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INSECTA MUNDI

0833

Phyllobaenus thomasi and *P. turnbowi*, two new species from Mexico and Belize (Coleoptera: Cleridae: Hydnocerinae: Hydnocerini)

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Michael C. Thomas Festschrift Contribution
Date of issue: December 25, 2020

Center for Systematic Entomology, Inc., Gainesville, FL

Leavengood JM Jr. 2020. *Phyllobaenus thomasi* and *P. turnbowi*, two new species from Mexico and Belize (Coleoptera: Cleridae: Hydnocerinae: Hydnocerini). Insecta Mundi 0833: 1–6.

Published on December 25, 2020 by
Center for Systematic Entomology, Inc.
P.O. Box 141874
Gainesville, FL 32614-1874 USA
http://centerforsystematicentomology.org/

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0833: 1–6 **INSECTA MUNDI** 2020

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Abstract. The two **new species** *Phyllobaenus thomasi* (Campeche, Oaxaca, Quintana Roo and Yucatán, Mexico, and Belize) and *P. turnbowi* (San Luis Potosi, Mexico), are described (Coleoptera: Cleridae: Hydnocerinae: Hydnocerini). The primary types are photographed and intrageneric relationships of the species are discussed.

Key words. Checkered beetle, Michael Thomas, patronym.

ZooBank registration. urn:lsid:zoobank.org:pub:4D0A52BA-A515-438C-ADDD-E339CF5A6B2D

Introduction

Recent nomenclatural and descriptive work by Leavengood (2014), Leavengood and Garner (2014), Barr (2018) and Leavengood and Rifkind (2020) have made changes to the approximately 120 described species of New World Hydnocerini (i.e., *Phyllobaenus* Dejean, *Isohydnocera* Chapin and *Wolcottia* Chapin). Over 100 of these species comprise the genus *Phyllobaenus*.

Mexico and Central America are home to about half of the described species and most of the known undescribed species of *Phyllobaenus* (pers. obs.). Many of these species exhibit significant intraspecific variation in color pattern and occur across broad geographic ranges, making species delimitation difficult without large specimen series even after accounting for type specimens.

The purpose of this paper is to describe two new species of *Phyllobaenus* from specimens collected in central and southern Mexico and Belize. These new species appear to be rarely collected compared to other species of *Phyllobaenus*, which are often collected in large series. In my review of the genus (spanning a decade) and examination of over twenty thousand specimens from over 100 collections, only 15 and 7 specimens respectively, have been collected of these two new species with the entire series of one species being collected during a single collecting trip in 1982. These two species are herein named after their collectors, Michael C. Thomas and Robert H. Turnbow, Jr., two exceptional coleopterists who shared a long friendship and a rich history of field work.

Materials and Methods

Characters used to describe the new species herein were derived from the author's observations and the most recent descriptions of North American Hydnocerinae: *Isohydnocera californica* Barr, 1966; *Isohydnocera chiricahuana* Knull, 1949; *Phyllobaenus atriplexus* Foster, 1981; *Phyllobaenus lautus* Barr, 1960; *Phyllobaenus varipunctatus* Knull, 1949; and *P. inusitatotibialis* Leavengood and Rifkind, 2020.

Holotypes were selected based on their depository. Illustrations are presented of the holotype and a paratype of *P. turnbowi* and a male paratype of *P. thomasi*. A paratype was photographed instead of the holotype of *P. thomasi* because of the disposition of the specimen.

Specimens were photographed with a Nikon Digital Sight DS-Fi2 imaging system mounted on a Nikon SMZ-18 stereomicroscope. Photograph layers were stacked using Helicon Focus 6 (http://www.heliconsoft.com/

heliconsoft-products/helicon-focus/) and edited using Adobe Photoshop Elements 12 Editor (https://www.adobe.com/products/photoshopelements.html). Label data is presented with the addition of county/state/department (when omitted from labels) and standardization of dates, followed by depository for each respective specimen.

