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ARTICLE

# Elevating *Omophoita octoguttata elytralis* Bechyné, 1956 (Coleoptera: Chrysomelidae: Galerucinae: Alticini) to species

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**Abstract.** An updated morphological description for *Omophoita elytralis* (Bechyné, 1956), **stat. nov.**, is presented, including the first account of the genitalia for this species. The separation *Omophoita elytralis* from *O. octoguttata* (Fabricius, 1775) is supported by differences found in the median lobe of males, elytral tegument uniform in color (not patterned), and their allopatric geographical distribution.

**Keywords.** Flea beetles; Genitalia; Neotropics; Oedionychina; Taxonomy.

## INTRODUCTION

Neotropical beetles in the subtribe Oedionychina Chapuis 1875 display as their most noticeable feature a great variation in their colorful elytral patterns, the main characteristics separating Oedionychina from related groups being the inflated posterior tarsal segment in combination with confused elytral punctuation (Konstantinov *et al.,* 2022). An example of such dubious utility for elytral patterns is the genus *Omophoita* Chevrolat, 1836, in which the color patterns have shown to be somewhat constant among some species and useful for delimitations and identification, while varying within populations in other species (Bechyné, 1955).

*Omophoita* (Chrysomelidae: Galerucinae: Alticini: Oedionychina) is a diverse genus of the Neotropical coleopteran fauna, currently including 89 species, 83 of which are recorded for Brazil (Bechyné, 1955; Bechyné, 1959; Sekerka *et al.,* 2020). Individuals of this genus are often sampled in biodiversity studies (Linzmeier *et al.,* 2006; Rech & Linzmeier, 2019). The main distinctive characters of *Omophoita* are the pale-yellow macula observed in the vertex, the presence of three or more pairs of irregularly distributed bristles on the labrum, and the first metatarsomere longer than the adjacent tarsomeres (Bechyné, 1955). Most species of *Omophoita* have yet to be revised, and the existing literature dealing with description usually focus on external characters like coloration, lack illustrations, and only rarely detail the genitalia morphology. However, whenever taxonomic conundrums of similar species are encountered, the specific morphology of genitalia has proven to be reliable on delimiting species (*e.g.,* Konstantinov, 1998; Richmond *et al.,* 2016).

This appears to be the case for the species *O. octoguttata* (Fabricius, 1775), particularly referring to *O. octoguttata elytralis* Bechyné, 1956, its only subspecies, whose entire taxonomic history consists of a brief initial description note, that does not allow for an unambiguous separation. *Omophoita octoguttata elytralis*' distribution also does not overlap with *O. octoguttata stricto sensu*'s, with the former being only known in literature from a single publication, *i.e.,* its original description, for the central state of Goiás, in the Brazilian Cerrado (Bechyné, 1956), while the latter has a broader distribution from Bahia to Rio Grande do Sul, within moist ombrophilous forests (Begha *et al.,* 2021). Aiming to clarify such taxonomic issues, we present an updated description of the morphology and discuss its delimiting

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features to elevate the *O. octoguttata elytralis* taxonomic status to a species of its own, *O. elytralis.*

## MATERIAL AND METHODS

The morphological studies of *O. elytralis* were based on holotype and ten paratypes housed in the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZSP). Genitalia were dissected following protocols described by Smith (1979). The dissected structures were preserved in glycerin, stored in a microtube placed alongside the original individuals (which were fixed in ethanol 70% after dissection). Only the *tignum,* vaginal palpi, spermatheca (for females), and median lobe (for males) were analyzed, as the other components of the genitalia were much less sclerotized and often lost during the dissection process.

The descriptions followed the morphological concepts and nomenclature of Bechyné (1955, 1956), Crowson & Crowson (1996), Lingafelter & Konstantinov (1999), Morais *et al.* (2016) and Begha *et al.* (2021). Label data are presented as follows: Country, State, City, Month, Year, Collector, Symbol indicating the sex of the specimen (when dissected), ID number (when available), number of specimens presenting the same data label. Different individuals are separated by semicolons (;).

