Research Article

A new genus and two new species of Litini (Lepidoptera: Gelechiidae) from Chile

Nuevo género y dos nuevas especies de Litini (Lepidoptera: Gelechiidae) de Chile

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Abstract. The new genus *Amplusuncus* **gen. nov.**, with two new species, *A. cantus* **sp. nov.** and *A. andes* **sp. nov.** are described from Chile. Diagnostic characters and descriptions of the genus and each new species of adults and genitalia of males and females are illustrated. *Schinus* **sp.** (Anacardiaceae) is recorded as the host plant of *A. andes* **sp. nov.**

Key words: Andes, Gelechiinae, Neotropical, Schinus, taxonomy.

Resumen. Se describe el nuevo género *Amplusuncus* **gen. nov.**, con dos nuevas especies, *A. cantus* **sp. nov.** y *A. andes* **sp. nov.** Se entregan caracteres diagnósticos del género, junto a la descripción de los adultos y figuras de las genitalias masculina y femenina. Se registra a *Schinus* sp. (Anacardiaceae) como hospedante de *A. andes* **sp. nov.**

Palabras clave: Andes, Gelechiinae, Neotropical, Schinus, taxonomía.

Introduction

Litini (= Teleiodini), one of tribes of Gelechiinae (Lepidoptera: Gelechiidae) is referred to a total of 8 genera in the Neotropical Region: *Agnippe* Chambers, *Recurvaria* Haworth, *Coleotechnites* Chambers, *Schistophila* Chrétien, *Exoteleia* Wallengren, *Arogalea* Walsingham, *Barticeja* Povolný and *Telphusa* Chambers (Becker 1984; Lee and Brown 2008a, 2010). Currently, the tribe was defined morphologically and treated systematically for Europe by the contribution of Huemer and Karsholt (1999), who reviewed over 60 species, ascribed in 18 genera. Later, Lee and Brown (2008a, 2008b) reviewed all Holarctic-Nearctic genera and performed a phylogenetic analysis, based on morphological characters and supported by molecular studies, and they established the monophyly of this group. Systematic studies of Litini for the Neotropical region have not been carried out so far. This paper provides the first record of this tribe for Chile, including the description of a new genus and two new species, diagnostic characters for these taxa and a morphological description of adults and their genitalia. Furthermore the systematic position of the new genus is discussed.

Materials and Methods

The genitalia structures were examined using the methodology proposed by Pitkin (1986), with modifications related to dorsal view of vinculum and tegumen. The

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descriptions of adults follows Huemer and Karsholt (1999) and Lee and Brown (2008a). An EZ4E Leica stereomicroscope was used for observations and photographs of adults, furthermore processed using the LAS-EZ 3.2.0 Leica Application Suite software. The forewing wingspan was measured with the same program, comprising the distance from the basal to the apical ends of the termen. The genitalia structures were examined under a DM500 Leica microscope model, and photographs were taken with a 14 mega pixel resolution HD Movie Fujifilm digital camera. Later, the photographs and drawings were processed using the Adobe Photoshop CS5.1 software. The specimens examined in this study, including permanent genitalia slides, are deposited in: Luis Peña Entomological Museum, Department of Plant Protection, College of Agronomic Sciences, University of Chile. Santiago, Chile (MEUC); Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria (TLMF).

Results

Amplusuncus gen. nov.

Type species: *Amplusuncus cantus* **sp. nov**., here designated.

Diagnosis. *Amplusuncus* it is distinguished from *Sinoe* by the broadly rounded uncus, articulate ventral part of the gnathos, a curved gnathos-hook, the acute medial processes of the vinculum, the ductus bursae is shorter and corpus bursae without signum. From *Recurvaria* it differs by the shorter valva-vinculum complex, phallus with fulcrum and the absence of a signum in corpus bursae. From *Coleotechnites* it differs by a wider uncus, narrower tegumen and curved gnathos and the female does not have a signum. From *Teleiodes* it is distinguished by the wider uncus, curved gnathos, tegumen non emarginated and corpus without signum.

