

SYSTEMATICS OF THE ANDEAN GENUS *ACRORIUS* KIRSCH
(COLEOPTERA: CURCULIONIDAE)

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ABSTRACT

The South American genus *Acrorius* Kirsch is endemic to higher elevations of the central and northern Andes. It includes the type species *A. puncticollis* Kirsch and seven new species described herein: *A. sisyphus* from Colombia, *A. papallacta*, *A. andersoni*, *A. nymphalis* and *A. cuprinus* from Ecuador, and *A. pillahuata* and *A. plicatifrons* from Peru. Species of the genus are recognized by the elytra covered with small tubercles, each bearing a semi-erect seta. In addition, the body vestiture consists of seta-like scales and setae; the scrobes are shallow, directed toward, but not reaching the eyes; the prothorax is slightly transverse; the elytra are ovate; and the tibiae have a mucro and one spur. Diagnostic characters, descriptions and illustrations of the genus and new species are given, type localities are mapped, and a key to species is presented. A cladistic analysis using 26 characters of external morphology and genitalia produced three cladograms; successive weighting resulted in one cladogram. In the cladogram, there are two major monophyletic groups. One of these includes *A. puncticollis*, *A. sisyphus*, and *A. papallacta*, and the other, the remaining species, which follow the sequence *A. nymphalis*, *A. andersoni*, *A. cuprinus*, *A. pillahuata*, and *A. plicatifrons*. The relationship of *Acrorius* to the subantarctic genus *Lamiarhinus* Morrone indicates the colonization of the central and northern Andes by elements from the Austral region.

The genus *Acrorius*, established by Kirsch (1889) for a single species, *A. puncticollis* Kirsch from the northern Andes of Colombia, was listed as a synonym of *Listroderes* Schönherr by Kuschel (1986). Although numerous species have been added to *Listroderes* since its original establishment by Schönherr (1826) (see Wibmer and O'Brien 1986), the genus has not been satisfactorily delimited. Recent attempts to resolve this problem have led to resurrection of the genera *Antarctobius* Fairmaire (Morrone 1992a), *Trachodema* Blanchard (Morrone 1992b), and *Hyperoides* Marshall (Morrone 1993), and to description of the genus *Lamiarhinus* Morrone (Morrone 1992b). The resurrection of *Acrorius* is proposed herein as another step toward establishing the proper limits of *Listroderes*.

Although the types of *A. puncticollis* have been lost (Rüdiger Krause, *pers. comm.*), the diagnosis and figures given by Kirsch (1889) enabled me to recognize the generic characters of *Acrorius* and to assign seven undescribed Andean species to it. One of these new species is found in Colombia, four in Ecuador, and two in Peru.

The objectives of this study are to revalidate and redescribe the genus *Acrorius*, to describe and illustrate seven new species assigned to it, to analyze their cladistic relationships, and to discuss their geographical distribution.

MATERIAL AND METHODS

Specimens examined in this study are from the following collections (codens identify collections referred to in the text):

- CMNC Canadian Museum of Nature Insect Collection, Ottawa, Canada (R. S. Anderson).
 CNCI Canadian National Collection of Insects, Centre for Land and Biological Resources Research, Biological Research Division, Agriculture Canada, Ottawa, Canada (D. E. Bright).
 FMNH Field Museum of Natural History, Chicago, U.S.A. (A. F. Newton, Jr.).
 HAHC Private Collection of Henry F. and Anne T. Howden, Ottawa, Canada (A. T. Howden).

Measurements were made with an ocular micrometer in a stereoscopic microscope. Body length was measured dorsally, along the midline, from the elytral apex to the fore margin of prothorax. Drawings were made with a camera lucida attached to the stereoscopic microscope. Label data of type specimens are cited *verbatim*, enclosing information from each label with square brackets, each line separated by a slash.

Characters for the cladistic analysis were derived from external morphology, body vestiture, and male and female genitalia. Apomorphic character states were identified by outgroup comparison with the genus *Lamiarhinus* Morrone (Morrone 1992b). All multistate characters were treated as non-additive. Analysis was carried out with Hennig86 version 1.5 (Farris 1988), applying the implicit enumeration option, and consistency (Kluge and Farris 1969) and retention (Farris 1989) indices were calculated. I used the successive weighting procedure implemented in Hennig86, which calculates weights from the best fits of the characters on the most parsimonious cladograms using rescaled consistencies (products of the character consistency and the character retention index). These products are scaled in the range 0–10, and the weighting procedure is repeated on successively produced cladograms until they no longer change (Farris 1989). CLADOS version 1.1 (Nixon 1992) was employed for examination of character distributions.

ACRORIUS KIRSCH

Type species *A. puncticollis* Kirsch (by indication, monotypy).

Acrorius Kirsch 1889:25; Schenkling and Marshall 1931:5 (cat.); Blackwelder 1947:812 (cat.); Kuschel 1986:112 (synonym of *Listroderes* Schönherr 1826:158).

Ocromis Sharp 1890:152 (incorrect subsequent spelling); Schenkling and Marshall 1931:5 (note error).

DIAGNOSIS. This genus is separated from other Rhytirrhini by the elytra with small tubercles, each bearing a semi-erect seta.

