type locality

French Guiana: Cayenne.

Centris chilensis (Spinola, 1851)

Hemisia chilensis Spinola, 1851: 167.

Type data

Spinola described this species using an undetermined number of females collected in the Coquimbo mountain range, Chile. The whereabouts of the syntypes are unknown. According to Zanella (2002), they are also probably housed at MSNT (not examined).

Type locality

Chile: Coquimbo Region.

Centris laticincta (Spinola, 1841)

Hemisia laticincta Spinola, 1841: 148.

Type data

Spinola proposed this species using two females from French Guiana. The syntypes are at MSNT (not examined).

Type locality

French Guiana: Cayenne.

Centris leprieuri (Spinola, 1841)

Hemisia leprieuri Spinola, 1841: 146–147 (junior synonym of *C. decolorata* Lepeletier, 1841).

Type data

This species was based on a single female collected in Cayenne, French Guiana. The holotype is housed at MSNT (not examined).

Type locality

French Guiana: Cayenne.

Centris nigerrima (Spinola, 1851)

Hemisia nigerrima Spinola, 1851: 167.

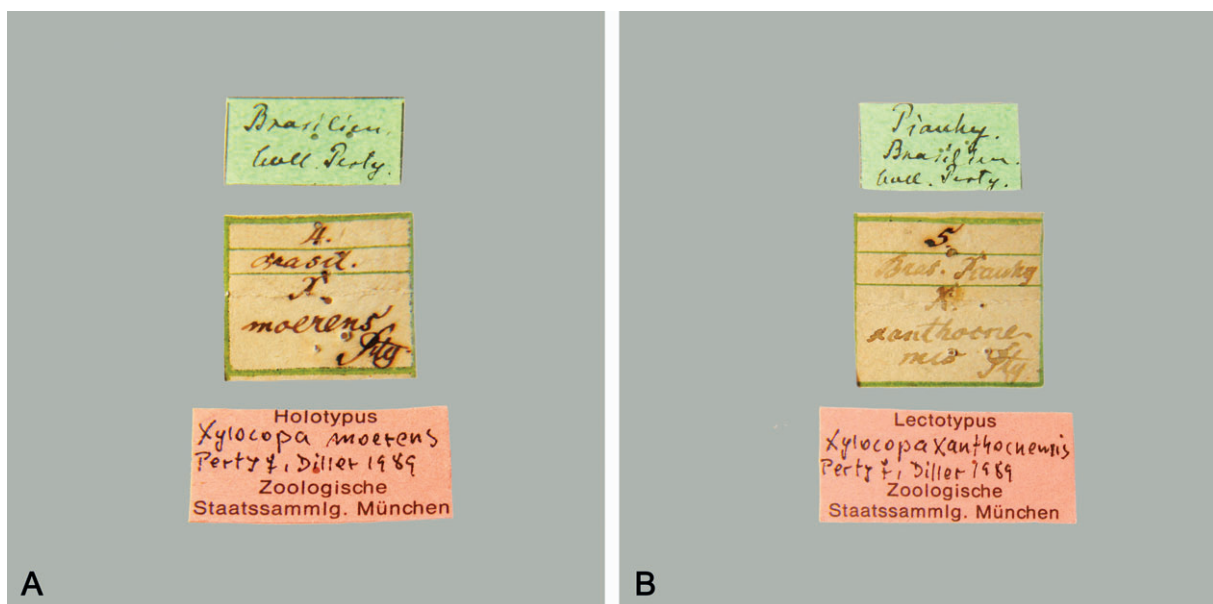


Fig. 5. Data labels. **A.** *Xylocopa moerens* Perty, 1833 (lectotype ♀). **B.** *Xylocopa xanthocnemis* Perty, 1833 (lectotype ♂).

Type data

This species was described based on specimens of both sexes collected in northern Chile. The syntypes are at MSNT (not examined).

Type locality

Chile: Coquimbo Region, Coquimbo.

Centris pyropyga (Spinola, 1841)

Hemisia pyropyga Spinola, 1841: 148 (junior synonym of *C. nobilis* Westwood, 1840).

