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BARUTUS HARTMANNI, A NEW GENUS AND SPECIES FROM PANAMA WITH A KEY TO THE GENERA OF NEW WORLD PENTODONTINI (COLEOPTERA: SCARABAEIDAE: DYNASTINAE)

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ABSTRACT

Barutus hartmanni, a new genus and species from Volcan de Baru, Chiriqui, Panama, is described and illustrated. A key to the New World genera of Pentodontini (Scarabaeidae: Dynastinae) is provided.

In 1976 Dr. Henry Stockwell sent me some Panamanian Scarabaeidae for identification. Among them was a specimen of a pentodontine from Chiriqui which I could not place to genus. In 1979 Dr. Henry Howden provided me with additional examples of this taxon that he had collected in Chiriqui in 1977, and we discussed the possibility of these specimens representing an undescribed genus. I have determined that this taxon is indeed undescribed and provide here a description and diagnosis for the new genus and species. The following description of puncture size follows my earlier usage (Ratcliffe 1975).

Barutus Ratcliffe, new genus
(Fig. 1)

Type-species: *Barutus hartmanni*, new species, here designated.
Description: Form suboval, stout. Length 23-31 mm; width across humeri 11-16 mm. *Head*: Frontoclypeal margin with a transverse tubercle. Clypeus subtriangular, apex rounded. Mandibles well exposed, forward projecting, normally bilobed. Antenna 10-segmented. *Pronotum*: Males with a weak, bilobed, tuberculate area just behind anterior margin; lacking in females. A very weak, longitudinal sulcus usually present between and behind tubercles in males or through corresponding area in females. Margins completely beaded. *Metasternum*: Completely, setigerously punctate. *Elytra*: Widest behind middle. Surface punctate; punctures irregular on median part of disc, arranged in rows on lateral part of disc. Sides punctate and variably, transversely rugose. *Legs*: Anterior tibia with 4 acute teeth, basal tooth very small. Apex of posterior tibia weakly crenulate on outside, bearing a series of slender spinules.
Diagnosis: The color, size, triangular clypeus, externally lobed and visible mandibles, weakly tuberculate-sulcate pronotum, heavily punctate elytra, and completely punctate metasternum are diagnostic for *Barutus*.
Distribution: Known from the eastern and northwestern slopes (1000-1400 m) of the Baru volcano (El Volcan; 3,475 m) in Chiriqui, Panama.
Etymology: From Baru, the name of the mountain on whose slopes specimens were taken, combined with the Latin suffix *-tus* indicating "belonging to" or "pertaining to," hence belonging to Baru. The generic name is considered masculine in gender.

