



Revista mexicana de biodiversidad

ISSN: 1870-3453

ISSN: 2007-8706

Instituto de Biología

Flórez-Gómez, Nathalia A.; Griswold, Terry  
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Revista mexicana de biodiversidad, vol. 91, e913062, 2020  
Instituto de Biología

DOI: <https://doi.org/10.22201/ib.20078706e.2020.91.3062>

Available in: <https://www.redalyc.org/articulo.oa?id=42571632083>

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## Taxonomy and systematics

### A new bee species of the subgenus *Ceratina* (*Rhysoceratina*) (Hymenoptera: Apidae) from northernmost South America

#### *Nueva especie del subgénero Ceratina (Rhysoceratina) (Hymenoptera: Apidae) para el norte de Sudamérica*

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Received: 17 May 2019; accepted: 21 February 2020

<http://zoobank.org/urn:lsid:zoobank.org:pub:1926ADE1-6D4A-43C3-8360-C27E96D6F54C>

#### Abstract

The subgenus *Ceratina* (*Rhysoceratina*) Michener has been known largely from southern South America, registered in Argentina, Paraguay, Uruguay and southern Brazil, with a single species, *C. (Rhysoceratina) nitidifrons*, from the Eastern Llanos of Colombia. Here we describe and illustrate females and males of a new species, *Ceratina (Rhysoceratina) macondiana* sp. nov. It is apparently endemic to the Caribbean Region of Colombia and Venezuela, extending the distribution range of *Rhysoceratina* to the extreme north of South America. *Ceratina macondiana* sp. nov. is easily separable from other *Rhysoceratina* species in both sexes by the color of the marginal cell, which is darker than the rest of the forewing and the dense white hairs on the lateral sides of the propodeum and posterior ridge of the scutellum.

**Keywords:** Bee; Small carpenter bee; Apoidea; Xylocopinae; Ceratinini

#### Resumen

El subgénero *Ceratina* (*Rhysoceratina*) Michener ha sido reconocido principalmente para el sur de Sudamérica en Argentina, Paraguay, Uruguay y sur de Brasil y con una sola especie, *C. (Rhysoceratina) nitidifrons*, descrita para los Llanos Orientales en Colombia. En el presente trabajo se describen e ilustran hembra y macho de la especie nueva, *Ceratina (Rhysoceratina) macondiana* sp. nov. Hasta el momento, se registra únicamente para la región Caribe de Colombia y Venezuela, extendiendo el rango de distribución del subgénero al norte de Sudamérica. *Ceratina macondiana* sp. nov. se diferencia fácilmente de las otras especies del subgénero porque ambos sexos presentan la celda marginal más oscura que el resto del ala, además presentan pilosidad densa y blanquecina en las partes laterales del propodeo y en el margen posterior del escutelo.

**Palabras clave:** Abeja; Pequeñas abejas carpinteras; Apoidea; Xylocopinae; Ceratinini

## Introduction

Small carpenter bees of the genus *Ceratina* Latreille comprise one of the most diverse and widespread genera of bees in the world. Five of the 21 subgenera currently recognized by Michener (2007) are native to the Americas: *Zadontomerus* Ashmead, diverse and widely distributed in temperate North America with some species in Central America and extending to northern South America; *Calloceratina* Cockerell and *Crewella* Cockerell, neotropical subgenera with distributions from southern Mexico to Argentina; *Ceratinula* Moure with few species in North America and most diverse in Central and South America, and *Rhysoceratina* Michener in South America from Colombia to Argentina, being more diverse in Argentina. Roig-Alsina (2013) added 1 South American subgenus, *C. (Neoclavicera)* Roig-Alsina that occurs from Peru to Argentina.

Revisionary work on Western Hemisphere *Ceratina* is limited. While nearctic species of *Ceratina* from the USA and Canada have been revised, there is no comprehensive revision of neotropical *Ceratina* (Daly, 1973). However, 2 neotropical subgenera, *Neoclavicera* (Roig-Alsina, 2013) and *Rhysoceratina* (Roig-Alsina, 2016) were recently revised. All but 1 of the 9 previously recognized *Rhysoceratina* species are found in the southern half of South America, mostly in Argentina and southern Brazil, with some species in Uruguay and Paraguay. The other species is a disjunct species in Colombia, *C. (R.) nitidifrons* Roig-Alsina, occurring in eastern Colombian Llanos in Villavicencio, Meta. Here we describe a new species of *C. (Rhysoceratina)* from the Caribbean region of Colombia and Venezuela, extending the distribution range of *Rhysoceratina* to the extreme north of South America.

