

## Two new species of *Xylocopa* (*Stenoxycopa*) from southeastern Brazil (Hymenoptera, Apidae)

### *Duas novas espécies de Xylocopa (Stenoxycopa) do sudeste do Brasil (Hymenoptera, Apidae)*

[urn:lsid:zoobank.org:pub:F9D15850-AAEA-4768-9261-F8FA7D9A8D0D](https://zoobank.org/pub:F9D15850-AAEA-4768-9261-F8FA7D9A8D0D)

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Received 07/23/2023 | Accepted 10/30/2023 | Published 11/01/2023 | Edited by Rodrigo Gonçalves

#### Abstract

Two new species of *Xylocopa* (*Stenoxycopa*) are described from the highlands of Minas Gerais, in southeastern Brazil: *X. urbanae* sp. nov. and *X. silveirai* sp. nov. They stand out from other South American species of *X.* (*Stenoxycopa*) by the quasitridentate mandibles and the dense pilosity covering the metasomal terga.

**Keywords:** Carpenter bees, Neotropical, Serra da Canastra, Serra do Espinhaço, Xylocopini

#### Resumo

Duas novas espécies de *Xylocopa* (*Stenoxycopa*) são descritas de regiões serranas de Minas Gerais, no sudeste do Brasil: *X. urbanae* sp. nov. and *X. silveirai* sp. nov. Elas se distinguem de outras espécies sulamericanas de *X.* (*Stenoxycopa*) pelas mandíbulas quasitridentadas and pela pilosidade densa cobrindo os tergos metassomais.

**Palavras-chave:** Mamangavas, Neotropical, Serra da Canastra, Serra do Espinhaço, Xylocopini

## Introduction

The New World fauna of large carpenter bees contains a series of distinct lineages, placed by Hurd & Moure (1963) in separate subgenera, among them the subgenus *Xylocopa* (*Stenoxycopa*) proposed previously by Hurd & Moure (1960) for a few species known to nest in bamboo culms. This subgenus is used here in the original sense given by Hurd & Moure (1960, 1963), and not in that of Minckley (1998), who included *X. (Xylocopina)* in it. It has been revised by Hurd (1978), who recognized five species, one of them divided by him in two subspecies. Currently, only three species are recognized for the South American fauna, *X. artifex* Smith, *X. lehmanni* Friese and *X. nogueirai* Hurd & Moure (Moure & Melo, 2022).

Here two new species of this subgenus are proposed from the highlands of Minas Gerais, in southeastern Brazil. They stand out from other South American species of *X. (Stenoxycopa)* by the quasitridentate mandibles and the dense pilosity covering the metasomal terga. The term quasitridentate was coined by Hurd (1978) to refer to the mandibles of females of *X. micheneri* Hurd, in which the cutting edge of the basal tooth is emarginated and therefore suggesting a tridentate condition. The new species names proposed here will be used in a forthcoming study on the molecular phylogeny and biogeography of the large carpenter bees from the Neotropical region (Melo & Martins, in preparation).

## Material and methods

The specimens studied here belong to the Coleção Entomológica Pe. Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba, Brazil (DZUP). In the list of type material, the quotation marks indicate the different labels 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 sterna, 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. <1pd: less than 1x the puncture diameter between the punctures). For explanation of some head measurements, see Melo (2016, 2017). 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 (Stenoxycopa) urbanae*  
sp. nov.  
(Fig. 1A-C)

[urn:lsid:zoobank.org:act:F54E18B7-4271-4C9D-9FE3-C29ECE4E65B1](https://doi.org/10.21203/rs.3.rs-2120311/v1)

## Diagnosis and Comments

Due to the predominantly dark coloration of their wings, with dark blue and violet reflexes, the two new species described here resemble *X. nogueirai* Hurd & Moure, the only other species of *X. (Stenoxycopa)* with similar appearance known to occur in the same major region. While *X. urbanae* sp. nov. is relatively larger (see measurements in the respective descriptions below), *X. silveirai* sp. nov. has a comparable body size with *X. nogueirai*. This latter species is easily set apart from the new species by the truncate, non-emarginated basal tooth of the mandible, the less projecting vertex laterally above the eyes, the less abundant and much shorter pilosity on the metasomal terga, and the coarser punctation on mesoscutum and metasomal terga.