Type data

Spinola described this species using a single female specimen. The holotype is currently housed at MSNT (not examined).

Type locality

French Guiana: Cayenne.

Embrik Strand

Embrik Strand (1876–1947) was a Norwegian botanist, entomologist, arachnologist and naturalist. Between 1901 and 1903, he worked as curator in the Museum of Zoology of the Universitetet i Kristiania, currently Universitetet i Oslo (University of Oslo), Norway. Later he moved to Germany to continue his studies in zoology. In Norway, Strand worked at different museums and universities until 1923, when he moved to Latvia. There he worked as professor of zoology at the Rīgas Universitāte, currently Latvijas Universitāte (University of Latvia) (Natvig 1944). Specimens of the Strand's collection can be found in the Zoological Museum of the University of Oslo, and in the ZMB. Strand passed away in Riga, Latvia, aged 71.

Strand's *Centris* bee

Strand described a single taxon in *Centris*, the variety *C. sponsaasuncionis* Strand, 1910. The description was based on specimens collected by the Hungarian pharmacist, biologist, botanist and researcher János Dániel Anisits (1856–1911). Anisits migrated to Paraguay after he graduated as a pharmacist in Budapest (Vivallo 2020d). In this country he worked actively, collecting biological material and discovering several new species, mainly plants (Magyarország és Latin-Amerika 2019).

This variety remained forgotten until it was cited by Moure *et al.* (2007) as junior synonym of *C. sponsa* Smith, 1854. Despite the similarity between them, they seem to be different species. Here, it is proposed to withdraw *C. sponsa asuncionis* from the synonymy of *C. sponsa*, revalidate it and raise it to species level.

Centris asuncionis Strand, 1910 nom. rev.

Centris sponsa var. *asuncionis* Strand, 1910: 521–522.

Type data

Strand proposed this variety based on several specimens of both sexes collected in the cities of Asunción and Sapucaí, in SE Paraguay. Two males and one female of the type series were found at ZMB, the latter

being designated lectotype. The female specimen bears the following data label: [black-rimmed white yellowish label] Asuncion, Paraguay J.D. Anisits [printed] Villa Morra 19.II.06 [handwritten] \ *Centris sponsa* var. *asuncionis* m. [handwritten] Strand det. [printed] \ [black-rimmed red label] Type [printed] \ [white label with lateral red margins] LECTOTYPE [printed] *Centris sponsa asuncionis* Strand, 1910 [handwritten] desig. Melo, 2016 [printed] \ <http://coll.mfn-berlin.de/u/58fa33> [QR code] (ZMB).

Paralectotype male with the following data label: Asuncion, Paraguay J.D. Anisits [printed] 10.II.06 [handwritten] \ *Centris sponsa* v. *asuncionis* m. [handwritten] Strand det. [printed] \ [white label with lateral yellow margins] PARALECTOTYPE [printed] *Centris sponsa asuncionis* Strand, 1910 [handwritten] desig. Melo, 2016 [printed] (ZMB).

Paralectotype male with the following data label: Asuncion, Paraguay J. D. Anisits [printed] Sapucay XII.04 [handwritten] \ [black-rimmed red label] Type [printed] \ *Centris sponsa* v. *asuncionis* m. [handwritten] Strand det. [printed] (ZMB).

The lectotype and one paralectotype were previously labeled as such, but those designations remained unpublished. I agree with that interpretation and maintain both specimens as such.

Type locality

Paraguay: Distrito Capital, Asunción (Villa Mora).

Arthur Louis Marie Joseph Vachal

Best known as Joseph Vachal (1838–1911), he was a French notary, politician, entomologist, and the 5th most prolific describer ever of new bee taxa (Rasmussen 2012). Thanks to his contact with the French entomologist and carcinologist Eugène Louis Bouvier (1856–1944), former chair of entomology at the MNHN, Vachal started working at the Museum, deciding that after his death, his entire entomological collection would be donated to that institution (Rasmussen 2012). He passed away in Argentat, France, at the age of 72.