The subgenus *Rhysoceratina* consists of small-sized bees (4.8–8.5 mm long), with weakly metallic integument and yellow marks in the paraocular area, clypeus, pronotal lobe and legs. Most of the species have extensive punctation. The subgenus is easily recognized in the female by a strong, transverse carina on T6 and by the wax plate restricted to S2. Males have a medial marginal projection on T7 (Roig-Alsina, 2016).

## Materials and methods

Morphological terminology follows that proposed by Michener (2007). Abbreviations used in the descriptions are T, S, and OD for metasomal terga, metasomal sterna and ocellar diameter, respectively. Bee specimens were examined and measured using a Leica MZ12 dissection microscope with ocular micrometer. The illustrations were taken using a Keyence and a Leica Z16 APO to illustrate

male genital capsules. The distribution map of South America was generated with QGIS 2.18.24, using the geographic data taken from labels of examined specimens and the localities referenced in Roig-Alsina (2016). Type specimens are deposited in the USDA-ARS Pollinating Insects Research Unit, Utah State University (BBSL).

## Description

*Ceratina (Rhysoceratina) macondiana* Flórez-Gómez & Griswold, sp. nov.

(Figs. 1–13)

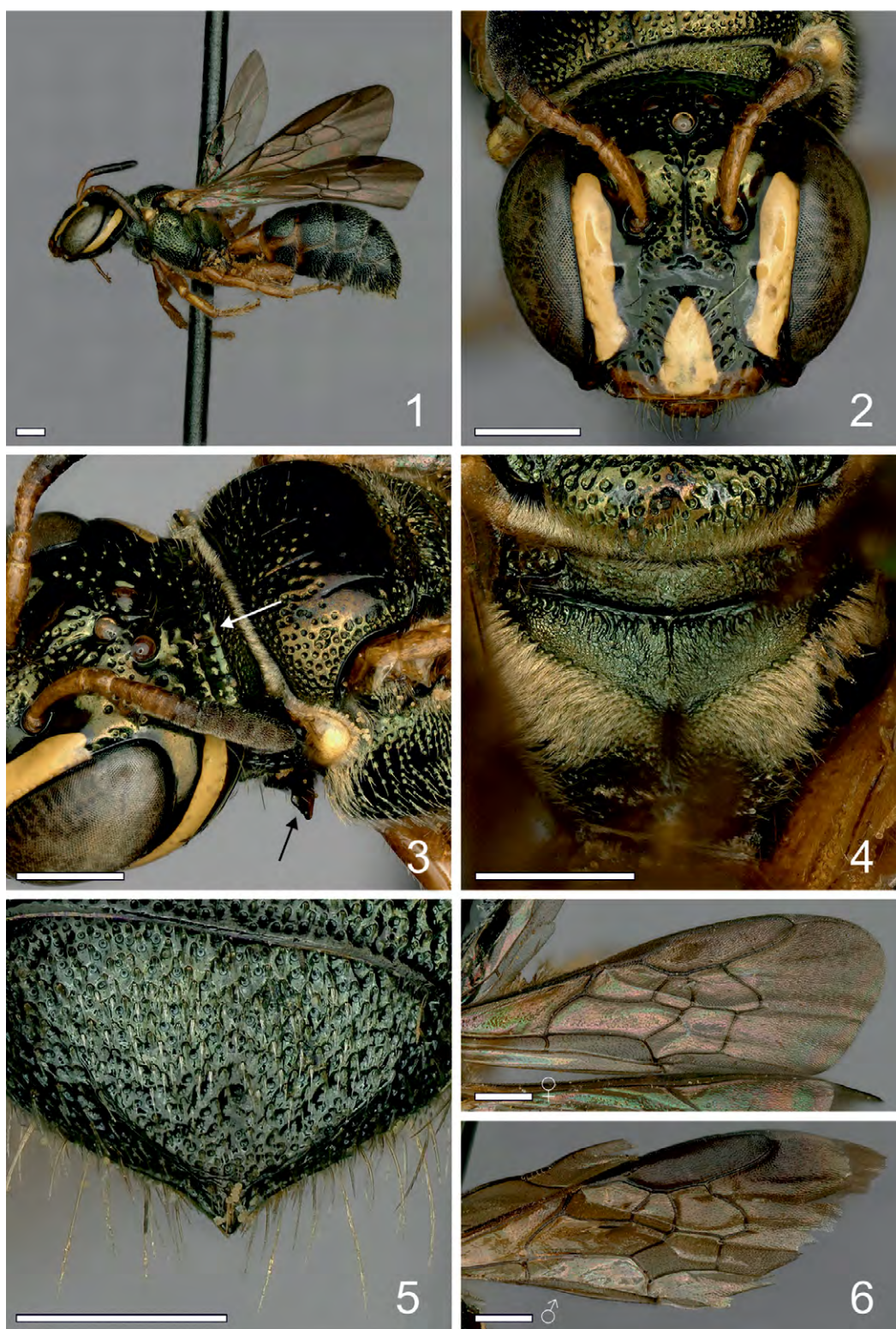
<http://zoobank.org/urn:lsid:zoobank.org:act:ADC82443-67C4-456B-A95C-E0CDB13453B7>