DESCRIPTION. Medium-sized (body length 4.0–6.8 mm); integument dark brown to black; body vestiture of seta-like scales and setae. Frons usually with fovea. Eyes ovate, medium-sized, flat. Rostrum slightly curved, shorter than prothorax, with three dorsal carinae. Scrobes shallow, lateral, directed toward, but not reaching the eyes; ventral carina lacking teeth. Pterygia well-developed. Epistome generally not protruding. Mandibles robust, external face with two setae. Antennae subapically inserted; scape exceeding hind margin of eye when resting in scrobe; funicular article 1 longer than 2, articles 3–6 subglobose; club usually fusiform. Prothorax slightly transverse, sides expanded in median third; postocular lobes present, narrow. Metepisternal suture usually present. Scutellum visible. Elytra ovate, wider than prothorax, convex or flat; humeri rounded; dorsal surface with small tubercles, each bearing a semi-erect seta; anteapical and de-

clivital tubercles on intervals 2 and 5 usually present. Legs with robust femora; tibiae mucronate, with one spur; tarsomere 3 bilobed.

Male: Aedeagus (Figs. 2–11) symmetrical, sclerotized, body robust in lateral view, sides subparallel. Tegmen lacking parameres.

Female: Sternum 8 (Figs. 12–15) subpentagonal or suboval; with two sclerotized, basally bifurcated arms; apical margin with long setae; apodeme straight. Hemisternites (Figs. 16–19) short, generally with basal prominence; styli apical, with few long setae. Spermatheca (Figs. 20–22) with nodulus and ramus well-developed.

COMPARATIVE NOTES. *Acrorius* is most closely related to *Lamiarhinus* Morone than to any other known Rhytirrhini, as indicated by the shared possession of the declivital tubercle on elytral interval 5.

DISTRIBUTION. The species of *Acrorius* occur at higher elevations in the central and northern Andes. Six species are found in the Cordillera Central of the northern Andes: *A. puncticollis* and *A. sisyphus* in Colombia, and *A. papallacta*, *A. andersoni*, *A. nymphalis*, and *A. cuprinus* in Ecuador. *Acrorius pillahuata* and *A. plicatifrons* are found in the Cordillera Oriental of the central Andes of Peru (Fig. 24). *Acrorius pillahuata* and *A. plicatifrons* were collected in leaf litter; *A. nymphalis* and *A. andersoni* were found under rocks.

Key to species of *Acrorius* Kirsch

- | | | |
|----|---|------------------------|
| 1 | Prothorax with sinuate hind margin; elytra flat | 2 |
| 1' | Prothorax with straight hind margin; elytra convex | 3 |
| 2 | Frons with fovea; rostral carinae broad; antennae with subglobose funicular articles 3–6 and ovate club; prothorax with tuberculate disc; elytra with prominent humeri | <i>A. papallacta</i> |
| 2' | Frons lacking fovea; rostral carinae slender; antennae with elongate funicular articles 3–6 and fusiform club; prothorax with not tuberculate disc; elytra lacking prominent humeri | <i>A. sisyphus</i> |
| 3 | Antennae with ovate club; elytra with declivital tubercle on interval 5 blunt | <i>A. puncticollis</i> |
| 3' | Antennae with fusiform club; elytra with declivital tubercle on interval 5 conical | 4 |
| 4 | Rostral carinae slender; elytra with conspicuous striae, intervals flat, and lacking oblique, tuberculate, apical carina | <i>A. nymphalis</i> |
| 4' | Rostral carinae broad; elytra with inconspicuous striae, intervals convex, and with oblique, tuberculate, apical carina | 5 |
| 5' | Epistome not protruding; elytra with intervals flat | 6 |
| 5' | Epistome protruding; elytra with intervals convex | 7 |
| 6 | Metepisternal suture absent; elytra lacking anteapical tubercle | <i>A. pillahuata</i> |
| 6' | Metepisternal suture present; elytra with anteapical tubercle | <i>A. andersoni</i> |
| 7 | Body seta-like scales copper-colored; frons smooth; elytra lacking prominent humeri | <i>A. cuprinus</i> |
| 7' | Body seta-like scales yellowish; frons rugose; elytra with prominent humeri | <i>A. plicatifrons</i> |

Acrorius puncticollis Kirsch

Acrorius puncticollis Kirsch 1889:25; Schenkling and Marshall 1931:5 (cat.); Blackwelder 1947:812 (cat.).

