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A NEW SPECIES OF *XYLOCOPA* (*NANOXYLOCOPA*) FROM BRAZIL (HYMENOPTERA, APIDAE)

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ABSTRACT

Xylocopa bella sp. nov., the second known species of the subgenus *Xylocopa* (*Nanoxylocopa*) Hurd & Moure, is newly described from the Espinhaço mountain range, in the state of Minas Gerais, and the Chapada Diamantina, in the state of Bahia, in eastern Brazil. It differs from *X. ciliata* Burmeister, the type species of *X. (Nanoxylocopa)*, mainly by the possession, by females, of pale hairs intermixed with the black pubescence on the head and metasoma, the more abundant pubescence on mesoscutum and the much denser tergal pilosity, and the possession, by the male, of weakly infumated wing membrane, entirely dark scape, a patch of finely plumose pubescence on the anterior corners of the mesoscutum, narrower face, and shorter distance between the lateral ocellus and the eye. Additionally, *X. ciliata*, previously known from Argentina, Uruguay, Paraguay and southern Brazil, is newly recorded from the state of Minas Gerais.

KEY-WORDS: Carpenter bees; Neotropical; New species; Xylocopini.

INTRODUCTION

The large carpenter bees-genus *Xylocopa* Latreille are ubiquitous components of the tropical and subtropical bee faunas worldwide. Together with other groups of solitary bees, the carpenter bees have received increased attention in recent years due to their role as pollinators of cultivated plants (e.g., Yamamoto *et al.*, 2014). A total of 17 subgenera, all of them having species in the Neotropical region, were recognized for the New World fauna by Hurd & Moure (1963) in their worldwide monograph of the carpenter bees. While the two most speciose New World subgenera, *X. (Neoxylocopa)* and *X. (Schonherria)*, contain respectively 50 and 30 species (Moure, 2007), most subgenera are monotypic or possess only a few species. The diversity of the genus in the neotropics, however, remains poorly studied and new species are being

discovered in originally monotypic subgenera (e.g., Zanella & Silva, 2010). Here, an additional subgenus believed to be monotypic has its diversity increased with description of a second species. The present work is part of an ongoing study on the phylogeny and classification of the Neotropical subgenera of *Xylocopa*.

MATERIAL AND METHODS

Material from the following institutions was examined: **DZMG** – Departamento de Zoologia, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil; **DZUP** – Coleção de Entomologia Pe. Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba, Brazil; **MZUSP** – Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil. In the list of type material, the quotation marks indicate the different labels

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for the same specimen, the backslashes (\) indicate different lines on the same label. The general morphological terminology follows Urban (1967), Silveira *et al.* (2002) and Michener (2007). Antennal flagellomeres are indicated as F1, F2, etc.; metasomal terga and sternae, respectively, as T1 to T7, and S1 to S8. The density of punctation and intervals between the punctures are based on relative puncture diameter, pd (*e.g.*, < 1 pd: less than 1× the puncture diameter between the punctures). In the species description, the following measurements, all taken as minimum distances, should be interpreted as follows: (a) length of subantennal suture: from pit under antennal alveolus to upper section of epistomal suture; (b) interalveolar distance: from inner rim of one alveolus to the closest inner rim of opposite alveolus; (c) alveolocular distance: from inner rim of alveolus to inner orbit; (d) malar space: from lower orbit to margin of mandibular cavity. The color images of the specimens were taken on a camera Nikon Coolpix 995 attached to a stereomicroscope Leica MZ7, and processed by the software CombineZ.

Taxonomy

Xylocopa (*Nanoxylocopa*) **Hurd & Moure, 1963**

This subgenus was proposed by Hurd & Moure (1963) for a single species, *X. ciliata* Burmeister, 1876. The new species described here, *X. bella* sp. nov., was recognized a long time ago by Moure based on a single female from Minas Gerais. The name remained unpublished and it is here proposed after additional specimens from Bahia have been obtained, including the male. The female of the new species shares with *X. ciliata* the characteristic medial protuberance on the frons, with a tuberculiform shape and positioned almost halfway between the upper tangent of the antennal alveoli and the lower tangent of the anterior ocellus, a medial emargination on the posterior margin of the S1, and the gentle curvature of the posterior margin of the metanotum, which advances onto the metapostnotum medially (this last character is shared with females of a larger clade to which the subgenus belongs). Also, the male of *X. bella* sp. nov. has the typical large and coarsely punctate tegulae exhibited by the males of *X. ciliata*.

