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Source: Florida Entomologist, 102(1) : 121-124

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/024.102.0119

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Phyllophaga (*Chirodines*) *moroni* (Coleoptera: Scarabaeidae: Melolonthinae), a new species from Oaxaca, Mexico

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Abstract

Phyllophaga (*Chirodines*) *moroni* is described based on 8 males collected by black-light trap in a disturbed area of pine-oak forest of the Sierra-Sur region of Oaxaca State, Mexico. This finding represents the fifth described species of the subgenus on the American continent, the second species of the subgenus listed for Oaxaca State, and the third species of the subgenus for Mexico. A key to separate the 5 species in the subgenus *Chirodines* presently described is provided.

Key Words: taxonomy; Scarabaeoidea; Melolonthini; beetles

Resumen

Se describe una especie nueva, *Phyllophaga* (*Chirodines*) *moroni* con base en ocho machos colectados con trampa de luz negra en un área perturbada de bosque de pino-encino de la región de la Sierra-Sur del estado de Oaxaca, México. Este hallazgo representa la quinta especie descrita del subgénero en el continente americano y la segunda especie enlistada para el estado de Oaxaca, y la tercera descrita para México. Se ilustran las estructuras diagnósticas, y se proporciona una clave para separar las cinco especies descritas hasta el momento.

Palabras Clave: taxonomía; Scarabaeoidea; Melolonthini; escarabajos

The genus *Phyllophaga* Harris (Coleoptera: Melolonthidae) is a speciose group of Scarabaeidae, subfamily Melolonthinae, with approximately 800 species currently described from the New World. After the proposal of Bates (1888), much has been discussed about the taxonomic classification of the subgenus *Chirodines* (Saylor 1942; Morón 1986, 1991; Rivera-Gasperín & Morón 2017). The members of the subgenus *Chirodines* (Bates) have the general appearance of the subgenus *Chlaenobia* Blanchard (Coleoptera: Melolonthidae); however, the structure of the claws of the males differs. In *Chlaenobia* all the claws are bifids, whereas in *Chirodines* the pro- and mesotarsal claws are simple and the metatarsal claws are bifids. Morón (1986) supported the proposal of Saylor (1942) giving *Chirodines* the position of subgenus, although he commented about the need to revise a greater number of specimens to determine, among other characters, if the simple structure of the claws represents sexual dimorphism or a primitive condition. The shortage of male specimens of the 4 species previously described and the absence of female specimens studied (Morón 1991) are notable aspects to consider in developing a more precise classification. This manuscript contributes to the knowledge of the subgenus *Chirodines* with the description of a new species collected in the Sierra-Sur region of Oaxaca, Mexico.

Materials and Methods

The specimens were collected with a black-light trap placed in the experimental field of the Universidad Tecnológica de la Sierra Sur de Oaxaca in Oaxaca, Mexico, and these were mounted using the traditional procedures proposed by Moron and Terrón (1988). The images were taken using a Canon EOS-T6 camera (Ota, Tokyo, Japan) adapted to a Zeis-Stemi stereoscopic microscope (Hoberkochen, Germany), and Adobe Photoshop (2017) was used to edit the final images. The criteria to separate this new species were based on the structure of the tarsal claws, and the morphology of the male genitalia. All specimens examined were deposited in the National Polytechnic Institute in the Entomologic Collection of the Center for Interdisciplinary Research for Integral Regional Development in Santa Cruz Xoxocotlán municipality of Oaxaca State, Mexico, and the insect collection of Miguel Ángel Morón Ríos † (1952-2017).