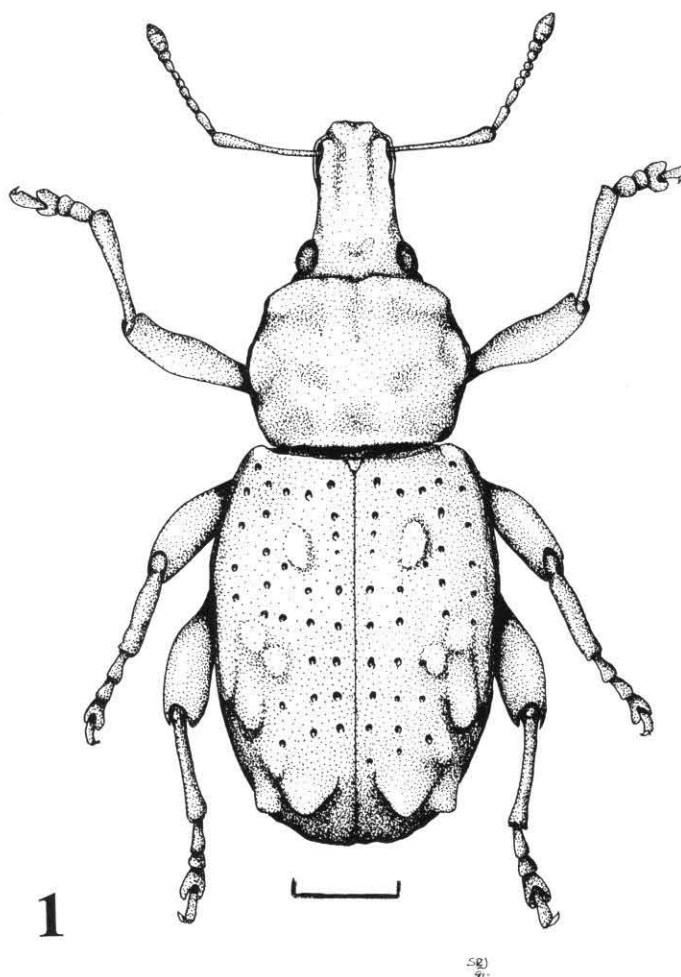
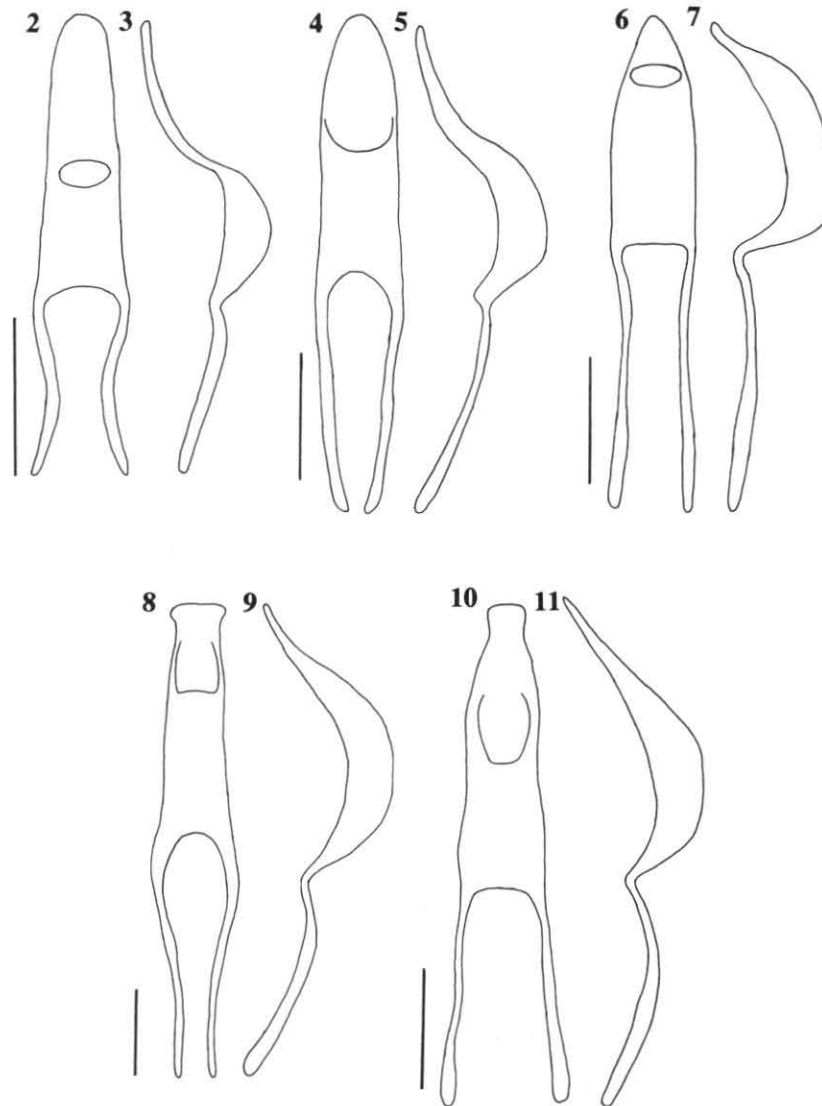


Fig. 1. *Acrorius papallacta*. Male habitus. Scale = 1 mm.

Listroderes puncticollis: Kuschel 1986:114; Wibmer and O'Brien 1986:114 (checklist).

DIAGNOSIS. This species is distinguished by the combination of seta-like scales gray, eyes ovate-broad, and declivital tubercle of interval 2 absent.

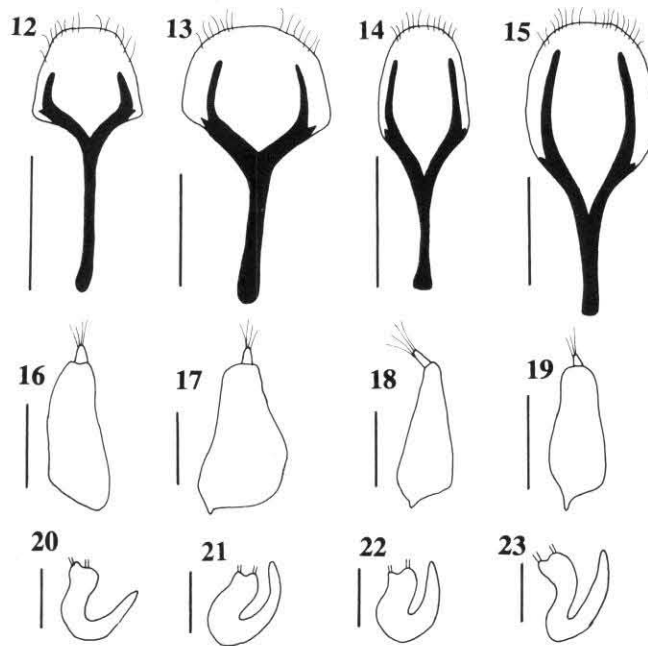
NOTE. I have not studied specimens of this species; characters for the diagnosis and cladistic analysis are based on the original description and illustrations (Kirsch 1889). The type material upon which it was described is lost (R. Krause, *pers. comm.*); the type locality is Colombia, Huila, 2,500 m.