Type material is deposited in the following collections:

AMNH American Museum of Natural History, New York, New York
FSCA Florida State Collection of Arthropods, Gainesville, Florida
JNRC Jacques Rifkind, private collection
NMNH National Museum of Natural History, Washington, D.C.
RHTC Robert H. Turnbow, private collection
SEMC Snow Entomological Museum, Lawrence, Kansas
TAMU Texas A & M University, College Station, Texas

Results

Phyllobaenus thomasi Leavengood, new species

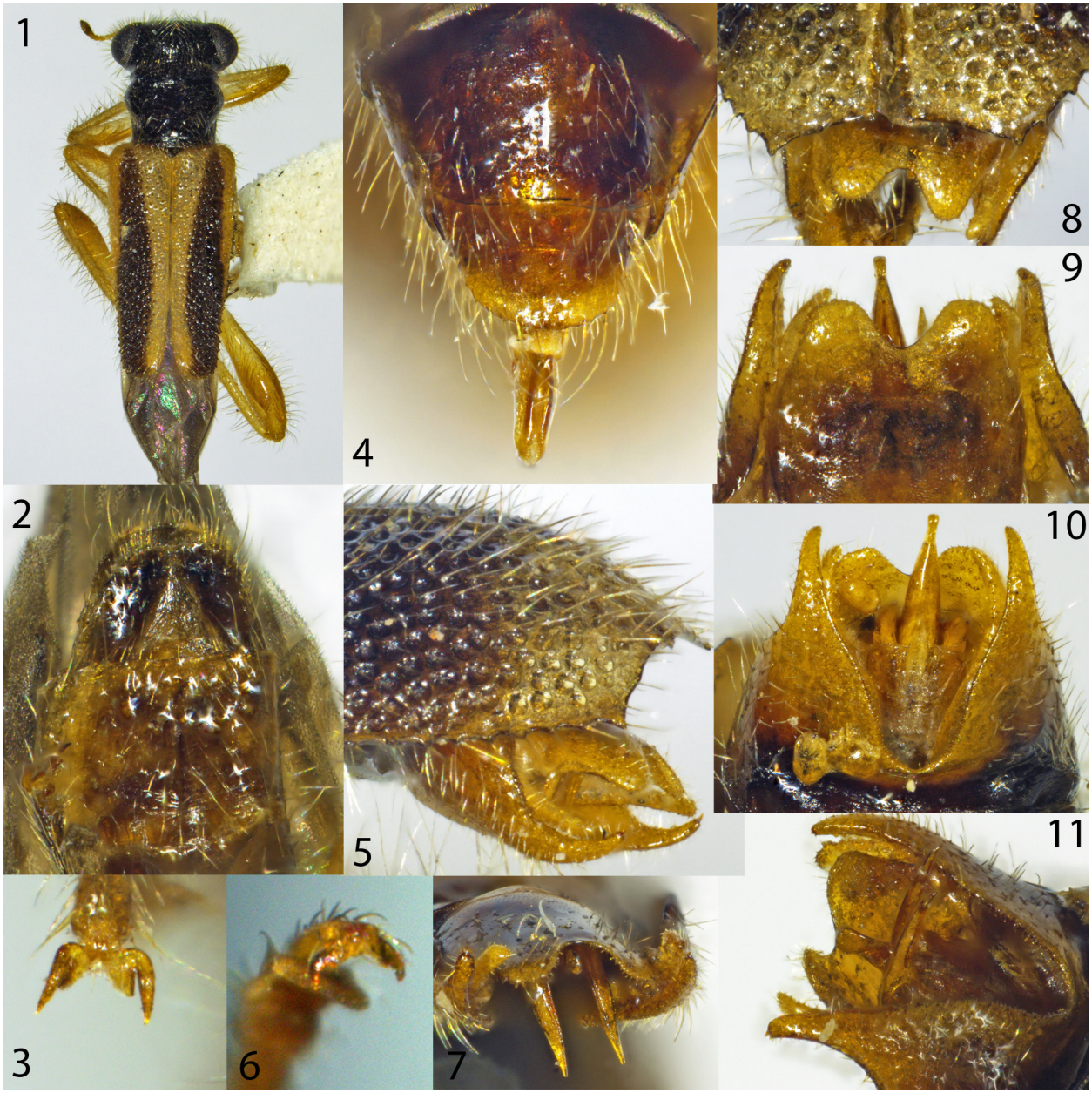
(Fig. 1–4)

Holotype. Male. MEXICO: Yucatán: 2km E Chichén Itzá, blacklight trap, 15-VI-1990, M. C. Thomas (FSCA).