## RESULTS

A description of internal and external morphology of *O. elytralis* follows. We believe the morphological details present in *O. elytralis* are enough to classify it as a separate species of its own, and not as a subpopulation of *O. octoguttata.*

### *Omophoita elytralis* (Bechyné, 1956) stat. nov. (Figs. 1-3)

*Omophoita octoguttata elytralis* Bechyné, 1956: 1039.

**Diagnosis:** Body shape oval. Pronotum orange. Elytral integument yellow, lacking discernible maculae, edges of the elytral black. Head black, with three pale yellow to light brown maculae: one covering most of the vertex and the antennal calli, and two covering the lateral portions of the frontoclypeal region. Ventral area of mesothorax, metathorax, and legs black and covered with fine pale hairs.

#### External morphology (Fig. 1)

**Body length:** 7,85-9,56 mm (based on measurements of eleven specimens).

**Head:** Rounded, black. Vertex at the same level of tegument, with sparse punctation. Inconspicuous supraorbital suture, smooth integument. Supraorbital pore with long and erect seta. Eight to ten setae at lateral margin of head macula, near eyes. Twelve setae scattered between antennal insertions. Gena with nearly same width as the eye, bearing several setae. Antennae black, filiform, with eleven antennomeres; scape subcylindrical, antennomere II shorter than III, antennomere III-X subequal in length, subconical, longer than antennomere XI, which is also subcylindrical, albeit with a narrower, acute apex; antennal insertions ovoid, smaller than the diameter of the eye, interantennal space approximately same size of antennal insertions. Antennae comparatively longer in males. Frontoclypeus subtrapezoid. Labrum with rounded distal margins, central portion emarginated, with ten long setae disposed horizontally.

**Thorax:** Pronotum transverse, width twice the length, lateral margins and angles rounded, with a long seta at each angle; anterior angles extending beyond the head insertion; hypomeral lobe inflated, laterally and ventrally distinct; disk lacking any setae or impression, dark orange. Prosternum with the same color as the pronotum; prosternal process relatively narrow, widening apically, rounded at apex. Scutellum black, triangular with rounded posterior vertex; procoxal cavities open. Elytral integument yellow, lacking visible maculae region, edges of the elytral black. Epipleura visible laterally in the humeral region. Mesosternum and metasternum black, surface densely covered with fine pale hairs; metasternum elongated, rectangular; outer margins of the thorax with a higher density of hairs.

**Legs:** Fore and median legs similar, with coxae subcylindrical, slender femur and tibiae; middle legs slightly


**Figure 1.** *Omophoita elytralis* (Bechyné, 1956), ♂ habitus. (A) Dorsal view. (B) Ventral view. (C) Lateral view.

longer. Surface densely covered with fine pale hairs, pilosity on the metafemur concentrated in the outer margin. Metafemora thickened due to the internal metafemoral spring; fusiform shape. Tarsi pseudotetramerous, claws appendiculate; metatarsomere V enlarged, fusiform.

**Abdomen:** Black, with five ventrites densely covered with fine pale hairs: ventrites I-IV subequal in length, pygidium slightly longer than the other ventrites and rounded.

**Male genitalia: Median lobe (Fig. 2A)** with apical hood *(APH)* acuminated. Ventral sclerite *(VNS)* visible in dorsal view; longer than the sides of the median lobe, apex acuminated. Dorsal median process *(DMP)* visible; proximal portion of the dorsal median process and apex with subequal width; with two wide divergent projections at the apex *(PDM),* triangular-shaped. Two lateral dorsal sclerites *(LDS)* visible, triangular, forming a straight angle. Oblique dorsal process *(ODP)* ventrally curved.

**Female genitalia:** Membranous *bursa copulatrix*. ***Tignum*** **(Fig. 2B)** with base *(BPT)* three times wider than the apex; hood-like structure *(HDL)* in the median portion present; median portion opaque; distal portion slender; apical margins divergent. **Spermatheca** simple, with reniform and well-sclerotized receptacle; spermathecal duct long, curled. **Vaginal palpi** elongated with sigmoid shape, with a thin base, slightly wider and more sclerotized at the apex, ten setae at the apex.