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Results

Phyllophaga (*Chirodines*) *moroni* **sp. nov.** 2018

TYPE MATERIAL. 8 males. HOLOTYPE: MEXICO: Oaxaca, Villa Sola de Vega. (Fig. 1): Total body length: 14.2 mm. Humeral width: 4.9 mm. Straw yellowish body, back of vertex and tarsomeres slightly darkened (Fig. 1a, b). Clypeus 2.6 times wider than long, anterior margin slightly sinuate at middle and complete margin noticeably elevated; surface with uniformly distributed punctures. Frontoclypeal suture clearly impressed and nearly straight. Frons 1.9 times wider than long, glabrous and slightly convex with uniformly distributed small punctures. Antenna 10-segmented with 3-segmented club, lamellae are longer than preceding 6 segments combined. Eye canthi short and narrow with 9 to 10 erect setae. Labrum bilobed with many setae along the borders. Mentum slightly concave, with some setae at sides, anterior border broadly notched.

Pronotum 1.8 times wider than long, glabrous. Pronotal disk shiny with shallow round punctures homogenously distributed; anterior angles obtuse, slightly prominent; posterior angles almost right, prominent and projected downward; lateral borders broadly angulated with 3 to 5 setae at the ends.

Scutellum 1.5 times wider than long, with fine punctures laterally. Elytron 3 times longer than wide, glabrous, shiny with shallow punctures uniformly distributed. Epipleural border progressively narrowed toward apex of the elytron. Humeral and apical calla rounded and slightly prominent. Apical angles of elytra obtuse with a small projection inward. Metathoracic wings completely developed.

Propygidium with homogeneous and shallow punctures. Pygidium semi-oval, convex, prominent towards the apex, apical margin marked-

