

## Research Article

**A new species of *Chrysina* Kirby, 1828 (Coleoptera: Scarabaeidae: Rutelinae: Rutelini) from Ecuador and inclusion into proposed *veraguana* species-group**

Una nueva especie de *Chrysina* Kirby, 1828 (Coleoptera: Scarabaeidae: Rutelinae: Rutelini) de Ecuador e inclusión dentro del grupo de especies *veraguana* propuesto

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**Abstract.** *Chrysina mercedesae* **sp. nov.** is described from Ecuador. A description of the species including illustrations of the adults, distribution map, as well as diagnostic characters and a key to three species that are hereby placed into the *veraguana* species-group, are presented.

**Key words:** Chocó; jewel scarabs; taxonomy.

**Resumen.** Se describe *Chrysina mercedesae* **sp. nov.** de Ecuador. Se presenta una descripción de la especie que incluye ilustraciones de los adultos, un mapa de distribución, así como caracteres diagnósticos y una clave para las tres especies que se colocan en el grupo de especies *veraguana*.

**Palabras clave:** Chocó; escarabajos gema; taxonomía.

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## Introduction

The genus *Chrysina* Kirby, 1828 includes about 127 valid species, and is exclusively distributed in the Americas, from the southwestern United States to southwestern Ecuador (Monzón 2017; Hawks 2017; Moore *et al.* 2017; Morón & Nogueira 2017). Highest species richness is found in Central America and Panama (about 64 described species) and Mexico (with more than 60 species). Much lower diversity is found in the United States of America (four species) and northwest South America (three species) (Hawks 2017). Species of the genus inhabit different forest types, mainly primary forests between 400 and 3800 m, but mostly between 1200 and 2300 m. Adults have been reported feeding on the foliage of various trees, including species of the genera *Heliocarpus* Linnaeus (Malvales: Tiliaceae), *Juniperus* L. (Cupressales: Cupressaceae), *Pinus* L. (Pinales: Pinaceae), *Quercus* L. (Fagales: Fagaceae), *Juglans* L. (Fagales: Juglandaceae) among others (Morón 1991; Márquez *et al.* 2013).

Hawks (2001) designated *Chrysina veraguana* (Ohaus, 1922) as “*incertae sedis*” because the species did not fit into any of the defined groups at that time. Subsequently, he described *Chrysina galbina* Hawks, 2017, based on 2 males collected in El Valle, Coclé Province, Panama (Hawks 2017). In his paper, Hawks stated that *C. galbina* is very closely related to *C. veraguana*; however, the two species were not formally assigned to any group.

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Members of the *marginata* species-group are characterized by having the parameres with acute apices resembling fangs or long projections, and the elytral surface smooth with micropunctuations (Hawks 1999). The species *C. veraguana* and *C. galbina* have parameres similar to those of the *marginata* species-group, but the elytra in both species are distinctly striated. According to D. Hawks (pers. comm.), these two species should be assigned to a new group based on the oldest-named species, i.e., the *veraguana* species-group.

In the present work, I describe a new species of *Chrysina* from Ecuador morphologically related to *C. veraguana* and *C. galbina*. I also formally propose the *veraguana* species-group in order to place these three species to make more manageable and accessible the study of the species in the genus, following the current trends in the taxonomic study of the group.

## Materials and Methods

This work follows the taxonomy proposed by Hawks (2001). Terminology used in descriptions follows Curoe (2011) and Hawks (2017). The photos of adults and habitat were taken with a Canon Rebel T7 camera with a 18-55 mm lens. Genitalia were extracted with forceps and mounted on cardboard points. The genitalia were photographed with a digital camera adapted to a Carl Zeiss Stemi 305 stereoscopic microscope. The photos of the adults and genitalia were edited with the program Adobe Photoshop 2022. The distribution map was created using the software ArcMap 10.8.

Material examined is deposited in the collections of Museo de Zoología de la Universidad Nacional de Loja, Loja, Ecuador (LOUNAZ) and Manuel D. Barria personal collection, LEBA, Universidad de Panamá, Ciudad de Panamá, Panamá (MDBC).

