



# Types of *Cuyabasa* Bechyné, *Palmaraltica* Bechyné and *Rhynchasphaera* Bechyné (Coleoptera: Chrysomelidae: Galerucinae: Alticini: Oedionychina) of the Naturhistorisches Museum, Basel, with keys to species and descriptions of genitalia, and new combinations for species transferred to the oedionychine genus *Walterianella* Bechyné

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## Abstract

Jan Bechyné described several genera within the species-rich subtribe Oedionychina Chapuis, 1875. A large part of his collection is housed at the Naturhistorisches Museum Basel—Georg Frey holdings (NMB). Images of type specimens of the following species are provided: *Cuyabasa chiquitoensis* Bechyné, 1959, *Cuyabasa gastrophysoides* Bechyné, 1959, *Cuyabasa minor* (Bechyné, 1955), *Palmaraltica heteronycha* Bechyné, 1959, *Rhynchasphaera basisticta* Bechyné, 1958, *Rhynchasphaera latipleura* Bechyné, 1956 and *Rhynchasphaera orophila* Bechyné, 1955. Additionally, photographs of *Palmaraltica yepezi* Bechyné & Bechyné, 1969 and *Palmaraltica tomentosa* (Jacoby, 1880), **comb. nov.** are provided. Keys to species of the treated genera are provided, as well as notes on taxonomy and distribution. Lastly, the following new combinations are established: *Palmaraltica tomentosa* (Jacoby, 1880), *Walterianella basimaculata* (Jacoby, 1905), *Walterianella dimidiaticornis* (Jacoby, 1905), *Walterianella discolor* (Jacoby, 1886), *Walterianella illigeri* (Jacoby, 1886), *Walterianella jansonii* (Jacoby, 1886), *Walterianella marginicollis* (Jacoby, 1885), *Walterianella montana* (Jacoby, 1886) and *Walterianella pavonina* (Jacoby, 1892), all **comb. nov.**

**Key words:** digitization, leaf beetle, taxonomy, Neotropical Region

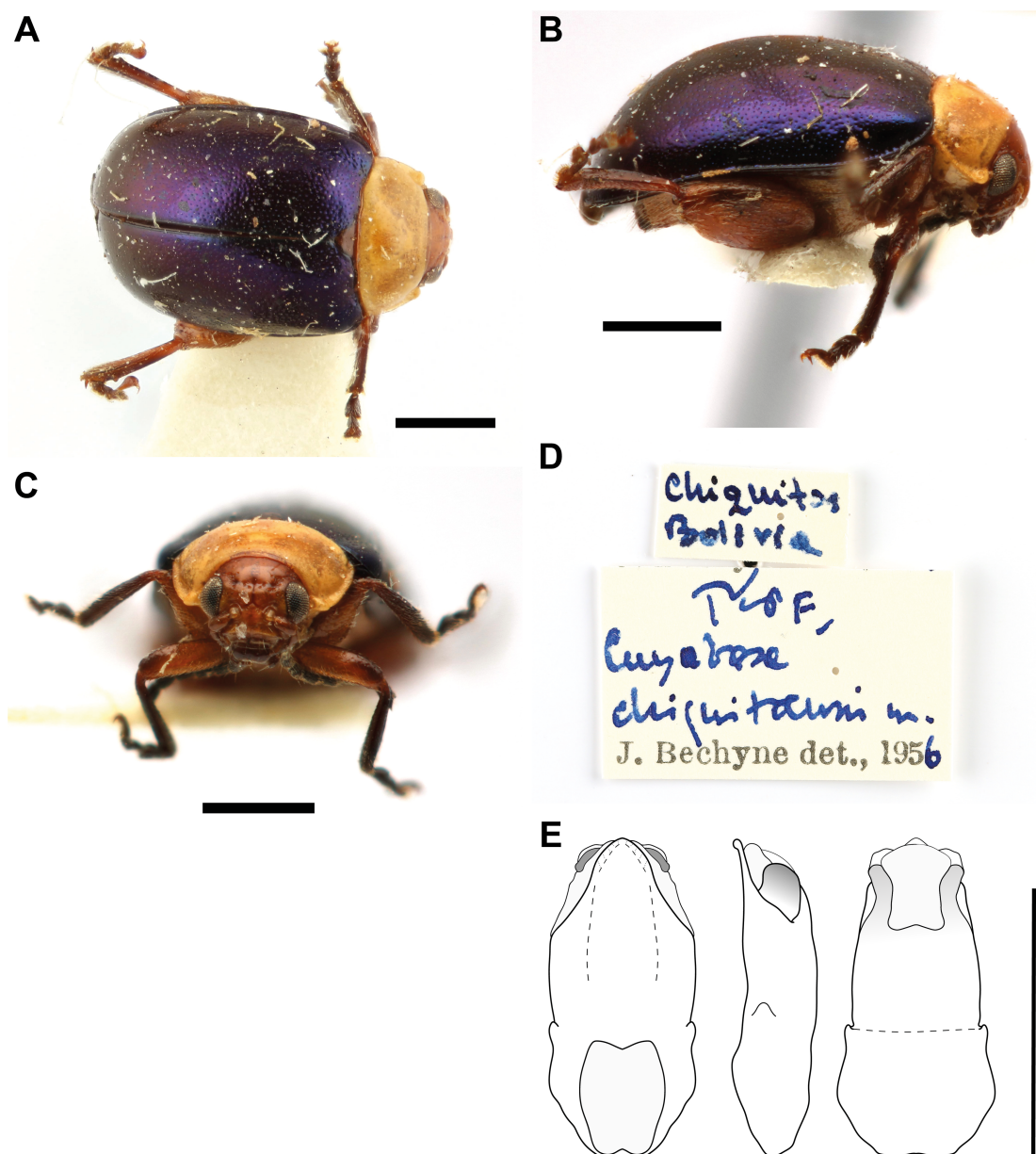
## Introduction

Within the chrysomelid tribe Alticini Newman, 1835, the subtribe Oedionychina Chapuis, 1875 forms a species-rich group, with most species occurring on the American continents. The subtribe is relatively easy to diagnose, since its members have the distal portion of the terminal metatarsomere globosely swollen, and the elytral punctures are confused (Duckett & Kjer 2003). Some members are also among the biggest flea beetles, with body lengths above 10 mm (Konstantinov *et al.* 2022). A last and most definitive feature of Oedionychina involves the vaginal palpi, which are shaped as conical funnels with their narrow ends facing medially or anteromedially; this characteristic is unique among flea beetles (Konstantinov *et al.* 2022). Despite this relative ease by which one can identify the subtribe, generic placement of many species is still problematic.

Much of the species diversity of American Oedionychina was described by Jacoby (1886–1892), with his well-known contributions in the *Biologia Centrali-Americana* and by Horn and Harold in the 1800's. In the 1900's, Blake (mainly focusing on the USA and West Indies fauna) and Bechyné (dedicated to studying essentially fauna

of Central- and South America) revised various Oedionychina and described many of them. Blake stayed within boundaries of already described genera like *Oedionychis* Latreille, 1829, *Omophoita* Chevrolat, 1836, and *Asphaera* Duponchel & Chevrolat in d'Orbigny, 1842 (e.g., Blake 1940). Bechyné described several genera of this subtribe. Some were speciose, like *Alagoasa*, that nowadays harbor around 300 species (Bechyné 1955a). Other genera were small, with only one or a handful of species (e.g., Bechyné 1959). Despite the small number of species within some genera, they are practically unknown morphologically, and only a few of them are illustrated.

To improve our understanding of genus and species delimitations within Oedionychina, we focus on three small genera: *Cuyabasa* Bechyné, 1959, *Palmaraltica* Bechyné, 1959 and *Rhynchasphaera* Bechyné, 1955. They were all described during Bechyné's work in the Georg Frey collection, now housed at the Naturhistorisches Museum, Basel, Switzerland. During a visit to this collection, members of these three genera were studied and photographed, with the aim of discovering morphological characteristics that facilitate identification. This paper summarizes the results thereof. Also, in conjunction with this study, new combinations were discovered involving the genus *Walterianella* Bechyné, 1955.



