

## SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

### A New Species of *Alucita* L. (Lepidoptera: Alucitidae) from Northern Chile

HA VARGAS

Depto de Recursos Ambientales, Facultad de Ciencias Agronómicas, Univ de Tarapacá, Arica, Chile

#### Keywords

*Alucita proseni*, hostplant, Neotropical, taxonomy

#### Correspondence

HÉCTOR A VARGAS, Depto. de Recursos Ambientales, Facultad de Ciencias Agronómicas, Univ de Tarapacá, Casilla 6-D, Arica, Chile; [havargas@uta.cl](mailto:havargas@uta.cl)

#### Abstract

Male and female adults of a new species of *Alucita* L. (Lepidoptera: Alucitidae) are described and illustrated from the Azapa Valley, northern Chile. Immature stages are associated with fruit of "chuve", *Tecoma fulva* (Cav.) D. Don. (Bignoniaceae). This is the first species of Alucitidae described from Chile.

Edited by Marcelo Duarte – MZ/USP

Received 08 October 2009 and accepted 21 June 2010

#### Introduction

Alucitidae is a worldwide family with more than 180 described species (Gielis 2003, Landry & Landry 2004, Byun 2006, Byun & Park 2007). A conspicuous apomorphy of this family is the multiple and deep division of the fore and hindwings, which is little pronounced only in a few taxa (Dugdale *et al* 1998). Larvae of Alucitidae may be gall-makers, or borers in flowers, buds, fruits or shoots; hostplants are found in at least eight families of dicotyledoneous plants, including Caprifoliaceae, Bignoniaceae and Rubiaceae (Dugdale *et al* 1998), and Gesneriaceae (Carlson & Harms 2007).

*Alucita* L. is the more diverse and widespread genus in Alucitidae (Dugdale *et al* 1998, Gielis 2003). It comprises three nearctic (Landry & Landry 2004) and 19 neotropical species (Gielis 2003).

The alucitids were unknown in Chilean territory until some adults of an undescribed species of *Alucita* be reared from larvae in fruits of *Tecoma fulva fulva* (Cav.) D. Don (Bignoniaceae) in the Azapa valley, Arica Province, northern Chile. Male and female adults of this new species are described and illustrated in this paper.

#### Material and Methods

Specimens were mostly reared from fruits of *T. fulva fulva* in the Azapa valley, between July 2003 and November 2006. Three additional adults (one male and two females) were collected at light in August 2009 in the same locality. Type material is deposited in Museo Nacional de Historia Natural de Santiago – MNNC, Santiago, Chile.

#### *Alucita danunciae* Vargas sp. nov. (Figs 1-8)

##### Type material

Holotype male, CHILE, Arica: Azapa, Arica, Chile/ Noviembre 2006/ H.A. Vargas coll.// criado de larva en/ fruto *Tecoma fulva*/ Octubre 2006 (MNNC). Paratypes: three males, three females same data as holotype (MNNC); four males, three females Azapa, Arica, Chile/ June 2004/ H.A. Vargas coll.// reared from larva on fruit of *Tecoma fulva*/ May 2004; two males, three females, Azapa, Arica, Chile/ July 2003/ H.A. Vargas coll.// reared from larva on fruit of *Tecoma fulva*/ June 2003; one male, two females



Fig 1 *Alucita danunciae*, male adult in dorsal view.

Azapa, Arica, Chile/ August 2009/ H.A. Vargas coll.

**Diagnosis**

Adults are micromoths with six plumes or lobes on the fore and hindwings which are covered by dark brown, grayish brown and whitish scales; male genitalia with laterally compressed cucullus and short spinules scattered on lateral surface of the sacculus; female genitalia characterized by the absence of signa on the corpus bursae.

**Male (Fig 1)**

**Head.** Compound eyes conspicuous; ocelli small, beyond dorsal margin of the compound eyes, posterior to antennae; vertex covered by plain, long and forward

whitish brown scales; frontoclypeus scaling identical to vertex, except for the presence of grayish brown scales along ventral margin; occiput with elongated grayish brown scales. Antenna filiform; scape elongated with grayish brown scales on dorsal surface and whitish brown scales on ventral surface; pedicel short, coloured as scape; flagellum ciliated ventrally, with grayish brown scales dorsally. Haustellum without scales. Labial palpus with first palpomere covered by grayish brown scales laterally and whitish scales ventrally; second palpomere straight, porrect, long, about two times the diameter of the compound eye, covered by whitish scales medially and at base of the ventral surface, laterally covered by grayish brown scales; third palpomere upturned, pointed, about half the length of the second palpomere, with three transverse stripes of grayish brown scales: at base, at middle and at apex, separated by transverse stripes of whitish scales. **Prothorax.** Patagium covered by plain grayish brown scales, coxa mostly grayish brown, with some whitish brown scales at apex; femur and tibia grayish brown; tarsomere I-IV mostly grayish brown, whitish brown at apex, tarsomere V whitish brown. **Mesothorax.** Tegula covered by plain grayish brown scales; femur, tibia and tarsus whitish brown with some grayish brown scales; one pair of spurs at apex of the tibia. **Metathorax.** Whitish brown, legs as on mesothorax, but tibia with two pairs of spurs. Forewing with costa dark brown basally, until near the first cleft, interrupted by four thin whitish stripes, other five dark brown spots equidistant, delimited by thin lines of whitish scales and separated by broad pale brown spots; plume II basally

