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**NEW SPECIES OF *HEMIPHILEURUS* Kolbe (Coleoptera:
Scarabaeidae: Dynastinae) from the Dominican Republic with a
Key to the West Indian Species of *HEMIPHILEURUS***

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Abstract

Hemiphileurus ryani and *H. phratrius*, new species of dynastine scarabs, are described from the Dominican Republic. They are compared to their closest congeners. A new key to the nine species of *Hemiphileurus* Kolbe that occur in the West Indies is provided along with diagnostic illustrations of the male parameres.

The genus *Hemiphileurus*, the most speciose of the New World Phileurini, contains 32 species (Ratcliffe 1998). Eight species are exclusive to South America, 12 species occur in Mesoamerica, and three species are found in both Central and South America; nine species inhabit the West Indies. A synopsis of the genus was provided by Endrödi (1978, 1985) although some species have been described since that time (Chalumeau 1988; Ratcliffe 1988, 1998).

In this paper, we describe two new species of *Hemiphileurus* collected from the Dominican Republic. In order to enable identification of the West Indian species, we also provide a new key that incorporates species not actually known to Endrödi (1985).

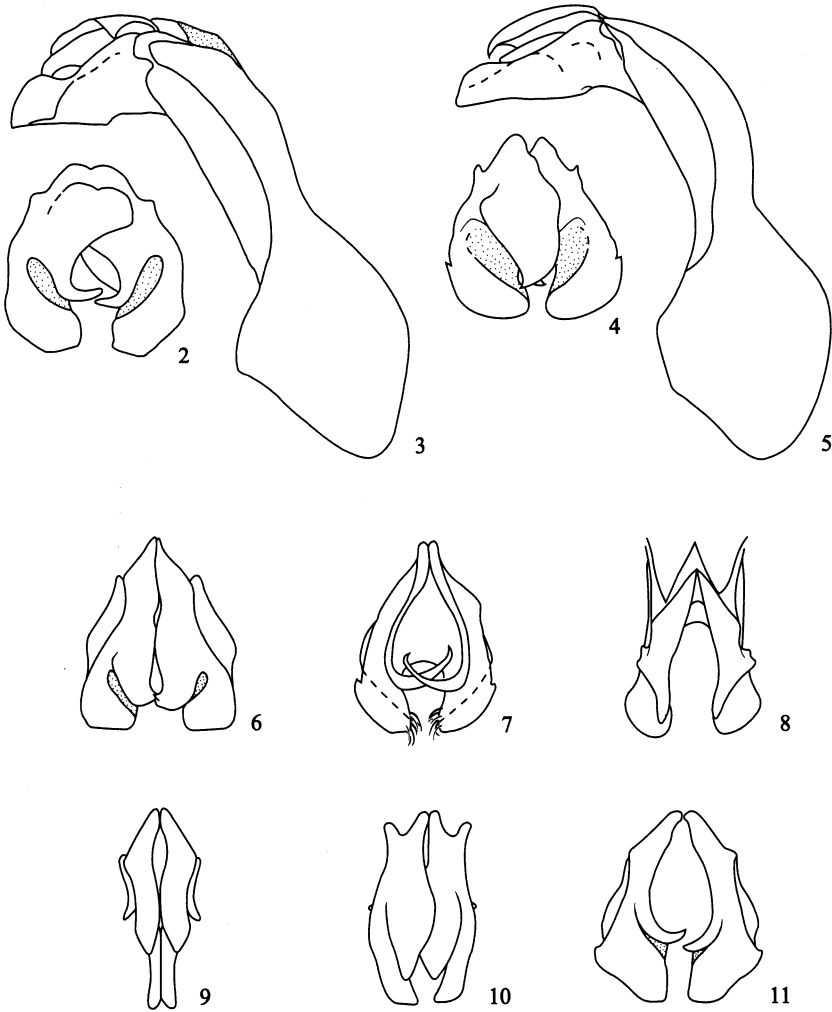
Hemiphileurus ryani Ratcliffe and Ivie, new species
Figs. 1–3