*Xylocopa urbanae* sp. nov. differs from *X. silveirai* sp. nov. by its larger body size, head pubescence entirely black, denser tergal pilosity and by the abundant plumose hairs intermixed with simple pilosity on dorsal portion of T1. Also, they have allopatric distributions, with *X. urbanae* sp. nov. occurring in the Serra da Canastra, to the west, and *X. silveirai* sp. nov. in the Serra do Espinhaço, to the east.

## Distribution

*Xylocopa urbanae* sp. nov. is currently known only from the Serra da Canastra, in southwestern Minas Gerais. The specimens were collected on the highest areas of the plateau, in sites above 1300 m in altitude. Considering the high degree of endemism in the flora and insect fauna of Serra da Canastra (e.g., Romero &

Nakajima 1999; Machado & Bedê 2016), it is possible that *X. urbanae* sp. nov. might represent an additional endemic species.

### Description

Holotype female. Approximate body length 19 mm; forewing, including tegula, 18.6 mm. Body integument mostly black, except for dark reddish brown lower surface of F2-F10, apical tarsomeres and basal half of claws. Wing membrane black infumated, reflexes of dark greenish-blue and violet hues. Pubescence entirely black, except for reddish setae on apex of T6 around pygidial plate; tergal pilosity very dense and relatively long, on T2 and T3 surpassing posterior margin of sclerites; dorsal portion of T1 densely clothed with both simple and plumose pubescence. Vertex and gena densely punctured throughout, density on upper portion of gena slightly sparser than that on vertex; tergal punctation very dense, punctures almost contiguous on lateral thirds of T2 and T3, and becoming slightly sparser along medial portion of sclerites (laterally adjacent punctures placed apart by less than 1 pd on T2 and T3). Structure and proportions (measurements in mm): Head about 1.3x wider than long (6.3:4.7); eyes slightly more separate along upper than lower orbits (3.6:3.5); maximum interorbital distance longer than eye length (4.0:3.8); clypeus about 1.8x wider than long (3.3:1.8), its length slightly longer than clypeo-ocellar distance (1.8:1.6); length of subantennal suture subequal to inner diameter of antennal alveolus (0.42:0.40); interalveolar distance slightly longer than alveolo-orbital distance (1.1:1.0); distance between posterior ocelli about 2.2x diameter of mid ocellus and about 0.8x ocello-orbital distance (0.78:0.36:1.0); upper head margin, in frontal view, closer to lateral ocellus than to upper orbit (0.62:0.73); malar space much shorter than maximum diameter of F1 (0.12:0.30); length of F1 longer than summed length of F2-F3 and shorter than length of F2-F4 (0.77:0.60:0.92).

### Type material

Holotype female (DZUP), “DZUP\ 028425” “Brasil, MG, São Roque,\ P.N. Serra da Canastra,\ 20.1906°S 46.6601°W,\ 1370m, 19.xii.2013,\ G. Melo & B. Rosa”. Paratypes: Brazil, Minas Gerais: 1 female (DZUP), “DZUP\ 028444” “Brasil, MG, São Roque,\ P.N. Serra da Canastra,\ 20.2239°S 46.4861°W,\

1405m, 15.xii.2013,\ G. Melo & B. Rosa”; 1 female (DZUP), “DZUP\ 028451” “Brasil, MG, São Roque, P.N. Serra da Canastra, 20.2452°S 46.5686°W, 1388m, 18.xii.2013, G. Melo & B. Rosa”.

### Etymology

The species is named in honor of Prof. Danúncia Urban on the year of her 90th birthday.

*Xylocopa (Stenoxycopa) silveirai*

sp. nov.

(Fig. 1D-F)

[urn:lsid:zoobank.org:act:4944E39B-32A6-4B74-B922-39136E5357A2](https://doi.org/10.21203/rs.3.rs-2913653577/v1)

