

A review of larval *Pyropinae*
(*Insecta: Coleoptera: Curculionidae*)

JAMES PAKALUK

Systematic Entomology Laboratory, USDA, National Museum of Natural History, Smithsonian
Institution NHB 168, Washington, DC 20560, U.S.A.

Abstract. The larvae of the two genera of the curculionid subfamily *Pyropinae* are described for the first time. Both genera presently placed in the subfamily, *Craspedotus* SCHOENHERR and *Pyropus* SCHOENHERR, are described and illustrated. An unidentified species of *Craspedotus* from Brazil was collected in the seed pods of a tentatively identified labiate plant (*Lamiaceae*). *Pyropus cyaneus* (HERBST) from Cuba was collected from the leaves and stems of species of *Brassica*.

Key words: Entomology, taxonomy, morphology, larvae, *Curculionidae*, *Pyropinae*, New World.

INTRODUCTION

The *Pyropinae* are a small neotropical SUBFAMILY of *Curculionidae* with two genera and eight species described (O'BRIEN and WIBMER 1982, 1984; WIBMER and O'BRIEN 1986, 1989). *Craspedotus* SCHOENHERR contains five species and is endemic to South America, while *Pyropus* SCHOENHERR contains three species and is endemic to the West Indies. Although this subfamily has been recognized as distinct since first described by LACORDAIRE (1866), the immature stages have remained undescribed. This paper addresses this deficiency by describing larvae representing an unidentified species of *Craspedotus* from Brazil and *Pyropus cyaneus* (HERBST) from Cuba.

There are few published host plant associations for pyropines, and these are all for adults. *Craspedotus psychotria* (BONDAR) was reported from the flowers of *Psychotria* sp. (*Rubiaceae*) (BONDAR 1946). He (BONDAR 1948) also recorded *Craspedotus trapia* Bondar from the flowers of "trapia" (*Euphorbiaceae*). The only other known host associations are those reported here: *Craspedotus* sp. from the seed pods of a putative labiate plant (*Lamiaceae*) and *Pyropus cyaneus* from species of

Brassica. One of these records was reported as a species of *Ceutorhynchus* by BRUNNER et. al. (1945) (W. H. ANDERSON, unpublished data).

When LACORDAIRE (1866) first established the subfamily *Pyropinae*, he suggested that it had an affinity with *Baridinae*. This idea was also suggested by BONDAR (1948). Pyropines lack a diagnostic feature of baridine adults, the ascending mesepimeron. Moreover, pyropines have distinctly margined lateral edges of the pronotum, a character that is almost certainly derived within *Curculionidae*. These traits conflict with the supposed ground plan for baridines. Larval characters are also incongruent with such an hypothesis. A number of larval pyropine features are shared only with primitive baridines, e. g., *Nertinini*. These characters include a lack of the epicranial endocarinae and sensilla not in groups of three on the epipharynx. Thus it is probable that similarities to *Baridinae* are based upon plesiomorphic features. It is premature to speculate further about the relationship of *Pyropinae* to other *Curculionidae* until additional taxa are studied and more character data are gathered. This paper is a contribution toward this goal.