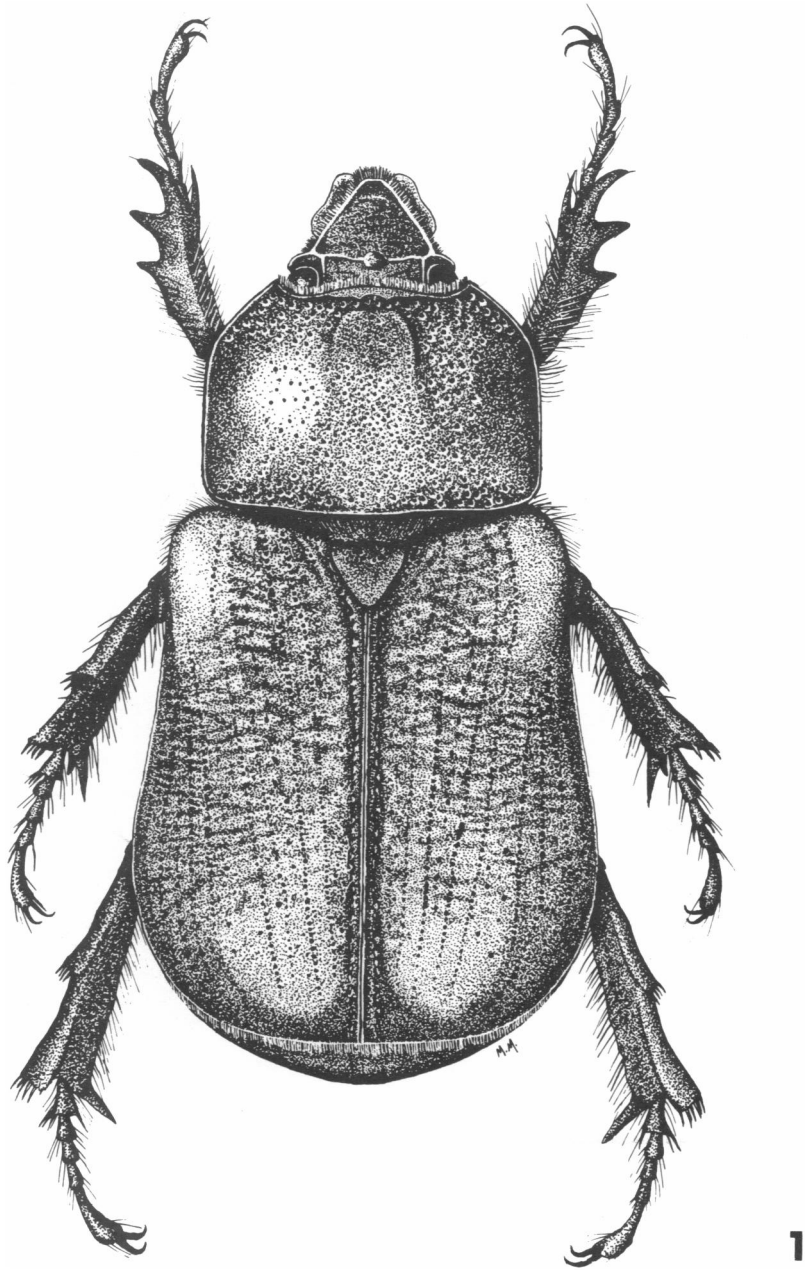


Fig. 1. Dorsal habitus of *Barutus hartmanni* Ratcliffe.

Discussion: *Barutus* is most similar to *Hiekianus* Endrödi but differs noticeably in the punctation of the metasternum, the form of the clypeus and pronotum, and the entire versus bilobed tubercles of both the head and the pronotum.

Since the publication of Endrödi's (1969) key to the genera of New World Pentodontini, four new genera have been described: *Hiekianus* Endrödi (1978), *Indieraligus* Dechambre (1979), *Gillaspytes* Howden (1980), and now *Barutus*. I herewith provide a revised and updated key to the genera of New World pentodontines to reflect these additions and to clarify Endrödi's key.

KEY TO THE GENERA OF NEW WORLD PENTODONTINI

1. Antenna with 9 segments 2
1′. Antenna with 10 segments 3

2(1). Head in both sexes with a short horn. Apical region of pronotum declivous. (Argentina) ..... *Eremobothynus* Ohaus 1910
2′. Head lacking horns, instead with a transverse carina. Apical region of pronotum not declivous. (SW. United States) ..... *Aphonides* Rivers 1889

3(1′). Small species, generally less than 15 mm in length. Head lacking carina, tubercles, or horn (rarely with a trace of tubercles). Pronotum lacking tubercles or fovea. Posterior tibia strongly broadened 4
3′. Larger species, generally greater than 15 mm in length. Head with transverse carina (on subapex of clypeus or frontoclypeal suture), tubercles or horn. Pronotum with tubercles (rarely obsolete: *Aphonus, Indieraligus)* and usually with a fovea or sulcus behind tubercles. Posterior tibia not strongly broadened apically 7

4(3). Color black 5
4′. Color rufous or reddish-yellow 6

5(4). Pronotum completely and distinctly punctate. Propygidium lacks stridulatory striae. (S. United States through South America) ..... *Euetheola* Bates 1888
5′. Pronotum virtually impunctate. Propygidium with stridulatory striae. (African species introduced into S. Brazil) ..... *Heteronychus* Burmeister 1847

6(4′). Posterior femur greatly thickened, apex of posterior tibia very expanded. (Peru) ..... *Pentodina* Endrödi 1968
6′. Posterior femur normal, apex of posterior tibia not greatly expanded. (Honduras to Brazil and Peru) ..... *Parapucaya* (in part) Prell 1934

7(3′). Size large (30-35 mm). Color rufous. Mandibles without teeth on external margin. Male with central horn on head, pronotum with a strong bifurcate tubercle or horn. Anterior tibia with a small, basal, fourth tooth. Posterior leg with basal tarsomere very wide. Propygidium without stridulatory striae. (Argentina, Brazil, Colombia) ..... *Thronistes* Burmeister 1847