One of the features exhibited by the male of *X. bella* sp. nov., but absent in *X. ciliata*, is a distinct patch of dense plumose pubescence on the anterior corners of the mesoscutum. Judging from the tight interweaving of the fine hairs, which form a mat on each corner, the structure is likely the evaporative surface of an underlying gland. This character has been observed also on

males of a larger group, including those of *X. (Mega)xylocopa*, *X. (Neo)xylocopa*, *X. (Steno)xylocopa*, *X. (Xylocopina)*, and *X. (Xylocopoda)*. Although not available for study, males of *X. (Cirro)xylocopa* and *X. (Mono)xylocopa* are expected to also possess this character, due to their close relationship with *X. (Nano)xylocopa* and *X. (Xylocopoda)* (unpublished data). Males of *X. (Steno)xylocopa* have a derived condition, in which the patches are smaller and displaced slightly backwards, leaving a glabrous and shiny area on the mesoscutum corners. Among females, only those of *X. (Xylocopina)* possess such plumose patches on their mesoscutum.

Xylocopa (*Nanoxylocopa*) ***bella* sp. nov.**

(Figs. 1-6)

Diagnosis and Comments

In addition to the slightly smaller body size, females of *X. bella* sp. nov. can be distinguished from those of *X. ciliata* by the possession of pale hairs intermixed with the black pubescence on the head and metasoma, by the more abundant pubescence on mesoscutum, the much denser tergal pilosity, the mostly plumose pilosity on the dorsal portion of T1, gena with less coarse punctures, the less coarse and denser punctation on the mesoscutum, tergal punctation finer than that on vertex, apex of hind tibia with a single spine, and by the straight posterior margin of the S2 to S5. The males differ from those of *X. ciliata* by the lighter wing membrane, which is light-brown infumated and lacks metallic reflexes, the entirely dark scape, the paler pilosity on the head and metasoma, the patch of finely plumose pubescence on the anterior corners of the mesoscutum, the decumbent short pilosity on the discs of the T3 and T4, the finer punctation of the gena, the narrower face, the shorter distance between the lateral ocellus and the eye, the much narrower head behind the eyes, the slanted metanotum and the less protruding basal portion of the propodeum.

Distribution

The known records indicate a distribution from the Serra do Espinhaço, in central Minas Gerais to the Chapada Diamantina, in central Bahia.

Description

Holotype female: Approximate body length, 14 mm; forewing, including tegula, 12.5 mm. Body integument mostly black, except for dark reddish brown low-

er surface of F2-F10, apical tarsomeres and basal half of claws. Wing membrane black infumated, with dark steel-blue and bronze hues. Pubescence chiefly black; face and vertex with intermingled pale hairs; lateral

portions of T4 and T5 with some simple and plumose pale yellow hairs among the dark pubescence; a few pale hairs also laterally on marginal fringe of T3; pubescence on T1 very dense and mostly plumose. Vertex and gena



FIGURES 1-6: *Xylocopa bella* sp. nov. (1-3) Holotype female. (1) Head, frontal view; (2) Head and mesosoma, dorsal view; (3) Apex of metasoma, dorsal view. (4-6) Paratype male. (4) Head and mesosoma, dorsal view; (5) Head, frontal view; (6) Detail of head and mesosoma, frontolateral view.

