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Source: *Southwestern Entomologist*, 40(3):503-510.

Published By: Society of Southwestern Entomologists

DOI: <http://dx.doi.org/10.3958/059.040.0308>

URL: <http://www.bioone.org/doi/full/10.3958/059.040.0308>

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Two New Species of *Phyllophaga* Harris (Coleoptera: Melolonthidae: Melolonthinae) from Oaxaca, Mexico

Julián Hernández-Cruz¹, Miguel Ángel Morón², and José Antonio Sánchez-García^{1*}

Abstract. Descriptions of two new species of June beetles from Mexico are presented: *Phyllophaga (Listrochelus) herminiae*, found at Teposcolula, Mixteca region, Oaxaca (2,180 m altitude); and *P. (Phyllophaga) jorgevaldezi*, from San Nicolás Yaxe, Central Valleys region, Oaxaca (1,550 m altitude). Images of diagnostic characters and comments about differences among the new and other Mexican species of *Phyllophaga* are included.

Resumen. Se presentan las descripciones de dos nuevas especies mexicanas: *Phyllophaga (Listrochelus) herminiae* colectada en Teposcolula, localidad de la Mixteca oaxaqueña, ubicada a 2180 m de altitud; y *P. (Phyllophaga) jorgevaldezi* colectada en San Nicolás Yaxé en la región de los Valles Centrales de Oaxaca ubicados a 1550 m. Se incluyen imágenes de los caracteres diagnósticos y comentarios acerca de sus diferencias con otras especies mexicanas de *Phyllophaga*.

Introduction

The most important study of the genus *Phyllophaga* in Mexico and Oaxaca occurred in 1888 when H. W. Bates published the document *Biología Centrali Americana* in which 110 Mexican species were described; 28 of them were from Oaxaca (Morón 2003). This was followed by a period of 100 years when only 30 additional Mexican species were described by a small group of taxonomists. Finally, a third period began in 1991 when M. A. Morón described at least 30 new taxa of *Phyllophaga* beetles from Oaxaca alone. However, when reviewing the geographical distribution of the effort by M. A. Morón and collaborators to collect *Phyllophaga*, it is evident that a large section of Oaxaca was not explored, and capture at the visited sites was not exhaustive. The irregular orography of Oaxaca is probably one of the main limitations that prevented a broader coverage of the collection sites. Nevertheless, this rugged terrain has many microenvironments with a wide diversity of soils and climate that led us to suspect new taxa would yet be discovered in the unexplored areas. This paper describes two new species found at sites in Oaxaca which, until 3 years ago, had never been explored for *Phyllophaga*.

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Materials and Methods

Phyllophaga specimens were obtained from the Mixteca and Central Valleys regions in the state of Oaxaca which is located in the Southeast of Mexico. During the period of emergence, individuals are commonly observed after sunset on the ground, on flowers, shrubs and grasses common in the research area, particularly in areas around public lighting. During these days, collectors captured specimens by hand and preserved them in containers filled with 70% alcohol. After collection, individual species were determined through examination of external morphological characters and genitalia. Once classified, individuals of each species were mounted with entomological pins in accordance with procedures used by Morón and Terrón (1988).

The characters and terms used in the descriptions are those of Saylor (1940) and Morón (1986, 1991, 2004). Photographs were taken with a Carl Zeiss Stemi-2000-C stereoscope (Germany) equipped with a Canon digital camera (Thailand). Illustrations were prepared using Photoshop Version CS5.1. Measurements were obtained with an ocular micrometer adapted to the stereoscope. Specimens were deposited in the collections of Instituto de Ecología, Xalapa, México (IEXA), CIIDIR IPN Unidad Oaxaca, México (CIIDIR), and M. A. Morón, Xalapa, Mexico (MXAL).