Figs. 2-11. *Acrorius*, male genitalia. 2, 4, 6, 8, 10) aedeagus, dorsal; 3, 5, 7, 9, 11) aedeagus, lateral. 2, 3) *A. papallacta*; 4, 5) *A. sisyphus*; 6, 7) *A. pillahuata*; 8, 9) *A. andersoni*; 10, 11) *A. plicatifrons*. Scale = 1 mm.

Acrorius sisyphus Morrone, **new species**
(Figs. 4, 5, 24)

TYPE SERIES. Holotype, male: [13,000', 15 mi. E. Silvia/ Cauca, Colombia, / July 16, 1970/ H. & A. Howden] [? *Listroderes* sp./ det./ R. T. Thompson



Figs. 12–23. *Acrorius*, female genitalia. 12–15) sternum 8, ventral; 16–19) hemisternite, ventral; 20–23) spermatheca. 12, 16, 20) *A. papallacta*; 13, 17, 21) *A. nymphalis*; 15, 19, 23) *A. cuprinus*; 14, 18, 22) *A. pillahuata*. Scale = 0.5 mm.

1977] [*Acrorius/ sisyphus* Morrone/ holotype male] (HAHC). One paratype: [COLOM., 20 km E/Silvia, Cauca, VII./16.1970, 11,000/J. M. Campbell] [CANADIAN NATIONAL/COLLECTION—AGRICULTURE/CANADA, OTTAWA] [*Acrorius/sisyphus* Morrone/paratype] (CNCI).

DIAGNOSIS. This species is distinguished by the absence of a fovea on the frons.

DESCRIPTION. Holotype male. Integument dark brown; seta-like scales whitish. Frons smooth, lacking fovea. Eyes ovate-elongate. Rostrum 1.3 times as long as wide, 0.5 times as long as prothorax, dorsal carinae slender. Epistome not protruding. Antennae with article 1 of funicle 1.4 times as long as 2; articles 3–6 elongate; club fusiform. Prothorax 0.9 times as long as wide, hind margin sinuate; disc not tuberculate, with well developed rounded tubercles. Metepisternal suture present. Elytra flat, 1.5 times as long as wide; striae inconspicuous, intervals flat; humeri not prominent; disc with oblique, tuberculate carina; declivital tubercle on interval 2 conical and on interval 5, blunt. Aedeagus (Figs. 4, 5) with rounded apex, strongly curved in apical third, apodemes representing one half length of the aedeagal body. Length (prothorax + elytra) 4.8 mm.

Female: Unknown.

ETYMOLOGY. The name of this species is taken from the Greek *Sisyphos*, referring to the mythological king condemned forever to roll a huge rock up a hill in Hades only to have it roll down again on nearing the top.