**FIGURE 1.** Holotype male of *Cuyabasa chiquitoensis* Bechyné from the NMB. **A.** Dorsal view; **B.** Lateral view; **C.** Frontal view; **D.** Label; **E.** Aedeagus. Scale bar: 1 mm.

## Methods

From 13 to 23 June 2022, two of the authors visited the Georg Frey collection at the Naturhistorisches Museum, Basel. All type specimens of genera *Cuyabasa*, *Palmaraltica* and *Rhynchaspheera* were digitized, using a focus stacking setup consisting of a Canon 700D camera with a Canon EF-S 60 mm macro lens (1:1) or a Laowa 25 mm 2.5–5X Ultra Macro lens. For stacking, we used a WeMacro stand and rail, in combination with two Nanlite Compac 24 LED studio lights, and Helicon remote software (HeliconSoft Ltd., Kharkiv, Ukraine). Stack step size was dependent on specimen size, but it usually ranged between 50 and 200 µm. Some other relevant specimens from other collections were photographed as well, using the same method, except for a specimen of *Palmaraltica yepezi* Bechyné & Bechyné, 1969, which was photographed with Macropod Pro photomacrography system (Macroscopic Solutions, LLC, Tolland, CT, USA). Individual images were processed with Zerene Stacker, version 1.04 and edited with Adobe Photoshop Elements 2020.

Additionally, from 30 January to 10 February 2023, two of the authors visited The Natural History Museum, London. Several Jacoby syntypes were studied there, leading to some new combinations established in this paper.

Dissections and genital terminology followed Konstantinov (1998). Specimen labels are cited verbatim, following Konstantinov (1998). Information on each name is provided as follows: verbatim type locality, kind of type and gender of type specimen. If original and current generic placements differ, the original genus name, in parentheses, follows the species name treatment. The following abbreviations are used to report species measurements: **LB**, total length of body; **WB**, maximal width of body. Measurements are in millimeter (mm).

Collection acronyms used are as follows:

**AMNH**, American Museum of Natural History, New York, NY, USA;

**BYU**, Brigham Young University, Monte L. Bean Life Science Museum, Provo, UT, USA;

**BMNH**, The Natural History Museum, London, United Kingdom;

**MCZC**, Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA;

**MIZA**, Museo del Instituto de Zoología Agrícola “Francisco Fernández Yépez”, Facultad de Agronomía, Universidad Central de Venezuela, Maracay, Venezuela;

**NMB**, Naturhistorisches Museum, Basel, Switzerland;

**USNM**, United States Museum of Natural History, Washington DC, USA.

## Results

### Genus *Cuyabasa* Bechyné, 1959

*Cuyabasa* Bechyné 1959:346 (type species: *Wanderbiltiana minor* Bechyné, 1955, by original designation).

**Number of species.** Three.

**Distribution.** Bolivia, Brazil (states of Minas Gerais and São Paulo), Paraguay.

**Remarks.** Members of *Cuyabasa* share the following characteristics: body small (<5 mm), habitus rounded; frontal ridge wide, at least as wide as an antennal socket; interocular space at least as wide as twice the diameter of an eye; antennae moniliform; pronotum with narrow lateral edge, with rounded anterolateral corners of pronotum; distal portion of terminal metatarsomere strongly globose. Bechyné (1959) described the genus *Cuyabasa* as a possible link between Oedionychina and Disonychina LeConte & Horn, 1883, due to the presence of characters found in both subtribes. Indeed, the rather narrow lateral edge of the pronotum, rounded anterolateral pronotal corners and wide frontal ridge do correspond with genera of Disonychina like *Disonycha* Chevrolat, 1836 and *Phenrica* Bechyné, 1959. However, the strongly globose distal portion of the terminal metatarsomere, together with the confused elytral punctation, put this genus within Oedionychina.

## Key to species of *Cuyabasa* (adapted from Bechyné 1959)

- 1 Punctuation of pronotum almost absent or at least finer than elytral punctuation; surface of antennal calli mostly smooth . . . . . 2  
- Punctuation of pronotum as apparent as elytral punctuation; surface of antennal calli rugose; elytra metallic blue to green; pronotum, underside, head and legs dark red to reddish black; antennomeres 4–11 more dark; spermatheca as in Figure 2 . . . . .  
..... *Cuyabasa gastrophysoides* Bechyné, 1959
- 2 Ventral side, scutellum, head, legs and antennae black; elytra metallic blue to green; pronotum yellow to red; frontal ridge not reaching antennal sockets; spermatheca and aedeagus as in Figure 3 . . . . . *Cuyabasa minor* (Bechyné, 1955)  
- Underside, head, legs and antennae red or dark red; antennomeres 4–11 darkened; frontal ridge reaching antennal sockets; aedeagus as in Figure 1 . . . . . *Cuyabasa chiquitoensis* Bechyné, 1959

### *Cuyabasa chiquitoensis* Bechyné, 1959

(Figure 1)

*Cuyabasa chiquitoensis* Bechyné 1959:346 (Bolivien: Chiquitos, holotype male).

**Measurements.** LB = 3.60 mm; WB = 2.23 mm (N=1)

**Distribution.** Bolivia.

**Type examined.** Holotype male: Chiquitos Bolivia, Type *Cuyabasa chiquitoensis* ns. J. Bechyné det., 1956 (NMB).

**Literature records.** Apart from the locality given in the original description, no other published localities exist.

**Description of genitalia.** Aedeagus (Figure 1E), in ventral view, almost blunt; maximum width situated at about distal third, followed by constriction and thereafter widening again apically. In lateral view, nearly straight; maximum width at about distal third. Apical denticle rounded with slight tip in ventral view, slightly curved in lateral view. Ventral surface of aedeagus smooth, with apex slightly wrinkled. Basal opening angulate. Female genitalia not available for study.

**Diagnosis.** *Cuyabasa chiquitoensis* can be separated from *C. minor* by the red or dark red coloration of the head, underside, scutellum and appendages (Figure 1); by the frontal ridge that reaches the antennal sockets (Figure 1C); and by the apex of the aedeagus that lacks the lamelliform protrusion (Figure 1E). *Cuyabasa chiquitoensis* can be separated from *C. gastrophysoides* by the pronotal punctuation that is finer than that of elytra (Figure 1A); by the smooth (non-rugose) antennal calli (Figure 1C); and by the less deeply punctate orbital sulcus (Figure 1C). Since only one male of *C. chiquitoensis* and one female of *C. gastrophysoides* are known to date, genitalia of these species could not be compared.

### *Cuyabasa gastrophysoides* Bechyné, 1959

(Figure 2)

*Cuyabasa gastrophysoides* Bechyné 1959:347 (Paraguay, holotype female).