7′. Not with above combination of characters 8

8(7′). Clypeal apex acute, unidentate; subapical margins cariniform 9

8′. Clypeal apex bidentate, truncate, or rounded; subapical margins not cariniform 10

9(8). Mandibles large, tridentate. (S. United States, N. Mexico) ..... *Oxygrylius* Casey 1915

9′. Mandibles smaller, nearly hidden by clypeus, lacking lateral teeth. (South America) ..... *Oxyligyrus* Arrow 1908

10(8′). High, transverse carina present immediately behind apex of clypeus 11

10′. High, transverse carina absent immediately behind apex of clypeus 12

11(10′). Transverse carina just behind apex of clypeus tridentate. Pronotum without tubercles. Apex of foretibia truncate. Size generally less than 17 mm. (United States) ..... *Aphonus* LeConte 1856

11′. Transverse carina just behind apex of clypeus entire or bidentate. Pronotum tuberculate or not. Apex of foretibia rounded. Size generally greater than 17 mm. (Central and SW. United States, Mexico, Guatemala, Nicaragua) ..... *Orizabus* Fairmaire 1878

12(10′). Club of antenna very elongated, in male as long or longer than all other segments together, and in female longer than stem without basal segment. (Chile) ..... *Oryctomorphus* Guérin-Méneville 1830

12′. Club of antenna short, about as long as stem without basal segment 13

13(12′). Mandibles only slightly visible from above or hidden under clypeus; outer edge arcuate, not toothed or convexly rounded 14

13′. Mandibles distinctly visible from above; outer edge toothed or convexly rounded or lobed 16

14(13). Clypeus strongly narrowed towards apex, apex narrowly bidentate. Color castaneous to black. (Canada to Chile) ..... *Ligyrus* (in part) Burmeister 1847

14′. Clypeus not strongly narrowed towards apex, apex broadly truncate. Color fulvous to rufocastaneous 15

15(14′). Clypeofrontal suture absent. A small horn (males) or tubercle (females) next to eye. Apex of pronotum declivous, subapex binodose or bituberculate. Length 10 mm or greater. (Panama, Colombia, Ecuador) ..... *Pucaya* Ohaus 1910

15′. Clypeofrontal suture present, deeply impressed, strongly arcuate either side of middle. Head without horns or tubercles. Apex of pronotum faintly bituberculate to entire. Length 18 mm or less. (Honduras to Brazil and Peru) ..... *Parapucaya* (in part) Prell 1934

16(13′). Mandibles convex (entire or lobed) on lateral edge 17

16′. Mandibles distinctly tridentate (1 apical tooth, 2 lateral teeth) 22

17(16). Apex of clypeus narrowly bidentate. (Galapagos Islands) ... . *Neobothynus* Prell 1936

17′. Apex of clypeus truncate, acute, or narrowly rounded 18

18(17′). Clypeus abruptly constricted at apex; tip elongate, narrowly truncate or rounded. Males with head horn, pronotum with bifurcate horn; females lacking horns. Color piceous (females) to grey-tomentose (males), opaque. (Brazil, Argentina) ..... *Diloboderus* Reiche 1859

18′. Clypeus regularly acuminate, subtriangular. Horns absent. Color castaneous, shining 19

19(18′). Pronotum lacking distinct apical fovea, sulcus, or tubercles or fovea either side of middle; marginal bead absent on base. Scutellum impunctate. Base of pygidium, lateral edge of abdominal sternites and meso- and metatibiae with extremely long, dense setae. (Puerto Rico) .... *Indieraligus* Dechambre 1979

19′. Pronotum with distinct apical fovea, sulcus, or tubercles or fovea either side of middle; marginal bead present on base. Scutellum with punctures. Extremely long, dense setae absent from meso- and metatibiae, pygidium, or sternites 20

20(19′). Clypeus strongly convex on dorsal surface. Frontoclypeal suture strongly elevated into a transverse, binodose ridge. Pronotum with a shallow, ovoid concavity in median half behind subapical tubercle (male) or with subapical rounded swelling (female). Elytron with sutural stria and 3 feebly indicated discal striae. (Mexico) ..... *Gillaspytes* Howden 1980