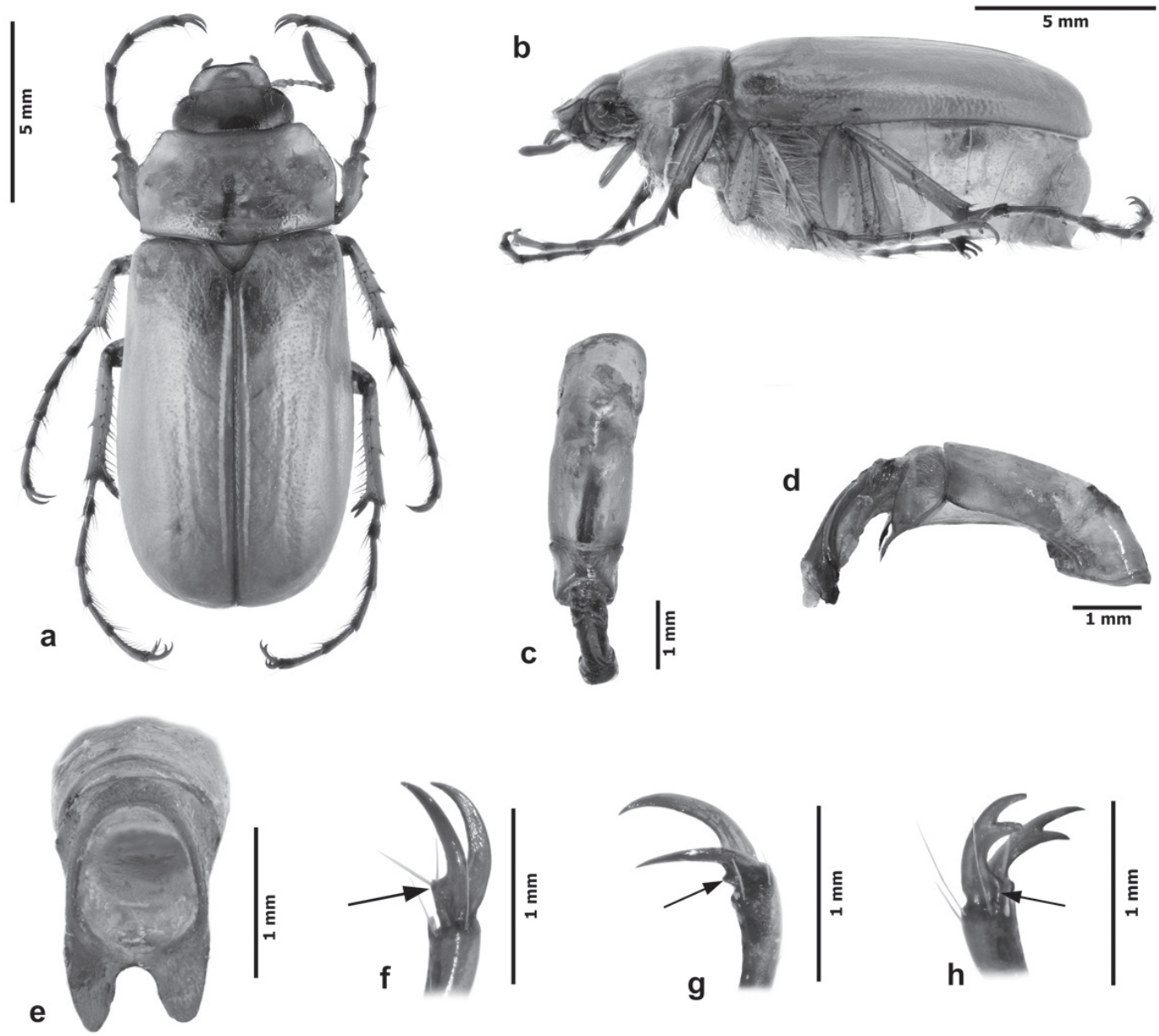


Fig 1. Holotype of *Phyllophaga* (*Chirodines*) *moroni* **n. sp.**: (a) dorsal habitus; (b) lateral habitus; (c) aedeagus in dorsal view; (d) adeagus in lateral view; (e) parameres, distal view; (f) protarsal claws; (g) mesotarsal claws; (h) metatarsal claws.

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ly elevated with 17 to 18 erect setae. Pterosternum with long, dense, yellowish setae. Visible abdominal sternites (2nd to 4th) depressed at middle; the 5th sternite with a row of long setae. Anal plate convex with fine and scarce punctures and setae of different sizes in the posterior margin.

Protibia slender, noticeably shorter than respective tarsomeres (1:1.5); distal end of the outer edge with 2 teeth directed forward with insinuation of a third dentiform process. Apical spur short, straight, acute. Mesotibia shorter than respective tarsomeres (1:1.3) with 1 oblique, complete carina on external side. Metatibia shorter than respective tarsomeres (1:1.3) with 1 oblique and complete carina at middle in outer side, inner apical border with small projection, and short, erect setae. Mesotibial spurs articulated, long, slender, and acute; upper apical spur longer than lower spur. Metatibial spurs articulated, long, slightly curved, and subacute; upper apical spur as long as lower spur. Tarsomeres elongate, semicylindrical; protarsomeres and mesotarsomeres (1st to 4th) with microgrooves in ventral side. Protarsal and mesotarsal claws simple, without projection in the lower margin (Fig. 1f, h), but all claws show 1 acute projection in the basal area (Fig. 1f, g, h); metatarsal claws clearly cleft (Fig. 1h).