Paratypes. 13 specimens. BELIZE: British Honduras: Prov. Corozal 15 mi. S. Santa Elena, 1-VII-1966, U. Kans. Mex. Exped. (SEMC, 1); Orange Walk: 5 mi. N. Orange Walk, 12-VIII-1979, CW & L O'Brien & G Marshall (JNRC, 1). MEXICO: Campeche: Carmen, 14-VII-1959, NLH Krauss (NMNH, 1). Oaxaca: 27 miles southwest Salina Cruz, 14-VII-1987, Kovarik, Schaffner (TAMU, 2). Quintana Roo: 24 km N Carrillo Puerto, 28-V-1984, R. Turnbow (RHTC, 1). Yucatán: Chuminopolis, 7-VII-1952, J. & D. Pallister, C. R. Vose Fund, Explorers' Club, A.M.N.H. Exped. (AMNH, 1); Colonia Yucatan, 17-VIII-1952, J. & D. Pallister, C. R. Vose Fund, Explorers' Club, A.M.N.H. Exped. (AMNH, 1); Holactun, 14-VII-1974, Coll. by W. F. Chamberlain (TAMU, 1); Libra Union, 14-VII-1974, Coll. by W. F. Chamberlain (TAMU, 1); 26 km. SW. Merida, 30-VII-1990, C. W. & L. B. O'Brien (JNRC, 1); Merida, 29-30-VII-1964, Paul J. Spangler (FSCA, 1; NMNH, 1).

Diagnosis. The color pattern of *Phyllobaenus thomasi* most closely resembles *P. antillae* (Wolcott), *P. schmidti* (Pic), *P. semimarginatus* (Pic) and *P. postsuturalis* (Pic), from which it differs by having the sutural and lateral orange-testaceous elytral markings distinctly connecting at the elytral base. The other four species have pale borders, at least in part, of both the lateral and sutural margins of the elytra, but the lateral and sutural colored portions never converge and meet humerally.

Description. Holotype (male): Body length 4.13 mm. Head, scutellum, prothorax, lateral portions of meso- and metathorax, and an elongate central stripe on each elytron reaching from the apex to just before the humerus brownish-black; antennae, mouthparts, coxae, legs, ventral portions of meso- and metathorax, most of the abdomen, and the elytral region surrounding the central stripe pale testaceous; infuscations on antennal club, lateral portions of meso- and metathorax, and abdominal tergites (Fig. 1). Head slightly wider than elytral humeri, with the prominent eyes protruding beyond the lateral pronotal angles; finely punctate; sparsely clothed with fine, long, erect, pale hairs interspersed with short semirecumbent hairs directed centrally between the eyes, and eyes sparsely clothed with only fine long erect pale hairs. Antennae 10-segmented, with funicular segments (i.e., III–IX) of typical form, VIII smaller than segments VII or IX; terminating in a large one-segmented club. Pronotum nearly impunctate; sparsely clothed with fine long erect pale hairs interspersed with short semirecumbent hairs; lateral pronotal angles somewhat anteriorly placed and as wide as eyes or elytral humeri. Elytra moderately and evenly punctate; sparsely clothed with fine, long, erect, pale hairs interspersed with short, semirecumbent hairs; somewhat dorsoventrally flattened, dehiscent at the apical third, and weakly tumid apically; at the point of elytral dehiscence (one-third from the elytral apex), internal plical margin forming an elongate subulate excavation with a distinct margin and acuminate ends; elytral apices serrulate, independently truncate with a briefly smooth inner margin; lateral elytral margins serrulate, growing slightly stronger apically, obsolete in anterior third of elytral margin (reduced to setigerous punctures), each serrulation with a posteriorly projecting seta. Ventral pro- and mesothorax sparsely clothed with fine, long, erect, pale hairs interspersed with short, semirecumbent



Figures 1–11. *Phyllobaenus thomasi* female paratype. **1)** Habitus, dorsal. **2)** Abdomen, ventral. **3)** Tarsal claw. **4)** Abdomen, dorsal. *Phyllobaenus turnbowi* male paratype. **5)** Abdomen, lateral. **6)** Tarsal claw. **7)** Terminalia, caudal. **8)** Abdomen, dorsal. **9)** Terminalia, dorsal. **10)** Terminalia, ventral. **11)** Terminalia, ventrolateral.