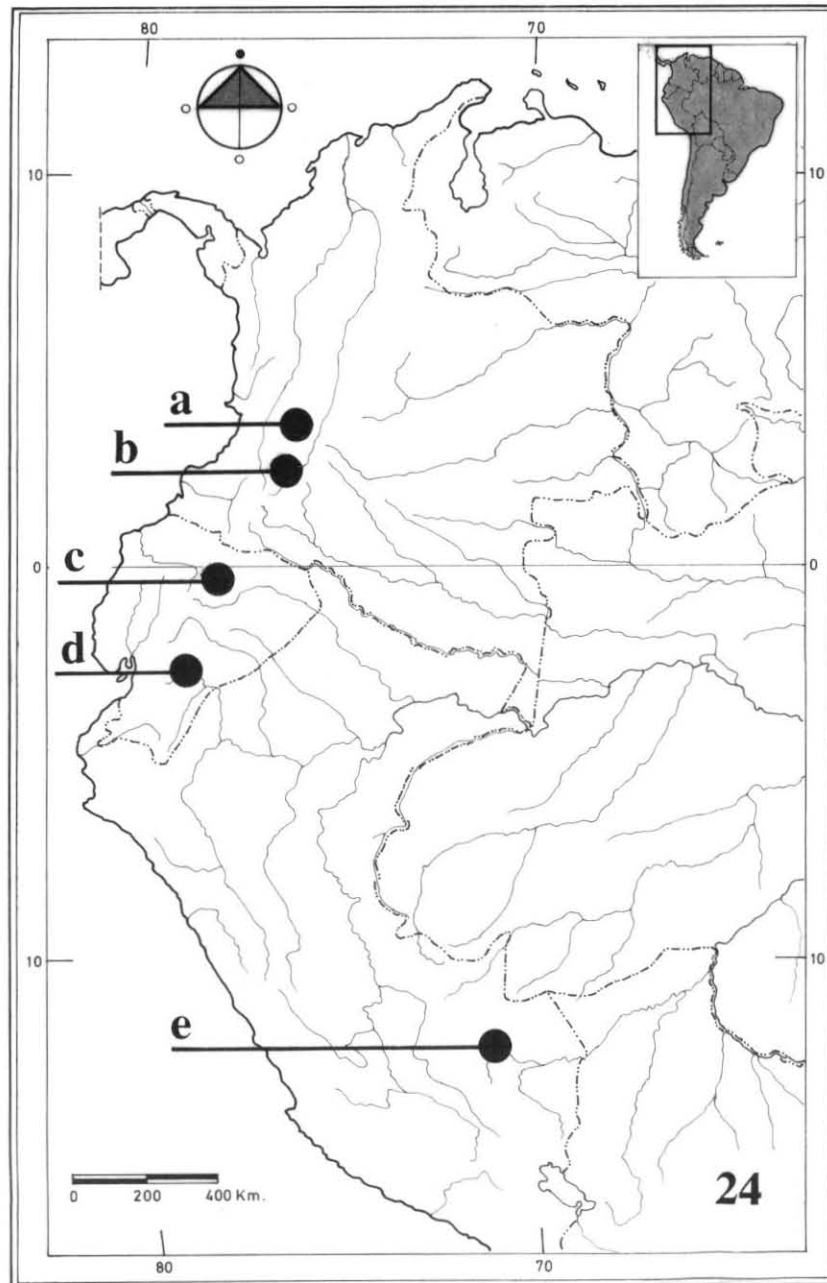


Fig. 24. Geographical distribution of the species of *Acrorius*. a) *A. puncticollis*; b) *A. sisyphus*; c) *A. papallacta*; d) *A. andersoni*, *A. nymphalis* and *A. cuprinus*; e) *A. pilahuata* and *A. plicatifrons*.

Acrorius papallacta Morrone, **new species**
(Figs. 1–3, 12, 16, 20, 24)

TYPE SERIES. Holotype, male and allotype, female: [Ecuador: Napo prov./ 4 km W. Papallacta/ 3,400 m 24.II-1979/ H. & A. Howden] [*Acrorius/ papallacta* Morrone/ holotype male (allotype female)] (HAHC). Two paratypes: [ECUADOR Napo/ Quito-Baeza Rd./ III 83 4,100 m/ L. Masner pan tr.] [H. & A. Howden/ Collection] [*Acrorius/ papallacta* Morrone/ paratype] (HAHC). One paratype: [ECUADOR, Napo/ 48 km E Quito/ 14,000 III.7.1976/ J. M. Campbell] [CANADIAN MUSEUM/ OF NATURE INSECT/ COLLECTION] [*Acrorius/ papallacta* Morrone/ paratype] (CMNC).

DIAGNOSIS. This species is distinguished by the tuberculate prothoracic disc, with poorly developed tubercles.

DESCRIPTION. Holotype male (Fig. 1). Integument dark brown; seta-like scales whitish. Frons smooth, with fovea. Eyes ovate-elongate. Rostrum 1.5 times as long as wide, 0.7 times as long as prothorax, dorsal carinae broad. Epistome not protruding. Antennae with article 1 of funicle 1.8 times as long as 2; articles 3–6 subglobose; club ovate. Prothorax 0.9 times as long as wide, hind margin sinuate; disc tuberculate, with poorly developed rounded tubercles. Metepisternal suture present. Elytra flat, 1.5 times as long as wide; striae inconspicuous, intervals flat; humeri not prominent; disc with oblique, tuberculate carina; declivital tubercle on interval 2 conical and on interval 5, blunt. Aedeagus (Figs. 2, 3) with rounded apex, strongly curved in apical third, apodemes one third length of the aedeagal body. Length (prothorax + elytra) 4.5 mm.

Allotype female: Prothorax with median carina. Sternum 8 (Fig. 12) subpentagonal. Hemisternites (Fig. 16) lacking basal prominence. Spermatheca as in Fig. 20. Length (prothorax + elytra) 5.0 mm.

ETYMOLOGY. The name of this species is taken from the type locality.

Acrorius nymphalis Morrone, **new species**
(Figs. 13, 17, 21, 24)

TYPE SERIES. Holotype, female: [ECUADOR: Azuay Prov./ 25 km NW. Cuenca at/ Lago Toreadora, 3,800 m/ 1.i.1992, Carlton & Leschen/ under rocks] [CANADIAN MUSEUM/ OF NATURE INSECT/ COLLECTION] [*Acrorius/ nymphalis* Morrone/ holotype female] (CMNC).

DIAGNOSIS. The following combination of characters is diagnostic for this species: rostral carinae slender, declivital tubercle in interval 2 conical, and hemisternites with basal prominence.

DESCRIPTION. Holotype female. Integument black; seta-like scales whitish. Frons smooth, with fovea. Eyes ovate-elongate. Rostrum 1.3 times as long as wide, 0.5 times as long as prothorax, dorsal carinae slender. Epistome not protruding. Antennae with article 1 of funicle 1.4 times as long as 2; articles 3–6 subglobose; club fusiform. Prothorax 0.8 times as long as wide, hind margin straight; disc not tuberculate, with well developed rounded tubercles. Metepisternal suture present. Elytra convex, 1.3 times as long as wide; striae conspicuous, intervals convex; humeri not prominent; disc without oblique, tuberculate carina; declivital tubercle on interval 2 blunt and on interval 5, conical. Sternum 8 (Fig. 13) subpentagonal. Hemisternites (Fig. 17) with basal prominence. Spermatheca as in Fig. 21. Length (prothorax + elytra) 4.7 mm.