densely punctate throughout, density on upper portion of gena similar to that on vertex; punctures on anterior portion of mesoscutum, and along its lateral margins, much finer than those on frons and vertex; tergal punctation relatively fine, with puncture diameter smaller than those on vertex, and very dense, punctures almost contiguous on lateral thirds of T2 and T3, becoming slightly sparser medially (laterally adjacent punctures placed apart by less than 1 pd on T2 and about 1-2 pd on T3). Structure and proportions (measurements in mm): Head about $1.3\times$ wider than long (5.2:4.0); eyes equally distant between both upper and lower orbits (2.6:2.6); maximum interorbital distance shorter than eye length (3.1:3.4); clypeus about $1.8\times$ wider than long (2.4:1.35), its length subequal to clypeocellar distance (1.35:1.4); length of subantennal suture about $1.2\times$ inner diameter of antennal alveolus (0.35:0.30); intervalveolar distance slightly longer than alveolobital distance (0.94:0.83); distance between posterior ocelli $1.7\times$ diameter of mid ocellus and about $0.9\times$ ocellocular distance (0.62:0.36:0.68); upper head margin, in frontal view, about $1.8\times$ more distant from lateral ocellus than to upper orbit (0.47:0.26); malar space much shorter than maximum diameter of F1 (0.12:0.22); length of F1 longer than summed length of F2-F3 and shorter than length of F2-F4 (0.57:0.42:0.67).

Paratype male: Approximate body length, 14 mm; forewing, including tegula, 13.3 mm. Body integument mostly black to dark brown, except for reddish brown on lower surface of F2-F10, fore coxal and trochanteral spines, apical portion of fore femur, anterior and inner surfaces of fore tibia and most of foretarsus; mid- and hindtarsus mostly dark reddish-brown. With the following pale yellow maculae: a small, rounded spot at the mandible base; labrum entirely, except narrow dark stripe along its lower margin; clypeus entirely; lower paraocular area up to midsection of antennal alveolus; supraclipeal area up to tangent across lower third of antennal alveolus. Wing membrane light brown infumated, without metallic reflexes. Pubescence on head chiefly pale yellow to white, with conspicuous black setae intermingled, particularly on upper frons, vertex and upper gena; mesoscutum with about equal amounts of dark and pale hairs, its anterior corners with a conspicuous dense patch of short finely plumose pale yellow pubescence intermingled among the longer hairs; scutellum mostly pale pubescent, with a few dark hairs; mesepisternum, including its ventral portion, with an anterior band of pale pubescence, hairs ventrally on central portion of band mostly reddish yellow, upper lateral portion with mostly pale hairs, remainder of sclerite with dark pu-

bescence; metanotum, metepisternum and propodeum mostly dark pubescent; fore leg mostly with pale pubescence; mid and hind legs with coxa, trochanter, femur and inner surface of tibia and tarsus mostly dark pubescent, outer surface of mid tibia and of mid and hind tarsi mostly pale pubescent, outer surface of hind tibia dark pubescent on anterior two-thirds, a stripe of reddish yellow setae basal to the basitibial plate and a stripe of pale hairs along entire posterior border; anterior surface of T1 and dorsal surface of T2-T7 mostly dark pubescent; dorsal surface of T1 and lateral portions of T1-T5 mostly pale pubescent; setae on disc of T3-T4 mostly very short and decumbent, length of setae becoming longer toward posterior margin of sclerites. Punctuation on gena less coarse and shallower than that on vertex immediately behind ocelli; tergal punctation coarser than that on gena. Structure and proportions (measurements in mm): Head about $1.4\times$ wider than long (4.6:3.2); eyes much closer to one another along upper than lower orbits (1.35:1.9); maximum interorbital distance much shorter than eye length (1.9:3.3); clypeus about $1.3\times$ wider than long (1.9:1.45), its length about $1.5\times$ the clypeocellar distance (1.45:0.94); length of subantennal suture shorter than inner diameter of antennal alveolus (0.20:0.27); intervalveolar distance $1.8\times$ longer than alveolocular distance (0.57:0.31); distance between posterior ocelli about $1.2\times$ as long as the diameter of mid ocellus and about $3.2\times$ ocellocular distance (0.42:0.36:0.13); vertex not projecting above eyes in frontal view; malar space very narrow, linear; F1 about $2.8\times$ longer than its maximum width (0.57:0.20), its length longer than summed length of F2-F3 and shorter than length of F2-F4 (0.57:0.45:0.70). Inner tubercle on apex of hind tibia projecting as a blunt spine, about as long as spine on apex of outer surface.