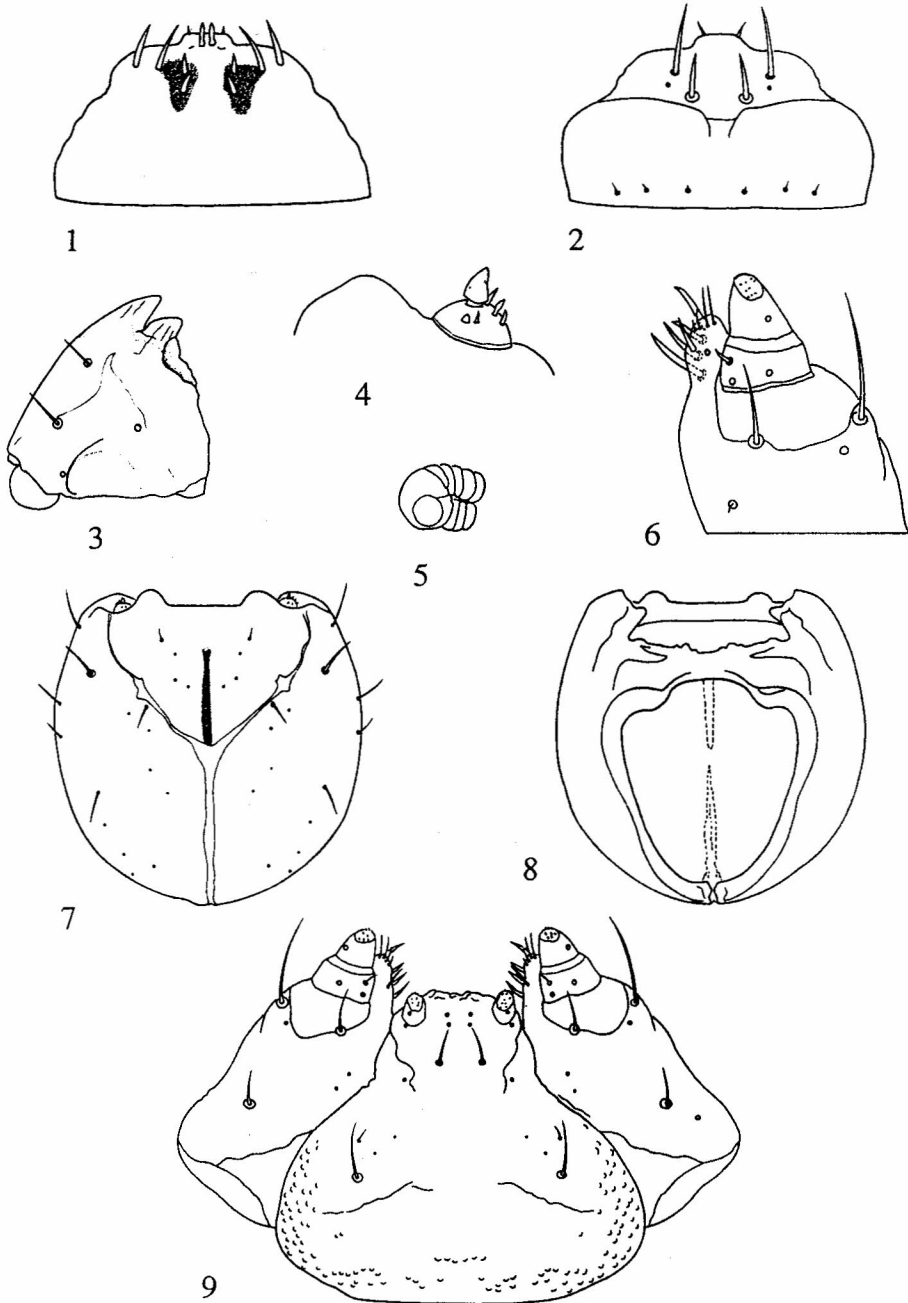
The methods for examining larval specimens and preparing illustrations are those used in previous work on larval *Curculionidae* (PAKALUK 1993, 1994; PAKALUK and CARLOW 1994a, 1994b). These methods are briefly restated. The terms for structures and chaetotaxy follows ANDERSON (1947), although modifications introduced by MAY (1967) are used. The range for body length was measured from presumed last instar larvae. All illustrations and most of the descriptions were prepared from slide-mounted larvae using a Leitz Diaplan compound microscope with Nomarski differential-interference contrast illumination.

Description of larva of *Craspedotus* sp.

(Figs. 1-9)

Length 2.5 mm. Body moderately slender, subcylindrical, gently curved, with asperities distinct, evenly spaced, not in rows. Head light orange. Pronotum without pigmented sclerites.

Head (Figs. 7, 8) free, length and width subequal. Anterior stemma present; posterior stemma absent. Antenna (Fig. 4) with sensorium conical apically, with distinct stalk basally, with 4 conical rods and 1 dome-shaped sensillum, longest conical rod about 0.5x as long as sensorium. Epicranial suture distinct; frontal arms converge at about a 100 degree angle; coronal suture elongate, about 0.5x as long as cranium. Endocarina distinct, about 0.3x width of cranium. Frontal setae 1-3 absent, seta 4 short, seta 5 minute, about 0.5x as long as 4. Dorsal epicranial setae 1 and 4 absent, seta 2 slightly longer than 3, seta 5 longest, about 1.5x longer than 3. Lateral epicranial seta 1 about 0.65x as long as 2; a short prelateral seta present at middle. Ventral epicranial seta 1 minute, seta 2 absent. Clypeus (Fig. 2) about 3.5x wider than long, widest at apical third, emarginate medially, clypeal setae 1 and 2 minute,



