

SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

A New Species of *Acanthoscelides* Schilsky (Coleoptera: Bruchidae) from Mexico with Some Biological NotesJESÚS ROMERO NÁPOLES¹, JOHN M KINGSOLVER²¹ Colegio de Posgraduados, Campus Montecillo, km 36.5 Carretera México-Texcoco Montecillo Edo. de México, C. postal 56230, México; jnapoles@colpos.mx; ² Florida State Collection of Arthropods, Florida Department of Agriculture & Consumer Services, Gainesville, Florida; Bruchid@aol.com

Edited by Roberto A Zucchi – ESALQ/USP

Neotropical Entomology 38(4):497-500 (2009)Nueva Especie de *Acanthoscelides* Schilsky Mexicana (Coleoptera: Bruchidae) con Algunas Notas Biologicas

RESUMEN - Se describe e ilustra una nueva especie de *Acanthoscelides* colectada en Chiapas, México. Se cita a *Rhynchosia precatória* como una nueva planta hospedera para *A. dani* sp.n y *A. flavescens* (Fahraeus). Al braconido *Heterospilus prosopidis* Viereck se le encontró parasitando a ambas especies de brúquidos.

PALABRAS CLAVE: Gorgojo de la semilla, taxonomía, región Neotropical, morfología, Acanthoscelidini

ABSTRACT - A new species of *Acanthoscelides* collected in Chiapas, Mexico is described and figured. *Rhynchosia precatória* is cited as a new host plant record for *A. dani* sp.n and *A. flavescens* Fahraeus. The braconid *Heterospilus prosopidis* Viereck was found as parasitoid of both species of bruchids.

KEY WORDS: Seed beetle, taxonomy, Neotropical region, morphology, Acanthoscelidini

Acanthoscelides Schilsky is the largest genus of Bruchidae of the New World containing about 340 species, however there are more than 200 species remaining to be described (Johnson 1990). A checklist published in 2004 states that in Mexico there are 119 species of *Acanthoscelides*, representing 35% of the species recorded for this endemic genus of the New World (Romero & Johnson 2004a).

According to Johnson (1990) *Acanthoscelides* is characterized by following combination of characters: antenna short to long, sexually dimorphic or not; pronotum conical, campaniform; elytra about twice as long as broad, striae moderately to deeply impressed; hind femur usually expanded medially to about width of or wider than width of hind coxa, armed with large subapical acuminate spine followed by none to four smaller spines, mucro 0.05-1.0 times as long as tarsomere 1; abdomen usually with sterna unmodified, pygidium ranging from evenly rounded to strongly convex, apical margin of last sternum slightly to strongly emarginate to receive apex of pygidium, apical margin of last sternum of female usually without emargination; male genitalia usually without dorsal hood at apex, armature of internal sac ranging from only a lining of spicules to large spines; lateral lobes cleft for a part of their length.

However Johnson (1990) recognized that the genus often is used as a genus into which species are placed that do not fit

within the limits of other genera. In order to partly solve this problem Johnson and Romero (2006) created a new genus, *Neobruchidius*, transferring to it seven *Acanthoscelides* with metafemur armed with one large subapical acuminate spine, with no additional smaller spines. So the character quoted by Johnson (1990) to describe *Acanthoscelides* "metafemur armed with large subapical acuminate spine followed by none to four smaller spines" should be changed to "metafemur armed with large subapical acuminate spine followed by two to four smaller spines".

The last species of *Acanthoscelides* described from Mexico was in 1990 by Johnson in his work "Systematics of the Seed Beetle genus *Acanthoscelides* (Bruchidae) of Northern South America". After 17 years a new species of this genus from Mexico is here described including a new host plant record.

Material and Methods

Methods adopted in this paper to prepare genitalia were those of Kingsolver (1970) and Kingsolver and Whitehead (1974); for interpretation of genitalia of Romero and Johnson (1999), and for terminology and taxonomic characters of Johnson (1983, 1990).

Results

Acanthoscelides dani Romero and Kingsolver, new species (Figs 1a,b; 2a,b)

Male. Measurements. Length (pronotum-elytra) 2.38 mm; width 1.70 mm; maximum thoracic depth 1.35 mm.

Integument color. Body dark except, base of vertex, antennal segments 1 to 4 and 11 red orange; legs red orange to dark brown.

Vestiture. Pronotum, elytra, and pygidium with variegated pubescence of white, pale and black tufts of hairs, rest of the body with mixed white and pale pubescence; base of metepisternum, and lateral areas of ventral segments 2 to 5 with a white spot (Figs 1a,b).