hairs, metathorax similar but with long, ventral, erect, hairs; mesepisternum and metepisternum evenly covered in recumbent hairs. Legs somewhat shining, sparsely clothed with fine, long, erect, pale hairs of varying length; slender, with femora thicker than spindly tibiae; metafemora somewhat clavate and reaching well beyond elytral apex; tarsi with well-developed triangular ungues (Fig. 3). Abdomen shining and sparsely clothed with fine, long, erect, pale hairs (longest at apical margin of each ventrite) interspersed with short, semirecumbent hairs which are shorter and more densely arranged on the fifth visible sternite; visible sternite V with apical margin broadly, evenly emarginate across entire width; sternite VI modified, with posterior margin concealed by sternite V ventrally, but produced dorsolaterally on each side into a curved, setose, clasper-like appendage terminating

in a blunt end; apical visible tergite with a very weak emargination and particularly long, curved marginal setae. Paratype (female) with apical visible abdominal sternite divided into two free sclerites, each with long setae on the apical margins (Fig. 2); apical visible tergite apically margined with long setae (Fig. 4).

Distribution. Known from Belize and Mexico (Campeche, Oaxaca, Quintana Roo and Yucatán).

Etymology. This patronym honors my thesis advisor, Dr. Michael C. Thomas, who gave me my first museum job curating the recent accession of the Giesbert Collection into the Florida State Collection of Arthropods. Mike also ignited my interest in checkered beetles, which became the subject of my master's thesis and doctoral dissertation.

Remarks. The distinctly dehiscent, marginally serrulate, apically subtruncate and dorsoventrally flattened elytral form in combination with distinct bifid tarsal ungues ally *P. thomasi* with *P. antillae, P. lateralis, P. postsuturalis, P. schmidti, P. semimarginatus, P. subulatus* and *P. subvittatus*. These species (and others of similar elytral and tarsal form) likely represent a natural group. Whereas the holotype and many paratypes possess uniformly pale legs, some paratypes possess partial to complete black bands on the apical metafemora. This is the only noteworthy variation in the type series.

One specimen not included in the type series has a locality label indicating it was collected in Perú (Loreto Prov.: 25 mi. NE Iquitos, Explorama Inn, 19-21-VII-1989, Amazon rainforest, G. B. Edwards; FSCA, 1). Given that all other specimens are from southern Mexico or Belize, I strongly suspect that this specimen was mislabeled.

Phyllobaenus turnbowi Leavengood, new species

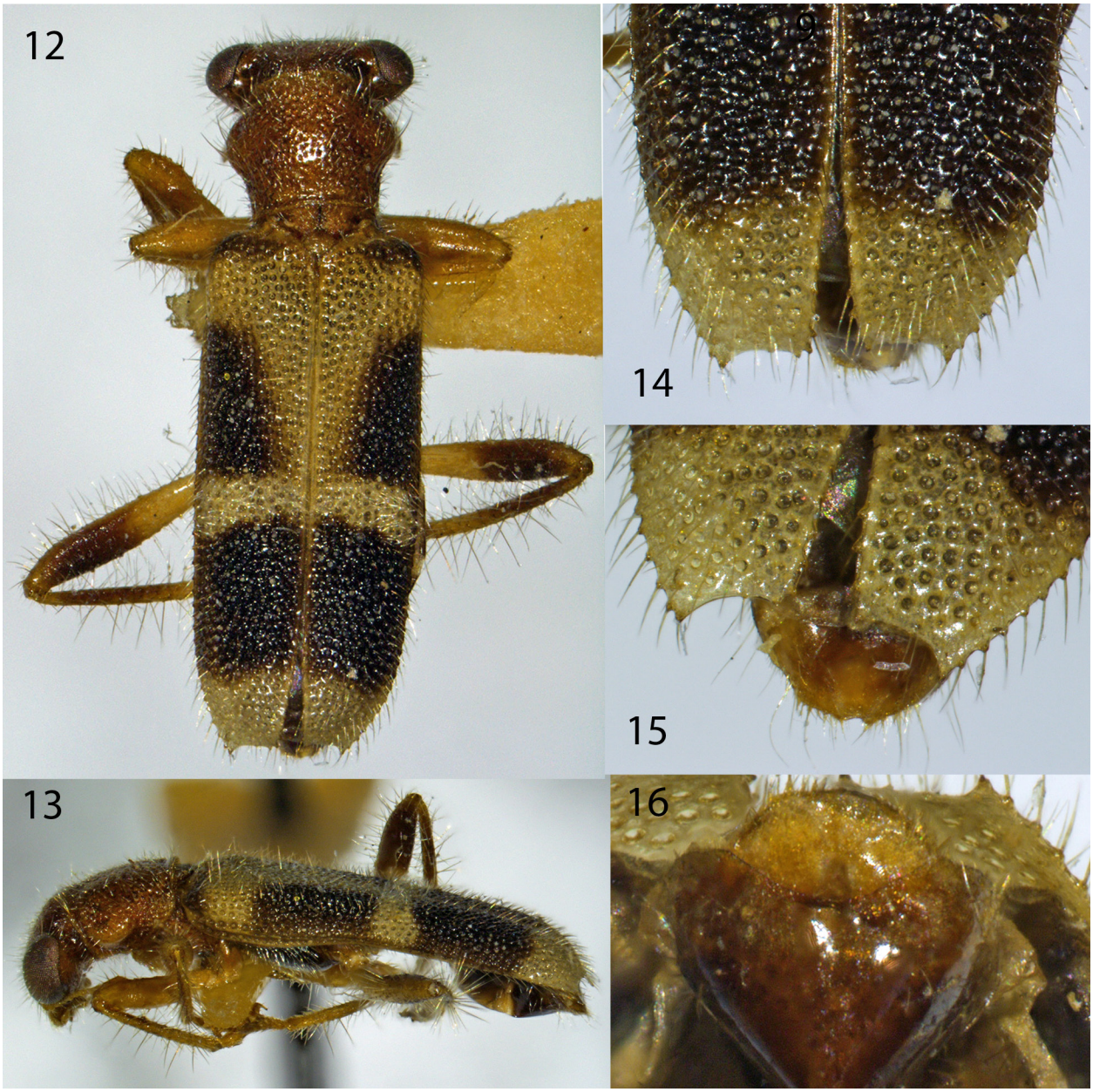
(Fig. 5–16)