Type Material. Holotype labeled “DOM. REP: Prov. Hato Mayor, W. Sabana de la Mar, Parq. Nac. Los Haitises, Bosque Humido, 16 Apr 1992, M.A. Ivie Colr.” Allotype labeled “Mt. Diego de Ocampo, Dom. Rep., 3–4,000 ft., July ‘38, Darlington.” Paratypes (3) labeled as follows : one with same data as holotype except with elevation of 15 m, date of 16 Apr–01 July 1992, and Lindgren funnel; one with same data as allotype; one with “DOM. REP; La Vega Prov., PN. A. Bermudez, Cienaga, 19.VII–2.VIII.95, 1000 m, trop. evgrn. for., Malaise, S. + J. Peck, 95–31.”

Holotype and allotype (the latter from the Museum of Comparative Zoology)



Fig. 1. Habitus of *Hemiphileurus ryani* Ratcliffe and Ivie, new species.



Figs. 2–3. Parameres of *H. ryani*, caudal and lateral views.

Figs. 4–11. Parameres: **4–5** *H. phratrius* **6** *H. scutellaris*, **7** *H. cribratus*, **8** *H. puertoricensis*, **9** *H. laeviceps*, **10** *H. cubaensis*, **11** *H. dispar*. (4–5 caudal and lateral; 6–11 caudal only)

deposited at the University of Nebraska State Museum (Lincoln); one paratype deposited at the West Indian Beetle Fauna Project Collection (Montana State University, Bozeman), one paratype deposited at the Museum of Comparative Zoology (Harvard University, Cambridge); one paratype deposited at the Canadian Museum of Nature (Ottawa).

Holotype. Male. Length 15.7 mm; greatest width 6.9 mm. Color dark reddish brown.

Head: Frons smooth, strongly concave between eyes; posterior edge of concavity with large, transversely oval punctures. Frontoclypeal carinae distinct, each extending from apex of clypeus to base of frontoclypeal horn. Frontoclypeal horn subquadrate in lateral view, laminar (compressed from, obliquely, front to back), height subequal to width of eye in dorsal view; located anterior to inner margin of eye. Clypeus subtriangular, apex acute and strongly reflexed; surface with small, sparse punctures, punctures nearly obsolete at center. Interocular width equals 5.0 transverse eye diameters. Antenna with 10 segments, club subequal in length to segments 2–7. Mandible slender, lacking teeth laterally, with apex acute. **Pronotum:** Surface with moderately dense punctures, punctures becoming denser near anterior angles; punctures mostly moderately large, umbilicate, those few in median furrow larger, ocellate. Median longitudinal furrow moderate in width and depth, extending from base to apical declivity. Marginal bead present on all margins. **Elytron:** Surface with rows of large punctures; punctures ocellate, separated from adjoining punctures in same row by mostly less than 1 puncture diameter; rows also separated by less than 1 puncture diameter. Intervals narrow, all equally convex, with small, sparse punctures. **Pygidium:** Surface at middle with moderately dense punctures, punctures becoming a little denser laterally; punctures large and ocellate at base, simple and moderate in size elsewhere; each puncture with a minute, pale seta. In lateral view, surface strongly convex, base along entire margin with shallow depression. **Legs:** Foretibia quadridentate on lateral margin, all teeth subequally spaced. Apex of posterior tibia with 3 teeth, dorsal tooth a little longer than twice length of ventral tooth, ventral tooth not quite twice as long as middle tooth. Apex of basal tarsomere of posterior tarsus extended into long, acute tooth. **Venter:** Prosternal process behind coxae short, broad, nearly semicircular, with low, rounded tumosity at base on posterior surface. **Parameres:** figures 2–3.

Allotype. Female. Length 15.3 mm; greatest width 6.9 mm. As holotype except in the following respects: **Head:** Frons with sparse punctures and transverse rugae between eyes. Frontoclypeal horn reduced to low, anteriorly acute ridges. Clypeus with sparse, transverse rugae. **Pygidium:** Punctures dense. In lateral view, surface nearly flat. **Legs:** Apex of posterior tibia with ventral tooth about twice as long as middle tooth.