Male: Unknown.

ETYMOLOGY. The name of this species is taken from the Greek *nymphē*, for a goddess of rivers, springs, trees, and mountains.

Acrorius andersoni Morrone, **new species**
(Figs. 8, 9, 24)

TYPE SERIES. Holotype, male: [ECUADOR: Azuay Prov./ 25 km NW. Cuenca, Cajas/ Rec. Area, Lago Toreadora/ 3,800 m, 1.i.1992, Carlton &/ Leschen, under rocks] [CANADIAN MUSEUM/ OF NATURE INSECT/ COLLECTION] [*Acrorius/ andersoni* Morrone/ holotype male] (CMNC).

DIAGNOSIS. This species is distinguished by the following combination of characters: eyes ovate-broad, funicular articles 3–6 elongate, and apex of aedeagus truncate.

DESCRIPTION. Holotype male. Integument black; seta-like scales whitish. Frons smooth, with fovea. Eyes ovate-elongate. Rostrum 1.8 times as long as wide, 0.6 times as long as prothorax, dorsal carinae broad. Epistome not protruding. Antennae with article 1 of funicle 1.8 times as long as 2; articles 3–6 elongate; club fusiform. Prothorax 0.9 times as long as wide, hind margin straight; disc not tuberculate, with well developed rounded tubercles. Metepisternal suture present. Elytra convex, 1.3 times as long as wide; striae inconspicuous, intervals flat; humeri not prominent; disc with oblique, tuberculate carina; declivital tubercles on intervals 2 and 5 conical. Aedeagus with truncate apex, slightly curved in apical third, apodemesone half length of the aedeagal body. Length (prothorax + elytra) 5.3 mm.

Female: Unknown.

ETYMOLOGY. I name this species in honor of Bob Anderson, in recognition for his contributions to weevils systematics and his helpful advice.

Acrorius cuprinus Morrone, **new species**
(Figs. 15, 19, 23, 24)

TYPE SERIES. Holotype, female: [ECUADOR: Azuay Prov./ 45 km NW. Cuenca, 2,700 m/ 2.i.1992, Carlton &/ Leschen] [CANADIAN MUSEUM/ OF NATURE INSECT/ COLLECTION] [*Acrorius/ cuprinus* Morrone/ holotype female] (CMNC).

DIAGNOSIS. This is the largest known species of *Acrorius*. It is distinguished by the following combination of characters: seta-like scales copper-colored, frons smooth, and elytra with anteapical tubercle present.

DESCRIPTION. Holotype female. Integument black; seta-like scales copper-colored. Frons smooth, with fovea. Eyes ovate-elongate. Rostrum 1.6 times as long as wide, 0.6 times as long as prothorax, dorsal carinae broad. Epistome protruding. Antennae with article 1 of funicle 1.7 times as long as 2; articles 3–6 elongate; club fusiform. Prothorax 0.8 times as long as wide, hind margin straight; disc not tuberculate, with well developed rounded tubercles. Metepisternal suture present. Elytra convex, 1.3 times as long as wide; striae inconspicuous, intervals flat; humeri not prominent; disc with oblique, tuberculate carina; declivital tubercle on interval 2 blunt, and on interval 5, conical. Sternum 8 (Fig. 15) suboval. Hemisternites (Fig. 19) with basal prominence. Spermatheca as in Fig. 23. Length (prothorax + elytra) 6.8 mm.

Male: Unknown.

ETYMOLOGY. The name of this species is taken from the Latin *cuprum* for copper, referring to the copper-colored seta-like scales.

Acrorius pillahuata Morrone, **new species**
(Figs. 6, 7, 14, 18, 22, 24)

TYPE SERIES. Holotype, male and allotype female: [PERU: Cuzco Dept./ Pillahuata, Manu Rd./ km 128, 24.IX.1982/ L. Watrous & G. Mazurek/ ex

vine litter] [FIELD MUSEUM OF/ NATURAL HISTORY/ CHICAGO, IL, USA] [*Acrorius/ pillahuata* Morrone/ holotype male (allotype female)] (FMNH and CMNC, respectively).

DIAGNOSIS. This species is distinguished by the absence of a metepisternal suture.

DESCRIPTION. Holotype male. Integument black; seta-like scales copper-colored. Frons smooth, with fovea. Eyes ovate-elongate. Rostrum 1.8 times as long as wide, 0.6 times as long as prothorax, dorsal carinae broad. Epistome not protruding. Antennae with article 1 of funicle 0.5 times as long as 2; articles 3–6 subglobose; club fusiform. Prothorax 0.9 times as long as wide, hind margin straight; disc not tuberculate, with well developed rounded tubercles. Metepisternal suture absent. Elytra convex, 1.5 times as long as wide; striae inconspicuous, intervals convex; humeri not prominent; disc with oblique, tuberculate carina; declivital tubercle on interval 2 absent, and on interval 5, conical. Aedeagus (Figs. 6, 7) with pointed apex, slightly curved in apical third, apodemes one half length of the aedeagal body. Length (prothorax + elytra) 4.0 mm.