Structure. Head short and broad, densely micropunctulate; frons with median carina; distance between eyes about 0.60 as wide as eye width; eye cleft 0.63 its length by ocular sinus; posterior margin of eye protruding from adjacent surfaces; postocular lobe rounded; distance from base of antennae to apex of labrum about half as long as distance from upper limits of eyes to apex of labrum; antennal segment one filiform, 2, 3 moniliform to filiform, 4 subserrate, 5 to 10 serrate, 11th subacute apically; antenna extending to humerus or slightly beyond. Disk prothorax campanulate; punctulate with many scattered coarse punctures; cervical sulcus moderately deep, extending from near coxal cavity to about 0.75 distance to pronotal midline; lateral prothoracic carina extending from base to 0.35 distance to coxal cavity; without short median impressed line on median basal lobe; prosternum separating procoxae for about 0.7 their length. Scutellum black, moderate in size, bifurcate at posterior margin, clothed with moderately dense white and pale hairs to give quadrate appearance; elytron about twice as long as broad; striae deep, punctate, strial intervals punctulate; distance between striae at base subequal; humerus punctulate, glabrous, shiny black; undersurfaces and all of hind coxa punctulate, metepisternum coarsely foveolate; hind femur constricted basally and apically, expanded medially to about width of coxa, ventral surface with carina subserrate on

inner margin; femur armed with subapical acuminate spine about 1.18 times as long as width of tibial base and two acuminate spines about 0.4 as long as first spine; hind tibia with dorsomesal, lateral, lateroventral, and ventral glabrous longitudinal carinae; dorsal surface of tibia without fossa; tibial corona with four spinules, mucro 0.28 as long as first tarsomere; without sinus at base of spine; first tarsomere with ventral and lateral glabrous longitudinal carina, usually lacking mesal carinae. First visible abdominal sternum slightly flattened medially, posterior margin straight, longer than remaining sterna; sterna 2 to 4 similar in size; fifth emarginate; pygidium punctate with scattered foveolae, convex in lateral view.

Genitalia. Median lobe moderate in length; in ventral view, ventral valve rounded, lateral margins lightly convex; armature of internal sac with apical line of spines, a mesal couple of angulate spines, below of these a pair of spinescent sclerites with scattered spinules, three pairs of spines with different shape, and sometimes a unpaired small spine, and a basal sclerite clothed with spines (Fig 2a). Lateral lobes elongate expanded at apex, cleft to about 0.28 their length (Fig 2b).

Female. Similar to male. Length (pronotum-elytra) 2.48 mm; width 1.77 mm; maximum thoracic depth 1.43 mm.

Type series. Holotype male, allotype and one paratype: MEXICO, *Chiapas*, km 40 carr. fed. Estacion La Chontalpa - Romulo Calzada, 17°23'03.7" N; 93°32'48.4" W, 21/IV/2007, J Romero Nápoles collector; in *Rhynchosia precatoria* seeds, JRN # 446/2007. Holotype deposited at National Museum of Natural History (USNM), Washington, allotype at Florida State Collection of Arthropods (FSCA), Gainesville and paratype at Colección Entomologica del Instituto de Fitosanidad (CEAM), Mexico.

Distribution. Mexico (*Chiapas*).

Host Plant. *Rhynchosia precatoria* (Humb. & Bonpl. Ex Willd.) DC. (Fig 3).

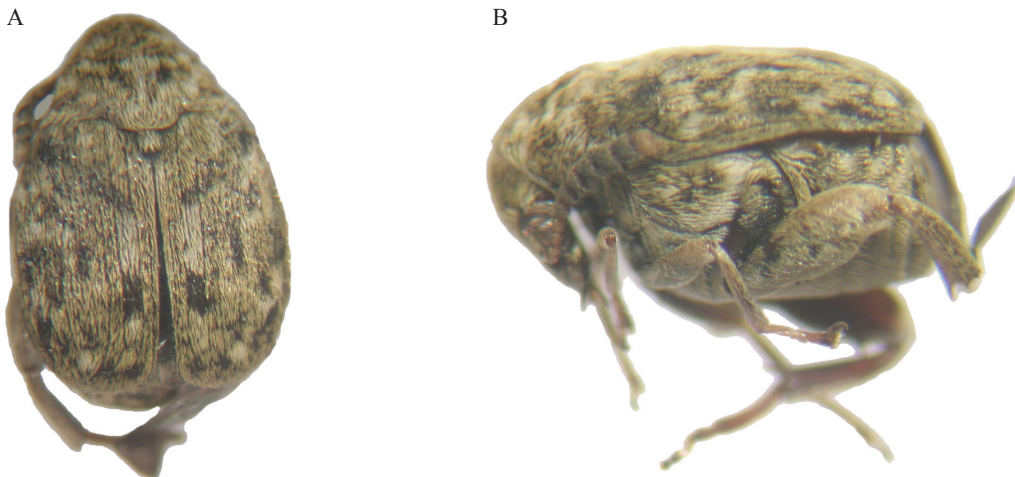


Fig 1 *Acanthoscelides dani* n.sp.; a) dorsal view, b) lateral view.