1-9. *Craspedotus* sp.: 1 - epipharynx, 2 - labrum and clypeus, 3 - mandible, 4 - antenna, 5 - sixth abdominal spiracle, 6, apex of mala, ventral, 7 - cranium, dorsal, 8 - cranium, ventral, 9 - ventral mouthparts

seta 1 shorter than 2, with a pair of minute, subbasal, median setae. Labrum (Fig. 2) about 3x wider than long, widest at base, with anterior edge produced medially, labral seta 2 longest, about 1.5x longer than seta 1, with a pair of lateral sensilla, median sensilla absent. Labral rods short, stout, broadest apically. Epipharynx (Fig. 1) with 2 pairs of anterolateral setae, each subequal in length, 2 pairs of anteromedian setae, medial pair subapical, long, stout, lateral pair apical, minute, 2 pairs of median spines, each subequal in length, and 4 pairs of minute pores. Mandible (Fig. 3) with 2 apical teeth, seta 1 longer than 2. Maxilla (Figs 6, 9) with palp 2-segmented, basal segment with 1 seta, 2 pores, apical segment with 1 pore; mala with 4 dorsal setae, 5 ventral setae. Labium (Fig. 9) with palp 1-segmented, with 1 pore; prementum with sclerite lacking median process, with 1 pair of setae, 3 pairs of pores, 1 pair adjacent to base of palp, 2 pairs between palps, distance between pores subequal; postmentum with 2 pairs of setae, seta 1 long, seta 2 minute, distances between setae subequal.

Pronotum with 11 setae, 3 moderately long, subequal in length, 8 minute. Spiracle bicameral, with air tube subequal in length to diameter of peritreme. Prodorsum of meso- and metathorax without setae; postdorsum of each segment with 4 setae, setae 1 and 2 minute, 3 and 4 moderately long, subequal in length. Alar area with 1 minute seta. Spiracular area of mesothorax with 1 minute seta. Pedal area with 5 setae, 2 setae moderately long, subequal in length, 3 setae minute. Sternal setae minute, subequal in length to abdominal eusternal setae.

Abdomen with 8 pairs of bicameral spiracles laterally, with air tubes oriented posteriorly, subequal in length to diameter of peritreme. Dorsal fold 1 weakly developed laterally. Prodorsum of segment VIII with 1 seta. Postdorsum of segments I-VI with 5 setae, VII with 3 setae, VIII and IX with 2 setae, when 5 setae are present setae 1, 2, and 4 minute, setae 3 and 5 longest. Spiracular area with 2 setae, minute. Epipleurum with 2 setae, 1 seta much longer than other. Pleurum with 2 setae, 1 seta minute, other much longer. Pedal area with setae short. Eusternal area with setae minute, shorter than pedal setae. Sternellum distinct. Anus terminal, with 4 lobes.

MATERIAL EXAMINED

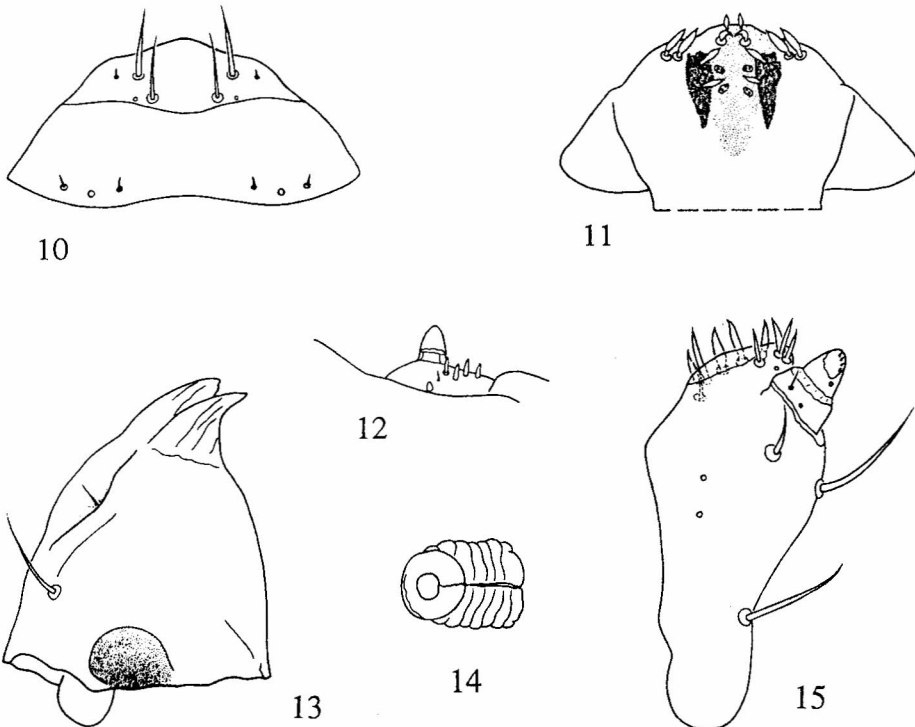
Three specimens with the following collecting data: Brazil, Itaquaquecetuba, in seed pods of ?Labiate plant, sent 26 February 1943, shipment #82, H. L. PARKER #801.1, Lot #43-5781. These larvae were taken from the same lot containing a large series of associated adults. It is not apparent from the labels whether some of these adults were reared. The details of the description are based upon a single slide-mounted specimen. All specimens are in the alcohol and slide collections of larval Coleoptera in the National Museum of Natural History, Washington.

