



A second species of *Apterodina* (Chrysomelidae: Eumolpinae) from Ecuador

R. WILLS FLOWERS

Center for Biological Control, Florida A&M University, Tallahassee, FL 32307 USA. E-mail: rflowers7@earthlink.net

The flightless genus *Apterodina* Bechyné is known from four South American species: two in southeastern Brazil and one each in Colombia and Ecuador (Flowers 2004). This paper describes a second Ecuadorian *Apterodina* and gives the first habitat data for this genus. Specimens are deposited in the following institutions: FSCA, Florida State Collection of Arthropods, Gainesville, Florida, USA; MECN, Museo Ecuatoriano de Ciencias Naturales, Quito, Ecuador.

Apterodina achuparia Flowers, new species.

(Figs. 1–10)

Holotype Male. Length 3.3 mm. Head, pronotum, elytra and underside shining coppery-black; antenna and apical three segments of the abdomen reddish brown. Legs dark reddish brown (Figs. 1–2). Apex of labrum rounded, clypeus and vertex microreticulate with strongly aciculate punctures. Prothorax distinctly wider than long, $L/W = 0.63$; pronotum strongly convex, anterior angles acute, directed antero-laterally; lateral margins narrow, undulate at middle, strongly converging in apical third, with widest part of pronotum anterior to middle; disc regularly, finely punctate, with punctures separated by a distance greater than their own diameters, and with fine punctulae between punctures. Prosternum large and trapezoidal behind coxae, with long setae, surface wrinkled; intercoxal process shallowly concave, its posterior margin weakly convex, lateral angles quadrate; width of intercoxal process 0.8 x diameter of procoxa. Mesosternum flat between coxae, strongly depressed anterior to mesocoxae, wrinkled with long yellow setae. Metasternum narrow between meso- and metacoxae, alutaceous, with short yellow setae. Metendosternite Y-shaped, basal stalk short, lateral arms narrow (Fig. 10). Elytra inflated, punctate in disorderly rows, punctures becoming weak in apical fourth, with punctures separated by distance greater than the diameter of a puncture; surface between punctures smooth with scattered small punctulae; humeri not prominent, broadly rounded, width across humeri subequal to width across pronotum; basal calli obsolete; postbasal depression lacking. Sides of elytra broadly rounded, convergent; apices rounded. Inner surface of elytra lacking binding sites. Hind wing reduced to a narrow strap (Fig. 9), vein R thick, a field of short seta at its apex. Tip of wing folded back over wing surface in living beetle. Scutellum V-shaped. Abdomen with scattered prostrate setae; surface of segments alutaceous. Sternum VII with lateral margins smooth, a weak depression in center. Median lobe in lateral view smoothly curved (Fig. 5); apex broadly rounded with median point (Fig. 7); basal hood long, lightly sclerotized, with apodemes distinct at lateral margins of hood; subbasal fenestra present; basal spurs prominent; tegmen triangular; apical sclerite small, rod shaped (Fig. 6).

Allotype Female. Length 4.6 mm; color similar to male (Figs. 3–4). Head with labrum, frons, clypeus and antennae similar to male; mouthparts similar to male. Prothorax distinctly wider than long, $L/W = 0.65$; pronotum as in male, evenly punctate on disc, with punctures separated by distance equal to or slightly greater than their own diameters. Prosternum similar to male, but with width of intercoxal process 1.2 x diameter of procoxa; somewhat smoother and more inflated between procoxae, posterior margin straight. Mesosternum, metasternum and metepisternum as in male. Elytra with scattered punctation in basal two thirds, becoming punctate-striate in apical third. A strong lateral carina runs along lateral margin of elytra above epipleuron; carina interrupted behind humerus (Fig. 3). Abdomen with segments VIII–IX forming elongate ovipositor. Sternum VIII with a long aciculate apodeme; gonocoxae slender, with long setae in apical half, coxostyli small with long apical setae. Spermatheca (Fig. 8) with pump and receptacle not differentiated, spermathecal duct long, thin, and densely coiled.

Etymology. The epithet *achuparia* is an arbitrary combination of letters derived from Achuparias, the name of the township where this species was discovered.

Specimens examined. (3 ♂♂, 2 ♀♀) Male HOLOTYPE labelled: ECUADOR, Bolívar, Achuparias, Guaranda–Caluma hwy. betw. Km 7 & 8. S01.59971; W079.05371; 3019m. 26–ene–2008. R.W. Flowers (MECN). Female ALLOTYPE (same data as holotype)(MECN). PARATYPES (2 ♂♂, 1 ♀♀) same data as holotype) (FSCA).