### Diagnosis and Comments

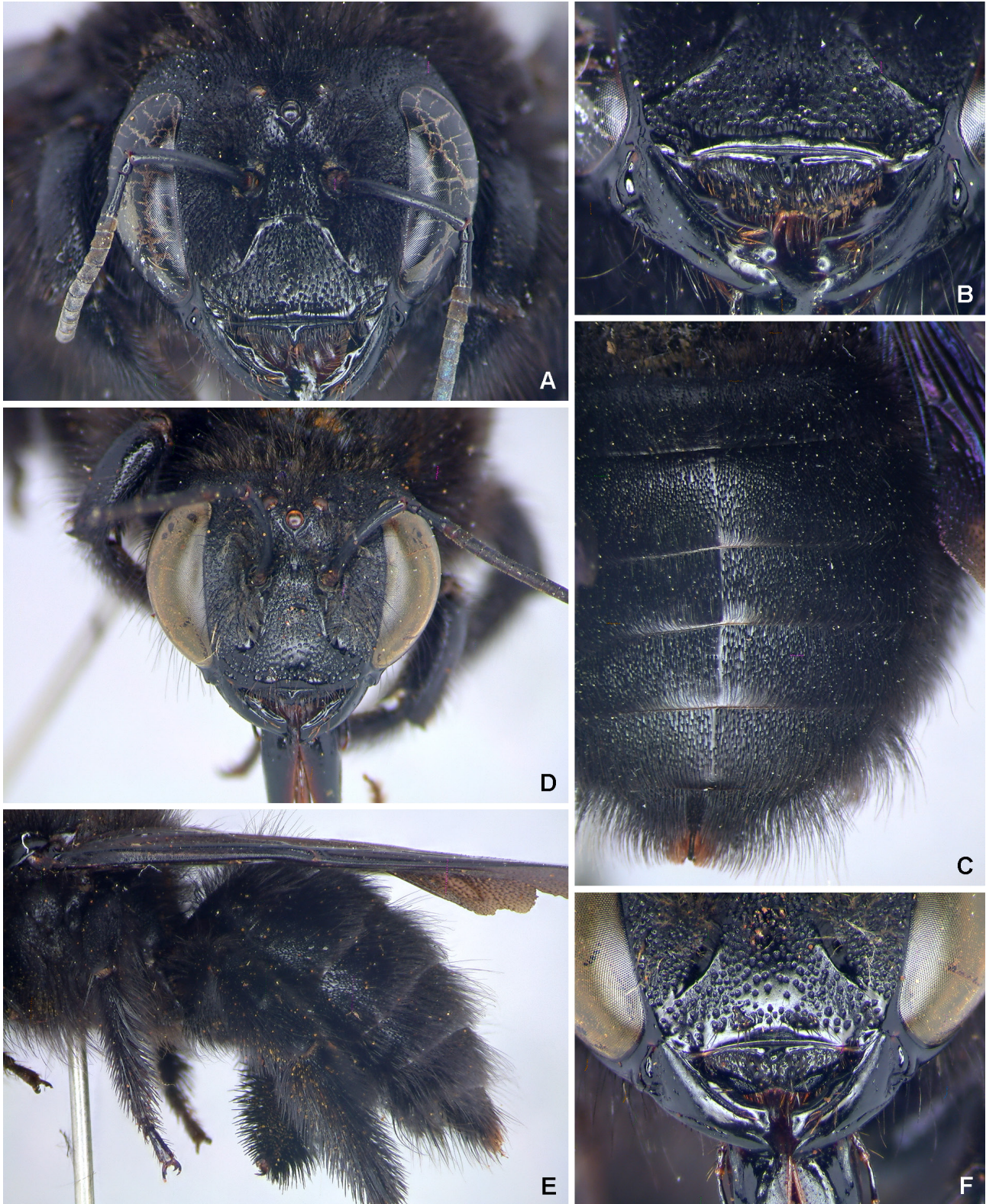
*Xylocopa silveirai* sp. nov. differs from *X. urbanae* sp. nov. by its smaller body size, head pubescence black with white to pale yellow plumose hairs on face, vertex and upper portion of occipital area, sparser tergal pilosity and by the mostly simple pilosity on dorsal portion of T1.

### Distribution

The current records indicate a distribution restricted to the southern portion of the Espinhaço mountain range, in central Minas Gerais.