Description of larva of *Pyropus cyaneus* (HERBST)

(Figs. 10-18)

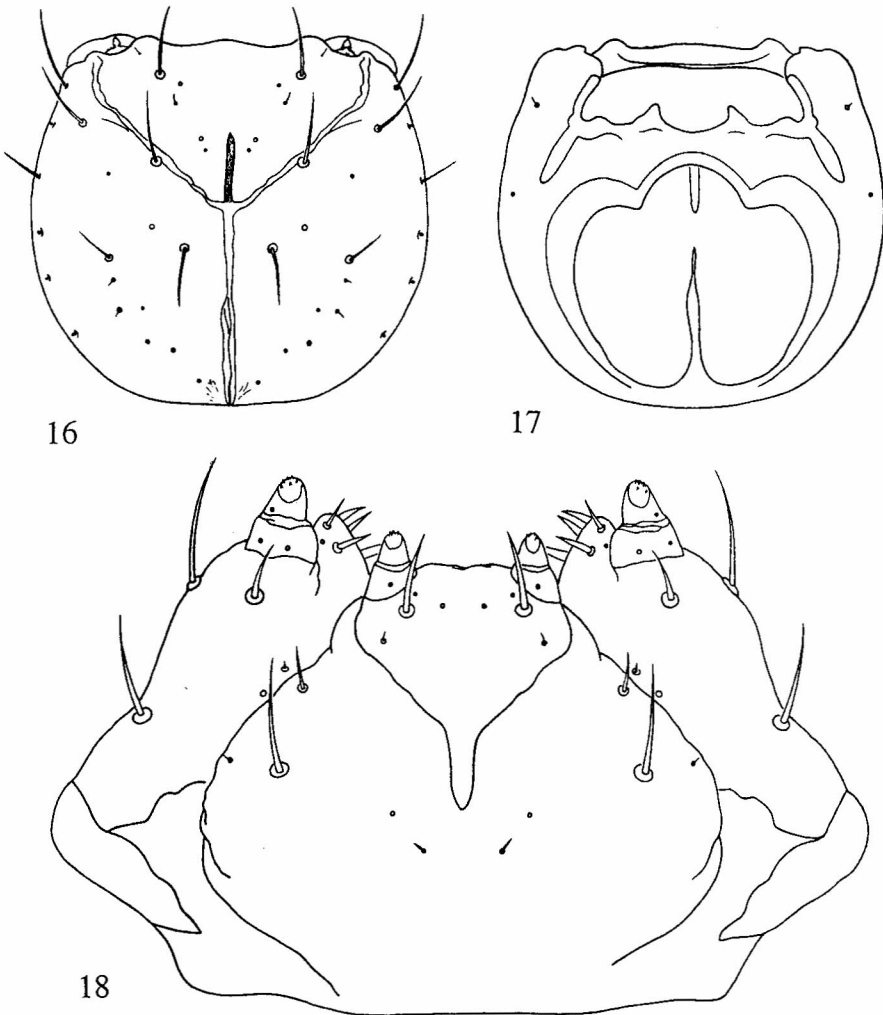
Length 2.6-3.1 mm. Body moderately slender, subcylindrical, gently curved, with asperities minute, barely visible, irregularly spaced, some in short, transverse rows. Head orange. Pronotum with lightly pigmented sclerites.