Allotype female: Sternum 8 (Fig. 14) suboval. Hemisternites (Fig. 18) with basal prominence. Spermatheca as in Fig. 22. Length (prothorax + elytra) 4.3 mm.

ETYMOLOGY. The name of this species is taken from the type locality.

Acrorius plicatifrons Morrone, **new species**
(Figs. 10, 11, 24)

TYPE SERIES. Holotype, male: [PERU: CUZCO DEPT.,/ Pillahuata, Manu Rd. 128 km/ 17.IX.1982/ L. E. Watrous & G. Mazurek/ ex litt. at seepage area] [FIELD MUSEUM OF/ NATURAL HISTORY/ CHICAGO, IL, USA] [*Acrorius/ plicatifrons* Morrone/ holotype male] (FMNH).

DIAGNOSIS. This species is distinguished by the rugose frons.

DESCRIPTION. Holotype male. Integument black; seta-like scales yellowish. Frons rugose, with fovea. Eyes ovate-elongate. Rostrum 1.2 times as long as wide, 0.6 times as long as prothorax, dorsal carinae broad. Epistome protruding. Antennae with article 1 of funicle 0.5 times as long as 2; articles 3–6 elongate; club fusiform. Prothorax 0.9 times as long as wide, hind margin straight; disc not tuberculate, with well developed rounded tubercles. Metepisternal suture present. Elytra convex, 1.3 times as long as wide; striae inconspicuous, intervals flat; humeri not prominent; disc with oblique, tuberculate carina; declivital tubercle on interval 2 absent, and on interval 5, conical. Aedeagus (Figs. 10, 11) with truncate apex, slightly curved in apical third, apodemes one half length of the aedeagal body. Length (prothorax + elytra) 4.9 mm.

Female: Unknown.

ETYMOLOGY. The name of this species is taken from the Latin *plicatus* for fold and *frons*, referring to the rugose frons.

CLADISTIC ANALYSIS

Initial analysis of 26 characters (Table I) arranged in a data matrix (Table II), all having equal weights, yielded three equally parsimonious cladograms, each with 41 steps, consistency index (calculated excluding autapomorphies and synapomorphy of the group) of 0.60, and retention index of 0.50. When the successive weighting procedure was applied, one minimum-length cladogram (Fig. 25) resulted from the second round of weighting, with length 147, consistency index improved to 0.90, and retention index improved to 0.89. All clades are defined by synapomorphies as well as homoplastic changes (Table III).

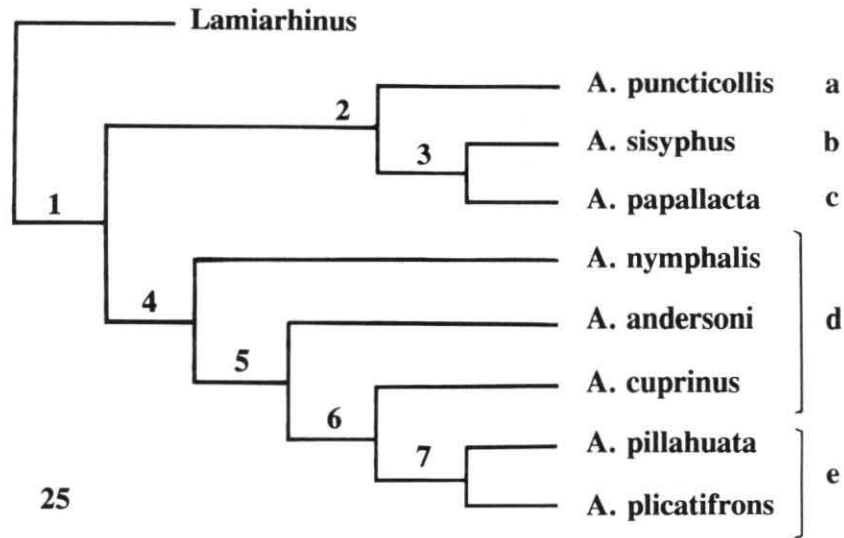


Fig. 25. Cladogram of the species of *Acrorius*. Detail of synapomorphies and homoplastic changes in Table III. Letters indicating geographical distribution as in figure 24.

DISCUSSION

Palynological studies in the northern Andes show the gradual upheaval of the Cordillera during late Pliocene and subsequent development of the high montane environment (Van der Hammen 1974). One source of taxa which colonized the northern Andes was the Austral region. Thus, it is not surprising to find that *Lamiarhinus*, closely related to *Acrorius*, is found in central Chile (Morrone 1992b). Two alternative explanations can be here supplied:

(1) Vicariance. The ancestor of both *Acrorius* and *Lamiarhinus* was widespread along Andes from Chile to Colombia, and as climate warmed populations became raised to higher elevations and were eliminated from intermediate areas.

(2) Dispersal. Some species of *Lamiarhinus* flew north and speciated originating *Acrorius*, or some species of *Acrorius* flew south and speciated originating *Lamiarhinus*.

In order to evaluate these explanations, more area-cladograms of other plant and animal taxa will be necessary. Ongoing studies on *Macrostyphlus* Kirsch and allied genera will provide an area cladogram for this purpose. Other possible weevil genera that could be studied are listed by Sturm and Rangel (1985).