Variation. Males (3 paratypes). Length 13.9–17.5 mm; greatest width 6.0–7.8 mm. As holotype except in the following respects: **Head:** Frontoclypeal horns reduced to low, laminate tubercles (male minor) in 1 specimen. Frons just mesad of each eye with moderately dense punctures, punctures moderate in size in one specimen. Interocular width equals 4.0 transverse eye diameters. **Pronotum:** Punctures slightly less dense in 2 specimens. **Pygidium:** Punctures slightly less dense in 1 specimen.

Etymology. *Hemiphileurus ryani* is named in honor of Ryan O. Ivie who, at 11 years of age, braved clouds of mosquitoes for two days to retrieve traps at the type locality in Los Haitises National Park.

Distribution. *Hemiphileurus ryani* is known only from the Dominican Republic.

Remarks. This species is most similar to *H. phratrarius* (described herein), *H. puertoricensis* (Chapin) (1935), *H. scutellarus* Howden and Endrödi (in Howden 1978), and *H. dispar* (Kolbe) (1910). These species also occur in the West Indies. *Hemiphileurus ryani* will key to *H. puertoricensis* in Endrödi (1985), but Endrödi had not seen Chapin's species and did not further describe it or illustrate the diagnostic parameres of the male. The holotype of *H. puertoricensis* is at the U.S. National Museum, and it was found to differ significantly from *H. ryani*. In *H. puertoricensis*, the parameres are symmetrical and lack the inward-curving hooks seen in *H. ryani*, and the foretibiae are tridentate as opposed to the quadridentate tibiae in *H. ryani*. *Hemiphileurus puertoricensis* is only known from Puerto Rico.

Like *H. dispar*, *H. ryani* has a quadridentate foretibia and inward-curving

hooks on the parameres. However, *H. ryani* has basally lobed, asymmetrical parameres whereas *H. dispar* has symmetrical parameres that are not lobed at their bases.

Hemiphileurus scutellaris is known from the south coast of Hispaniola and, although the parameres have somewhat similar inward-curving hooks, they are symmetrical. Moreover, *H. scutellaris* lacks a longitudinal furrow on the pronotum (present in *H. ryani*) and has three teeth on the foretibia (four in *H. ryani*).

Hemiphileurus ryani is externally indistinguishable from *H. phratrius*, and so identification must be made between these two species by the form of the male parameres.

The holotype of *H. ryani* was collected at the Parque Nacional Los Haitises which is located on the north coast of the Dominican Republic on the south shore of the Bahía de Samana. This is an area of karst "magotes" and lowland tropical humid forest (Hoppe 1989). It receives an average of 1,900–2,000 mm of rain per year. The narrow depressions between the magotes are filled with soil and support larger trees than the magotes themselves. The general area from which our specimens were collected is known locally as the "bosque humido." A good dock is the only real landmark in the area, and no trail map is available. No detailed latitude/longitude is available because the steep-sided magotes blocked any reading by the handheld global positioning system unit. The holotype was taken from a large, rotten log on a moist soil pocket just beyond the camping area (about 100 m from the dock and just above sea level). A paratype was taken in a Lindgren funnel located on the side of a small magote about 0.5–1.0 km beyond the camping area (ca. 15 m elevation).

The allotype and a paratype were collected on Pico Diego de Ocampo at an elevation between 3–4,000 ft., which shows that this species tolerates a broad elevational range. At the time Darlington collected these specimens, the habitat would have been wet tropical rain forest, but today it is much degraded by agriculture. The last paratype was collected in a flight intercept trap in moist to wet tropical rain forest near the headquarters of the Parque Nacional Armando Bermudez just above the village of La Ciénaga. All three locales suggest that *H. ryani* can be found in areas with good forest cover and high rainfall from sea level along the northern coast to mid-elevations in the mountains further to the south in the Dominican Republic.

Hemiphileurus phratrius Ratcliffe and Ivie, **new species**

Figs. 4–5

Type Material. Holotype labeled "DOMINICAN REP., Pr. Pedernales, Sra. Bahoruco, 26 km. N. Cabo Rojo, 730 m; VII.1990, L. Masner. FIT, RD90–13." Allotype labeled "DOMINICAN REP: Prov. Barahona, nr. Filipinas, Larimer Mine: 26–VI–7–VII–1992: R.E. Woodruff, P.E. Skelley; at light." Two paratypes with same data except "day catch" instead of at lights.