Head (Figs 16, 17) free, length slightly shorter than width. Anterior stemma present; posterior stemma absent. Antenna (Fig. 12) with sensorium conical apically, with distinct stalk basally, with 4 conical rods, 1 short seta, and 1 dome-shaped sensillum, longest conical rod about 0.5x as long as sensorium. Epicranial suture distinct; frontal arms converge at about 100 degree angle; coronal suture elongate, slightly more than 0.5x as long as cranium. Endocarina distinct, about 0.15x width of cranium. Frontal setae 1, 2 absent, setae 3, 5 minute, seta 4 longest, about 8x longer than 5. Dorsal epicranial seta 4 absent, seta 1 slightly longer than 2, setae 3 and 5 longest, subequal in length. Lateral epicranial seta 1 about 0.5x as long as seta 2.



10-15. *Pyropus cyaneus*: 10 - labrum and clypeus, 11 - epipharynx, 12 - antenna, 13 - mandible, 14 - sixth abdominal spiracle, 15 - maxilla, ventral

Ventral epicranial seta 1 minute, seta 2 absent. Clypeus (Fig. 10) about 4.5x wider than long, widest at base, emarginate medially, clypeal setae 1 and 2 minute, subequal in length, with a pair of sensilla. Labrum (Fig. 10) about 3x wider than long, widest at base, with anterior edge produced medially, labral setae 1, 2 long, subequal in length, seta 3 minute, with a pair of lateral sensilla, median sensilla absent. Labral rods short, stout, broadest apically, subparallel. Epipharynx (Fig. 11) with 2 pairs of anterolateral setae, each subequal in length, 3 pairs of anteromedian setae, 2 medial pairs longest, subequal in length, 2 pairs of median spines, anterior pair slightly longer, more widely separated than posterior pair, and 4 clusters of pores, each cluster with 2 pores. Mandible (Fig. 13) with 2 apical teeth, seta 1 longer



16-18. *Pyropus cyaneus*: 16 - cranium, dorsal, 17 - cranium, ventral, 18 - ventral mouthparts

than 2. Maxilla (Figs 15, 18) with palp 2-segmented, basal segment with 1 seta, 2 pores, apical segment with 1 pore; mala with 6 dorsal setae, 4 ventral setae. Labium (Fig. 18) with palp 1-segmented, with 1 pore; prementum with sclerite weakly tridentate, apical median process short, truncate, with 3 pairs of setae, middle pair much longer than others, 3 pairs of pores, 1 pair adjacent to base of palp; postmentum with 3 pairs of setae, seta 1 minute, about 0.5x as long as seta 3, seta 2 longest, about 3x longer than seta 3.

Pronotum with 11 setae, 3 moderately long, subequal in length, 8 minute. Spiracle bicameral, with air tube subequal in length to diameter of peritreme. Prodorsum of meso- and metathorax without setae; postdorsum of each segment with 4 setae, setae 1 and 2 short, 3 and 4 moderately long, subequal in length. Alar area with 1 minute seta. Spiracular area of mesothorax with 1 minute seta. Pedal area with 5 setae, 2 setae moderately long, subequal in length, 3 setae short to minute. Sternal setae minute, subequal in length to or shorter than abdominal eusternal setae.

Abdomen with 8 pairs of bicameral spiracles laterally, with air tubes oriented posteriorly, subequal in length to diameter of peritreme on segments I-VII, longer on VIII. Dorsal fold 1 weakly developed laterally. Prodorsum of segment VIII without setae. Postdorsum of segments I-VI with 5 setae, VII with 3 setae, VIII and IX with 2 setae, when 5 setae are present setae 1, 2, and 4 minute, setae 3 and 5 longest. Spiracular area with 2 setae, minute. Epipleurum with 2 setae, 1 seta much longer than other. Pleurum with 2 setae, 1 seta minute, other much longer. Pedal area with setae moderately long. Eusternal area with setae short, much shorter than pedal setae. Sternellum distinct. Anus terminal, with 6 lobes.