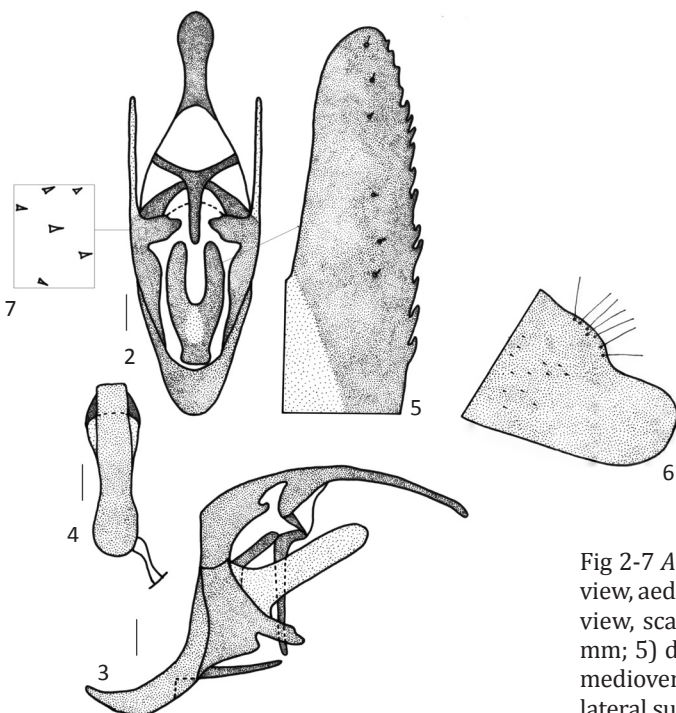


Fig 2-7 *Alucita danunciae*, male genitalia. 2) Male genitalia in ventral view, aedeagus removed, scale bar: 0.1 mm; 3) male genitalia in lateral view, scale bar: 0.1 mm; 4) aedeagus in dorsal view, scale bar: 0.1 mm; 5) detail of the lateral arm with serrate margin; 6) detail of the medioventral projection of the sacculus; 7) detail of the spinules on the lateral surface of the sacculus.

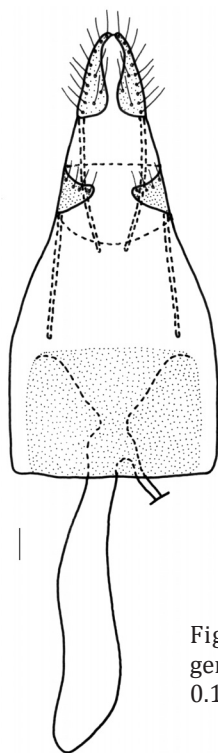


Fig 8 *Alucita danunciae*, female genitalia in lateral view, escale bar: 0.1 mm.

joined with costa, dark brown along this section, distally with four broad spots, two pale brown and two dark brown intercalated, distal dark brown spot with some whitish and black scales scattered; plumes III and IV joined along the basal one-third, maculation as plume II; plume V basally joined with plumes III and IV, maculation as plume II, but with the distal dark brown spot more broad; plume VI with maculation similar to plume V. Hindwing with six plumes, all with whitish, pale brown and dark brown scales mixed. Abdomen pale brown with dark brown transverse stripes along the distal margin of each segment; tergum VIII with an U- inverted form, sternum VIII with lateral plates of scent scales.

#### Male genitalia (Fig 2-7)

Uncus triangular at base, posterior projection conspicuous, elongated, slightly concave laterally, broadened distally, convex apex; gnathos Y-shaped, median arm straight, thinner at apex, lateral arms shorter than median arm; tegumen broad, lateral margins distally excavated; saccus U-shaped, anteriorly projected medially; transtilla broadened laterally, medially joined to gnathos; juxta bifurcated, a simple plate basally, with two long and wide arms, lateral margin of each arm serrated. Valva with cucullus slightly sclerotized, elongated, laterally compressed, round apically; sacculus well sclerotized, triangle-like in lateral view, lateral surface covered by short scattered spinules, ventral margin strongly excavated, medioventrally projected, this projection has

a slight excavation distally, few and short setae just before this excavation. Aedeagus round at base, truncated at apex, slightly concave laterally, with a broad lateroventral expansion arising around the mid length of the aedeagus, two spine-like projections arising laterally near the apex, apex of the projections directed toward the base of the aedeagus.