20′. Clypeus not strongly convex on dorsal surface, either weakly convex in basal half only or weakly concave. Frontoclypeal suture with a transverse tubercle only. Pronotum lacking a shallow, ovoid concavity in median half behind apical margin, instead a median longitudinal sulcus or a shallow fovea either side of middle. Elytron with sutural stria and 4-5 punctate-striate rows on disc 21

21(20′). Apex of clypeus narrowly truncate. Tubercle on head entire. Pronotum with shallow fovea either side of disc; subapical sulcus and apical tubercles absent. Metasternum setigerously punctate in anterior half only. (Paraguay) .... *Heikeianus* Endrödi 1978

21′. Apex of clypeus narrowly rounded. Tubercle on head feebly binodose. Pronotum without fovea either side of middle; both sexes with a weak, subapical, longitudinal sulcus (weaker in females), and males with an apical, binodose tubercle. Metasternum completely, setigerously punctate. (Panama) ..... *Barutus* Ratcliffe, new genus

22(16′). Propygidium with stridulatory structures 23

22′. Propygidium lacking stridulatory structures 25

23(22). Apical segment of maxillary palpus expanded, triangular. (South America) ..... *Hylobothynus* Ohaus 1910

23'. Apical segment of maxillary palpus normal, cylindrical 24

24(23'). Foretibia tridentate. (Mexico through South America) ..... *Bothynus* Hope 1837

24'. Foretibia bidentate. (S. Brazil) ..... *Parabothynus* Endrödi 1968

25(22'). Elytron very smooth, with just a few minute punctures. Clypeus emarginate laterally at base. (S. Brazil) ..... *Aceratus* Prell 1936

25'. Elytron very distinctly punctate or punctate-striate. Clypeus not emarginate at base 26

26(25'). Form of body suboval, stout, very convex on dorsum. Surface coarsely punctate-striate. Frontoclypeal carina short, less than 1/3 width of base of clypeus. Pronotum evenly convex or with a trace of an apical tubercle. (Argentina, Uruguay, S. Brazil) ..... *Philoscaptus* Bréthes 1919

26'. Form of body more elongate, less stout, not strongly convex on dorsum. Surface variably punctate. Frontoclypeal carina long, interrupted at middle or not or replaced by 2 distinct tubercles. Pronotum with or without apical tubercle and subapical fovea. (Canada to Chile) ..... *Ligyrus* (in part) Burmeister 1847

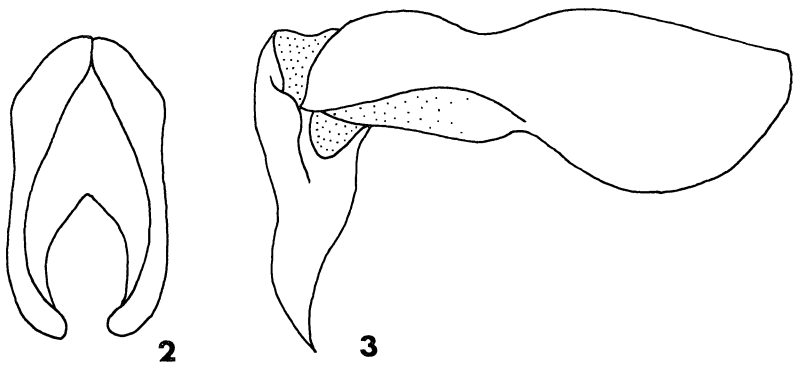
Barutus hartmanni Ratcliffe, **new species**
(Figs. 1-3)

Type Material. – Holotype male, labeled "PANAMA: Chiriqui Prov., 2.5 km W Cerro Punta, 8°51'N, 82°36'W, 1720 m, 23 May 73, H. Stockwell." Allotype female, labeled "PANAMA: Chiriqui, Boquete, 1250 m, 8°48'N, 82°26'W, II-14-78, coll. H. Wolda." Types deposited at the University of Nebraska State Museum.