**Measurements.** LB = 4.96 mm; WB = 3.05 mm (N=1)

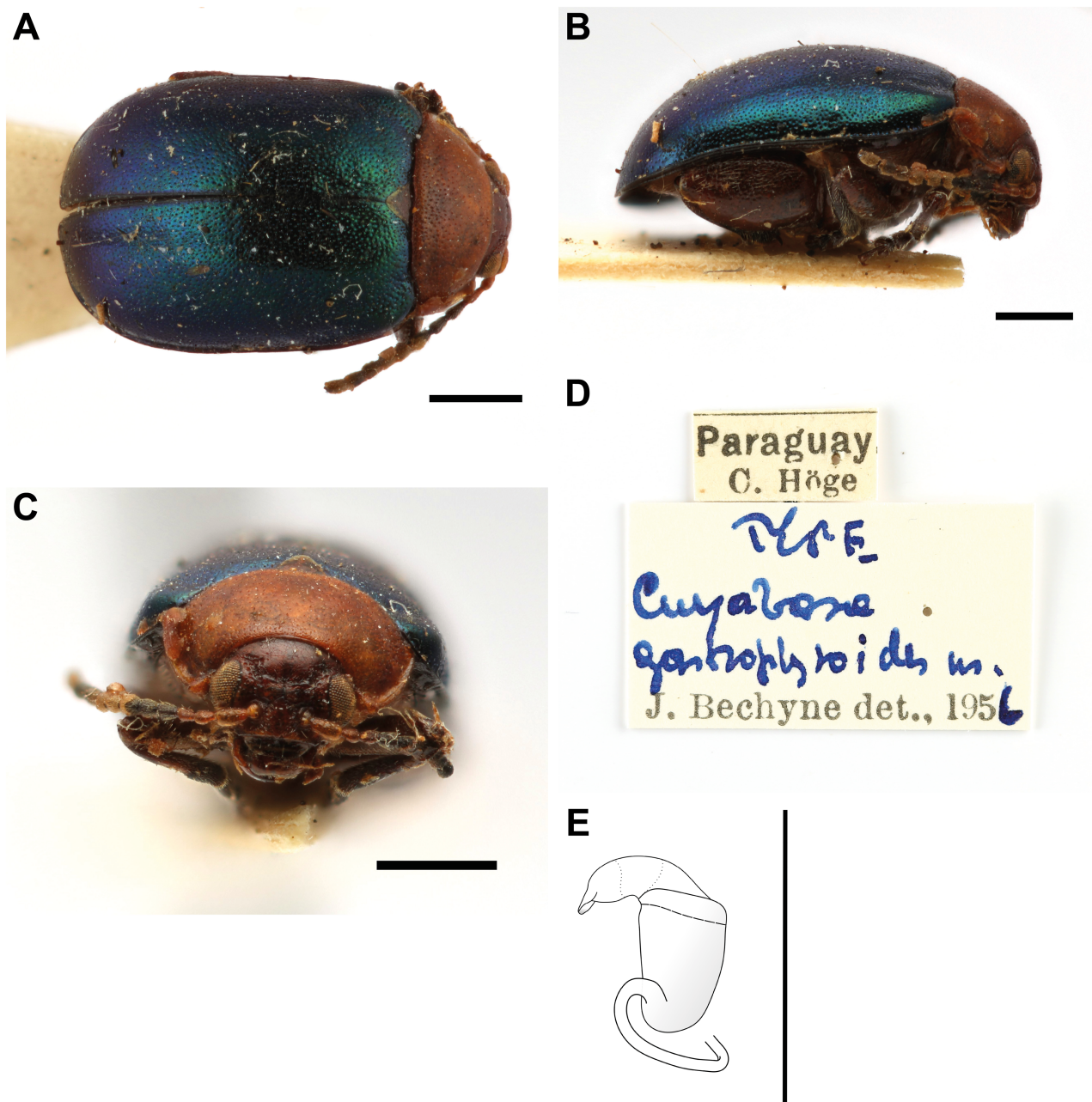
**Distribution.** Paraguay.

**Type examined.** Holotype female: Paraguay C. Höge, Type *Cuyabasa gastrophysoides* ns. J. Bechyné det., 1956 (NMB).

**Literature records.** PARAGUAY: (C. Höge, Mus. G. Frey) (Bechyné 1959).

**Description of genitalia.** Spermathecal pump (Figure 2E) arched, rounded, about two-thirds as long as receptacle. Apex flattened, evenly rounded, short, about one-fourth length of pump in lateral view. Receptacle cup-shaped, with maximum width situated near spermathecal pump, forming a collar, making 90° angle with pump. Canal attached slightly above base of receptacle. Male genitalia not available for study.

**Diagnosis.** *Cuyabasa gastrophysoides* differs from *C. minor* by the red or dark red coloration of the head, ventral side, scutellum and appendages (Figure 2), and by the frontal ridge that reaches the antennal sockets (Figure 2C). *Cuyabasa gastrophysoides* can be separated from *C. chiquitoensis* by the pronotal punctuation that is as apparent as that of the elytra (Figure 2A); by the rugose antennal calli; and by the deeply punctate orbital sulcus. Since only one male of *C. chiquitoensis* and one female of *C. gastrophysoides* are known to date, genitalia of these species could not be compared.



**FIGURE 2.** Holotype female of *Cuyabasa gastrophysoides* Bechyné from the NMB. **A.** Dorsal view; **B.** Lateral view; **C.** Frontal view; **D.** Label; **E.** Spermatheca. Scale bar: 1 mm.

***Cuyabasa minor* (Bechyné, 1955)**

(Figure 3)

*Wanderbiltiana minor* Bechyné 1955a:9 (Brasil, Est. Minas Gerais: Uberaba, holotype sex unknown).

*Cuyabasa minor*: Bechyné 1959:347.

**Measurements.** LB = 4.70 mm; WB = 2.91 mm (N=1)

**Distribution.** Brasil (states of Minas Gerais and São Paulo), Paraguay.

**Type examined.** Paratype: Brésil-Uberaba Minas Gerais, P-Type *Wanderbiltiana minor* ns. J. Bechyné det., 1954 (1 female NMB)

**Additional material examined.** Brésil-Uberaba Minas Gerais (2 females NMB); Brésil-Uberaba Etat de Minas

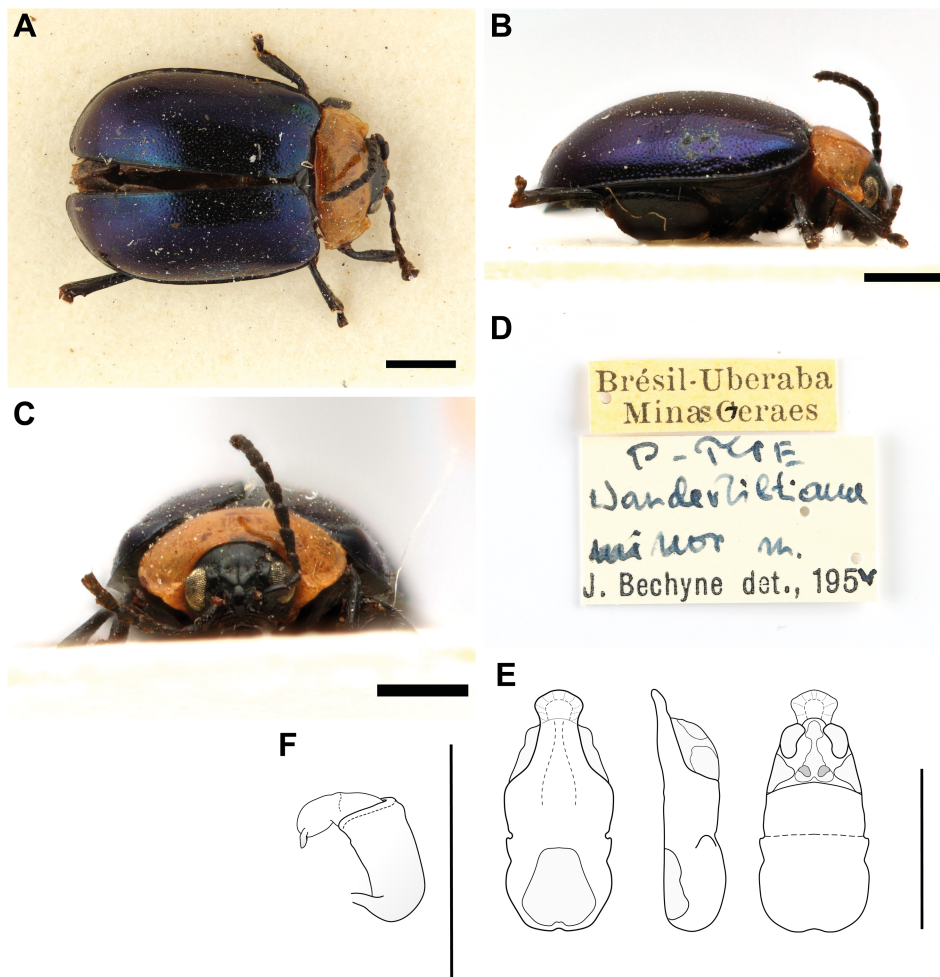
Gerais (1 male 1 female NMB); Estancia Postillon Puerto Max a. Rio Paraguay, N.-Paraguay, Louis Des Arts Jr. leg. (1 female NMB).