Based on the cladogram (Fig. 25), *A. papallacta* from northern Ecuador is most closely related to species from Colombia, whereas the species from southern Ecuador are most closely related to those in southern Peru (Figs. 24, 25). Berry (1982) distinguished in southern Ecuador the Amotape-Huancabamba zone, which he considered as transitional between the northern and central Andes, citing as evidence *Fuchsia steyermarkii* Berry (Onagraceae), which is endemic to this zone and is related to Peruvian species. The biogeographical distribution exhibited by species of *Acrorius* apparently fits the same pattern.

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APPENDIX

Table 1. Characters and character states used in the cladistic analysis of *Acrorius*.

Plesiomorphic states	Apomorphic states
1. Frons with fovea (0);	frons lacking fovea (1).
2. Frons smooth (0);	frons rugose (1).
3. Eyes ovate-elongate (0);	eyes ovate-broad (1).
4. Rostral carinae broad (0);	rostral carinae slender (1).
5. Epistome protruding (0);	epistome not protruding (1).
6. Funicular articles 3-6 elongate (0);	funicular articles 3-6 subglobose (1).
7. Club ovate (0);	club fusiform (1).
8. Prothoracic disc not tuberculate (0);	prothoracic disc tuberculate (1).
9. Prothoracic disc lacking rounded tubercles (0);	prothoracic disc with poorly developed rounded tubercles (1); with well-developed (2).
10. Metepisternal suture present (0);	metepisternal suture absent (1).
11. Elytra convex (0);	elytra flat (1).
12. Elytral striae conspicuous (0);	elytral striae inconspicuous (1).
13. Elytral disc lacking small rounded tubercles (0);	elytral disc with small rounded tubercles (1).
14. Elytral disc lacking oblique tuberculate carina (0);	elytral disc with oblique tuberculate carina (1).
15. Anteapical tubercle present (0);	anteapical tubercle absent (1).
16. Declivital tubercle on interval 2 present (0);	declivital tubercle on interval 2 absent (1).
17. Declivital tubercle on interval 5 conical (0);	declivital tubercle on interval 5 blunt (1).
18. Apex of aedeagus pointed (0);	apex of aedeagus rounded (1); truncate (2).
19. Aedeagus slightly curved in apical third (0);	aedeagus strongly curved in apical third (1).
20. Apodemes one third as long as aedeagal body (0);	apodemes one half as long as aedeagal body (1).
21. Female sternum 8 subpentagonal (0);	female sternum 8 suboval (1).
22. Female sternum 8 setae short (0);	female sternum 8 setae long (Figs. 12-15) (1).
23. Female sternum 8 with arms not bifurcated (0);	female sternum 8 with arms basally bifurcated (Figs. 12-15) (1).
24. Hemisternites lacking basal prominence (0);	hemisternites with basal prominence (Figs. 17-19) (1).
25. Integument dark brown (0);	integument black (1).
26. Seta-like scales copper-colored (0);	seta-like scales whitish (1); yellowish (2); gray (3).

Table 2. Data matrix used in the cladistic analysis of *Acrorius*, with *Lamiarhinus* as outgroup. Refer to Table 1 for characters.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
<i>Lamiarhinus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>A. puncticollis</i>	0	0	1	1	1	1	0	0	2	?	0	0	1	0	0	1	1	?	?	?	?	?	?	?	?	0	3
<i>A. sisyphus</i>	1	0	1	1	1	0	1	0	2	0	1	1	1	1	0	0	1	1	1	?	?	?	?	?	0	1	
<i>A. papallacta</i>	0	0	0	0	1	1	0	1	1	0	1	1	1	1	0	0	1	1	1	0	0	1	1	0	0	1	
<i>A. nymphalis</i>	0	0	0	1	1	1	1	0	2	0	0	0	1	0	0	0	0	?	?	?	0	1	1	1	1	1	1
<i>A. andersoni</i>	0	0	1	0	1	0	1	0	2	0	0	1	1	1	0	0	0	2	0	1	?	?	?	?	?	1	1
<i>A. cuprinus</i>	0	0	0	0	0	0	1	0	2	0	0	1	1	1	0	0	0	?	?	?	1	1	1	1	1	1	0
<i>A. pillahuata</i>	0	0	0	0	1	1	1	0	2	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0
<i>A. plicatifrons</i>	0	1	0	0	0	0	1	0	2	0	0	1	1	1	1	1	0	2	0	1	?	?	?	?	?	1	2

Table 3. Synapomorphies of *Acrorius*. Clade numbers refer to the cladogram of Fig. 23; asterisks indicate homoplastic changes.

clade 1	4.1, 5.1, 6.1, 9.2, 13.1, 18.1, 20.1, 22.1, 23.1, 26.1
clade 2	*3.1, 17.1
<i>A. puncticollis</i>	*16.1, 26.3
clade 3	11.1, *12.1, *14.1, 19.1
<i>A. sisyphus</i>	1.1, *6.0, *7.1
<i>A. papallacta</i>	*3.0, *4.0, 8.1, 9.1, *20.0
clade 4	*7.1, 24.1, 25.1
<i>A. nymphalis</i>	—
clade 5	*4.0, *6.0, *12.1, *14.1, 18.2
<i>A. andersoni</i>	*3.1
clade 6	21.1, *26.0
<i>A. cuprinus</i>	*5.0
clade 7	15.1, *16.1
<i>A. pillahuata</i>	*6.1, 10.1, *18.0
<i>A. plicatifrons</i>	2.1, *5.0, 26.2