Paratypes (20) with the following data: (a) as holotype (2 females); (b) as holotype but with date of 28 November 1975 (2 males); (c) as holotype but with H. Howden collector, at light, and dates of 15-30 May 1977 (2 males, 1 female), 6 June 1977 (1 male); (d) as holotype but with H. & A. Howden collectors and date of 19-23 May 1977 (1 male); (e) as allotype but with dates of 23 January 1977 (1 female), 29 January 1977 (2 females), 13 February 1977 (2 females), 23 March 1976 (1 female), 15 December 1976 (1 male), 17 December 1976 (2 males), 29 December 1976 (1 male); (f) Chiriqui Prov., PANAMA, El Volcan, 18 May 1976, coll. R. Belzer (1 female).

Paratypes deposited in the collections of the U.S. National Museum of Natural History (Washington, D.C.), Field Museum of Natural History (Chicago), California Academy of Sciences (San Francisco), Canadian National Collection of Insects (Ottawa), British Museum of Natural History (London), Museum für Naturkunde (Berlin), Museum National d'Histoire Naturelle (Paris), Roger-Paul Dechambre (Paris), Sebo Endrödi (Budapest), Henry Howden (Ottawa), Henk Wolda (Balboa, Panama), and Brett Ratcliffe (Lincoln).

Holotype. – Male. Length 27.0 mm; width across humeri 13.0 mm. Color dark castaneous, moderately shining. *Head*: Front coarsely rugose. A strong, erect tubercle located on margin with clypeus; tubercle darker than ground color, feebly binodose. Clypeus triangular, apex rounded, external margins reflexed; surface rugopunctate to weakly rugose. Mandibles large, leaf-like, with 2 broadly rounded lobes. Interocular width 3.5 transverse eye diameters. *Pronotum*: Length-width ratio 1: 1.7. Margins completely beaded, sides broadly and evenly rounded, posterior



Figs. 2-3. *B. hartmanni,* caudal and lateral views of parameres.

angle rounded and obtuse, anterior angle acute. Surface weakly aciculate; anterior half and sides with moderate to large punctures, punctures moderately dense, generally oval (some irregular), deep, umbilicate; posterior half with punctures smaller, less dense. Apical fourth with a distinct tubercle either side of middle; tubercles weak, widely separated, slightly transverse. A very feeble, longitudinal depression between tubercles. Scutellum triangular, 3 large punctures at base. *Metasternum*: Completely, setigerously punctate; punctures small, dense; setae long, dense, ferruginous. *Elytra*: Widest behind middle. Sutural stria deeply impressed, subcrenulate in basal third. Disc weakly aciculate, median half irregularly punctate, punctures moderate to large, shallow, becoming very shallow apically; lateral half of disc with 5 rows of punctures: rows 1-2 (counting laterally from suture) regular, punctures in a single line, moderate to large, shallow, some confluent at base, becoming obsolete in apical third; row 3 irregular, punctures not in a distinct single line, size moderate to large, shallow, becoming obsolete in apical third; rows 4-5 regular, similar to preceding rows except for presence of several irregular, transverse rugae. Sides with moderate to large punctures, some in 2-3 indistinct rows, majority irregularly arranged; punctures a little deeper than those of disc, interrupted by several transverse, strong rugae especially behind humerus. *Pygidium*: Strongly convex in lateral view. Surface weakly aciculate. Region of apical margin either side of middle with a distinct, shallow depression. Disc very sparsely punctate; punctures minute, shallow. Base setigerously punctate in a transverse band; punctures small, shallow, setae very slender, long, ferruginous. Lateral margins weakly punctate (apically) to weakly rugopunctate (basally); punctures small to moderately large (larger either side of middle), shallow. A distinct, transverse, arcuate suture present subapically. *Genitalia*: Figs. 2-3.

Allotype. – Female. Length 31.3 mm; width across humeri 15.5 mm. As holotype except in the following respects: *Head*: Tubercle on clypeofrontal margin reduced, transverse. Clypeus more strongly rugopunctate. Mandibles a single, larger, leaf-like lobe. *Pronotum*: Length-width ratio 1: 1.6. Sides more angulate at anterior third than holotype. Surface with all but basal area with moderate to large punctures; punctures dense, deep, umbilicate, becoming confluent (nearly rugopunctate) either side of midline and in anterior angles. Basal fourth with punctures less dense, moderate in size. Anterior tubercle completely lacking; longitudinal depression at center apex very feeble, coarsely punctate. *Elytra*: Sutural stria a row of deep, ocellate-umbilicate punctures, many punctures confluent. Discal area with rows of punctures less distinct. Sides with irregular, deep, transverse rugae, rugae interrupting punctation. *Pygidium*: Less convex than holotype in lateral view. Disc irregularly punctate; punctures moderate in density, deep, small to moderate in size.