Results

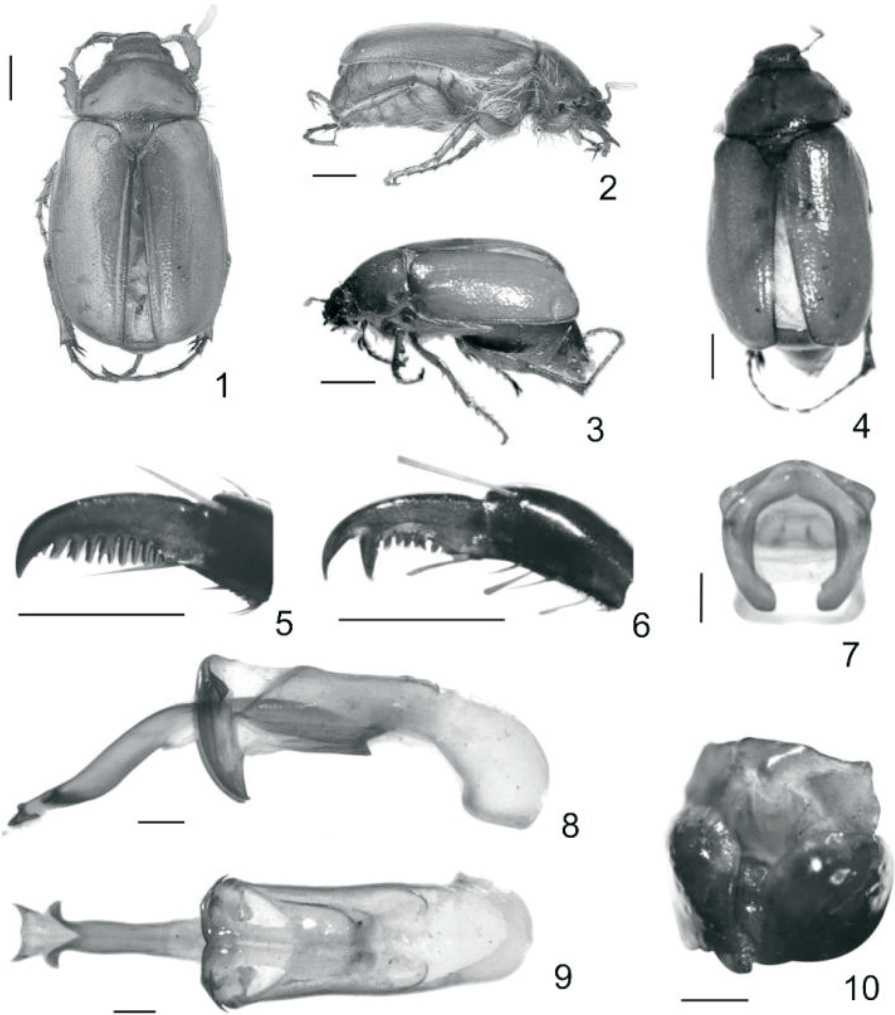
Phyllophaga herminiae Hernández-Cruz, Morón & Sánchez-García new species
(Figs. 1-10)

Description. Holotype. Adult male: Total body length 13.05 mm. Humeral width 5.85 mm. Length/body width ratio 2.23:1. Head and pronotum shiny reddish brown; elytron, abdominal region, and legs shiny yellowish brown (Figs. 1-2). Clypeus 3.1 times wider than long, anterior margin nearly straight, and borders noticeably elevated, surface nearly flat, with contiguous round-tip punctuation and some erect, medium, scattered setae. Fronto-clypeal suture sinuate and clearly impressed. Frons 2.77 times wider than long, moderately convex, with erect resizable setae and irregular dense rugo-punctuate aspect. Vertex of head with transverse carinate ridge. Surface of occipital area smooth, with minute punctures on sides. Antenna 10-segmented, with club 1.86 times longer than preceding six segments combined. Eye canthus short and narrowed with 12 setae. Labrum bilobed, widely sinuate with scattered erect setae on borders. Mentum concave, with scarce lateral setae, anterior border briefly sinuate.

Pronotum 1.86 times wider than long and 3.05 wider than frons, with a slight concavity in the center; surface shiny, with round shallow punctures, uniformly distributed; lateral borders widely angulated; lateral margin crenulate, with slender setae; anterior angles and posterior angles obtuse, slightly prominent. Scutellum 1.11 times wider than long, glabrous. Elytron 2.54 times longer than wide, glabrous, with some slender setae and small punctures; epipleural border progressively narrowed along complete margin with a fringe of slender setae; humeral callus rounded, prominent; apical callus rounded. Metathoracic wings completely developed.

Propigydium slightly shiny, yellowish, with shallow and scattered setiferous punctures. Pygidium uniformly convex, shiny, surface with scattered shallow punctures and short setae; apical margin thickened with 12 slender setae; basal margin incomplete in the middle. Pterosternum with dense, long, yellowish setae.

Visible abdominal sternites III to VII of similar length, slightly flattened with scattered short setae near the middle; sternite VII similar to the preceding with a mesial sulcus slightly indicated; anal plate with rugopunctuate aspect, briefly furrowed at midline.



Figs. 1-10. *Phyllophaga herminiae*. Dorsal view: 1) male, 4) female. Lateral view 2) male 3) female. Tarsal claw: 5) male, 6) female. Genital capsule: 7) paramera, distal view, 8) lateral view, 9) dorsal view. 10) Female genital plates, ventral view. Scale bars: Figs. 1-4 = 2 mm, Figs. 5-6 = 0.5 mm, Figs. 7-10 = 1 mm.