## Results

### Taxonomy

*Chrysina mercedesae* Barria, **sp. nov.**  
(Figs. 1-2)

**Material examined.** Male holotype (LOUNAZ), labeled: "ECUADOR: Provincia de Esmeraldas, Reserva Canandé, 400 m, 0°31'26.0"N 79°12'51.0"W, 6/IV/2022, Barria M.D. & Robacker D.C. coll., Metal-halide Hg lamp & UV light trap // (red label) HOLOTIPO ♂ *Chrysina mercedesae* Barria 2022". Female allotype (LOUNAZ), labeled: "ECUADOR: Provincia de Esmeraldas, Reserva Canandé, 400 m, 0°31'30.0"N 79°12'49.1"W, 3/IV/2022, Barria M.D. & Robacker D.C. coll., Hg & UV light trap // (red label) ALOTIPO ♀ *Chrysina mercedesae* Barria 2022". Paratype. 1 male (MDBC), labeled: "ECUADOR: Provincia de Esmeraldas, Reserva Canandé, 400 m, 0°31'26.0"N 79°12'51.0"W, 7/IV/2022, Barria M.D. & Robacker D.C. coll., Metal-halide Hg lamp & UV light trap // (yellow label) PARATIPO ♂ *Chrysina mercedesae* Barria 2022".

**Description. Male holotype** (Figs. 1a-c): Length: 27 mm. Humeral width: 11.7 mm. Maximum elytra width: 14.8 mm. *Color*: Dorsally, bright pale yellowish-green; antennal scape, external border of clypeus, ocular margins, lateral pronotal margin beads pinkish-violet; dorsal and ventral side of the tibiae pinkish-violet; in dorsal and ventral view, meso- and metatibia mostly pinkish-brown with greenish tones; in lateral view, meso- and metatibiae pinkish-violaceous; elytra epipleura margins pinkish; elytral *calli* and external borders metallic golden; internal borders of the tibiae and lateral sides of the mesosternal process metallic greenish; femora ventral side greenish, internal borders pinkish-brownish; protarsomeres and mesotarsomeres pinkish-violet, metatarsomeres greenish; venter

and abdominal sternites matte metallic greenish with pinkish reflections. *Head*: Frons depressed, surface densely and finely punctate; clypeus subtrapezoidal, apex slightly truncated, reflexed; labium with anterior margin strongly emarginated. *Pronotum*: Surface like the frons; basal bead diffused centrally. *Elytra*: Surface with about 8-9 striate; epipleura narrow, reaching level of second abdominal sternite. *Scutellum*: Wider than long; posterior margin parabolic; surface sparsely punctate. *Pygidium*: Plate (lateral view) weakly and uniformly convex; surface (frontal view) transversely and finely rugopunctate, with a few setae along rounded apex. *Venter*: Surface glabrous; prosternal plate subtriangular with rounded apex, central region slightly concave; mesometasternal process moderately long, surpassing base of mesocoxae; in lateral view, process semiconical, poorly robust, process directed forward; fifth abdominal sternite with a broad emargination at its posterior end, with a slightly sclerosed subtriangular isosceliform membrane between fifth and sixth sternites; sixth abdominal sternite with an arcuate emargination at posterior margin, followed by a slightly sclerosed membrane; posterior margins of abdominal sternites with several transversely arranged setae. *Legs*: Protibia tridentate. *Genitalia* (Figs. 2a- c): Males parameres short and symmetrical, with two recurved and divergent dentiform processes becoming progressively more robust apically (appreciable in lateral view, Fig. 2a), ventral plates protruding beyond parameres.