Setigerous punctures at base larger, more distinct than holotype. Apical margins punctate as on disc. Subapical, transverse suture angulate at midline, not arcuate.
Variation.—Males (7 paratypes): Length 23.5-29.0 mm; width across humeri 11.6-14.1 mm. Color varies from castaneous to piceous. *Head*: Front rugopunctate to rugose. Tubercle on clypeofrontal margin variable in size ranging from nearly effaced (though distinctly but feebly binodose) to a little larger than holotype (in which case tubercle entire). Clypeus rugopunctate to rugose, sculpturing weak to strong. Mandibles as holotype to formed into a single large lobe in 2 specimens, i.e., the constriction between the 2 lobes obsolete. Interocular width 3.0 transverse eye diameters (in smallest male) to as holotype. *Pronotum*: Length-width ratio 1: 1.6 (smaller specimens) to 1.8 (largest specimen). Degree of punctation slightly variable, punctures becoming dense to rugopunctate in anterior angle. Anterior tubercle as holotype to greatly reduced in 3 specimens, obsolete in smallest individual. Scutellum with several large, setigerous punctures in anterior half; setae apparently worn off in several examples and holotype. *Elytra*: Sutural stria as holotype to a line of deep, ocellate-umbilicate punctures, many punctures confluent. Disc as holotype to punctures less distinct to transverse rugae interrupting rows of punctures. *Pygidium*: Discal area as holotype to punctures slightly larger (becoming small instead of minute). *Genitalia*: As holotype to width of base of parameres slightly narrower.

Females (13 paratypes): Length 23.5-29.3 mm; width across humeri 11.7-15.3 mm. Color varies from castaneous to piceous. *Head*: Sides of clypeus distinctly arcuate in some specimens; otherwise variation is similar to that seen in the male paratypes. Interocular width 3.0 transverse eye diameters (in smallest female) to as allotype. *Pronotum*: Length-width ratio 1: 1.6-1: 1.7. Sides slightly angulate as allotype to more evenly rounded. Punctation varies from moderate in density in smaller specimens (less punctate than holotype) to very dense (more punctate than holotype). Scutellum varies from few punctures (as allotype) to several coarse punctures, confluent or not. *Elytra*: Sutural stria as allotype to a more continuous, impressed line. Rows of punctures on disc as allotype (majority) to rows a little more distinct. *Pygidium*: As holotype to punctation slightly reduced. Subapical, transverse suture arcuate as in holotype, not angulate as in allotype.
Etymology.—Named in honor of Señor Ratibor Hartmann whose generous hospitality and environmental concern for highland forests in Chiriqui have benefited many naturalists and collectors working from his finca near Santa Clara.
Discussion.—All of the specimens described in this paper were taken at black light traps in or near lower montane forests at an elevation of 1000-1400 meters. The Boquete light trap operated by Wolda was in an area called Alto Lino (1300 m) in a small tract of forest surrounded by coffee plantations (Wolda, personal communication, 1981). Wolda also informs me that two additional specimens were taken at Fortuna (8°44′N, 82°15′W; 1050 m) about 15 km SW of the Boquete light trap. The Alto Lino site has a distinct dry season whereas the Fortuna locality does not.

Activity patterns of the beetles (and not just of the collectors as light traps were run throughout the year) generally coincide with the seasonal precipitation for this region. The number of specimens taken per month is: January (3), February (3), March (1), May (8), June (1), November (2), and December (4). The onset of rainy season in May correlated with the most specimens/month taken, and the renewed precipitation in November-December again saw a peak in activity with apparent carryover into January and February. A bimodal period of activity correlated with increased precipitation is suggested by the limited data.

I collected intensively in May of 1977 and 1980 on the south slope of Cerro Pando to the NW of the type locality and in the same forest type. In spite of the close proximity of these two sites (approx. 15 km from Cerro

Punta), I did not encounter *Barutus hartmanni* nor have others who have collected extensively over several years in the Cerro Pando vicinity (Hartmann's farm). *Barutus hartmanni* may be relatively isolated on the slopes of El Volcan, but further collecting is needed to verify this.

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