**Literature records.** BRASIL: Est. Minas Gerais: Uberaba (Bechyné 1955a, as *Wanderbiltiana*). Minas Gerais: Lagoa Santa, I. 1954 (B. Silva, coll. M. Alvarenga) (Bechyné 1959). PARAGUAY: Paraguay, Río Paraguay: Estancia Postillon, Puerto Max (Louis Des Arts Jr., Mus. G. Frey) (Bechyné 1959).

**Description of genitalia.** Aedeagus (Figure 3E) rhomboid at apex ; lamellate projection visible in ventral and dorsal views; maximum width situated at about distal fifth, followed by constriction, thereafter widening apically. In lateral view, nearly straight, about equally wide throughout length. Apical denticle flattened, slightly curved in lateral view. Ventral surface smooth, with apex slightly wrinkled. Apical opening with two C-shaped sclerites situated anterolaterally.

Spermathecal pump (Figure 3F) arched, rounded, about half as long as receptacle, forming a bend so that midline of pump is about perpendicular to midline of receptacle. Apex flattened, evenly rounded, short, about one-fourth length of pump in lateral view, curved slightly downwards. Receptacle cup-shaped, with maximum width situated near spermathecal pump, forming collar. Receptacle with slight constriction situated at about middle of receptacle. Canal attached slightly above base of receptacle.

**Diagnosis.** *Cuyabasa minor* can be separated from both *C. gastrophysoides* and *C. chiquitoensis* by the black coloration of the head, underside, scutellum and appendages (Figure 3), and by the frontal ridge that does not reach the antennal sockets (Figure 3C). *Cuyabasa minor* differs also from *C. chiquitoensis* by the apex of the aedeagus bearing a lamelliform protrusion (Figure 3D) and from *C. gastrophysoides* by having a more elongate spermathecal receptacle with a constriction near the middle (Figure 3F).



**FIGURE 3.** Paratype of *Cuyabasa minor* (Bechyné) from the NMB. **A.** Dorsal view; **B.** Lateral view; **C.** Frontal view; **D.** Label; **E.** Aedeagus; **F.** Spermatheca. Scale bar: 1 mm.

## Genus *Palmaraltica* Bechyné, 1959

*Palmaraltica* Bechyné 1959:347 (type species: *Palmaraltica heteronycha* Bechyné, 1959, by original designation).

**Number of species.** Three.

**Distribution.** Costa Rica, Bolivia, Ecuador, Venezuela.

**Remarks.** Bechyné (1959) erected this genus to accommodate species with clearly pubescent elytra, with the third antennomere as long as the fourth, and with bifid pro- and mesotarsal claws (metatarsal claws simple). The latter character was amended in Bechyné & Bechyné (1969), with the description of the second species in the genus, *Palmaraltica yepezi*, in which all tarsal claws are bifid. Based on our examination of both species, the following additional diagnostic characters of the genus are proposed: pronotum at least twice as wide as long; anterior corners of pronotum not overly thickened (like in *Omophoita*) and directed anterolaterally; posterior corners of pronotum slightly directed upwards in lateral view; sides of pronotum explanate. Currently, only one other genus with clearly pubescent elytra is known in Oedionychina: the genus *Hirtasphaera* Medvedev, 2004 from the West Indies (see also Konstantinov *et al.* 2022). However, *Hirtasphaera* clearly differs from *Palmaraltica* by the shape of the pronotum, simple tarsal claws, much more diffuse pubescence of the elytra and more slender antennomeres. Furth *et al.* (2003) reported *Palmaraltica* in Costa Rica, but the species could not be determined since only a few photographs of the specimen were available for study. These photographs did however show some morphological differences from *P. yepezi*, like the lack of a yellow sutural band, less elongate antennal calli and more finely punctate vertex. It is highly likely that this genus also occurs in Colombia and Panama.

### Key to species of *Palmaraltica*

- 1 Pro- and mesotarsal claws bifid; metatarsal claws simple. Elytra dark red with yellow band. . . . . 2  
- All tarsal claws bifid. Head black, with exception of yellow antennal calli, interantennal callus and frontal ridge; antennomeres 1–3 yellow, 4–11 black; legs and underside black, with exception of yellow distal half of femora; pronotum yellow; elytral suture and apical and lateral borders, including elythropleura, yellow (Figure 6) . . . . .  
. . . . . *Palmaraltica yepezi* Bechyné & Bechyné, 1969
- 2 Head and pronotum dark red to black, with slight metallic blue-green sheen; legs, antennae and underside dark red; elytra yellow, with exception of dark red coloration at anterior third and posterior sixth (Figure 4) . . . . .  
. . . . . *Palmaraltica heteronycha* Bechyné, 1959
- Head and pronotum dark red; legs, antennae and underside dark red to black; elytra red, with exception of yellow at apical 1/3<sup>rd</sup> (Figure 5) . . . . . *Palmaraltica tomentosa* (Jacoby, 1880), **comb. nov.**

### *Palmaraltica heteronycha* Bechyné, 1959

(Figure 4)

*Palmaraltica heteronycha* Bechyné 1959:347 (Bolivia, Yungas del Palmar, holotype female).

**Measurements.** LB = 8.98 mm; WB = 5.80 mm (N=1)

**Distribution.** Bolivia.

**Type examined.** Holotype female: Bolivia, Yungas del Palmar 2000m, Zischka Ew. Reitter, Type *Palmaraltica heteronycha* ns. J. Bechyné det., 1956 (NMB).

**Literature records.** BOLIVIA: Yungas del Palmar, 2000m (R. Zischka, Mus. G. Frey) (Bechyné 1959).

**Description of genitalia.** Spermatheca (Figure 4E) coil-shaped, 4–5 times as long as wide. Spermathecal pump rounded, about one-fifth as long as receptacle. Division between receptacle and pump faint. Apex of pump flattened, blunt, short. Receptacle widest at base. Canal attached at base of receptacle. Vaginal palpi (Figure 4F) conical, slightly rounded; apex with some setae. Male genitalia not available for study.

**Diagnosis.** *Palmaraltica heteronycha* can be separated from *P. yepezi* by general coloration and habitus (Figure 4), together with having simple front tarsal claws. Only the female of this species is currently known. *Palmaraltica heteronycha* differs from *P. tomentosa* by the broader shoulders, more rounded pronotal edges and dark coloration of the apex and basal third of the elytra. The female genitalia of both species seem to be different as well, with strongly arched vaginal palpi and a downward facing spermathecal pump in *P. tomentosa* (Figure 5D&E).