#### Female genitalia (Fig 8)

Anterior and posterior apophyses thin and elongated; antrum membranous, broadened basally; ductus bursae short and membranous; corpus bursae membranous and elongated; signum absent; ductus seminalis arising laterally from the base of the corpus bursae.

#### Etymology

*Alucita danunciae* is nominated in honour of Dr. Danúncia Urban, Departamento de Zoologia, Universidade Federal do Paraná, by her outstanding work on Neotropical Hymenoptera.

#### Distribution

*Alucita danunciae* is currently known only from the type locality, Azapa valley, Arica Province, northern Chile.

#### Hostplant

Immature stages of *A. danunciae* are associated with the shrub *Tecoma fulva fulva* (Cav.) D. Don (Bignoniaceae). Larvae are seed-eaters into the fruits.

#### Discussion

*Alucita danunciae* is the first species of Alucitidae described from northern Chile. The morphology of the genitalia of *A. danunciae* is remarkably similar to *Alucita proseni* (Pastrana). However, both species can be easily separated. In the male genitalia *A. proseni* has the cucullus cylindrical, which is laterally compressed in *A. danunciae*; additionally, the spinules scattered on the outer surface of the sacculus are shorter and are at lower density in *A. danunciae* than in *A. proseni*. On the other hand, the female genitalia of *A. proseni* is characterized by the presence of a plain signum in the corpus bursae, which is absent in *A. danunciae*.

*Alucita danunciae* is known only from the type locality, in the desert of northern Chile, but its hostplant, the shrub *T. fulva fulva*, is also distributed in the desert of southern Peru (Wood 2008). Collections along the distribution area of *T. fulva fulva* would be useful in order to determine the effective geographical distribution of *A. danunciae*. Moreover, two exotic ornamental species of *Tecoma* Juss are present in the Arica Province: *T. capensis* (Thunberg)

Lindley, native to southern Africa, and *T. stans* (L.) Juss ex Kunth, with geographical origin in South America. Several fruits of *T. capensis* and *T. stans* were collected in Arica, but larvae of *A. danunciae* were not found, which would suggest a highly specific association between *A. danunciae* and *T. fulva fulva*.

The remarkable morphological similarity of the genitalia of *A. danunciae* and *A. proseni* could be suggesting a close evolutionary relationship between both species. *A. proseni* was described from the Jujuy Province, northern Argentina (Pastrana 1951). Until now this species is known only from the type locality, and have not been published hostplant records for its immature stages. However, three species of *Tecoma* have been recorded from Jujuy: *T. stans*, *T. tenuiflora* (A. DC) Fabris and *T. fulva garrocha* (Hieron) J.R.I. Wood (Wood 2008). Then, future samplings should be interesting in order to verify if the immature stages of *A. proseni* are associated with some species of *Tecoma* in northern Argentina.

### Acknowledgments

To Dr. Bernard Landry, Muséum d'Histoire Naturelle, Geneva, Switzerland; Dr. Olaf H.H. Mielke, Universidade Federal do Paraná, Curitiba, Brazil; Dr. Bong-Kyu Byun, Division of Bio-Specimen & Genetic Resources, Korea National Arboretum, Pocheon, Korea, by kindly send literature; and Dr. Arturo Roig-Alsina, Museo Argentino de Ciencias Naturales Bernardino Rivadavia, by kindly loan paratypes of *A. proseni* for examination. This study was supported by project DEXA-UTA 9710-08.

### References

- Byun BK (2006) Alucitidae (Lepidoptera) of Korea: description of a new species and records of two previously unrecorded species. *Zootaxa* 1188: 37-47.
- Byun BK, Park KT (2007) Discovery of two new species of Alucitidae (Lepidoptera) from Vietnam. *Zootaxa* 1390: 51-57.
- Carlson JE, Harms KE (2007) The benefits of bathing buds: water calyces protect from a microlepidopteran herbivore. *Biol Lett* 3: 405-407.
- Dugdale JS, Kristensen NP, Robinson GS, Scoble MJ (1998) The smaller microlepidoptera-grade superfamilies, p.217-232. In Kristensen NP (ed) *Handbook of zoology, Lepidoptera, moths and butterflies, v. 1: Evolution systematic and biogeography*. Walter de Gruyter, Berlin & New York, 491p.
- Gielis C (2003) Pterophoroidea & Alucitoidea (Lepidoptera). *World catalogue of insects, v. 4*. Stenstrup, Apollo Books, 198p.
- Landry B, Landry JF (2004) The genus *Alucita* in North America, with description of two new species (Lepidoptera: Alucitidae). *Can Entomol* 136: 553- 579.
- Pastrana JA (1951) Dos nuevas especies de Orneodidae de la Argentina y Paraguay (Lep.). *An Soc Cient Argent* 152: 116-126.
- Wood JRI (2008) A revision of *Tecoma* Juss. (Bignoniaceae) in Bolivia. *Bot J Linn Soc* 156: 143-172.