Holotype in the Henry and Anne Howden collection (to be deposited at the Canadian Museum of Nature) in Ottawa. Allotype and one paratype at the Florida State Collection of Arthropods (Gainesville), remaining paratype at the University of Nebraska State Museum (Lincoln).

Holotype. Male. Length 16.4 mm; greatest width 7.2 mm. Color dark reddish brown (black to the naked eye). *Head:* Frons smooth, deeply hollowed between eyes. Fronto-

clypeal carina strong, each extending from base of clypeus to base of frontoclypeal horn. Frontoclypeal horn in lateral view subquadrate, with rounded upper angles, slightly compressed laterally, placed obliquely in front of each eye, height a little longer than width of eye in dorsal view. Clypeus subtriangular, apex acutely pointed and moderately reflexed; surface with small, sparse punctures. Interocular width equals 4.5 transverse eye diameters. Antenna with 10 segments, club subequal in length to segments 2–7. Mandibles slender, lacking teeth laterally, apex acute. *Pronotum*: Surface with moderately dense punctures, punctures becoming denser near lateral and anterior margins; punctures moderately large, umbilicate, those in median furrow a little denser. Median longitudinal furrow moderate in width and depth, extending from base to near apical margin. Marginal bead present on all margins. *Elytron*: Surface with rows of large punctures; punctures ocellate, separated from adjoining punctures in same row by less than 1 puncture diameter; rows also separated by less than 1 puncture diameter. Intervals narrow, all equally convex, with small, sparse punctures. *Pygidium*: Surface at middle with moderately dense punctures, punctures becoming a little denser laterally; punctures large and ocellate at base, simple and moderate in size elsewhere; each puncture with a minute, pale seta. In lateral view, surface strongly convex, base along entire margin shallowly depressed. *Legs*: Foretibia quadridentate on lateral margin, all teeth subequally spaced. Apex of posterior tibia with 3 principal teeth, dorsal tooth a little longer than twice length of ventral tooth, ventral tooth not quite twice as long as middle tooth. Apex of basal tarsomere of posterior tarsus extended into long, acute tooth. *Venter*: Prosternal process behind coxae short, broad, apically rounded, with feeble swelling at base on posterior surface. *Parameres*: figures 4–5.

Allotype. Female. Length 17.7 mm; greatest width 7.9 mm. As holotype except in the following respects: *Head*: Frons and clypeus with moderately large, moderately dense punctures. Frontoclypeal horns reduced to prominent tubercles. Interocular width equals 3.5 transverse eye diameters. *Pronotum*: Punctures either side of median furrow moderate in size instead of large. *Pygidium*: Punctures on disc denser. Surface in lateral view weakly convex. *Legs*: Apex of posterior tibia with small, fourth tooth.

Variation. Males (2 paratypes). Length 17.2–19.7 mm; greatest width 8.2–9.2 mm. As holotype except in the following respects: *Head*: Frontoclypeal horns larger in both specimens; in largest, horn is subquadrate, slightly recurving posteriorly, about twice as long as width of eye in dorsal view. *Pygidium*: Punctures a little larger and denser.

Etymology. From the Greek *phratrios*, meaning “of a clan;” in reference to the fact that this species is closely related to the other species of *Hemiphileurus* from Hispaniola.

Distribution. *Hemiphileurus phratrius* is known only from the Dominican Republic.

Remarks. This species is nearly identical, externally, with *H. ryani*, but the form of the parameres is diagnostic. In *H. phratrius* the median “lobes” of the parameres are broad, and their apices become abruptly acute and recurve laterally (Fig. 4) whereas *H. ryani* has slender median “lobes” that curve inwardly as slender hooks (Fig. 2). See the discussion for *H. ryani* for remarks concerning other similar species.