### Description

Holotype female. Approximate body length 15 mm; forewing, including tegula, 13.6 mm. Body integument mostly black, except for dark reddish brown lower surface of F2-F10, apical tarsomeres and basal half of claws. Wing membrane black infumated, reflexes of dark steel-blue and violet hues. Pubescence entirely black, except for white to pale yellow plumose hairs on face, vertex and upper portion of occipital area, a few reddish-brown plumose hairs on lower gena and for reddish setae on apex of T6 around pygidial plate; tergal pilosity very dense and relatively long, on T2 and T3 surpassing posterior margin of sclerites; dorsal portion of T1 densely clothed with simple pubescence, except for some plumose hairs on corners and along anterior margin. Vertex and gena densely



**Figure 1.** A-C, *Xylocopa urbanae* sp. nov., holotype female. A. Head, frontal view; B. Close-up of lower portion of head, fronto-ventral view; C. Metasoma, dorsal view. D-F, *Xylocopa silveirai* sp. nov., holotype female. D. Head, frontal view; E. Metasoma, lateral view; F. Close-up of lower portion of head, fronto-ventral view.

punctured throughout, density on upper portion of gena distinctly sparser than that on vertex; tergal punctation dense, punctures placed apart by about 0.5 pd on lateral thirds of T2 and T3, and becoming sparser along medial portion of sclerites (laterally adjacent punctures placed apart by about 1 pd on T2 and by 1-2 pd on T3). Structure and proportions (measurements in mm): Head about 1.3x wider than long (5.0:3.7); eyes slightly more separate along upper than lower orbits (2.9:2.65); maximum interorbital distance subequal to eye length (3.1:3.0); clypeus about 1.7x wider than long (2.5:1.5), its length slightly longer than clypeo-ocellar distance (1.5:1.35); length of subantennal suture subequal to inner diameter of antennal alveolus (0.42:0.40); interalveolar distance 1.2x longer than alveolo-orbital distance (0.94:0.78); distance between posterior ocelli about 1.8x diameter of mid ocellus and about 0.7x ocello-orbital distance (0.57:0.31:0.83); upper head margin, in frontal view, slightly farther from lateral ocellus than to upper orbit (0.36:0.31); malar space much shorter than maximum diameter of F1 (0.10:0.22); length of F1 longer than summed length of F2-F3 and shorter than length of F2-F4 (0.57:0.45:0.72).

### Variation

The paratypes are slightly larger than the holotype, with body length of 16.1; 16.7; 17.1 mm (wing length with tegula, respectively, 15.3; 16.0; 16.6 mm).

### Type material

Holotype female (DZUP), "DZUP\ 028454" "Brasil, Minas Gerais,\ Serra da Moeda,\ 20°05' S, 43°59' W,\ 1400m, 23.v.1998,\ Gabriel A. R. Melo". Paratypes: 1 female (DZUP), "DZUP\ 028455" "S. Cipó MG\ v-1990\ L. Queiroz e\ H. C. Sousa"; 1 female (DZUP), "DZUP\ 028456" "Serra do Cipó\ MG - 1300m\ Machado 12.III\ 1994, O. Mielke"; 1 female (DZUP), "DZUP\ 028415" "Brasil, Minas Gerais,\ São Gonçalo do Rio\ Preto,\ 18°13'S 43°20'W,\ 3.ix.2008, A. Aguiar &\ A. Martins".

### Etymology

The species is named in memory of the late Prof. Fernando Amaral da Silveira, renowned bee systematist and a cherished friend, who sadly passed away last year.

### Biology

The nesting biology of *X. silveirai* sp. nov. was studied by Silveira (2002), who misidentified it as *X. artifex*, a species of *X. (Stenoxycopa)* known to nest only within bamboo culms (Hurd & Moure, 1960). Several nests of *X. silveirai* sp. nov. were found by him within the fibrous stems of *Vellozia*. Silveira (2002) suggested that the females might not be able to start the nests and reuse cavities made by other species, such as *Xylocopa (Diaxylocopa) truxali* Hurd & Moure. Considering its restricted distribution in the southern portion of the Espinhaço mountain range, it is likely that *X. silveirai* sp. nov. nests only within this specialized plant substrate.

### Acknowledgments

I thank Brunno B. Rosa for taking part in the collecting trip to the Serra da Canastra, in 2013, ICMBio, for the collecting permit to the Parque Nacional da Serra da Canastra, and the park administration, for assistance during field work. Antônio Aguiar and Aline Martins are thanked for donation of one of the paratypes of *X. silveirai*. Financial support has been provided by Conselho Nacional de Desenvolvimento Científico e Tecnológico (grant 313588/2021-0).

### Conflicts of interest

The author declare no conflicts of interest.

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