Description. Adult (Figs. 1-12). Clypeus with rounded ventral margin. Labial palpus with the third segment slightly longer than the second, or sub-equal than second. Ocellus absent. Sitophore with four campaniform sensilla arranged in a trapezoid form. Forewing with presence of tufts of raised scales, without pterostigma and discal cell open. R_4 and R_5 stalked, M_1 separated from R_5 , M_2 and M_3 connate, CuA_1 present, CuA_2 present or absent. Hindwing trapezoidal, with a slight excavation of the termen before the apex. M_1 present, M_3 and CuA_1 connate, CuA_2 diverges the disc cell center.

Male genitalia. Tergite VIII longer than wide, with rounded margin and anterolateral hair pencil; sternum VIII broad and with rounded margin. Uncus with broadly rounded anterior margin, broader than long, two times the wide than gnathos-hook; gnathos present, strongly sclerotized and with a form of a curved hook, articulate ventral part present. Tegumen longer than wide, more than three times the length of the gnathos, with strongly sclerotized pedunculus. Vinculum wider than long, with two acute medial processes. Valva with bulbous base, costal part with internal duct present, saccular part absent, symmetrical valva-vinculum complex. Phallus with bilobed fulcrum, elongate and curved in an obtuse angle, without cornuti.

Female genitalia. Apophyses anteriores of rod-like shape, more than twice the length of segment VIII. Apophyses posteriores slender, twice as long as the anterior ones. Segment VIII simple, membranous, present or absent antrum. Ductus bursae

narrow and short, small corpus bursae, without micro spinous processes and without signum.

Larva and pupa. Undescribed.

Host plant. Schinus sp. (Anacardiaceae).

Distribution. Present from the Province of Choapa (Coquimbo Region) to the Province of Maipo (Metropolitan Region). According to Morrone (2015), this distribution corresponds to the biogeographic sub-region of central Chile, from the Province of Coquimbo to the Province of Santiago.

Etymology. It corresponds to the Latin word broad, attached to the word uncus.

Remarks. This new genus represents an evolutionary form difficult to position and in general with simple morphological characters. *Amplusuncus* is defined by the male and female genital characters: uncus with rounded margin; gnathos with a hook shape; vinculum with 2 acute medial processes and corpus bursae small, without signum. Regarding the larval host-plant, it should be noted that the genus *Schinus* is distributed essentially in Neotropical region, and some species of *Schinus* may be considered invasive outside their natural ecosystem (Stonis and Remeikis 2017). The botanical records for Litini mainly correspond to Fagaceae, Rosaceae, Rhamnaceae, Anacardiaceae and Corylaceae (Huemer and Karsholt 1999; Lee and Brown 2008a, 2012).

| Characters | Amplusuncus | Sinoe | Recurvaria | Coleotechnites |
|------------|---------------|---------------------|--------------|----------------|
| Uncus | Broad rounded | Rounded apically | Wide as long | Small |
| VPG* | Present | Absent | Present | Present |
| Gnathos | Curved hook | Hook shaped | Hook short | Hook short |
| MPV ** | Acute | No acute | No acute | Acute |
| Valva | Bulbous base | Bulbous base (part) | Bulbous base | Bulbous base |
| VVC*** | Symmetrical | Symmetrical | Symmetrical | Asymmetrical |
| Fulcrum | Present | Present | Absent | Absent |
| D. bursae | Small | Elongated | Elongated | Elongated |
| Signum | Absent | Present | Present | Present |

Table 1. Comparison of Amplusuncus gen. nov., Since Chambers, Recurvaria Haworth and ColectechnitesChambers.

*= Ventral part ganthos **= Medial process of the vinculum; ***= Valva-vinculum complex.