**Material examined (11 specimens – MZSP):** Holotype – Brazil, Goiás, Leopoldo de Bulhões, Dec. 1933, Spitz. Ten paratypes – Goiás, Goiânia, Jan. 1934, Spitz, 1 ♂, MZSP 25592, 1 specimen; Goiás, Goiânia, Jan. 1934, Spitz, 1 ♀, MZSP 25593, 1 specimen; Brazil, Goiás, Leopoldo de Bulhões, Dec. 1931, Spitz, 3 specimens; Brazil, Goiás, Leopoldo de Bulhões, Mar. 1930, Spitz, 4 specimens; Brazil, Goiás, Vianópolis, Mar. 1936, Spitz, 1 specimen.

## DISCUSSION

The most noticeable difference between *O. octoguttata* and *O. elytralis* is that the latter presents no black markings dividing the yellow coloration of the elytra, thus it does not have distinct maculae. Most specific patterns among *Omophoita* can be considered and useful for identification. Even in species with intraspecific variations, elytral coloration tends to form a "gradient of patterns" as can be observed with *O. sericella* in Bechyné (1955). This species is remarkable compared to the other Brazilian *Omophoita* due to its homogeneously colored elytra that lack any visible macula patterns.

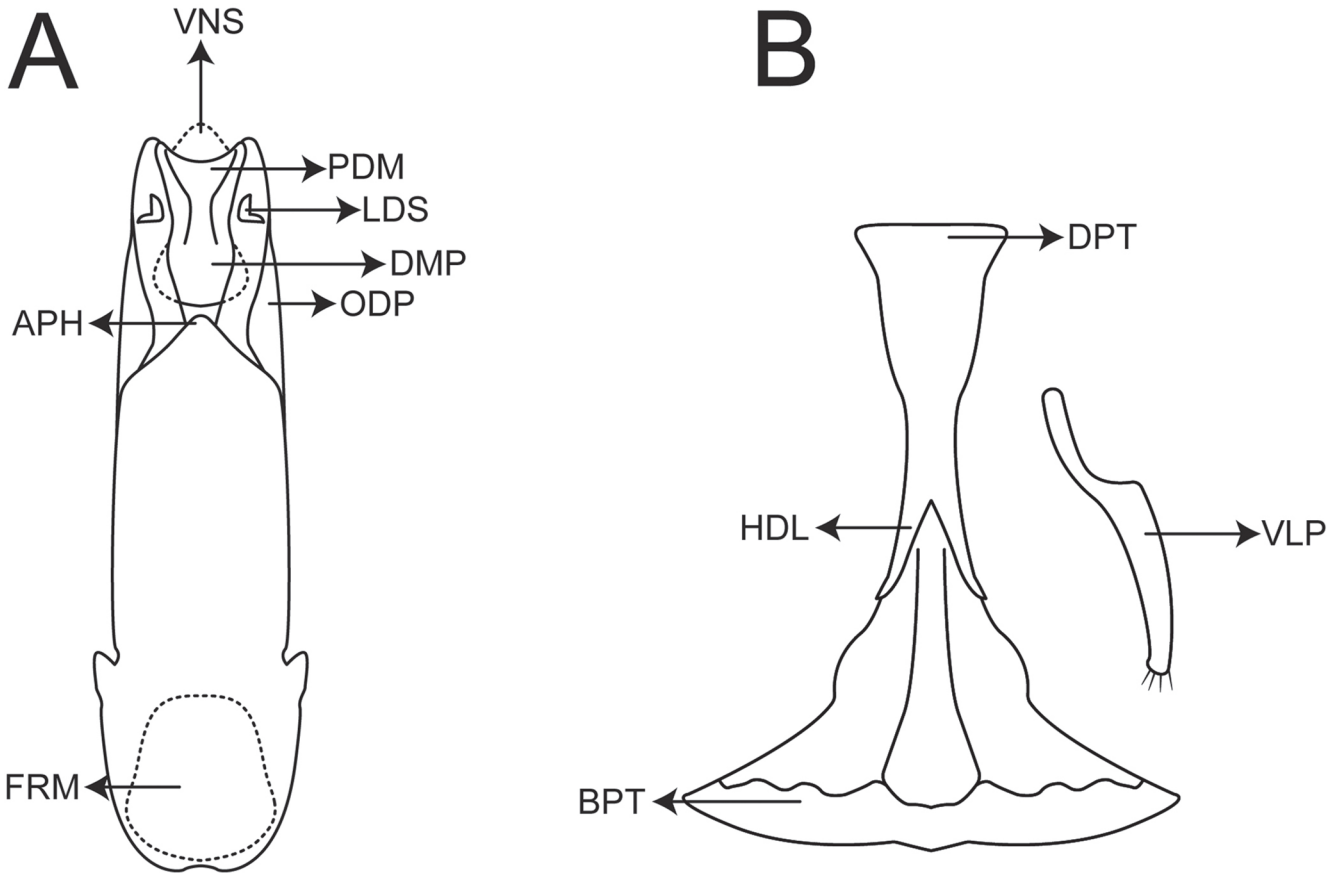


**Figure 2.** *Omophoita elytralis* (Bechyné, 1956). General structure of the genitalia. (A) General structure of the male median lobe. (B) General structure of the female *tignum* and vaginal palpus. Abbreviations: apical hood *(APH);* basal portion of the *tignum (BPT);* distal portion of the *tignum* (DPT); dorsal median process *(DMP);* hood-like structure *(HDL);* lateral dorsal sclerite *(LDS);* oblique dorsal process *(ODP);* projections of the dorsal median process *(PDM);* ventral sclerite *(VNS).*