Protibia shorter than the protarsus (0.62:1) with two large teeth and a basal small tooth on the external border. Mesotibia with one oblique, well-marked, setiferous carina on the external side. Upper apical spur slender, 1.4 times longer than lower slender spur. Metatibia slightly shorter than metatarsi (0.9:1) with an oblique setiferous carina on external side; upper apical spur articulated, slightly curved, pointed, 1.5 times longer than lower spur, and 1.2 times longer than basal metatarsomere. Tarsomeres nearly cylindrical, elongate, with some subapical setae and scattered setae on ventral side. All tarsal claws regularly unipectinate (Fig. 5).

Genital capsule with short parameres dorsally fused, symmetrical, with a basal triangular projection (Figs. 7-9), apex of each paramere rounded, directed downward, and ventrally; tectum convex, with rounded and basal prominences (Fig. 9). Aedeagus with sclerotized, tube-like support apically trifurcated, with two remarkable projections and one dorsal faint projection (Figs. 7-8). Length of genital capsule from apex of parameres to border of basal piece 3.6 mm.

Allotype Female: Total body length 12.0 mm (Figs. 3-4). Humeral width 4.5 mm. Similar to male except: antenna with club slightly shorter than length of preceding seven segments combined; anal plate large and convex. Pygidium moderately convex and enlarged. Tarsal claws with acute tooth before the middle of ventral border, and posterior border unipectinate (Fig. 6); ventral genital plates with the apex rounded and irregularly formed with some short setae (Fig. 10). Dorsal genital plates fused with the posterior border bearing two short projections and some setae.

Paratype Variation: Males are similar to holotype except in total body length 13.2-13.95 and humeral width 5.4-6.0 mm.

Type Material. Described from six males and one female. Holotype male IEXA: Mexico: Oaxaca, San Pedro and San Pablo Teposcolula, 2,180 m. 27-VI-2013, J. Hernández. Allotype female IEXA: Mexico: Oaxaca, San Pedro and San Pablo Teposcolula, 2,180 m. 24-VI-2013, J. Hernández. Paratypes (five males): same data as holotype (CIIDIR, MXAL).

Type Locality. San Pedro and San Pablo Teposcolula, state of Oaxaca, México (17° 33' 13" N, 97° 25' 38" W). The new species is known only from this site.

Biological Data. Specimens of *P. herminiae* were collected at white fluorescent lights during June, in areas covered by induced pasture surrounded by remnants of oak-pine forest. Other species captured simultaneously were *Phyllophaga lenis* (Horn), *P. ilhuicaminai* Morón, and *P. prodera* (Bates).

Etymology. The species is named in honor of Herminia Girón Pablo, wife of the first author and enthusiastic collector of scarab beetles in the Mixteca region of Oaxaca, Mexico.

Remarks. By the combination of diagnostic characters, *Phyllophaga (Listrochelus) herminiae* is placed into the species group "cavata" proposed by Morón (1986, 2004). However, at first glance, the claws of male and female, and the general shape of the male genitalia resemble those of *P. (Listrochelus) balsana* Morón & Aragón ("incerta sedis") although *P. herminiae* has fused parameres and laminar structures in the dorso-basal region of the parameres. Also the length of the female antennae and female genitalia of *P. herminiae* differ from those of *P. balsana*.