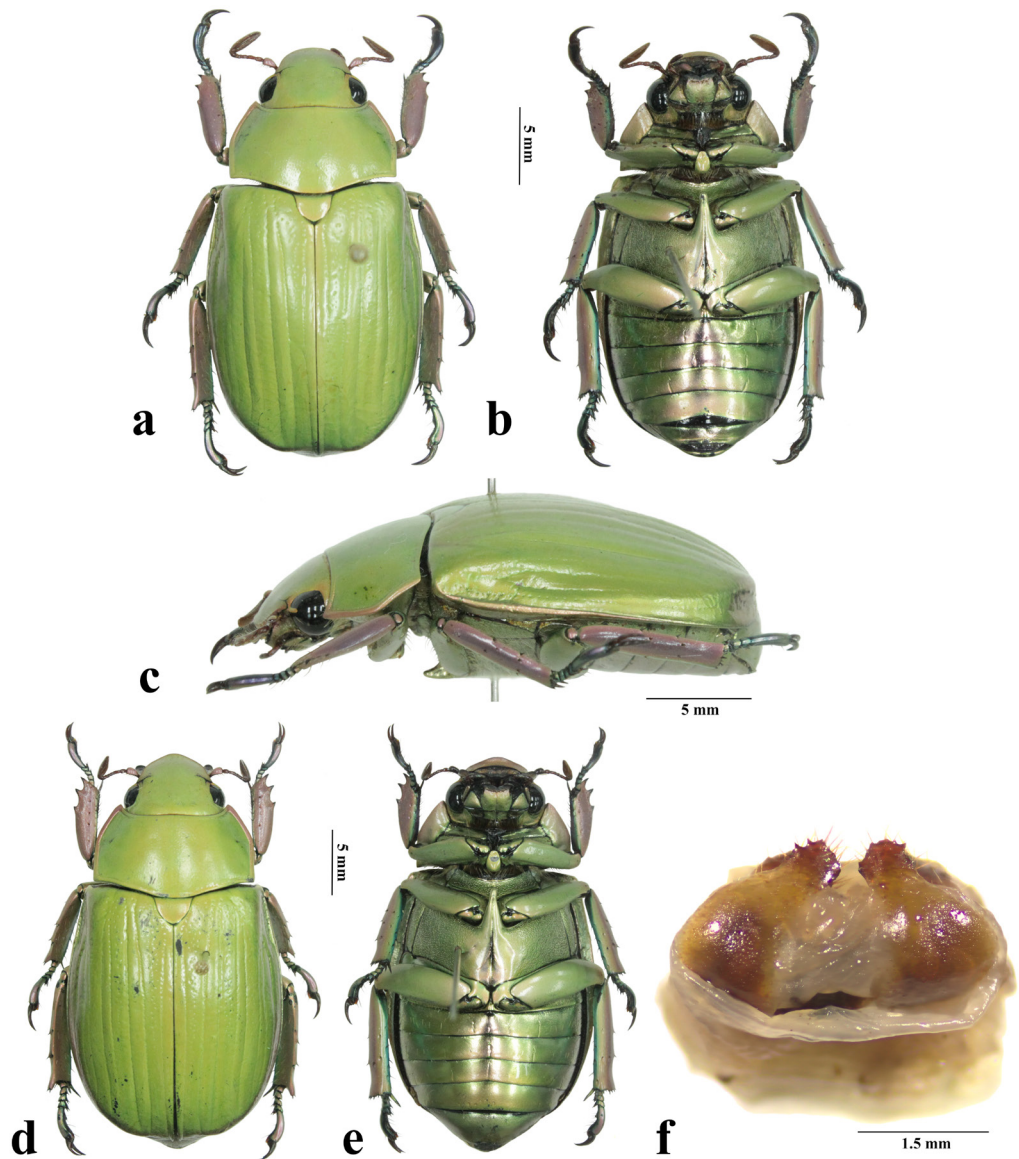
**Female allotype** (Figs. 1d-f): Length: 31 mm. Humeral width: 14.2 mm. Maximum elytra width: 17.1 mm. Similar in coloration to the male; more robust and larger than males; the apex of the clypeus is mostly rounded (not truncated as in the male); without emargination between the fifth and sixth sternites, sixth abdominal sternite with a small arched emargination at apex; anterolateral surface of abdominal sternites coarsely punctate. *Genitalia* (Fig. 1f): Female inferior plates pear-shaped, slightly narrower towards the apex, apical margins strongly serrate-ondulate with many erect rufous setae.

**Variation.** Male paratype: Length: 27.6 mm; humeral width: 12.2 mm. Maximum elytra width: 14.9 mm. All tarsomeres of the male paratype are metallic greenish.

**Diagnosis.** *Chrysina mercedesae* is distinguished from the other species of the genus by the combination of the following characters: striated elytra, pale yellowish-green dorsal coloration, venter matte metallic green with pinkish-violet reflections, tarsomeres pinkish-violet or greenish. The genitalia of the male have two symmetrical and recurved processes becoming progressively more robust apically, ventral processes of the phallus protrude beyond the parameres. *Chrysina mercedesae* differs from *C. galbina* and *C. veraguana* in coloration and the genitalia. *C. galbina* does not have a metallic venter, but it is yellowish-green, similar to dorsum, the male parameres are asymmetrical, with two dentiform projections oriented ventrally and to the right (third projection fused with central projection), left projection more robust and less acute than right. *C. veraguana* has silvery sternites and bluish tarsomeres, the male parameres present three projections, one short central dentiform process and two medians lateral dentiform processes, strongly curved towards ventral region, left process slightly more robust than right, both species are restricted to the central region of Panama.