Holotype. Female. MEXICO: San Luis Potosi, Guadalcazar Rd. at km. 11.5, 19 July 1982, R. Turnbow (RHTC).

Paratypes. 6 specimens. MEXICO: San Luis Potosi, Guadalcazar Rd. at km. 11.5, 19-VII-1982, R. Turnbow (RHTC, 1); 21 km E San Luis Potosi, 18-VII-1982, R. Turnbow (TAMU, 1); km. mk. 6, Guadalcazar rd., 19-VII-1982, R. Turnbow (TAMU, 3); gravel rd. at km. mk. 11.5 on Guadalcazar rd., 19-VII-1982, R. Turnbow (TAMU, 1).

Diagnosis. The unique color pattern and truncate-emarginate elytral apices will readily distinguish this species from its congeners. In terms of color pattern and general form, the most similar species are *Phyllobaenus corticinus* (Gorham) and *P. intricatus* (Gorham). However, neither of these species possess emarginate elytral apices and both have different overall color patterns.

Description. Holotype (female): Body length 5.78 mm. Head, anterior scutellum, pro- and mesothorax pale red; antennae, mouthparts and coxae pale orangish-testaceous; legs orangish-testaceous with infuscations forming bands in the apical third of the metafemora and weaker dispersed infuscations in the metatibiae; metathorax and abdomen dark reddish-brown; elytra black with white apices and a white area shaped as a Roman numeral "V" occupying the anterior three-fifths (excluding the humeri), the posterior margin of which completely divides the elytra with a white transverse fascia (Fig. 12–13). Head about as wide as elytral humeri, with the prominent eyes protruding beyond the lateral pronotal angles; moderately closely punctate; sparsely clothed with fine, long, erect, pale hairs interspersed with short semirecumbent hairs, and eyes sparsely clothed with only fine, long, erect, pale hairs. Antennae with funicular segments (i.e., III–IX) of alternating size, with segments IV, VI and VIII each smaller than the segments at either side; terminating in a large one-segmented club. Pronotum densely-irregularly coarsely punctate (larger punctures than on the head) with punctation weak on the pronotal tubercles and obsolete at anterior and posterior collars; sparsely clothed with fine, long, erect, pale hairs interspersed with short, semirecumbent hairs; lateral pronotal angles anteriorly placed and not quite as wide as eyes or elytral humeri. Elytra deeply, coarsely and evenly punctate; sparsely clothed with fine, long, erect, pale hairs interspersed with short semirecumbent hairs, the erect hairs longest at the humeri, hairs directed laterally along midelytral fascia; coleopterous in form and completely covering the abdomen, somewhat dorsoventrally flattened (Fig. 12–13), with apices broadly independently truncate-emarginate with a smooth inner margin; lateral elytral margins weakly serrulate, growing stronger apically (strongest just before the apical emargination), each posteriorly projecting denticle with a single seta (Fig. 14–15). Ventral prothorax sparsely clothed with fine, long, erect, pale hairs interspersed with short, semirecumbent hairs; metathorax similar but with very few semirecumbent hairs. Abdomen shining and sparsely clothed with fine, long, erect, pale hairs; apical visible sternite with a deep basal groove extending nearly to mid-length, apex of apical sternite evenly rounded and unmodified except for a