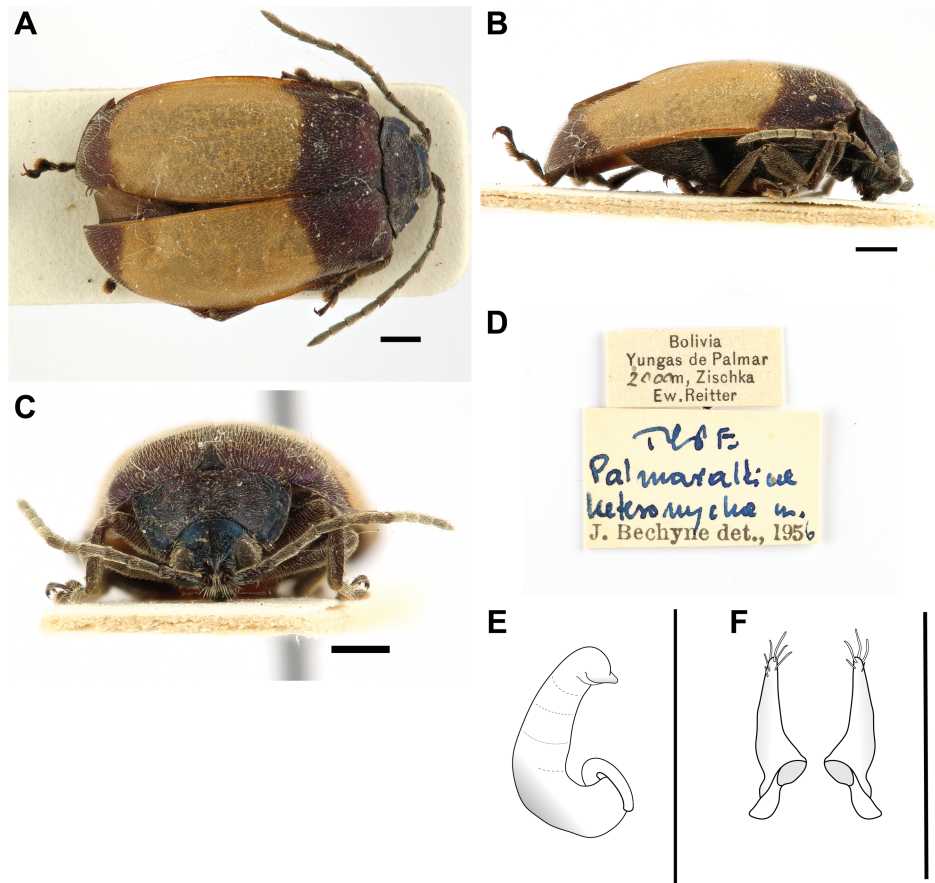


FIGURE 4. Holotype female of *Palmaraltica heteronycha* Bechyne from the NMB. A. Dorsal view; B. Lateral view; C. Frontal view; D. Label; E. Spermatheca; F. Vaginal palpi. Scale bar: 1 mm.

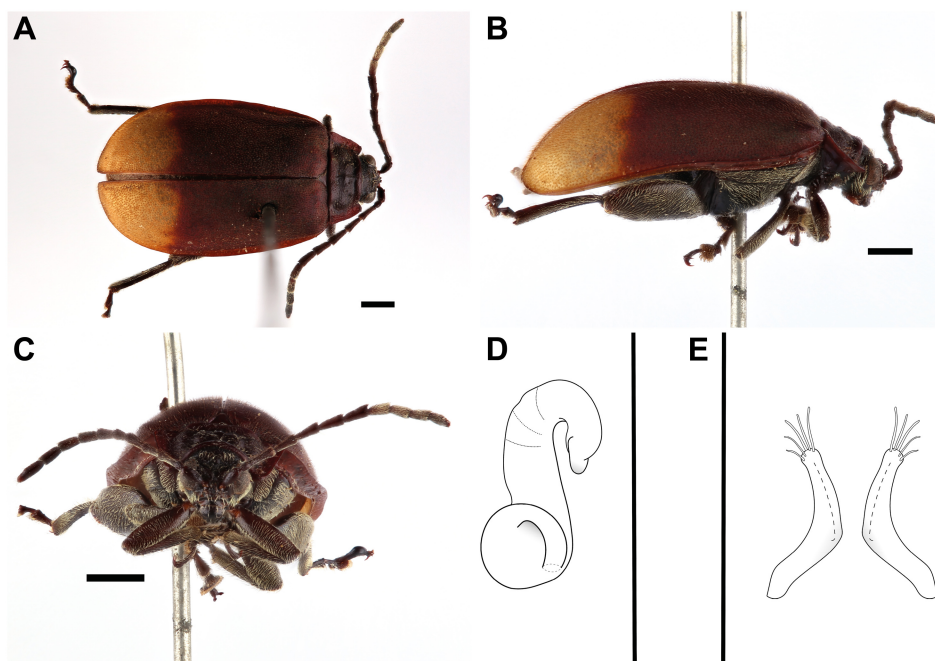


FIGURE 5. Female specimen of *Palmaraltica tomentosa* Jacoby, **comb. nov.** from the BMNH. A. Dorsal view; B. Lateral view; C. Frontal view; D. Spermatheca; E. Vaginal palpi. Scale bar: 1 mm.



***Palmaraltica tomentosa* (Jacoby, 1880), comb. nov.**

(Figure 5)

*Asphaera tomentosa* Jacoby 1880:601 (Eastern Ecuador, syntype sex unknown).

**Measurements.** LB = 8.62–9.46 mm; WB = 4.78–5.43 mm (N=2)

**Distribution.** Ecuador.

**Type examined.** Syntype: Ecuad. Buckley., 1st Jacoby Coll., Type. Sp. figured., Type 19071 (MCZC, <https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:19071>).

**Additional material examined.** 42201, Buckley, Equador Macas, Fry coll. 1905.100 (1 female BMNH).

**Literature records.** No specific locality was given in original description, but all of the species described in Jacoby (1880) are from eastern Ecuador.

**Description of genitalia.** Spermatheca (Figure 5D) coil-shaped, 4–5 times as long as wide. Spermathecal pump rounded, about one-fifth as long as receptacle, bent, with apex directed downwards. Division between receptacle and pump faint. Apex of pump flattened, blunt, short. Receptacle widest at base. Canal attached at base of receptacle. Vaginal palpi (Figure 5E) conical, arched, shaped nearly as boomerang; apex blunt with long setae. Male genitalia not available for study.

**Diagnosis.** *Palmaraltica tomentosa* can be separated from *P. yepezi* by general coloration and habitus (Figure 5), together with having simple front tarsal claws; it differs from *P. heteronycha* by narrower shoulders, straighter pronotal edges and dark coloration of the elytra on the basal two-thirds but not at the apex. The female genitalia of both species seem to be different as well, with strongly arched vaginal palpi and a downward facing spermathecal pump in *P. tomentosa* (Figure 5D&E).

**Remarks.** Examination of pictures of the syntype on the MCZ type repository ([https://mczbase.mcz.harvard.edu/MediaSearch.cfm?action=search&media\\_id=1375700,1388858,1378374,1388867,1381004](https://mczbase.mcz.harvard.edu/MediaSearch.cfm?action=search&media_id=1375700,1388858,1378374,1388867,1381004)), and study of two specimens from the BMNH, revealed that this species is congeneric with other species of *Palmaraltica*, based on the following characters: pro- and mesotarsal claws bifid; metatarsal claws simple; body covered in dense pubescence. The second BMNH specimen, from the Baly collection (not listed in additional material), was very dark in coloration and seemed to lack the yellow apical coloration of the elytra. We could not determine if this was due to poor preservation, or if the specimen demonstrated intraspecific variation, or if the specimen belongs to an undescribed species of *Palmaraltica*. More study is required with additional material.

***Palmaraltica yepezi* Bechyné & Bechyné, 1969**

(Figure 6)

*Palmaraltica yepezi* Bechyné & Bechyné 1969:54 (Venezuela, Aragua, Rancho Grande, holotype sex unknown).

**Measurements.** LB = 4.65–5.47 mm; WB = 2.56–3.30 mm (N=2)

**Distribution.** Venezuela.

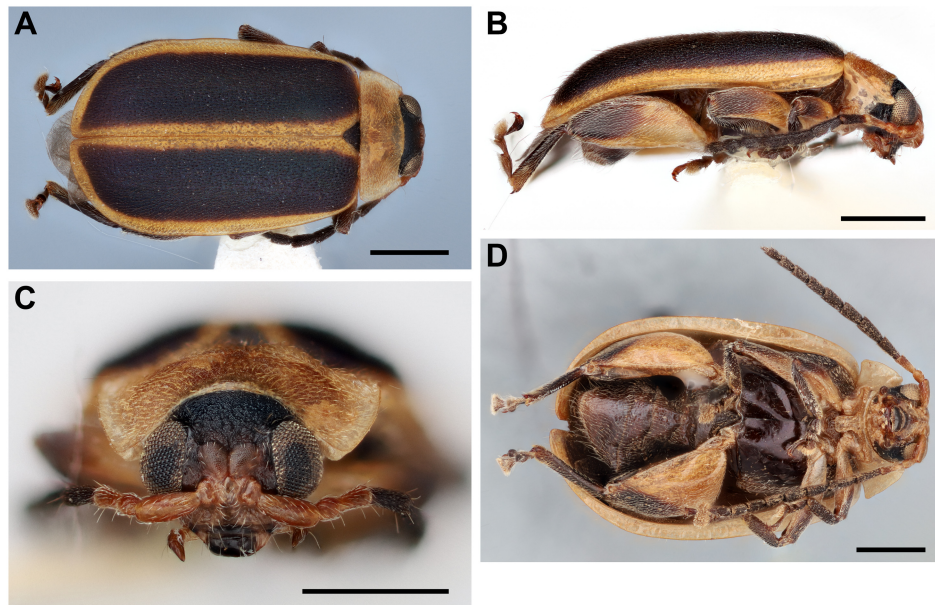
**Type material.** Not examined.