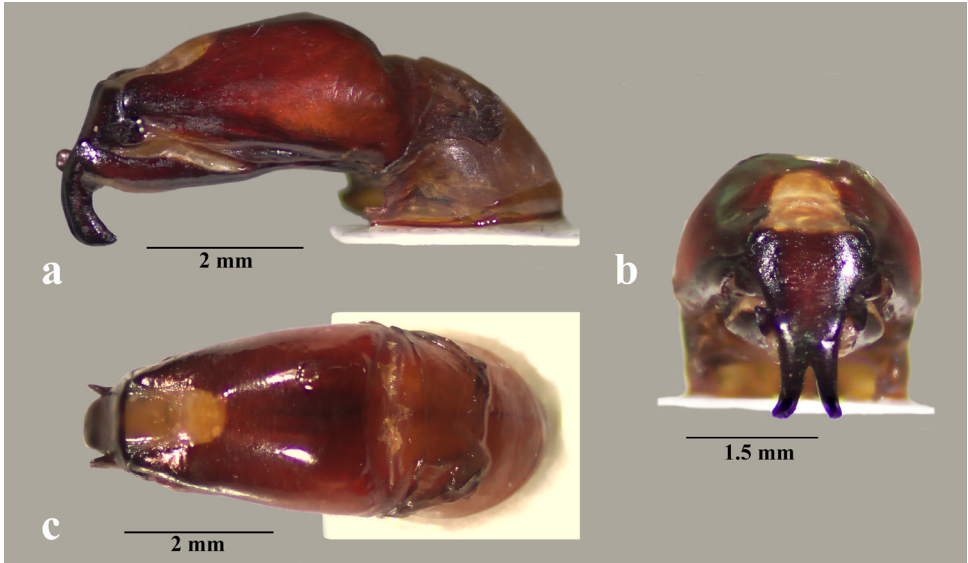
**Etymology.** The new species name is dedicated to my grandmother Mercedes A. Ortega, who during all my years of life and career as a student and researcher has always supported me and believed in me. The specific epithet is a singular feminine noun in the genitive case.