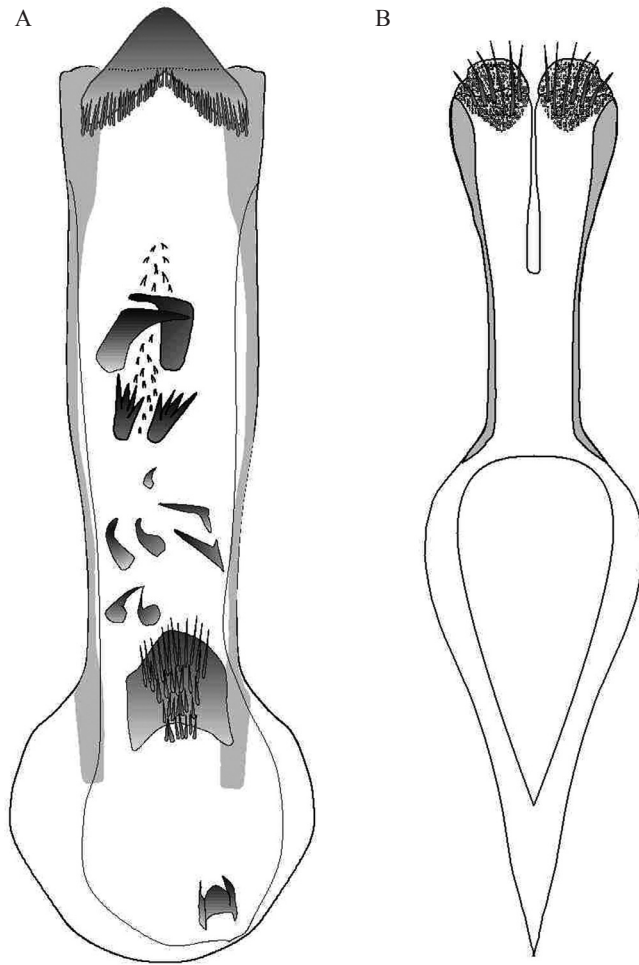


Fig 2 *Acanthoscelides dani* n.sp. male genitalia; a) median lobe, b) tegmen.

Etymology. The specific epithet refers to the second name of Clarence Dan Johnson, one of the most brilliant bruquidologists, who spent all his life working with taxonomy of the family and determining the relationships with host plants.

Remarks. *Acanthoscelides dani* n.sp. belongs to group *flavescens* of *Acanthoscelides* (Johnson 1983, 1990, Johnson & Romero 2006) which include 13 species (*alboscuteclatus*, *baboquivari*, *burkei*, *campeche*, *compressicornis*, *distinguendus*, *flavescens*, *hectori*, *isla*, *manleyi*, *soijae*, *zeteki*). All of them share the mucro 0.25 to 0.4 as long as the first hind tarsomere, rounded or almost rounded apex of the ventral valve of the male genitalia, and elytral pubescence variegated. The nearest species to *A. dani* n.sp. is *A. hectori* Kingsolver, 1980 where the external morphology is very similar, however the sclerites in the internal sac of male genitalia are very different considering the shape and number of sclerites in the internal sac.

Of those *Acanthoscelides* whose hosts are known, all feed in papilionid legumes (except for the North American species *A. alboscuteclatus* (Horn), 1873, which feeds on Onagraceae, and *A. compressicornis* (Schaeffer), 1907, which feeds in mimosoid and caesalpinoid legumes).

Final Considerations

Rhynchosia is a large and diverse genus of Malvaceae plants, consisting of nearly 200 species; there are 52 species in the New World (Grear 1978).

It is distributed in warm temperate and tropical regions of both eastern and western hemisphere. *R. precatoria* is recorded from Mexico to Colombia. Its seeds are used as a traditional medicine to cure some aches; some people also use the seeds to make necklaces and bracelets.

In the Old World there are four species of bruchids of two



Fig 3 *Rhynchosia precatoria*.

genera that feed on *Rhynchosia* seeds, *Specularius bridwelli* Arora (*Rhynchosia minima* (L.) DC.), *Specularius ruber* (Pic) (*Rhynchosia albae-pauli* Berhaut), *Specularius erythraeus* (Pic) (*Rhynchosia densiflora* (Roth) DC., *Rhynchosia buettneri* (Harms), and *Borowiecius varicolor* (Boheman) (*Rhynchosia* sp.) (Udayagiri & Wadhi 1989, Anton 1999). In the New World the following genera have *Rhynchosia* seeds as hosts: *Acanthoscelides* (15 species on 16 host plants), *Caryedes* Hummel (3:1), *Meibomeus* Bridwell (1:1), and *Zabrotes* Horn (1:1) (Romero & Johnson 2004b); so in 19 species of *Rhynchosia* there are a total of 24 species in six genera of Bruchid recorded.