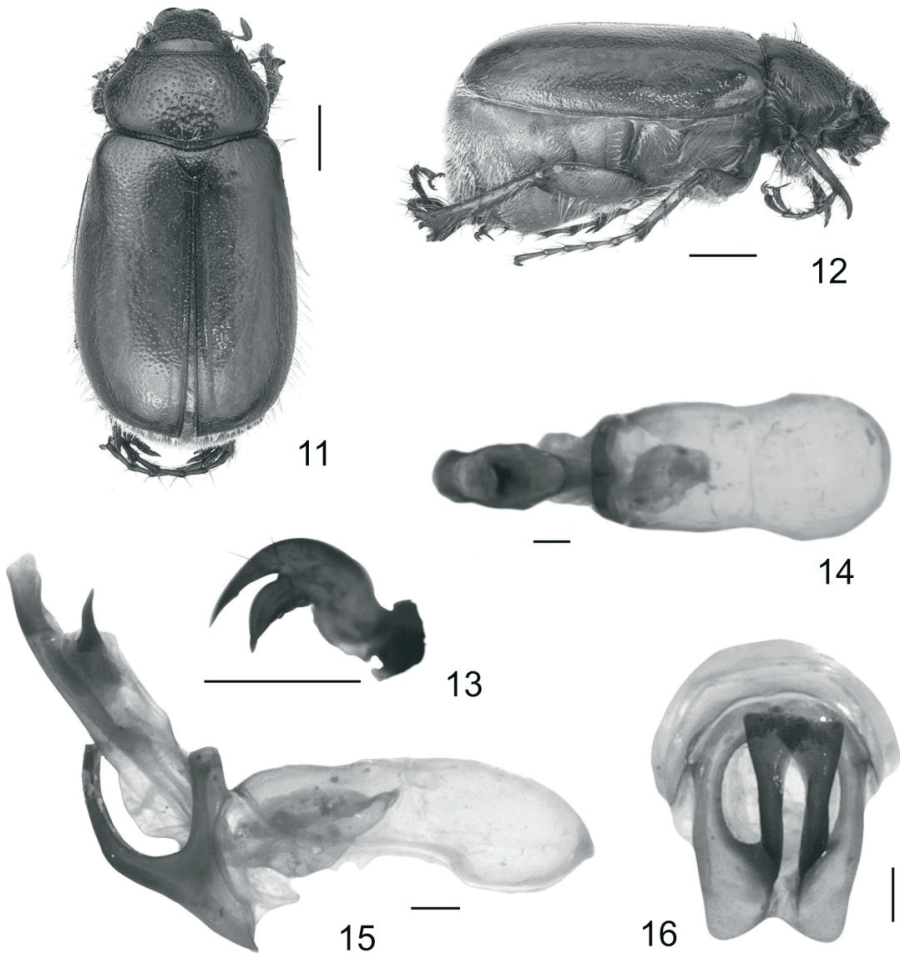
Phyllophaga jorgevaldezi Hernández-Cruz, Morón & Sánchez-García
new species (Figs. 11-16)

Description. Holotype. Adult male: Total body length 14.7 mm. Humeral width 6.0 mm. Length/body width ratio (2.42:1). Head and pronotum shiny reddish brown; elytron and legs shiny yellowish brown, abdominal region yellowish brown (Figs. 11-12). Clypeus bilobed, 3.3 times wider than long, anterior border sinuated with the margins slightly elevated, surface irregular rugo-punctuate, with some erect setae. Fronto-clypeal suture slightly sinuated and scarcely impressed. Frons 2.73 times wider than long, moderately convex, with erect setae and irregular rugo-punctuate aspect. Antenna 10-segmented, club lamellae slightly longer than preceding five segments combined, segment 4° as long as segment 3°, segment 5° without anterior projections, segment 6 and 7 wider than long, each with rounded process directed forward. Eye canthus curved and rounded with nine or 10 setae. Labrum deeply bilobed with erect setae on lateral borders. Mentum concave, polished with some setae on lateral sides, anterior border sinuated with scarce setae.

Pronotum 1.73 times wider than long and 2.25 wider than frons, with surface shiny, rugo-punctate, punctures irregularly distributed with some long, erect setae; lateral borders widely angulated; lateral marginal crenulate with slender setae; anterior angles acute with acute prominences; posterior angles obtuse, not prominent. Scutellum as long as wide, with some punctures. Elytron 2.75 times longer than wide, finely rugopunctuate with scattered setae near the lateral borders; epipleural border extended along the complete margin, narrowed toward apex; humeral calla rounded, prominent; apical callus rounded. Metathoracic wings completely developed. Propigydium shiny, finely punctuate, with abundant short setae. Pygidium convex, shiny with medium-sized erect setae covering all disk except in the preapical area; apical margin with some erect setae; basal margin effaced at middle. Pterosternum with dense, long, yellowish setae. Visible abdominal sternites II to V convex, glabrous; sternite VI widely convex and glabrous; sternite VII with rugo-punctuate aspect and medium setae mainly on lateral sides. Anal plate wide and concave, rugose with some erect slender setae; anterior and posterior borders thickened, with scattered erect, short setae on posterior border.

Protibia shorter than the protarsi (0.61:1) with two large teeth and a basal small tooth on external border; preapical spur long, straight as long as 2° protarsomerus. Mesotibia with long slender setae and one oblique, setiferous transverse carina on the external side; upper apical spur straight, narrow, nearly as long as lower spur. Metatibia shorter than metatarsi (0.65:1) with long slender setae and one oblique, short setiferous transverse carina; apical spurs with articulated border, upper spur lanceolate, slightly curved with rounded apex, nearly as long as 2° metatarsomerus and 1.5 times longer than lower spur. Tarsomeres semicylindrical, elongated, with enlarged apex and many setae around the apex. Tarsal claws symmetrical, similar on all legs with median acute tooth located near apical tooth (Fig. 13).