**Distribution.** Ecuador: Reserva Canandé (Esmeraldas Province) (Fig. 3).

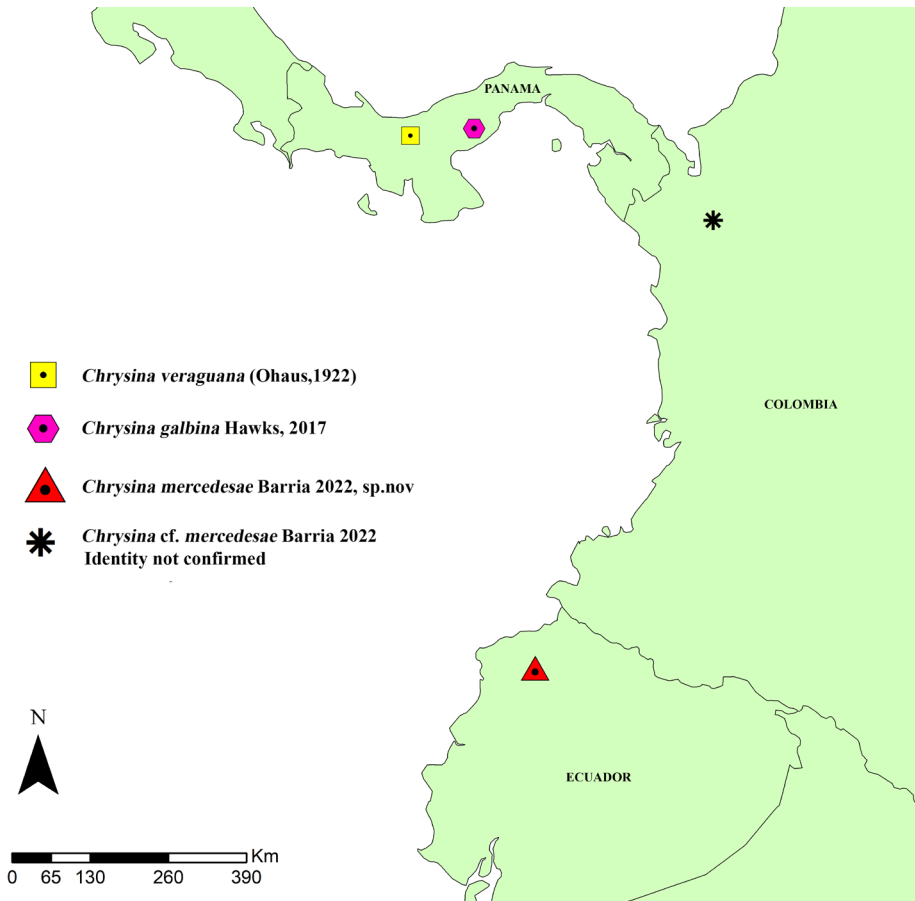


**Figures 1a-f.** *Chrysina mercedesae* sp. nov. **a-c)** Male holotype, dorsal, ventral and lateral views. **1d-e)** Female allotype, dorsal and ventral views. **f)** Female genital plates. / **a-c)** Holotipo macho, vistas dorsal, ventral y lateral. **1d-e)** Alotipo hembra, vistas dorsal y ventral. **f)** Placas genitales de la hembra.

**Distribution remarks.** I received a photo (January 2022) in dorsal view of a female specimen from east of Riosucio (Chocó, Colombia), south of Pavarando Grande, very close to the limits between the department of Chocó and Antioquia (Fig. 3, black asterisk). The female specimen appears identical to the one described in this work; however, I was unable to trace the collection where it was deposited to dissect the genitalia and confirm the identity. If this record is confirmed in the future, it would mean a great extension of the distribution of the species to the north of Chocó in Colombia. Assuming this, it could be thought that the species is distributed throughout the biogeographical Chocó, from the north in Colombia to the south in Ecuador.



**Figure 2.** *Chrysina mercedesae* sp. nov. a-c) Aedeagus holotype, lateral, caudal and dorsal views. / a-c) Edeago del holotipo, vistas lateral, caudal y dorsal.



**Figure 3.** Distribution map of the *veraguana* species-group. / Mapa de distribución del grupo de especies *veraguana*.



**Biology.** Immatures are unknown. The species inhabit in tropical premontane forest about the 300-600 m (Fig. 4). Adults were captured at night with mercury vapor light and ultraviolet light traps.



**Figure 4.** Habitat of *Chrysina mercedesae* sp. nov., Reserva Canandé, Prov. Esmeraldas, Ecuador. / Hábitat de *Chrysina mercedesae* sp. nov., Reserva Canandé, Prov. Esmeraldas, Ecuador.

*veraguana* species-group

**Diagnostic description.** Green dorsal coloration; striated elytra; abdominal sternites with or without metallic sheen; prosternal process short and subtriangular; male parameres ending in three or apparently two dentiform processes, parameres mostly “short” and robust.

**Remarks.** The *veraguana* species-group is very close to the *marginata* group in that the male genitalia have pronounced dentiform processes in both groups. Also, abdominal sternites of some species in each group are metallic while other species have matte appearance. Differences between the groups include elytral striation in the *veraguana* group compared with smooth elytra in the *marginata* group and much shorter and more robust male parameres in the *veraguana* group.

Key to species of the *veraguana* species-group

- 1. Abdominal sternites with metallic aspect..... 2
- 1'. Abdominal sternites without metallic aspect, greenish color as dorsally, with two dentiform projections oriented ventrally and to the right, left projection more robust and less acute than right.....*Chrysina galbina* Hawks, 2017
- 2. Sternites metallic green with silvery reflections, mesosternum setigerous, mesosternal

- process slightly away from the body, male parameres with three projections, one short central dentiform process and two medians lateral dentiform processes, from Panama.....*Chrysina veraguana* (Ohaus, 1922)
- 2'. Sternites matte metallic green with pinkish reflections, mesosternum poorly setigerous, mesosternal process directed forward, with two recurved and divergent dentiform processes becoming progressively more robust apically, ventral plates protruding beyond parameres, from Ecuador and ¿Colombia?.....*C. mercedesae* Barria, **new species**

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