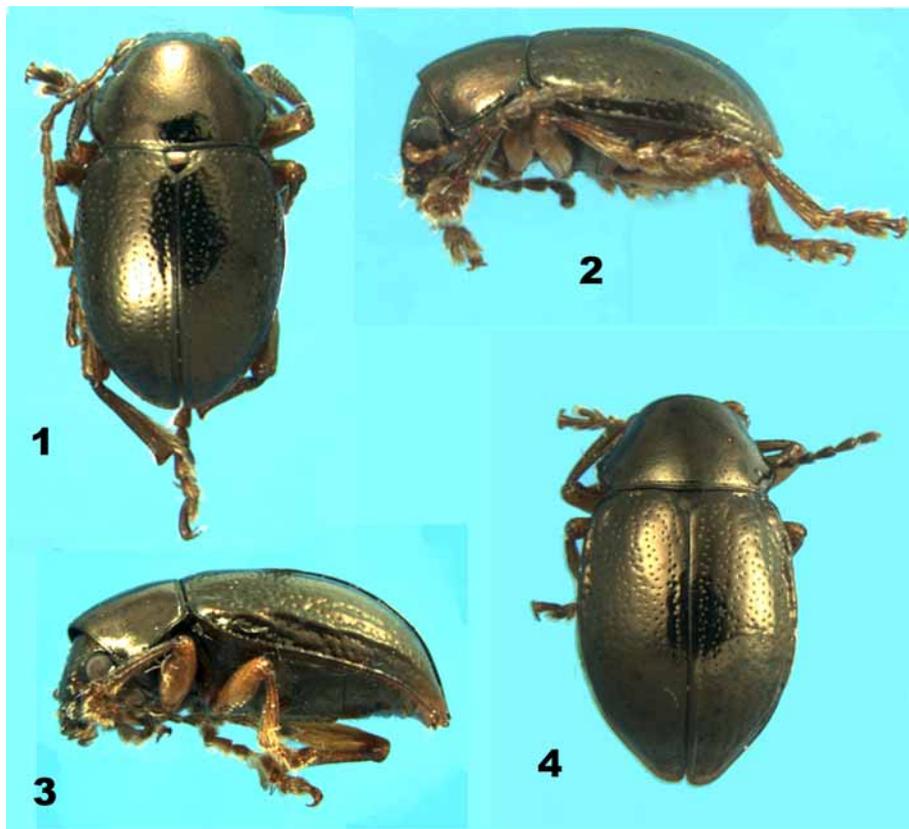
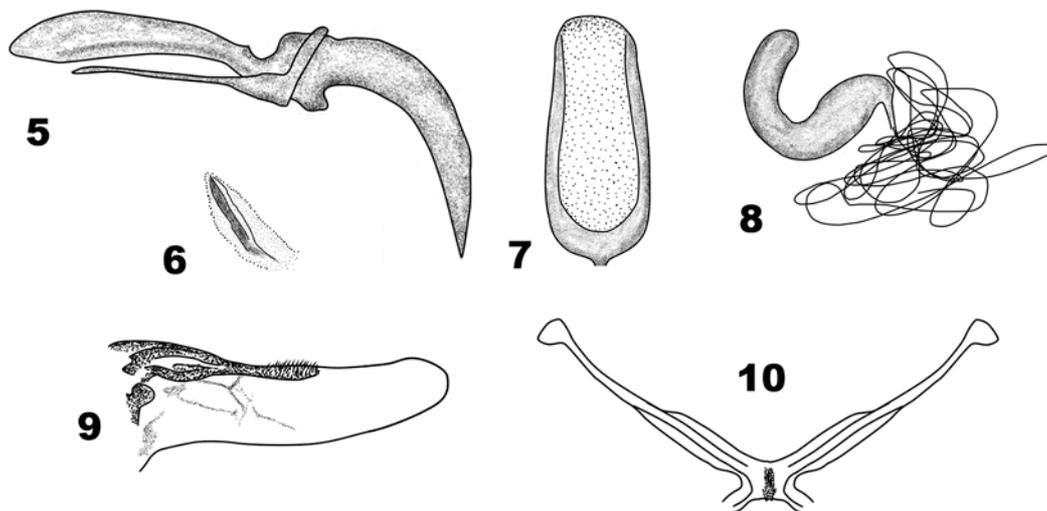


FIGURE 1–4. *Apterodina achuparia*. Figs. 1–2, holotype male: 1, dorsal view; 2, lateral view. Figs. 3–4. allotype female:.



FIGURES 5–10. *Apterodina achuparia*. Figs. 5–7, male genitalia: 5. median lobe; 6, apical sclerite; 7, apex of median lobe. Fig. 8, spermatheca. Fig. 9, hind wing. Fig. 10, metendosternite.

Discussion. Of the known species of *Apterodina*, *A. achuparia* and *A. granulifera* Bechyné have sexually dimorphic elytra with sublateral costae in the female of *A. achuparia* and posthumeral tubercles in *A. granulifera* (known only from the female). *Apterodina achuparia* differs from *A. bechynei* Flowers, *A. bucki* Bechyné, and *A. rummyahui* Flowers in having a distinct greenish sheen in both sexes (the other species are black, bronzy black, or dark brown,

Flowers 2004). The hind wings of three of the known species of *Apterodina* (*A. achuparia*, *A. bucki*, and *A. bechynei*) are vestigial but retain a well developed R vein with a field of short setae at its apex. Other veins are weakly indicated, with *A. achuparia* showing more vein traces than the other two species.