Vachal's *Centris* bee

Vachal described *Centris autrani* Vachal, 1904 based on specimens collected by the French naturalist Gustave-Adolphe Baer (1839–1918) between 1902 and 1903 in northern Argentina. The name of this species was in homage of his friend and colleague the Austrian botanist Eugène John Benjamin Autran (1855–1912), at that time, a senior official of the Ministry of Agriculture of Argentina.

***Centris autrani* Vachal, 1904**

Centris autrani Vachal, 1904: 16 (junior synonym of *C. flavohirta* Friese, 1899).

Type data

Vachal described this species based on two females and one male from Argentina and one female from Arica, Chile. Apparently, this type series was composed by at least two species, because *C. autrani* (= *C. flavohirta*) does not occur in Chile (Vivallo 2020b). Unfortunately, the female from Chile was not found during the preparation of this paper. The rest of the type series, including the lectotype male designated by Zanella (2002) is housed at MNHN. The specimen bears the following data label: [yellowish label] ARGENTINE PROV. TUCUMAN LARA 4000M G. A. BAER, 2-1903 [printed] \ [yellowish label] MUSEUM PARIS [printed] Tucuman A. Baer 1903 [handwritten] \ [yellowish label] *Centris autrani* 1903 n. sp J. Vachal [handwritten] \ [red label] TYPE [printed] \ [white label] LECTOTYPE *Centris autrani* Vachal F. Zanella, 2002 [printed] (MNHN).

Despite Vachal mentioning only four specimens in the original description, another six males with the same original label of Baer were found at MNHN. Those specimens were labeled as paralectotypes by Zanella (2002).

Type locality

Argentina: Tucumán Province, Lara.

John Obadiah Westwood

John Obadiah Westwood (1805–1893) was an English entomologist, archaeologist and the first appointed curator of the Hope Entomological Collections at the Oxford University Museum of Natural History (Anonymous 1893). Westwood was one of the first entomologists with an academic position at the University of Oxford. He donated to that institution his insect collection which was later incorporated to the Hope Collection (Wandolleck 1894). Westwood died in Oxford, aged 87.

Westwood's *Centris* bee

Westwood described a single species in *Centris*, based on an undetermined number of specimens that belonged to the collection of the British entomologist and naturalist Frederick William Hope (1797–1862). In 1849, Hope gave his entire collection of insects to the University of Oxford (Baker 1994), which included the specimens studied by Westwood. Currently, it is formally known as the Hope Entomological Collections and it is held by the Oxford University Museum of Natural History (OUMNH).

Centris nobilis Westwood, 1840

Centris nobilis Westwood, 1840: 263–264.

Type data

Westwood proposed this new species based on an undetermined number of females from an unknown locality in South America. Moure & Seabra (1960) studied a single female housed at OUMNH that they recognized as “type”. According to the article 74.6 (ICZN 1999), this assumption can be treated as a valid lectotype designation. The specimen bears the following data label: *Centris nobilis* Westw Nat Lib. Bees P 264 Pl 20 FI [handwritten] (OUMNH).

Type locality

“Locality doubtful; but in all probability South America”.

Discussion

The detailed transcription of the labels of the type material is essential to unequivocally recognize the specimen or specimens that were used to describe a certain species. In many cases, only through this procedure is it possible to detect inconsistencies between the information contained in the original descriptions and in the labels of the specimens considered primary types. The careful and detailed execution of this procedure allows confirmation of the status of the material, as well as the identity of a particular species.

As is often the case with old descriptions, it is not always possible to know the number of specimens studied with only the information indicated in the original description, since often they only mention male and female characteristics in a general way. In these cases, it is prudent to consider such specimens as part of a type series and designate a lectotype. This procedure brings taxonomic stability by fixing the

name of the species. Otherwise, complex problems may arise where the same name is being applied to more than one species as a result of a lack of extensive taxonomic work. This point is especially important in those cases in which the species were described from syntypes or composed of type series that ended up distributed in different collections. Among the old melittologists, perhaps the most exemplary case is that of Heinrich Friese, who described a large number of species of *Centris* bees mostly based on series of specimens deposited in several American and European collections (Vivallo 2019b, 2020c) using a very confusing and inaccurate labeling system (Rasmussen & Ascher 2008).

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