Genital capsule with long, narrow paramera fused dorsally at their basis, with preapical, curved projections ended in spatula-like structure (Figs. 15-16); tectum convex without prominences (Fig. 17); aedeagus with sclerotized, truncated, tube-like support, with a preapical, dorsal, curved spike (Fig. 15). Length of genital capsule from apex of parameres to border of basal piece 3.9 mm.



Figs. 11-16. *Phyllophaga jorgevaldezi* male: 11) dorsal view, 12) lateral view, 13) tarsal claw. Genital capsule: 14) dorsal view, 15) lateral view. 16) paramera, distal view. Scale bars: Figs. 11-12 = 2 mm, Fig. 13 = 0.5 mm, Figs. 14-16 = 1 mm.

Paratype Variation. Males are similar to the holotype in body length (14.25 and 14.85 mm) and in humeral width (6.0 mm). Head and pronotum slightly darker than holotype.

Type Material. Described from two males. Holotype male IEXA: México, Oaxaca, San Nicolás Yaxe. 1500 m. 05-VI-2013, J. Hernández. Paratype MXAL same data as holotype.

Type Locality. San Nicolás Yaxe, state of Oaxaca, Mexico (16°43'52" N, 96°28'24" W). The new species is known only from this site.

Biological Data. Specimens of *P. jorgevaldezi* were collected at white fluorescent lights in June, in a perturbed mixture of deciduous tropical forest and xeric shrub with predominance of mesquite [*Prosopis juliflora* (Swartz) D.C.], guamuchil [*Pithecellobium dulce* (Roxb) Benth], huizache [*Acacia farnesiana* (L.) Wild.], and some species of Cactacea, Agavaceae, and Poacea, including grasses and maize, *Zea mays* L. Other species captured simultaneously were *Phyllophaga lenis* (Horn), *P. porodera* (Bates), *P. obsoleta* (Blanchard), *P. nubipennis* (Bates), *P. misteca* (Bates), and *P. cinnamomea* (Blanchard).

Etymology. The species is dedicated to Jorge Manuel Valdéz Carrasco, M.Sc., Professor of Entomology at Colegio de Posgraduados, Mexico, and teacher of many successful entomologists, who have testified to his wisdom and kindness.

Remarks. *Phyllophaga jorgevaldezi* belongs to the species group “*blanchardi*”, complex “*pubicauda*” (*sensu* Morón 1986). The species can be recognized by the following diagnostic characters: anterior border of clypeus sinuate, frons, pronotum, and elytra glabrous with scarce erect setae on borders; prepygidium and pygidium setiferous; the genitalia of *P. jorgevaldezi* resemble those of *P. leonilae* (Morón 1991), but the details in the paramera and the sharp preapical spike are useful to separate them.

Acknowledgment

We are indebted to Professor Tomás Antaño Luna and his students and Armando Díaz Dionisio for their help obtaining the specimens here described. Sandra Smith Aguilar reviewed the English version. We also thank the economic support of the SIP project 20144658.

References Cited

- Bates, H. W. 1888-1889. Biología Centrali Americana. Insecta Coleoptera. Vol. 2 (Part 2): 161-415.
- Morón, M. A. 1986. El género *Phyllophaga* en México. Morfología, distribución y sistemática supraespecífica (Insecta: Coleoptera). Instituto de Ecología, A. C. México.
- Morón, M. A., y R. Terrón. 1988. Entomología Práctica. Publicación 22. Instituto de Ecología. A. C. México, DF.
- Morón, M. A. 1991. Notas sobre *Phyllophaga* (V). Dos especies nuevas del grupo Blanchardi (Coleoptera: Melolonthidae). Folia Entomológica Mex. 82: 119:132.
- Morón, M. A. 2003. Diversidad, distribución e importancia de las especies de *Phyllophaga* Harris en México (Coleoptera: Melolonthidae), pp. 1-27. In A. Aragón, M. A. Morón, y A. Marín [eds.], *Estudios sobre coleópteros del suelo*. Produce Guanajuato & BUAP, México.
- Morón, M. A. 2004. Revision of the *cavata* group of *Phyllophaga* (*Listrochelus*) Blanchard (Coleoptera: Melolonthidae: Melolonthidae: Melolonthinae). Ann. Entomol. Soc. Am. 91: 77-96.
- Saylor, L. W. 1940. Revision of the scarabeid beetles of the *Phyllophaga* subgenus *Listrochelus* of the U. S. with discussion of related subgenera. Proceedings, US National Mus. 89: 59-130.