With new knowledge of the genus provided by the discovery of *A. achuparia*, *Apterodina* now appears to be related to a complex of Neotropical taxa in which a propensity to strong sexual dimorphism in the development of the female elytra is expressed. The widespread genus *Brachypnoea* Gistel is the most familiar of these taxa. As in *Brachypnoea*, some, but not all, *Apterodina* have more strongly sculptured elytra in the females. This character is most strongly expressed (when it is) laterally around the humeri, where the male siezes the female during copulation. This raises the possible explanation of differential sexual selection, as recently described in the Dytiscidae (Bergsten and Miller 2007), but observations focused on this possibility have not yet been made for the Eumolopinae.

The known species of *Apterodina* can be separated with the following keys (updated from Flowers (2004).



FIGURES 11–12. Fig. 11, “Nariz del Diablo,” Recinto Achuparias, type locality of *Apterodina achuparia*. Fig. 12. ground cover vegetation where beetles were found.

Key to known species of *Apterodina*

- 1 Color distinctly greenish bronze; female with a lateral costae on elytra behind humeri; known from Ecuador
.....*achuparia* Flowers
- 1' Color black or piceous, may be bronzy; female elytra behind humeri tuberculate or punctate, never costate 2.
- 2 Punctures arranged in striae on basal half of elytra; lateral margin of pronotum weakly undulate; female unknown; known from Ecuador
.....*ruminياهوi* Flowers
- 2' Punctures confused on basal half; lateral margin of pronotum evenly rounded..... 3.
- 3 Elytra tuberculate behind humeri in the female; pronotum and elytra coarsely punctate; known from southeast Brazil
.....*granulifera* Bechyne.
- 3' Elytra not tuberculate; pronotum more finely punctate than elytra 4
- 4 Color bronzy black; male unknown; known from southeast Brazil.....
.....*bucki* Bechyne
- 4' Color dark brown; known from Colombia
.....*bechynei* Flowers

Clave a las especies conocidas de *Apterodina*

- 1 Color distintamente verde bronceado; hembra con las quillas laterales en los élitros detrás de los humeros; conocida de Ecuador.....*achuparia* Flowers
- 1' Color negro o pardo oscuro, puede ser bronceado; élitros de las hembras tuberculados o punteados, nunca con quillas 2.
- 2 Puntos arreglados en estrías en la mitad basal de los élitros; margen lateral del pronoto debilmente ondulado; hembra desconcida; conocida de Ecuador*ruminyahui* Flowers
- 2' Puntos confundidos en la mitad basal; margen lateral del pronoto redondeado uniformemente 3.
- 3 Hembra con élitros fuertemente tuberculados detrás de los húmeros; pronoto y élitros fuertemente punteados; conocido del sureste de Bresil*granulifera* Bechyné.
- 3' Élitros no tuberculados; puntos del pronoto más finos que los de los élitros 4
- 4 Color negro bronceado; macho desconocido; conocido del sureste de Bresil..... *bucki* Bechyné
- 4' Color pardo oscuro; conocido de Colombia*bechynei* Flowers

Apterodina achuparia was found in a small patch of degraded subparamo vegetation near the summit of a ridge in the western Andes (Fig. 11). Representative plants were *Bomarea* (Alstroemeriaceae), *Barnadesia*, and other Asteraceae. The beetles were found in the lowest level of vegetation next to the ground (Fig. 12). This represents the only data on the ecology of this genus. Given the ability of *A. achuparia* to live in highly altered geographies and its cryptic habitat, it is likely that *Apterodina* is much more widespread in the mountains of South America than it's current rarity in collections and reported disjunct distribution (Flowers 2004) suggest.

Acknowledgements

I sincerely thank Juan Calles and the staff at the Estación Experimental Tropical Pichilingue (Instituto Nacional Autónomo de Investigaciones Agropecuarias) for their assistance and support during this study. This publication was made possible through support provided by the Offices of Agriculture and of Natural Resources Management, Bureau for Economic Growth, Agriculture, and Trade, U.S. Agency for International Development, under the terms of the Award No. EPP-A-00-04-00016-00, and by a grant (FLAX 02-03) from CSREES, USDA to Florida A&M University. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development.

References

- Bergsten, B. & Miller, K.B. (2007) Phylogeny of diving beetles reveals a coevolutionary arms race between the sexes. *Public Library of Science One* 6:e522. www.plosone.org (accessed 15-XI-2008)
- Flowers, R.W. (2004) New flightless Eumolpinae of the genera *Apterodina* Bechyné and *Brachypterodina* n. gen. (Coleoptera: Chrysomelidae) from the Neotropics. *Zootaxa* 549, 1–18.