Figures 12–16. *Phyllobaenus turnbowi* female holotype. **12)** Habitus, dorsal. **13)** Habitus, lateral. **14)** Elytral apex. **15)** Abdomen, dorsal. **16)** Abdomen, ventral.

very weakly indicated emargination at which the marginal setae converge (Fig. 16); apical tergite with a more distinct emargination (Fig. 15). Legs somewhat shining, sparsely clothed with fine, long, erect, pale hairs of varying length; slender (not clavate), with femora thicker than spindly tibiae; metafemora not quite reaching elytral apex; tarsi with weakly developed ungues (Fig. 6). Paratype (male) with visible sternite V almost completely divided and forming two long, curved, clasper-like appendages (Fig. 10–11); sternite VI modified, with central posterior margin concealed by sternite V ventrally, but produced dorsolaterally on each side into a curved, setose, clasper-like appendage terminating in a blunt end (Fig. 7, 9–11); apical visible tergite with a deep emargination forming two rounded lobes (Fig. 7–11); visible portion of aedeagus with elongate parameres apically abruptly angled downward (as in *P. inusitatotibialis*) (Fig. 7, 11); phallus robust, elongate, strongly sclerotized, tapering apically and anteapically constricted, with apex laterally compressed, terminating in a blunt knob (Fig. 9–11).

Distribution. Known only from the type locality (San Luis Potosí, México).

Etymology. This patronym honors the sole collector of this species, Bob Turnbow, who I first met on a collecting trip with Mike Thomas.

Remarks. The specimens of the type series appear to have faded color such that in life (or with fresher specimens) the color pattern may be more brilliant. Otherwise, the paratypes show no noticeable variation in color pattern. The elytra are rather parallel, widest just behind the middle, and with no sign of constriction or antebasal depressions as are often found in species with similar elytral form (e.g., *P. corticinus, P. intricatus*) (Leavengood and Garner 2014). Unlike many species of *Phyllobaenus* and *Isohydnocera*, neither the ventrolateral metathorax nor the scutellum have an increased density of hairs (nor are they more silvery). Moreover, other species possessing truncate and/or emarginate elytral apices have more deeply apically dehiscent elytra (e.g., *P. lateralis, P. subulatus*) that are not coleopterous in form and have a midelytral plical subulation, they are less coarsely punctate (and certainly not for the full length of the elytra), and the elytra often do not fully cover the abdomen. The form of the tarsi (i.e., the weak ungues) is consistent with other species of similar elytral form (e.g., *P. corticinus, P. nitidicollis*), which Leavengood et al. (2012) identified as problematic with respect to generic assignment. As such, to remain consistent with those species of similar form, the new species is placed (tentatively) within *Phyllobaenus*. This new species appears to be closely allied with *I. albocincta*, *I. cryptocerina*, *P. albofasciatus, P. bituberculatus, P. cinctus, P. corticinus*, *P. cyanipennis, P. cyanitinctus, P. cylindricollis, P. impressus, P. intricatus*, *P. nitidicollis* and *P. vitrinus*. Sharing similar elytral form but possessing distinct tarsal ungues are the species *P. inusitatotibialis*, *P. niveifasciatus* and *P. unifasciatus*.

Acknowledgments

My greatest thanks to Bob Turnbow (Alabama) and Jacques Rifkind (California) for their specimen loans and patience. I am also grateful to Alan Burke (United States Department of Agriculture, APHIS-PPQ, Calexico, CA) and John Dorshorst (United States Department of Agriculture, APHIS-PPQ, Des Plaines, IL) for their reviews of the manuscript. The opinions expressed in this work do not necessarily reflect the policies or views of the United States government or of the United States Department of Agriculture.

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Received November 24, 2020; accepted December 3, 2020.
Review editor Oliver Keller.