**Additional specimens examined.** Venezuela—AR Rancho Grande 1100m 21/3 1966 J. & B. Bechyné, *Palmaraltica yepezi* B+B, U.C.V. Collection (1 MIZA, on loan to D. Furth). Rancho Grande AR. Venezuela 1100m 1-V-51 C.J. Rosales, *Palmaraltica yepezi* B+B, U.C.V. Collection (1 MIZA, on loan to D. Furth)

**Literature records.** VENEZUELA: Aragua : Rancho Grande, 1100 m, 1. V. (Typus, [male]) et 8. Vii. 1951, 9. V. 1953, 5. V. 1957 et 5. Xi. 1958 (F. Fernández Yépez, Fac. Agron., Maracay); *ibid.*, 1. V. 1951 (C. J. Rosales, Fac. Agron., Maracay); *ibid.*, 15. Iv. 1955 (F. Fernández Yépez et C.. J. Rosales, Fac. Agron., Maracay); *ibid.*, 20. Vii. 1949 (P. Fenjves, Fac. Agron., Maracay); *ibid.*, 20. Vi. 1965 (F. Romeo, Fac. Agron., Maracay); *ibid.*, 27. Iii. 1966, 13. Vii. 1967 et 21. Iv. 1968 (J. et B. Bechyné, Fac. Agron., Maracay); Carretera Maracay- Choroní, 13. V. 1948 (F. Fernández Yépez, Fac. Agron., Maracay). (Bechyné & Bechyné 1969).

**Description of genitalia.** Specimens studied were not allowed to be dissected.

**Diagnosis.** *Palmaraltica yepezi* can be separated from *P. heteronycha* and *P. tomentosa* by general coloration and habitus (Figure 6), together with the bifid protarsal claws.



**FIGURE 6.** Specimen of *Palmaraltica yepezi* Bechyné from MIZA. **A.** Dorsal view; **B.** Lateral view; **C.** Frontal view; **D.** Ventral view. Scale bar: 1 mm.

### Genus *Rhynchasphaera* Bechyné, 1955

*Rhynchasphaera* Bechyné 1955b:198 (type species: *Rhynchasphaera orophila* Bechyné, 1955, by original designation).

**Number of species.** Three.

**Distribution.** Bolivia, Peru.

**Remarks.** *Rhynchasphaera* closely resembles some members of *Asphaera* and *Aspicela* Dejean, 1836. Bechyné (1955b) stated the following differentiating characters: clypeus vaulted upwards, forming a tubercle, on which the antennae are implanted; epipleura vertical, not visible from lateral view, deeply grooved. We propose the following additional characters: anterolateral callosity of pronotum long, directing anteriorly; lateral margins of pronotum and elytra widely explanate. These characters seem to be common to genera closely related to *Asphaera* (see also Konstantinov *et al.* 2022).

### Key to species of *Rhynchasphaera*

- 1 Frons at most with a few small punctures. Basal third of elytra with blue-black macula that does not reach elytropleura; apical part of macula almost straight-edged (Figure 9) . . . . . *Rhynchasphaera orophila* Bechyné, 1955
- Frons punctate; coloration of elytra not as above . . . . . 2
- 2 Elytra evenly rounded when viewed laterally (Figure 8B); elytra matte, deeply punctate; elytra yellow with metallic blue-green coloration basally and sublaterally (Figure 8) . . . . . *Rhynchasphaera latipleura* Bechyné, 1956
- Elytra not evenly rounded when viewed laterally (Figure 7B); elytra shiny, not as deeply punctate; elytra mostly yellow or rufous, with small metallic blue-black maculae basally (Figure 7) . . . . . *Rhynchasphaera basisticta* Bechyné, 1958

### *Rhynchasphaera basisticta* Bechyné, 1958

(Figure 7)

*Rhynchasphaera basisticta* Bechyné 1958:680 (Peru: Oxapampa, holotype female).

**Measurements.** LB = 8.58 mm; WB = 4.91 mm (N=1)

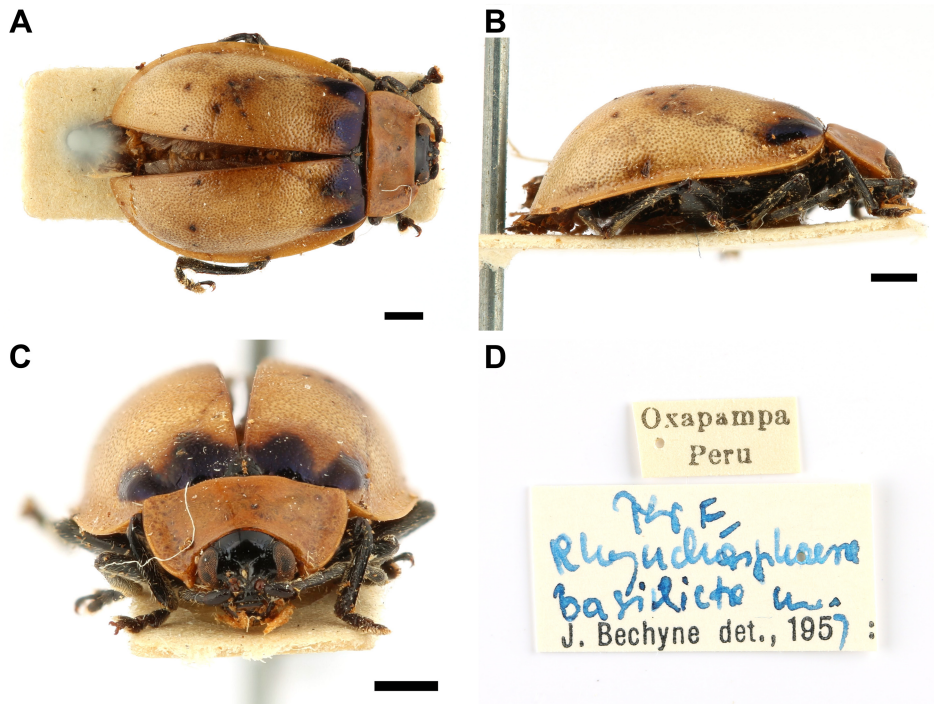
**Distribution.** Peru.

**Type examined.** Holotype female: Oxapampa Peru, Type *Rhynchaspheara basisticta* ns. J. Bechyne det., 1957 (NMB).

**Literature records.** PERU: Oxapampa (Mus. G. Frey) (Bechyne 1958).

**Description of genitalia.** Dissection of the holotype was not possible due to the poor condition of the abdomen.

**Diagnosis.** *Rhynchaspheara basisticta* can quite easily be separated from the two other species in this genus, based on the elytral coloration alone (see key above, Figure 7). *Rhynchaspheara basisticta* can additionally be separated from *R. latipleura* by having shiny (less deeply punctate) elytra (Figure 7A), and elytra that are not evenly rounded when viewed laterally (in *R. basisticta*, the basal half of the elytra is much less rounded than the apical half, Figure 7B). *Rhynchaspheara basisticta* can be further separated from *R. orophila* by having a clearly punctate frons (Figure 7C).