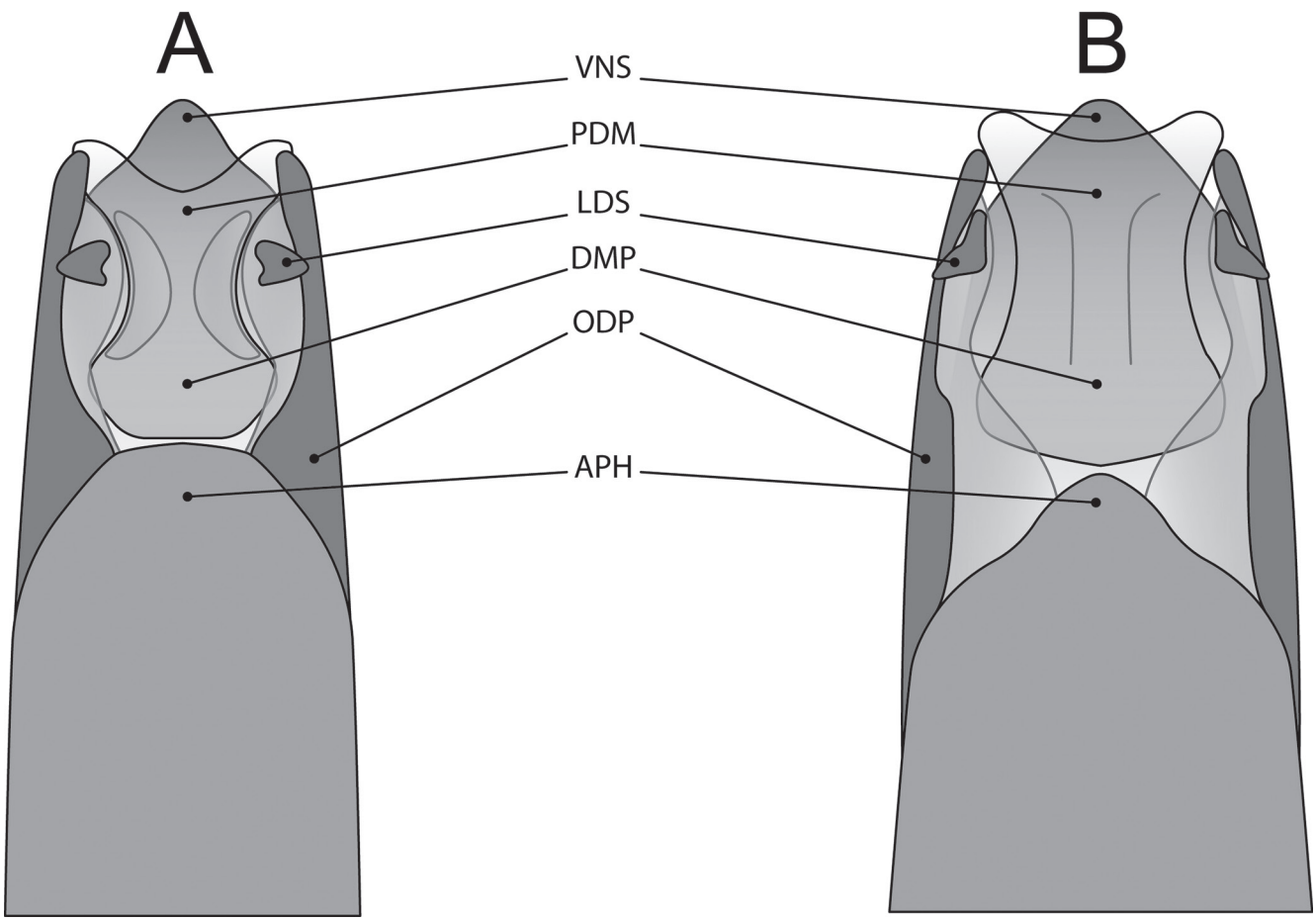


**Figure 3.** Comparison between the male median lobe of *Omophoita octoguttata* (Fabricius, 1775) (A) and *O. elytralis* (Bechyné, 1956) (B). Abbreviations: apical hood *(APH);* dorsal median process *(DMP);* lateral dorsal sclerite *(LDS);* oblique dorsal process *(ODP);* projections of the dorsal median process *(PDM);* ventral sclerite *(VNS).*

Morphological dissimilarity between male and female genitalia was also observed. The most noticeable and easily identifiable differences are in the male median lobe, the apical region is slightly different between *O. octoguttata* and *O. elytralis:* the apical hood in *O. elytralis* is acuminated and narrower at the apex, while *O. octoguttata* is broader and angulated; the dorsal median process of *O. elytralis* is broader in the median section; the shape of the dorsal lateral sclerite also differs, while both are triangular, *O. elytralis*' has a straight angle, and *O. octoguttata*'s points outwards (Fig. 3). As for female genitalia, the *tignum* of *O. octoguttata* has a goblet shape with the base a little more than two times the width of the apex (Begha *et al.,* 2021), while the base of the *tignum* of *O. elytralis* is much wider, with three times wider than the apex. The spermatheca and vaginal palpi of *O. elytralis* has identical morphology to that described in Begha *et al.* (2021, Figs. 14-15) for *O. octoguttata.* Morphology of the interlocking genitalia is often used to separate species through reproductive incompatibility (Fossen *et al.,* 2016), and relatively small differences must not be overlooked.

Another information that suggests the separation of species is the allopatric geographic distribution area. While specimens of *O. elytralis* do not present many records in literature, they have only ever collected in the state of Goiás, deep into the Cerrado biome, while *O. octoguttata* have shown a much wider distribution, collected in the Atlantic Forest or Mixed Rain Forest, and even when collected in other biomes, these collection sites are not far from a rainforest area. Even though there is enough distinction to separate these beetles into different species, both *O. octoguttata* and *O. elytralis* share many morphological traits, such as the patterns of the head maculae, labrum setae and overall genitalia structure (Bechyné, 1956; Begha *et al.,* 2021).

This study highlights how overlooked characteristics on older taxa can reveal new taxonomical insights, and that internal morphology should not be ignored. Based on geographical isolation and morphological differences, we here elevate *O. octoguttata elytralis* to species level, as *O. elytralis.* Further studies should be developed on *Omophoita,* and other close genera lacking detailed taxonomic resolution, especially those with complex elytral patterns prone to misidentification. Our study adds to the scarce knowledge of Oedionychina, in the hopes to better clarify the species delimitations and the true diversity of the neotropical fauna.

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