**Diagnosis.** This species is easily separable from all other *Rhysoceratina* species in both sexes by the color of the marginal cell, which is darker than the rest of the forewing, and by the dense white hairs on the lateral sides of the propodeum and posterior ridge of the scutellum. It differs from *C. nitidifrons* by the longer paraocular marks which reach above the antennal socket, the velvety pubescence dorsolaterally on the propodeum, the lamellate lateral carina of the pronotum, and in the female by the lateral projection of the forecoxa not directed posteriorly.

**Female.** Length 7.7 mm; length of forewing 6.1 mm. Color. Black with dark olive green metallic tints. Scape, pedicel and first flagelomeres reddish brown. Apical tarsomeres brown. Tegula light brown to golden, translucent. Yellow paraocular marks reaching above antennal socket, clypeus with triangular longitudinal yellow mark reaching upper margin. Gena with long longitudinal yellow mark reaching preoccipital ridge. Pronotal lobe with yellow spot. Legs, except coxae, orange. Foretibia with longitudinal yellow band, forefemur with apical yellow spot. Wings brownish, forewing with marginal cell distinctively darker than the rest of wing (Fig. 6). T1 orange.

**Structure.** Preoccipital ridge carinate. Circumantennal area slightly depressed. Pronotum with lamellate lateral carina, in frontal view carina compressed when it reaches dorsolateral angle; dorsolateral angle rounded. Axilla laterally projecting, rounded. Forecoxa with lateral projection truncate apically, not projecting posteriorly. T6 with transverse apical carina (Fig. 5) (diagnostic of the subgenus *Rhysoceratina*). S2 with basal wax plate. OD 0.14 mm.

**Punctation.** Paraocular area, gena polished, impunctate. Small area above antennal sockets impunctate, area near central ocelli and vertex with small punctures separated by distance equal to diameter of punctures or more. Area above lateral ocelli polished, impunctate. Area between antennal sockets with small, dense punctation. Mesepisternum with small, dense punctures, separated by less than diameter of punctures, except small impunctate



Figures 1-6. *Ceratina macondiana* sp. nov. female. 1, Holotype habitus; lateral view; 2, holotype habitus; frontal view; 3, preoccipital ridge and projection of the forecoxa truncate apically; 4, propodeum; dorsal view; 5, T6 transversal carina; 6, female and male forewing.





Figures 7-12. *Ceratina macondiana* sp. nov. male. 7, Habitus, lateral view; 8, habitus, frontal view; 9, forecoxa, ventral view; lateral projection yellowish; 10, hind trochanter and femur; 11, T6 median projection, dorsal view; 12, T7 and T6 median projection, ventral view.

region on hipoepimeral area. Scutum with disc impunctate, area between admedian line and notaulus with small, dense punctures. T1 polished, impunctate, with sparse punctation on medial area. T2-T3 with small, dense punctation except for transverse impunctate area.

Pubescence. Scarce, dispersed white pubescence, except dense on lateral sides of propodeum (appears golden in lateral view), posterior ridge of scutellum (Fig. 4). Sterna with sparse, but distinct, short apical pubescent bands.

Male. Length 7.3 mm; length of forewing 5.7 mm. Color. Similar to female except: paraocular marks long, yellow as in female, but broader. Clypeus with T-shaped yellow mark reaching upper margin. Labrum with yellow mark. Mandible with yellow spot medially. Pronotal lobe with yellow spot. Lateral projection of the forecoxa yellowish (Fig. 9). Foretibia with yellow stripe. Forefemur with yellow spot apically. Tarsi yellowish. Wings brownish, forewing with marginal cell distinctively darker than rest of wing (Fig. 6).

Structure. T6 with median projection with apical short hairs (Figs. 11, 12). T7 with apical margin flanged, with low medial lobe. OD 0.14 mm. Genital capsule, gonostylus with the lateral margin rounded and projected and hairs in the apical margin (Figs. 13, 14).

