

A NEW *ACANTHOSCELIDES* FROM *INDIGOFERA*
(COLEOPTERA: BRUCHIDAE)

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ABSTRACT

A new species of Bruchidae, *Acanthoscelides kingsolveri*, is described. It feeds in the seeds of *Indigofera suffruticosa* and *I. sphaerocarpa* and has a distribution from Texas and Arizona to Costa Rica. Characters to separate it from the very similar *Acanthoscelides submuticus* are given.

Few reports of bruchids feeding in the seeds of the legume genus *Indigofera* have been recorded in the literature. I have only been able to find references to 5 species of *Indigofera* which are attacked by 6 species of Bruchidae (Gyllenhal, 1839; Skaife, 1926; Bridwell, 1918; Zacher, 1952; Prevett, 1967, 1971). The few records of bruchids feeding in the seeds of *Indigofera* are surprising because this plant genus has been reported to contain from 750 to 800 species (Heywood, 1971).

In recent years a new species of *Acanthoscelides* has been reared on a number of occasions from the seeds of *Indigofera* from Texas, Arizona, Mexico, and Central America. This species is described at this time to make the name available for use in biological studies currently in progress. To my knowledge this is the first report of a bruchid feeding in the seeds of *Indigofera* from the New World.

Acanthoscelides kingsolveri Johnson, **NEW SPECIES**
(Fig. 1, 2, 3, 4, 5)

Length, pronotum—elytra: 1.5 to 2.4 mm; maximum width: 1.0 to 1.5 mm; maximum thoracic depth: 0.8 to 1.2 mm.

MALE: Integument color: Head varying from all black to black with red-orange postocular spot to red-orange with frons and vertex black, labrum red-orange to black; usually antennal segments 1 to 4 or 5 red-orange, remainder brown to black, sometimes all segments red-orange; prothorax usually red-orange varies to all black, sometimes red-orange with median black stripe; elytron varying from all black to all red-orange, usually black with broad median red-orange stripe; legs usually red-orange, sometimes procoxa and lateral margin of hind leg brown, sometimes base of hind femur black; undersurfaces, abdomen, and pygidium usually black but varying thru light brown to red-orange.

Vestiture: Body with white, golden, brown or intermixed recumbent hairs; eye with medial fringe of sparse, white hairs; postocular lobe with short, white hairs; small postocular patch of white hairs; pronotum with narrow median stripe of white hairs on dorsum flanked by contrasting stripes of yellow to brown hairs (Fig. 1); remainder of prothorax with sparse to dense, yellow to white hairs; sometimes with admedial basal patches of dense white hairs;

sometimes vestiture of pronotum uniform white or intermixed white and golden without a definite pattern; elytron sometimes with uniform white or intermixed white and golden pubescence, usually with a pair of brown patches basally, medially, and apically in a characteristic pattern (Fig. 1); sometimes patches faint or a variable number absent, occasionally patches confluent, forming dark bands across elytron; undersurfaces with uniform sparse to dense white hairs; first abdominal sternum usually with basal median circular white pubescent spot; pygidium with uniform sparse to dense white hairs, occasionally basal patches of dense white hairs and/or white median line.

STRUCTURE: Head: Usually short and broad, sometimes elongate; densely punctulate; frons usually with median glabrous line or carina extending from frontoclypeal suture to vertex; usually with vague transverse sulcus between upper limits of eyes; frons width about equal to width of eye; ocular sinus .66 to .75 as long as width of eye; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments of variable shape but usually 1 and 3 filiform, 2 and 4 moniliform, 4 usually shorter than adjacent segments, 5 to 10 eccentric, 11th subacute apically; 5 and 11 about as long as broad, 6 to 10 slightly broader than long; antenna usually reaching to or almost to humerus.

Prothorax: Disk campanulate (Fig. 1); punctulate with many scattered punctations; short median impressed line on median basal lobe; prosternum separating coxae for about 0.8 their length.