**FIGURE 7.** Holotype female of *Rhynchaspheara basisticta* Bechyne from the NMB. A. Dorsal view; B. Lateral view; C. Frontal view; D. Label. Scale bar: 1 mm.

### *Rhynchaspheara latipleura* Bechyne, 1956

(Figure 8)

*Rhynchaspheara latipleura* Bechyne 1956:1056 (Peru, Cuzco: Machupicchu, holotype sex unknown).

**Measurements.** LB = 7.5–9.32 mm; WB = 4.55–5.2 mm (N=4)

**Distribution.** Peru.

**Type examined.** Paratype: Machupicchu 2000m Peru XII.1947, Coll. Weyrauch, 5656, P-Type *Rhynchaspheara latipleura* ns. J. Bechyne det., 1956 (NMB).

**Additional specimens examined.** Macchu Picchu Pueblo, Cuzco, Peru March 22 1947 Alt. 6491 ft., J. C. Pallister Coll. Donor Frank Johnson, *Rhynchaspheara latipleura* Bechyne det. D.G. Furth (1 AMNH, on loan to D. Furth). Peru, Cusco: 80 km North of Calca 7-Mar-1978, Univ. Maryland-SEL: SMF Expedition, Cum typo Comparatum, *Rhynchaspheara latipleura* Bechyne det. M. Van Roie 2022 (1 female BYU). Peru: Cusco, Machupicchu 2040 meters 16-Feb-1978, Univ. Maryland SEL: SMF Expedition (2 females USMN). Peru dept. of Cuzco Machu Picchu Aguas Calientes 1800m, April 1999 coll. MVL Barclay BMNH {E}2003-49, *Rhynchaspheara latipleura* Bechyne, 1956 det. M. Geiser 2021, 3 more with same data at BMNH (1 female BMNH). Peru dept. of Cuzco Machu Picchu Aguas

Calientes 1800m, April 1999 coll. MVL Barclay BMNH {E}2003-49, *Rhynchasphaera latipleura* Bechyné, 1956 det. M. Geiser 2021 (1 female BMNH). Peru dept. of Cuzco Machu Picchu Aguas Calientes 2000m, April 1999 coll. MVL Barclay BMNH {E}2003-49, *Rhynchasphaera latipleura* Bechyné, 1956 det. M. Geiser 2021 (1 female BMNH).

**Literature records.** PERU: Cuzco: Machupicchu, 2000m, XII.1947 (Dr. W. Weyrauch) (Bechyné 1956).

**Description of genitalia.** Spermathecal pump (Figure 8E) clearly separated from receptacle, about half as long as receptacle, slightly arched, with top rounded. Apex of spermathecal pump flattened; length about one-fifth of spermathecal pump. Receptacle elongate, constricted just before and at spermathecal pump, forming clear neck; maximum width situated at about middle of receptacle. Male genitalia not available for study.

**Diagnosis.** *Rhynchasphaera latipleura* can quite easily be separated from the two other species of this genus by the elytral coloration alone (see key above, Figure 8). Additionally, *R. latipleura* distinguishes from *R. basisticta* by the more matte, deeply punctate and evenly rounded elytra (Figure 8A&B). Furthermore, *R. latipleura* can be separated from *R. orophila* by the clearly punctate frons (Figure 8C).



**FIGURE 8.** Paratype of *Rhynchasphaera latipleura* Bechyné from the NMB. **A.** Dorsal view; **B.** Lateral view; **C.** Frontal view; **D.** Label; **E.** Spermatheca. Scale bar: 1 mm.

### *Rhynchasphaera orophila* Bechyné, 1955

(Figure 9)

*Rhynchasphaera orophila* Bechyné 1955b:199 (Bolivia: Yungas del Palmar, holotype male).

**Measurements.** LB = 7.04 mm; WB = 4.43 mm (N=1)

**Distribution.** Bolivia.

**Type examined.** Holotype: Bolivia Yungas de Palmar 2000m Zischka Ew. Reitter, Holotype male *Rhynchasphaera orophila* ns. J. Bechyné det., 1954 (NMB)

**Additional specimens examined.** Yungas del Palmar 2000m, 5.2.1950 Bolivia, Zischka, Propiedad del MIZA Fac. Agronomica UCV Maracay, Venezuela, *Rhynchasphaera orophila* Bech. (1 on loan to D. Furth).

**Literature records.** BOLIVIA: Yungas del Palmar, 2000m (Zischka, Mus. G. Frey) (Bechyné 1955b). Yungas del Palmar, 2000m (R. Zichka, Mus. G. Frey) (Bechyné 1959).

**Description of genitalia.** Dissection of the single available specimen (holotype) was not possible due to the poor condition of the abdomen.

**Diagnosis.** *Rhynchasphaera orophila* can be quite easily separated from the two other species in this genus by elytral coloration (see key above, Figure 9) and by a nearly impunctate frons (Figure 9C).



**FIGURE 9.** Holotype male of *Rhynchasphaera orophila* Bechyne from the NMB. **A.** Dorsal view; **B.** Lateral view; **C.** Frontal view; **D.** Label. Scale bar: 1 mm.

### New combinations

In addition to *Palmaraltica tomentosa*, **comb. nov.**, other new combinations in the genus *Walterianella* Bechyne, 1955 are established here. All species mentioned below are congeneric with the type species of *Walterianella*, bearing the following characters: eyes big, such that interocular space is smaller than diameter of eye; prosternal process with a keel (and, in the case of *W. basimaculata*, strongly arched and protruding); antennomeres slender; pronotal lateral edges widely explanate; anterofrontal ridge sloping towards labrum, forming more than 90-degree angle between labrum and frons (Konstantinov *et al.* 2022). The following new combinations are established:

#### *Walterianella basimaculata* (Jacoby, 1905), **comb. nov.**

(Picture of syntype at <https://mczbase.mcz.harvard.edu/name/Asphaera%20basimaculata>)

*Asphaera basimaculata* Jacoby 1905:417 (Peru: Prov. Huallaga, Rio Mixiollo, syntype).

#### *Walterianella dimidiaticornis* (Jacoby, 1905), **comb. nov.**

*Asphaera dimidiaticornis* Jacoby 1905:408 (Ecuador, syntype) (*Asphaera*).

**Type examined.** Syntype: Type H.T.; Balzapamba (Ecuad.) R. Haensch S.; Jacoby Coll. 1909-28a.; *Asphaera dimidiaticornis* Jac.; SYNTYPE; NHMUK014590243 (BMNH).

#### *Walterianella discolor* (Jacoby, 1886), **comb. nov.**

*Oedionychis discolor* Jacoby 1886:434 (Panama, Volcan de Chiriqui, syntype).

*Alagoasa discolor*: Furth & Savini 1996:50; Furth & Savini 1998:133.

***Walterianella illigeri* (Jacoby, 1886), comb. nov.**

(Picture of syntype in MCZ at <https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:19180>)

*Oedionychis illigeri* Jacoby 1886:421 & Plate 23 fig. 21 (Panama, Volcan de Chiriqui, syntype).

*Alagoasa illigeri*: Furth & Savini 1996:50; Furth & Savini 1998:133.

**Type examined.** Syntype: Type; V. de Chiriqui, 3-4000 ft. Champion; Sp. Figured; *Oedionychis illigeri* Jac.; Godman-Salvin Coll., Biol. Centr.-Amer.; Syntype; NHMUK014590234 (BMNH).

***Walterianella jansoni* (Jacoby, 1886), comb. nov.**

*Oedionychis jansoni* Jacoby 1886:432 & Plate 24 fig. 24 (Nicaragua, Chontales, holotype male).

*Alagoasa jansoni*: Furth & Savini 1996:50; & Savini 1998:133.

**Type examined.** Syntype: Type; Chontales. Janson; Type. Sp. Figured.; Godman-Salvin Coll., Biol. Centr.-Amer.; *Oedionychis jansoni* Jac.; NHMUK014590236 (BMNH).

***Walterianella marginicollis* (Jacoby, 1885), comb. nov.**

*Asphaera marginicollis* Jacoby 1885:402 (Panama, Bugaba, Caldera in Chiriqui 1200 feet, syntype).