Material examined. The numbers in parentheses refer to the total number of specimens followed by the number that were slide-mounted. Twenty-four specimens with the following collecting data: Cuba: 2.III.37, in *Brassica chinensis* petiole, NY 68958 (1,1); 3.III.37, in *Brassica chinensis* petiole, NY 68957 (1,1); 23.I.39, white chard stem, #39-1114 (1,1); 14.II.39, *Brassica chinensis* stem (white chard), at NY, #39-2-011 (3,2); 18.IV.39, mustard greens stem, at NY, #39-5666 (1,1); 26.V.39, in white chard stems, at NY, #39-8341 (1,0); 11.VI.40, white greens leaf petiole, NY#86322, #40-12163 (1,1); 12.III.41, white greens stem, NY#88839, #41-3772 (1,1); 6.V.1941, mustard greens, NY#89190, #41-7063 (5,1); 21.V.41, mustard greens stem, NY#89892, #41-8907 (3,0); 27.V.41, white greens, NY#89809 & 89828, #41-9574 & 41-9576 (5,0); 27.V.41, white greens leaf, NY#89808, #41-9573 (1,1). All of the specimens were taken by port inspectors. The identification is based upon two collections with associated adults. All specimens are in the larval *Coleoptera* collection of the National Museum of Natural History, Washington.

ACKNOWLEDGMENTS

I thank Tami A. CARLOW, Robert D. GORDON, Joseph V. MCHUGH, and F. Christian THOMPSON for reviewing an earlier draft of this paper. Edward BRODIE composed the plates and Lisa ROBERTS made the line drawings; their assistance is gratefully acknowledged.

REFERENCES

- ANDERSON, W. H. 1947. A terminology for the anatomical characters useful in the taxonomy of weevil larvae. *Proceedings of the Entomological Society of Washington* **49**: 123-132.
- BONDAR, G. 1946. Notas entomológicas da Baía. XVII. *Revista de Entomologia*. **17**(1-2): 78-113.
- BONDAR, G. 1948. Notas entomológicas da Baía. XX. *Revista de Entomologia*. **19**(1-2): 1-54.
- BRUNNER, S. C., L. C. SCARAMUZZA & A. R. OTERO. 1945. *Catálogo de los Insectos que Atacan a las Plantas Económicas de Cuba*. Ministerio de Agricultura, La Habana. 246 pp.
- LACORDAIRE, T. 1866. *Genera des Coléoptères*. Part 7. Roret, Paris. 620 pp.
- MAY, B. M. 1967. Immature stages of *Curculionidae* 1. Some genera in the tribe *Araucariini* (*Cossoninae*). *New Zealand Journal of Science* **10**(3): 644-660.
- O'BRIEN, C. W. & G. J. WIBMER. 1982. Annotated checklist of the weevils (*Curculionidae* sensu lato) of North America, Central America, and the West Indies (*Coleoptera: Curculionoidea*). *Memoirs American Entomological Institute*, Number 34. 382 pp.
- O'BRIEN, C. W. & G. J. WIBMER. 1984. Annotated checklist of the weevils (*Curculionidae* sensu lato) of North America, Central America, and the West Indies - Supplement 1. *Southwestern Entomologist* **9**(3): 286-307.
- PAKALUK, J. 1993. Review of the immature stages of *Baridinae* I: *Nertinini* (*Coleoptera: Curculionidae*). *Elytron* **7**: 165-170.
- PAKALUK, J. 1994. Review of the immature stages of *Baridinae* II: *Madarini* (*Coleoptera: Curculionidae*). *Annales Zoologici* **45**: 1-14.
- PAKALUK, J. & T. A. CARLOW. 1994a. Revision of the genus *Eisonyx* LeConte (*Coleoptera: Curculionidae: Baridinae*). *Coleopterists Bulletin* **48**(2): 153-169.
- PAKALUK, J. & T. A. CARLOW. 1994b. Description of the larva of an unidentified species of *Ceratopus* - Schoenherr, with comments on plant associations in *Ceratopodinae* (*Coleoptera: Curculionidae*). *Journal of the New York Entomological Society* **102**(3): 350-354.
- WIBMER, G. J. & C. W. O'BRIEN. 1986. Annotated checklist of the weevils (*Curculionidae* sensu lato) of South America (*Coleoptera: Curculionoidea*). *Memoirs American Entomological Institute*, Number 39. 563 pp.
- WIBMER, G. J. & C. W. O'BRIEN. 1989. Additions and corrections to annotated checklists of the weevils of North America, Central America, and the West Indies, and of South America. *Southwestern Entomologist*, Supplement 13. 49 pp.