The habitat from which the holotype was collected is a dry, closed canopy, hardwood forest at an elevation of 730 m. The forest is situated in a region of limestone karst. The specimen was collected in a flight intercept trap located along a small stream (Masner, pers. comm. to Ratcliffe 1998). The allotype and paratypes were collected in an old coffee plantation with overstory trees at an elevation of 1,000 m.

Key to the West Indian species of *Hemiphileurus*
(females of some species are unknown)

- 1 Pronotum with dense, large punctures; median longitudinal furrow virtually absent. Parameres as in figure 6. Dominican Republic
..... *H. scutellaris* Howden and Endrödi
- 1' Pronotum with or without dense, large punctures; median longitudinal furrow present (shallow or deep) or represented by irregular row of punctures 2
- 2 Pronotum with median longitudinal furrow virtually obsolete, represented by irregular row of punctures. Elytra with small punctures, striae not paired, intervals wider than striae. Jamaica (male unknown)
..... *H. jamaicensis* (Howden)
- 2' Pronotum with median longitudinal furrow distinct. Elytra with punctures variable, striae paired or not 3
- 3 Foretibia with 3 teeth 4
- 3' Foretibia with 4 teeth 7
- 4 Pronotum with median longitudinal furrow strong, extending from base to apex. Elytral striae distinctly paired, punctures of striae large. Parameres (Fig. 7) almost symmetrical, apices setose on inner margin Cuba
..... *H. cribratus* (Chevrolat)
- 4' Pronotum with median longitudinal furrow weak, shallow, not extending to apical margin. Elytral striae not or only weakly paired, punctures of striae moderate in size. Parameres symmetrical, without setose process ...
..... 5
- 5 Parameres elongate, narrow, especially at apices 6
- 5' Parameres robust, dilated toward and at apices (Fig. 8). Puerto Rico
..... *H. puertoricensis* (Chapin)
- 6 Parameres with apices elongate, narrow, parallel (Fig. 9). Dominica
..... *H. laeviceps* (Arrow)
- 6' Parameres with apices converging toward one another from widest point at middle of each paramere, median edge of each paramere with large, elongate lobe, one overlapping the other (Fig. 10). Cuba
..... *H. cubaensis* (Chalumeau)
- 7 Prosternal process behind coxae small, triangular. Parameres (Fig. 11) with bases slender, not overlapping. Haiti, Dominican Republic
..... *H. dispar* (Kolbe)
- 7' Prosternal process behind coxae small, rounded. Parameres (Figs. 2, 4) with bases greatly expanded medially, one overlapping other 8
- 8 Parameres each with median edge developed into long, curving, slender hook-like process (Fig. 2) *H. ryani* Ratcliffe and Ivie, new species
- 8' Parameres each with median edge developed into large, broad process with apices acute that recurve laterally
..... *H. phratrius* Ratcliffe and Ivie, new species

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guides. Dr. Steve Lingafelter (U.S. National Museum) was kind enough to examine and draw for us the parameres of the holotype of *H. puertoricensis*. We thank Henry Howden, Robert Anderson, and François Genier (all Canadian Museum of Nature, Ottawa) and Paul Skelley (Florida State Collection of Arthropods, Gainesville) for loaning us material from their collections. Brian Farrel and Phil Perkins (Harvard University) are gratefully acknowledged for allowing us to keep the allotype of *H. ryani* (from the MCZ collections) with the holotype deposited at the University of Nebraska State Museum. Stewart Peck (Carleton University, Ottawa) and Lubomir Masner (Agriculture Canada) generously shared habitat information with us from locales in which they had collected in the Dominican Republic. Dan Schmidt (Schuyler, NE) provided the carbon dust habitus drawing, and Angie Fox (Scientific Illustrator, University of Nebraska State Museum) drew all the parameres. Gail Littrell (University of Nebraska State Museum) is acknowledged for preparing the manuscript. We thank R. L. Hurley, C. E. Seibert, and P. Denke (all Montana State University) and Henry H. Howden (Canadian Museum of Nature) for reviewing the manuscript. This project was supported by NSF grant BSR 9213266 and MONTS-EPSCOR. This is contribution J-5187 of the Montana Agricultural Experiment Station.

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