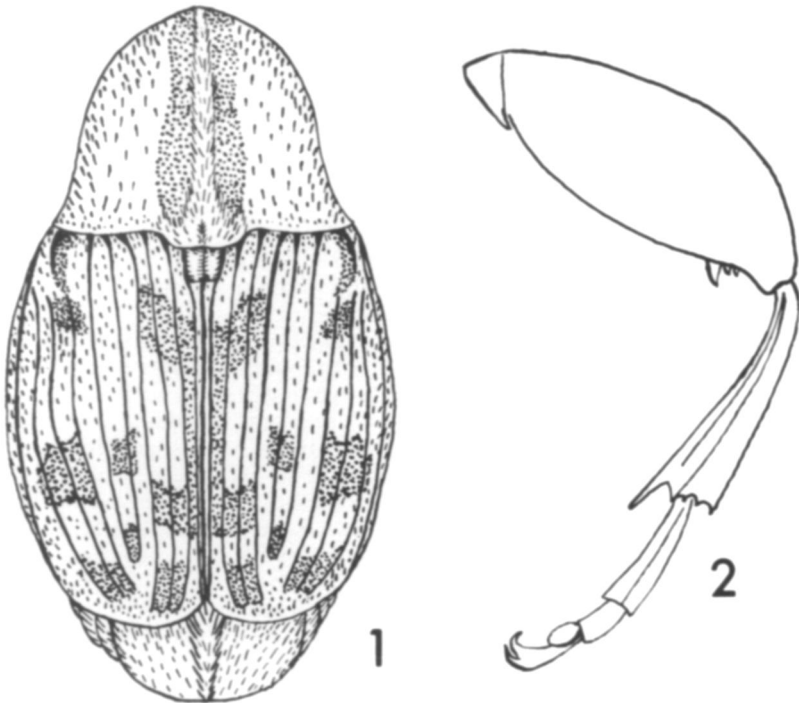


Fig. 1-2: *Acanthoscelides kingsolveri*: 1) dorsal aspect; 2) hind leg.

Meso- and Metathorax: Scutellum small, quadrate, with lateral posterior teeth, clothed with dense recumbent white hairs usually giving quadrate appearance; elytron about twice as long as broad, dorsal surface in an even, gentle convex curve between humerus and medial margin; striae deep, punctate, strial intervals punctulate; striae usually subequal, sometimes striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae; humerus punctulate, shiny, glabrous; undersurfaces punctate, punctations becoming more coarse laterally; hind coxa without depression near medial margin, ventral surface in a gentle convex curve from medial margin to lateral margin; hind femur constricted basally and apically, expanded medially to slightly more than width of coxa (Fig. 2); usually faint longitudinal carina on inner ventral surface, sometimes scattered spinules on inner carina; femur armed with a subapical acuminate spine about as long as or slightly longer than width of tibial base and 2 acuminate spines .33 to 0.5 as long as first spine; tibia (Fig. 2) with ventral, lateral, dorso-mesal, and latero-ventral glabrous longitudinal carinae; tibial corona with 3 or 4 spinules, mucro about .33 as long as 1st tarsomere; slight sinus at base of mucro (Fig. 2); 1st tarsomere with ventral, lateral and mesal glabrous longitudinal carinae.

Abdomen: 1st sternum flattened medially, slightly longer than remaining sterna, posterior margin straight; sterna 2 to 4 unmodified, 5th emarginate; pygidium punctate, convex in lateral view.