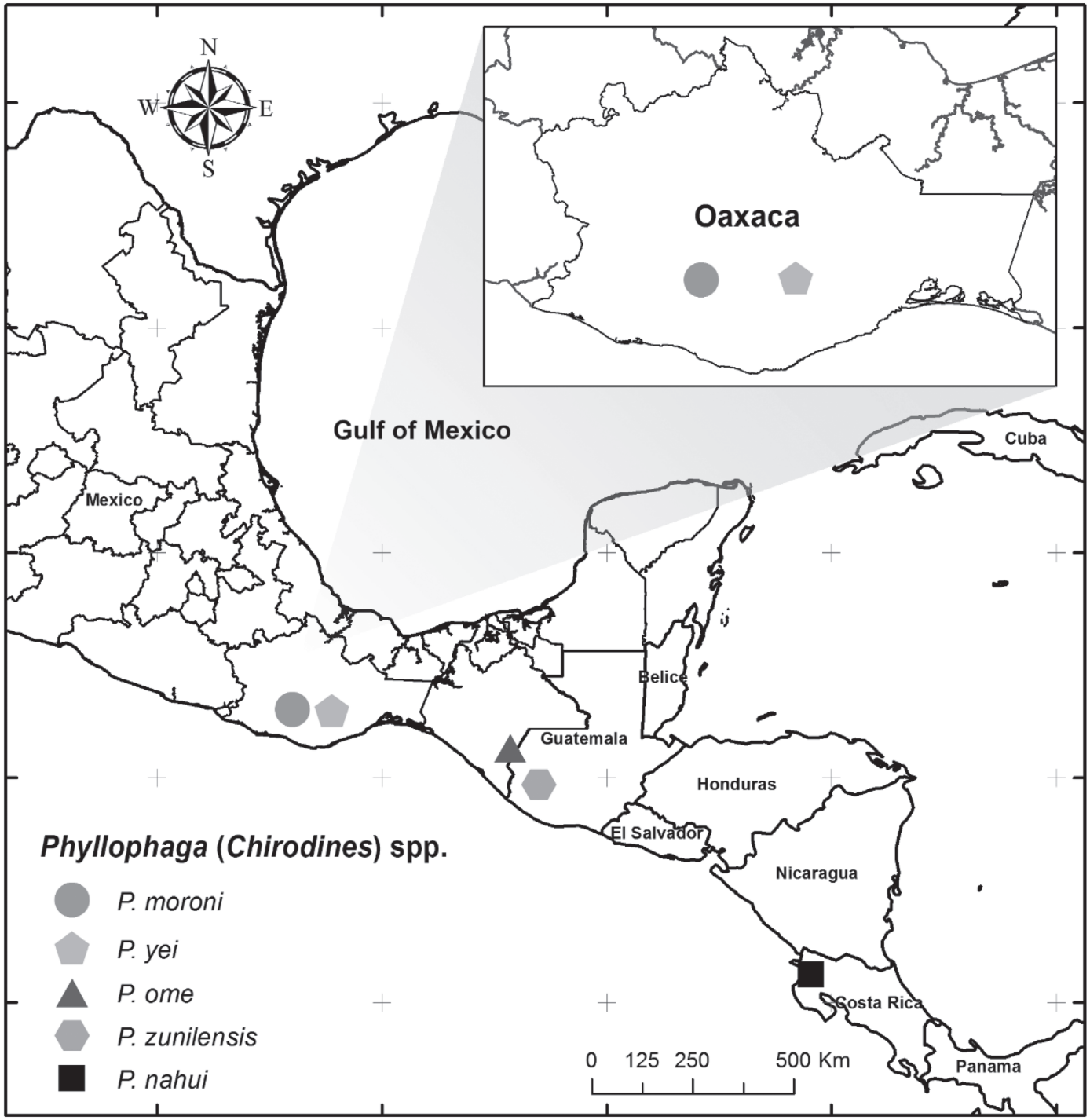


Fig 2. Map of Mexico (Oaxaca State) and Central America, showing the locations of collection records of *Phyllophaga* (*Chirodines*) spp.

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Genital capsule with long parameres, fused dorso-basally, in distal view clearly divergent, subacute (Fig. 1e), and lateral view widened in their base and flattened in the apex (Fig. 1d). Aedeagus asymmetric with a partly sclerotized tube with some translucent portions. The right side is tubular in appearance, truncated apically. The left side of the aedeagus twisted in appearance with an elongation in the apex covered with microspines. The right side of the aedeagus is tubular in appearance and the left side is twisted (Fig. 1c, d).

FEMALE: unknown.

VARIATION: There are no significant differences in the 8 specimens examined.

TYPE LOCALITY: Villa Sola de Vega, Oaxaca, México. (16.511622°N, 96.979469°W, 1,440 m asl).