Variation

The female from Minas Gerais has slightly more light pubescence on the terga, with a few pale yellow plumose hairs on the lateral margins of T2 and T3, distinct short lateral fasciae on T4 and T5, and a few long simple pale yellow setae on the lateral portions of T6. Also, the setae bordering the pygidial plate are reddish brown in this specimen.

Type Material

Holotype female (DZUP), "DZUP\ 028457" "PICO DAS ALMAS\ BAHIA BRASIL\ 26.03.1980\ F.P. Benton" [underside: "Mun. de\ Agua Quente\ on Ericaceae"]. Paratypes: 1 male (DZUP), "DZUP\

028458" "28-I-2005 PICO DAS ALMAS\ RIO DE CONTAS, BAHIA,\ 1400-1600 m, MIELKE\ & CASAGRANDE LEG."; 1 female (DZMG), "Serra do Cipó\ 2232-7044" "Santana do Riacho MG\ BRASIL 16/04/1998\ R.M. Carmo" "Nanoxylcopa\ bella n. sp. ♀\ Det. Moure, 1998"; 1 female (MZUSP), "BRASIL: BA: MUCUGÊ\ CAMPO RUPESTRE: 9-\ XII 1990\ S.T.P. AMARANTE COL".

Etymology

The species is named after *bellus*, pretty or lovely in Latin. The name has been given many years ago by the late Father Moure, but remained unpublished.

Xylocopa (Nanoxylcopa) ciliata Burmeister, 1876

This species is known from Argentina, Uruguay, Paraguay and southern Brazil (Hurd, 1978; Moure, 2007). In Brazil, it has been recorded from the states of Paraná, Santa Catarina and Rio Grande do Sul (Silveira *et al.*, 2002; Moure, 2007). Here it is newly recorded from the state of Minas Gerais. Females were collected, while foraging on flowers, during a brief survey of the bee fauna of the Serra da Canastra National Park, situated in a highland plateau in south-western Minas Gerais. This represents the northernmost record for the species.

New distribution record: Brazil, Minas Gerais: 1 female (DZUP), "DZUP\ 028437" "Brasil, MG, São Roque,\ P.N. Serra da Canastra,\ 20.2239°S 46.4861°W,\ 1405 m, 19.xii.2013,\ Melo & Rosa, 15-17 h" "Em Fabaceae"; 1 female (DZUP), "DZUP\ 028438" "Brasil, MG, São Roque,\ P.N. Serra da Canastra,\ 20.2239°S 46.4861°W,\ 1405 m, 18.xii.2013,\ Melo & Rosa, 10-13 h"

RESUMO

Xylocopa bella sp. nov., a segunda espécie conhecida do subgênero *Xylocopa* (*Nanoxylcopa*) Hurd & Moure, é descrita no presente trabalho a partir de material da Serra do Espinhaço, em Minas Gerais, e da Chapada Diamantina, na Bahia. A nova espécie difere de *X. ciliata* Burmeister, a espécie-tipo de *X. (Nanoxylcopa)*, principalmente por possuir pelos pálidos misturados à pilosidade negra na cabeça e no metassoma, pela pubescência mais abundante no mesoscuto e pela pilosidade mais densa nos tergos da fêmea, e pela membrana alar mais clara, o escapo inteiramente negro, presença de pilosidade

finamente plumosa nos cantos anteriores do mesoscuto, a face mais estreita e pela menor distância entre o ocelo lateral e o olho no macho. Apresenta-se também um novo registro de distribuição para *X. ciliata*, previamente conhecida da Argentina, Uruguai, Paraguai e sul do Brasil, e tendo sido coletada recentemente no sudeste do Brasil, em Minas Gerais.

PALAVRAS-CHAVE: Mamangavas; Neotropical; Nova espécie; *Xylocopini*.

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