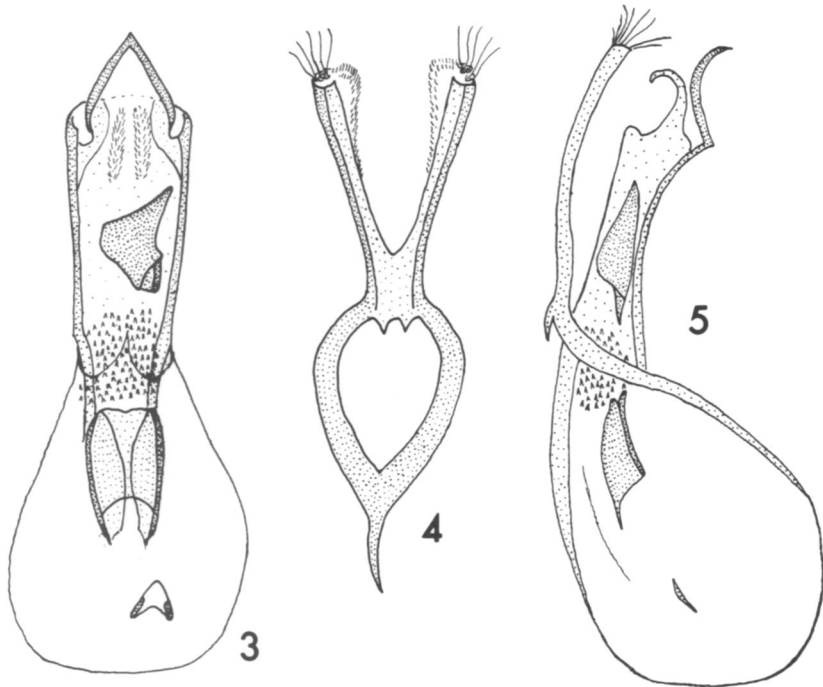


Fig. 3-5: *Acanthoscelides kingsolveri*, male genitalia: 3) median lobe, ventral view; 4) lateral lobes, ventral view; 5) median lobe and lateral lobes, lateral view.

Genitalia: (Fig. 3, 4, 5): Median lobe moderate in length; in ventral view ventral valve pointed apically, lateral margins slightly convex, base almost as broad as apex of median lobe, arcuate in lateral view; 2 faint, paired, setose structures that may be hinge sclerites near apex of median lobe (Fig. 3); armature of internal sac consisting of a large triangular spine about .33 from base, a large, broad, paired structure about .33 from apex and a gonopore sclerite that is usually triangular in shape at apex. Lateral lobes expanded apically, cleft to about 0.8 their length (Fig. 4).

Female: Similar to male but antennae usually shorter, hardly reaching humerus; vestiture of 1st abdominal sternum uniform, without basal median circular white pubescent spot, about as long as remaining sterna; apical margin of last abdominal sternum not emarginate.

Host Plants: *Indigofera* sp.: COSTA RICA: Prov. of Guanacaste, Playas del Coco, 15-XII-70, emerged by 4-III-71, D. H. Janzen. Prov. of Puntarenas, Boca de Barranca, Puntarenas, 10-III-71, D. H. Janzen.

Indigocera (sic): TEXAS: Sutton County, Sonora, 12-IV-38 (collector unknown).

Amorpha (?): MEXICO: State of Nayarit, San Blas, 3-II-64, P.M. Estes.

Indigofera sphaerocarpa Gray: ARIZONA: Cochise County, ca. 5600 ft., Miller Cyn., Huachuca Mts., 6-X-72, C.D. Johnson.

Indigofera suffruticosa Mill.: MEXICO: State of Veracruz, 30 mi. NW Veracruz, 13-VI-68, emerged from 19-VII-68 to 16-X-68, C. D. Johnson; State of Nayarit, 3100 ft., 14 mi. NW Ixtlan del Rio, 11-VII-68, emerged 16-VIII-68, C. D. Johnson; State of Sinaloa, 29 mi. NW Mazatlan, 12-VII-68, emerged from 15-VII-68 to 5-II-69, C. D. Johnson; 34 mi. NW Mazatlan, 12-VII-68, emerged from 15-VII-68 to 9-XII-68, C. D. Johnson. State of Sonora, Alamos, 14-VII-68, emerged from 30-VII-68 to 14-III-69, C. D. Johnson; 6 mi. NW Alamos, 14-VII-68, emerged from 15-VII-68 to 26-III-69, C. D. Johnson; 11 mi. N Guaymas, 15-VII-68, emerged from 19-VII-68 to 26-III-69, C. D. Johnson.