Punctuation. Similar to that of female.

Pubescence. Hind trochanter, basal third of hind femur in ventral view with short, dense pubescence (Fig. 10). Propodeum, posterior ridge of scutellum with dense pubescence laterally.

#### Taxonomic summary

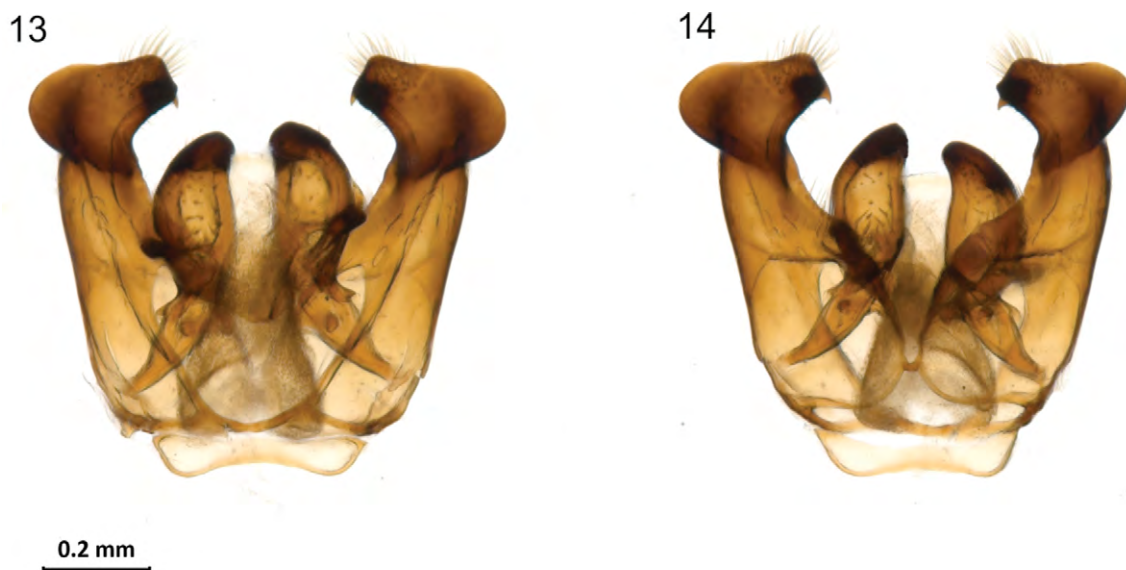
*Etymology.* The specific name refers to Macondo, the fictional town from Gabriel García Márquez's novel "Cien años de soledad". Macondo represents towns from the Colombian Caribbean.

*Distribution.* Known only from northern Colombia (Atlántico, Barranquilla. Bolivar, Zambrano) and Venezuela (Zulia, Carrasquero).

*Type material.* Holotype: Colombia 1 ♀; Atlántico, Barranquilla, 5 Oct 1971, 235 m, GE Bohart, (BBSL). Paratypes: Colombia, 3 ♂, 1 ♀, same data as for holotype (BBSL); Venezuela, 1 ♂, Zulia: Carrasquero, 15 Jun 1976, AS Menke et D Vincent (BBSL).

#### Discussion

Although *Ceratina* is a diverse genus in the Neotropics, few species are known from northern South America (Moure, 2012). Only 7 species are recorded from Colombia and Venezuela: 3 of the subgenus *C. (Ceratinula)*, 2 of *C. (Crewella)* and of *C. (Calloceratina)*, and 2 of *C. (Rhysoceratina)* including *C. macondiana* sp. nov. This is the first record of *C. (Rhysoceratina)* for Venezuela. Moreover, *C. macondiana* sp. nov. extends the distribution of the subgenus to the extreme north of South America. Based on the current records for the species of this subgenus, *C. macondiana* sp. nov. and *C. nitidifrons* have a disjunct distribution from the rest of *C. (Rhysoceratina)* species (Fig. 15).



Figures 13-14. 13, Male genital capsule, dorsal view; 14, male genital capsule, ventral view.





Figure 15. *Ceratina* (*Rhysoceratina*) distribution map. Northern species *C. (R.) nitidifrons* and *C. (R.) macondiana* sp. nov., show a disjunct distribution from the other species of the subgenus.

## Acknowledgements

To Chelsey Ritner for providing the images for this study. We thank Conacyt-Mexico mobility scholarship award for granting the visit to BBSL and Ricardo Ayala for the observations on the manuscript.

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