BIOLOGICAL DATA: The specimens were captured with a black-light trap in a disturbed area of pine-oak forest. Other species captured simultaneously were *Phyllophaga scabripyga* (Bates), *P. lenis* (Horn), *P. vetula* (Horn), *P. integriceps* (Moser), *P. chiapensis* (Chapin), *P. menetriesi* (Bianchard), *P. fulviventris* (Moser), *P. obsoleta* (Blanchard), *P. misteca* (Bates), and *P. porodera* (Bates) (all Coleoptera: Scarabeidae).

ETYMOLOGY: This species is dedicated in honor of Miguel Ángel Morón Ríos, as a posthumous recognition to his important and invaluable contribution to the knowledge of the beetles of Mexico, Central America, and part of South America.

Key to separate species of the subgenus *Chirodines* (modified from Morón 1991; Morón and Solís 1994)

1. Metatibial spurs of equal size, slightly curved, apexes of the parameres widely separated, divergent, with triangular aspect (Fig. 1e). Aedeagus asymmetrical, partly sclerotized and translucent, of twisted aspect (Fig. 1d). Villa Sola de Vega, Sierra-Sur Region of Oaxaca, Mexico (16.511622°N, 96.979469°W) . . . . . *Phyllophaga* (*Chirodines*) *moroni* **n. sp.**

1′. Metatibial spurs of different size. Apexes of the parameres sharp or rounded, and very close to each other 2

2. Lower metatibial spurs longer than the upper ones, clearly re-curved. Apexes of the parameres wide, truncated and very separate from each other. El Camarón, San Carlos Yautepec, Southeastern of Oaxaca, Mexico (16.4966°N, 96.1065°W) . . . . . *P*. (*Ch.*) *yei* Morón, 1991

2′. Upper metatibial spurs longer than lower ones, and slightly re-curved. Apexes of the parameres narrow, sharp or rounded, and very close to each other 3

3. Prominent pigidial plate toward apex and base, with the irregular surface, rough. Comalapa Frontier, Chiapas, Mexico (15.6604°N, 92.1425°W) . . . . . *P*. (*Ch.*) *ome* Morón, 1991

3′. Prominent pigidial plate towards the apex, with fine punctuation 4

4. Parameres with the exterior edges clearly angulated. Aedeagus ornamented with irregularly arranged microspines. Quetzaltenango, Cerro Zunil, Guatemala (14.8333°N, 91.5000°W) . . . . . *P*. (*Ch.*) *zunilensis* (Bates, 1888)

4′. Parameres with the exterior edges rounded. Aedeagus ornamented with microspines arranged in rows. Guanacaste Frontier, Costa Rica (10.6267°N, 85.4436°W) . . . . . .(*Ch.*) *nahui* Morón and Solís, 1994

Discussion

The discovery of *P. moroni* represents the fifth species of *Chirodines* (Bates) and extends the known distribution of this subgenus 200 km to the southern region of Oaxaca State. *Phyllophaga yei* was the first new species of the subgenus *Chirodines* collected in Oaxaca, named "El Camarón" in the Yautepec municipality, and *P. moroni* (here described) was collected 200 km towards western Oaxaca, as shown in Figure 2. It is distinguished from other species of the subgenus by the proportions of the parameres, consistency and ornamentation of the aedeagus. It seems to be more related to *P. yei* because of the slight similarity in the morphology of the parameres (Fig. 1e); however, the parameres in *P. yei* have a denticle on each side, which are absent in the *P. moroni* parameres. In addition, they differ in the detail of the ornamentation of the aedeagus, and also in the presence of denticles at the base of all the tarsal claws (Fig. 1f, g, h).

Acknowledgments

We are grateful to the students of the Agricultura Sustentable y Protegida career of the Universidad Tecnológica de la Sierra Sur de Oaxaca, Mexico, who collaborated in the collection of specimens.

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