Holotype male, allotype female, and numerous paratypes: MEXICO: State of Sinaloa, 29 mi. NW Mazatlan, 12-VII-68, reared seeds *Indigofera suffruticosa*, #290-68, C. D. Johnson. [USNM #71400]. Other paratypes: ARIZONA: Cochise County, ca. 5600 ft., Miller Cyn., Huachuca Mts., 6-X-72, C. D. Johnson. TEXAS: Sutton County, Sonora, 12-IV-38 (collector unknown); Uvalde County, Nueces Riv., 5 mi. W of Uvalde, 10-VII-41, B. E. White; Uvalde, 11-VII-41, W. F. Barr. MEXICO: State of Veracruz, 30 mi. NW Veracruz, 13-VI-68, C. D. Johnson; State of Nayarit, 3100 ft., 14 mi. NW Ixtlan del Rio, 11-VII-68, C. D. Johnson; State of Sinaloa, 34 mi. NW Mazatlan, 12-VII-68, C. D. Johnson; State of Sonora, Alamos, 14-VII-68, C. D. Johnson; 6 mi. NW Alamos, 14-VII-68, C. D. Johnson; 11 mi. N Guaymas, 15-VII-68, C. D. Johnson. COSTA RICA: Prov. of Guanacaste, Playas del Coco, 15-XII-70, D. H. Janzen; Prov. of Puntarenas: Boca de Barranca, Puntarenas, 10-III-71, D. H. Janzen. Other specimens (not paratypes): MEXICO: State of Veracruz, 27 mi. NW Veracruz, 26-XII-63, L. & C. W. O'Brien; State of Chiapas, 17 mi. W Tuxtla Gutierrez, 24-IV-59, 3000 ft., H. E. Evans; State of Nayarit, San Blas (Fort), 18-XII-63, C. W. & L. O'Brien; San Blas, 3-II-64, P. M. Estes; 4 mi. E San Blas, 27-VIII-65, C. D. Johnson; State of Sinaloa, 5 mi. NE Copala, 25-VIII-65, C. D. Johnson.

Holotype, allotype and numerous paratypes deposited in the U. S. National Museum of Natural History. Paratypes retained in the collection of the author and also deposited in the following collections: California Academy of

Sciences, San Francisco; Canadian National Collection of Insects, Ottawa; Field Museum of Natural History, Chicago; Entomology Department, Texas A & M University, College Station; Los Angeles County Museum of Natural History; and the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

Discussion. As would be expected with a species that has a distribution from the United States to Central America, there is considerable morphological variation in color and size. The most common ground color of the integument is reddish-orange. The few specimens collected in Arizona and in Veracruz state, Mexico, were almost all black. Whether most specimens from these areas are mostly black or whether this color difference is due to sampling error is not known.

The specimens from Costa Rica and Texas are larger in size and tend to have pubescence of a more uniform color on the elytra than specimens from other parts of the range of the species. The larger size is probably due to larger seeds of the host plants in which the insects developed.

Specimens of *kingsolveri* have been reported to breed only in the seeds of *Indigofera* and *Amorpha*. The report of *Amorpha* as a host plant could be in error and should be verified.

It is most similar in its external structure and in its male genitalia to *Acanthoscelides submuticus* (Sharp) (see Johnson, 1970: 87-89 for description, synonymy, host plants and distribution). Their similar structures and habits of feeding in the seeds of the somewhat similar plants in the Papilionoideae probably indicate that they have a monophyletic origin.

A. submuticus and *A. kingsolveri* differ in several ways, however. Externally, elytral striae 3 and 4 of *submuticus* are usually closer at their bases than they are to adjacent striae while those of *kingsolveri* are usually subequal (Fig. 1). In *submuticus* the subapical hind femoral spine is slightly shorter than the width of the tibial base and there are usually 3, sometimes 2, smaller spines near the large spine, while in *kingsolveri* the subapical spine is as long as or longer than the width of the tibial base and there are only 2 smaller spines associated with it (Fig. 2). *Acanthoscelides submuticus* usually lacks lateral and latero-ventral carinae on the hind tibia and always lacks lateral and mesal carinae on the first hind tarsomere while *kingsolveri* has strong carinae on both these structures (Fig. 2).

The male genitalia are similar in general structure but the ventral valve of *submuticus* is smaller and less pointed than *kingsolveri*. *A. submuticus* has an internal sac in which the only armature is a large pubescent structure while *kingsolveri* (Fig. 3, 4, 5) has a large, paired structure and a large triangular spine in its internal sac. The lateral lobes of *submuticus* are cleft to .625 their length while those of *kingsolveri* are cleft to about 0.8 their length. A pair of faint, setose structures are located near the apex of the median lobe of *kingsolveri* (Fig. 3). These are everted when the internal sac everts and may be hinge sclerites, structures not found in *submuticus* and most other *Acanthoscelides*.

This species is named for Dr. John M. Kingsolver, a leader in research on the systematics of the Bruchidae.

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