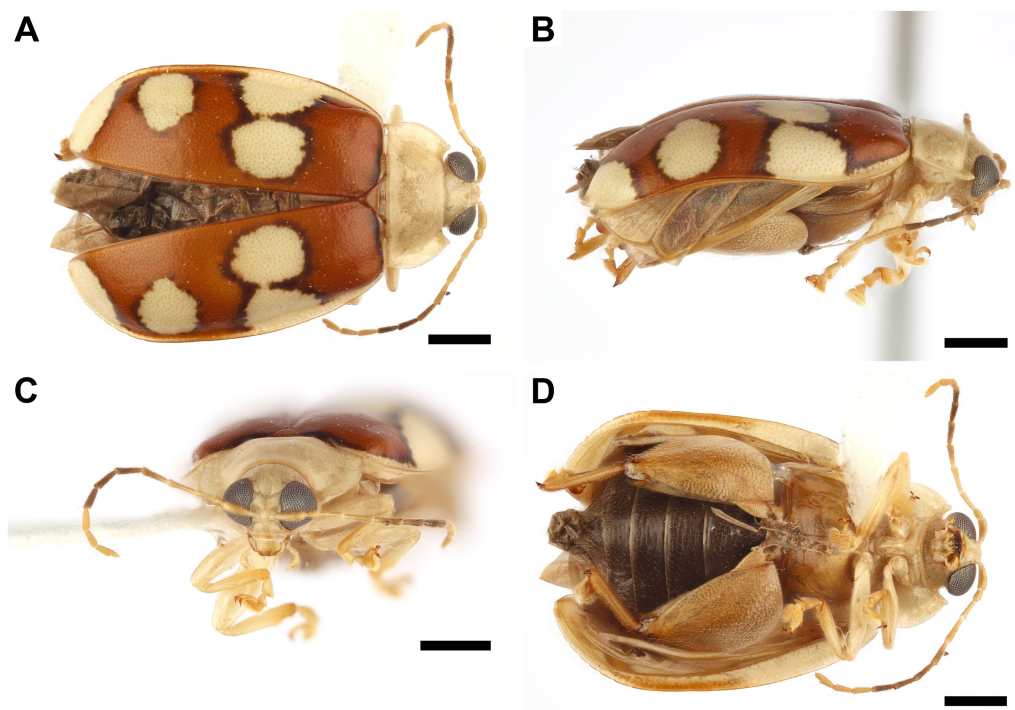
**Type examined.** Syntype: Type H.T.; Bugaba, 200-1,500 ft. Champion.; Godman-Salvin Coll., Biol. Centr.-Amer.; *Asphaera marginicollis* Jac.; SYNTYPE; NHMUK014590296 (BMNH).

***Walterianella montana* (Jacoby, 1886), comb. nov.**

*Oedionychis montana* Jacoby 1886:434 (Panama, Volcan de Chiriqui, Bugaba, syntype).

*Alagoasa montana*: Furth & Savini 1996:50; Furth & Savini 1998:133.

**Type examined.** Syntype: V. de Chiriqui, 25-4000 ft. Champion; Godman-Salvin Coll. Biol. Centr.-Amer.; SYNTYPE; NHMUK014590228 (BMNH).



**FIGURE 10.** Specimen of *Walterianella pavonina* (Jacoby), **comb. nov.** from BYU. **A.** Dorsal view; **B.** Lateral view; **C.** Frontal view; **D.** Ventral view. Scale bar: 1 mm.

## ***Walterianella pavonina* (Jacoby, 1892), comb. nov.**

(Figure 10)

*Oedionychis pavoninus* Jacoby 1892:319 (Mexico: Atoyac in Vera Cruz, syntype).

*Alagoasa pavonina*: Furth & Savini 1996:51; Furth & Savini 1998:133.

**Type examined.** Atoyac, Vera Cruz. May. H.H.S., Type, Godman-Salvin Coll. Biol. Centr.-Amer., Sp. figured, Holo-Type., *Oedionychis pavoninus* Jac., NHMUK015013995 [QR Code] (BMNH).

**Specimens examined.** Belize. Orange Walk Distr. Rio Bravo Conservat. area vic. La Milpa Field Station vii.8-13.1996; W.B. Warner J. Shuey, P. Kovarik & O'Brien; *Alagoasa pavonina* (Jacoby) det. S.M. Clark 1999 (1 BYU). Belize. Orange Walk Distr. Rio Bravo Conservat. area Well trail, 7-14 April 1995, P.W. Kovarik, yellow pan trap; *Alagoasa pavonina* (Jacoby) det. S.M. Clark 1998 (1 BYU). Belize, O.W. Dist. Rio Bravo Cons. Area, 7-19-1996, Lagunitas Trail C.W. & L.B. O'Brien (2 BYU). Belize. Orange Walk Distr. Rio Bravo Conservat. area 3-10 Sept. 1995 P. Kovarik, J. Shuey, Well Trail (near Res. Station); Well Trail Transect Site #2, flight intercept trap (1 BYU). Belize, Orange Walk Distr. Rio Bravo Conservat. area, Well trail near "Texas Camp" 10-18.VII.1996, P.W. Kovarik; Well Trail Transect, yellow pan trap (1 BYU). Belize, Orange Walk Distr. Rio Bravo Cons. area, LaMilpa, VII-11-1996, C.W. & L.B. O'Brien (1 BYU). Belize. Orange Walk Distr. Rio Bravo Conservat. area Well trail, 7-14 April 1995, P.W. Kovarik, yellow pan trap (1 BYU). Belize, O.W. Dist. Rio Bravo Cons. area Bajo & Well tr., vii-16-1996 C.W. & L.B. O'Brien (1 BYU).

## **Discussion**

Bechné described several small genera within Oedionychina over the course of 1950–1969, of which the species within them are often based on a single or just a few specimens. The present study aims to clarify three of those genera, *Cuyabasa*, *Palmaraltica* and *Rhynchaspheera*, and to provide a baseline for further study. Often, due to the lack of specimens available for study (e.g., *Cuyabasa*) or state of the abdomen (*Rhynchaspheera*), genitalia could not be described. However, most of the currently described species in these genera can be identified reliably with external characters alone.

Study of specimens led to one new combination in the three main genera of this investigation, namely *Palmaraltica tomentosa*, formerly placed in *Asphaera*. From the viewpoint of genitalia, only females of the very similar species *P. tomentosa* and *P. heteronycha* could be compared (to date, only the female of *P. heteronycha* is known), but these species do have some differentiating external morphological characters. Remarkable was the uniquely elongate, spiral-like spermatheca of both species, a feature that could not be studied in *P. yepezi*. However, this could prove to be an additional generic character. Beyond the main genera of the study, several species were transferred to the genus *Walterianella*.

Much is still unknown about the species treated in this paper, including elytral pattern variation, potential sexual dimorphism (for several species, only one sex is known), ecology and phylogenetic relationships to other genera of Oedionychina. Surely, many new combinations are to be established in this subtribe. However, the authors hope that, by providing this paper, identification of some taxa within Oedionychina will be easier.

## **Acknowledgements**

The authors sincerely wish to thank Christoph Germann, Matthias Borer, Isabelle Zuercher and Seraina Klopstein for providing access to the Georg Frey collection and for providing logistic support. Michael Geiser and Max Barclay (BMNH) are thanked for providing access to the collections of the British Museum of Natural History. Shawn Clark (BYU), Vilma Savini (MIZA) and Lee Herman (AMNH) are thanked for their loans, which greatly improved this manuscript. Wouter Dekoninck and Pol Limbourg from the Royal Belgian Institute for Natural Sciences (RBINS) are thanked for logistic support in sending and receiving loans. Jan Mertens is thanked for layout of the figure plates in this manuscript. Wills Flowers, Shawn Clark and an anonymous reviewer are greatly thanked for reviewing the manuscript prior to publication, greatly improving its quality. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the USDA; the USDA is an equal opportunity provider and employer.

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