Biological notes. From a sample of 158 dehiscent pods with 220 seeds 210 were healthy and 10 were damaged by bruchids. Of those with damage, five bruchids emerged from five seeds (one specimen per seed), two specimens of *Acanthoscelides flavescens* (Fahraeus) and three of the new species *A. dani*. **n.sp.** From the other five seeds emerged parasitoids. We did not see any glued egg on seeds or pods, just as bruchids commonly do, so we assumed that bruchids oviposit like *A. obtectus* (Say) just scattering eggs on pods and seeds, then larvae walk until they find a seed.

A. flavescens is a polyphagous bruchid, feeding on three species of *Rhynchosia* (*R. longeracemosa*, *R. minima*, *R. phaseoloides*, however "it may feed on other 10 more genera of Malvaceae, Polygonaceae and Leguminosae (*Abutilon*, *Acacia*, *Aeschynomene*, *Coccoloba*, *Crotalaria*, *Eriosema*, *Galactia*, *Tephrosia*, *Vicia*, *Vigna*) (Johnson 1989, Romero & Johnson 2004b). *Rhynchosia precatória* constitutes a new host record for *A. flavescens*. From the five seeds of *R. precatória* emerged five *Heterospilus prosopidis* Viereck (Braconidae) (one specimen per seed). This braconid was recorded as a parasite of *A. flavescens* in *Rhynchosia minima* (Hetz & Johnson 1988). Probably *H. prosopidis* may feed on any of either species of bruchids *A. flavescens* or *A. dani* **n.sp.**, because the two later are infesting seeds of *R. precatória*.

Acknowledgments

The first author thanks Margaret Johnson the friendship and will of all materials and literature that C D Johnson used in his bruchid work, including a magnificent synoptic bruchid collection.

References

- Anton K W (1999) Notes on *Borowiecius* Anton, with the description of a new species (Coleoptera: Bruchidae: Bruchinae). Genus 10: 65-72.
- Grear J W (1978) A revision of the New World species of *Rhynchosia* (Leguminosae: Faboideae). Mem N Y Bot Gard 31: 1-168.
- Hetz M, Johnson C D (1988) Hymenopterous parasites of some bruchid beetles of North and Central America. J Stored Prod Res 24: 131-143.
- Johnson C D (1983) Ecosystematics of *Acanthoscelides* (Coleoptera: Bruchidae) of Southern Mexico and Central America. Misc Publ Entomol Soc Am 56: 1-248.
- Johnson C D (1989) Adaptive radiation of *Acanthoscelides* in seeds: examples of legume-bruchid interactions. In Stirton C H, Zarucchi J L (eds) Advances in legume biology. Monogr Syst Bot 29: 747-779.
- Johnson C D (1990) Systematics of the seed beetle genus *Acanthoscelides* (Bruchidae) of Northern South America. Trans Am Entomol Soc 116: 297-618.
- Johnson C D, Romero Nápoles J (2006) *Neobruchidius lovie*. New genus and new species from Latin America (Coleoptera: Chrysomelidae: Bruchinae). Zootaxa 1123: 57-68.
- Kingsolver J M (1970) A study of male genitalia in Bruchidae (Coleoptera). Proc Entomol Soc Wash 72: 370-386.
- Kingsolver J M, Whitehead D R (1974) Classification and comparative biology of the seed beetle genus *Caryedes* Hummel (Coleoptera: Bruchidae). Trans Am Entomol Soc 100: 341-436.
- Romero N J, Johnson C D (1999) *Zabrotes sylvestris*, a new species from the United States and Mexico related to *Z. subfasciatus* (Boheman) (Coleoptera: Bruchidae: Amblycerinae). Coleopt Bull 53: 87-98.
- Romero N J, Johnson C D (2004a) Checklist of the Bruchidae (Coleoptera) of Mexico. Coleopt Bull 58: 613-635.
- Romero N J, Johnson C D (2004b) Date base Brucol. Programa de Entomología, Instituto de Fitosanidad, Colegio de Postgraduados, Mexico.
- Udayagiri S, Wadhi S R (1989) Catalog of Bruchidae. Mem Am Entomol Inst 45: 1-301.

Received 18/III/08. Accepted 06/III/09.