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Figures 1-6. *Amplusuncus* **gen. nov.** 1) Clypeus *A. cantus* **sp. nov.** 2) Clypeus *A. andes* **sp. nov.** 3) Labial palpus *A. cantus* **sp. nov.** 4) Labial palpus *A. andes* **sp. nov.** Scale: 0.25 mm (1, 2, 3, 4). 5) Forewing *A. cantus* **sp. nov.** 6) Hindwing *A. cantus* **sp. nov.** Scale: 1.0 mm.



Figures 7-12. *Amplusuncus* **gen. nov.** 7) VII tergum *A. cantus* **sp. nov.** 8) VII tergum *A. andes* **sp. nov.** 9) VIII sternum *A. cantus* **sp. nov.** 10) VIII sternum *A. andes* **sp. nov.** 11) Uncus and gnathos *A. cantus* **sp. nov.** 12) Uncus and gnathos *A. andes* **sp. nov.** Scale: 0.25 mm.

Amplusuncus cantus **sp. nov.**

Diagnosis. Tegumen more than 4 times the length of the gnathos-hook. Vinculum with medial processes ending in curved sharp spines. Valva with a sharp spine shape and shorter than the length of the phallus. Antrum present.

Description. Holotype male (Figs. 13-14). Forewing 6.5 mm. Head with frons covered by tight white scales, vertex and occiput covered with elongated white scales in the anterior half, and dark scales in the posterior half. Labial palpus white, with dark scales at the base of the second segment, in the posterior half with a medial dark band; third white with two dark bands, basal and apical. Antennae with white scape, with a dark medial band, banded flagellomera with a faint appearance. Thorax and tegulae coated with white scales at the base, and dark at the posterior half. Forewing with dark scales at the base near Sc; 2 groups of tufts raised dark scales central-posterior of the cell; middle dark fascia somewhat diffuse; apical fascia diffuse with white scales interspersed. Hindwing bright white hue and fringed by yellowish elongate scales.

Male genitalia (Figs. 15-16). Uncus broad with rounded margin, gnathos shaped as a recurved hook, with articulate ventral part sub-equal in length to the gnathos. Tegumen narrow, more than 4 times the length of the ganthos, pedunculus sclerotized and hook-shaped. Vinculum with two elongate medial processes and ending in sharp curved spines. Valva shorter than the phallus length and shaped as a sharp spine. Phallus with fulcrum bilobed, well developed, slightly curved, rounded apex.

Female. Wings relatively similar in coloration to the male, with the antennae banding more distinctive.

Female genitalia (Figs. 17-19). Apophyses anteriores in the form of rod-like, VIII segment membranous. Antrum well developed tubular. Ductus bursae very short, without spiniform processes. Corpus bursae small, signum absent.

Etymology. The name recognizes the poem "Canto General", especially dedicated to Latin American nature (1950) by the Chilean poet Pablo Neruda.

Host plant. Unknown.

Distribution. Known species in the Cordillera and Maipo Provinces, Metropolitan Region, Central Chile.

Material examined. 7 specimens. Holotype \Diamond El Escorial, Provincia de Maipo, Región Metropolitana, CHILE, 26 noviembre 2016, leg. D.E. Cepeda (MEUC); 6 Paratypes $2\Diamond$, $4\Diamond$ El Escorial, Provincia de Maipo, Región Metropolitana, CHILE, 25 diciembre 2015, leg. D.E. Cepeda; El Escorial, Provincia de Maipo, Región Metropolitana, CHILE, 25 noviembre 2017, leg. D.E. Cepeda; Río Clarillo, Santiago, 1, 5- X-88, L. Lamborot. Permanent slides n° 742 \Diamond , 743 \Diamond , 755 \Diamond , 760 \Diamond , 814 \Diamond and 816 \Diamond (MEUC).

Amplusuncus andes **sp. nov**.

Diagnosis. Tegumen more than three times the length of the gnathos-hook. Vinculum with the medial processes shorter, ending in not curved sharp spines. Valva thin and longer than the phallus. Antrum absent.



Figures 13-19. *Amplusuncus cantus* **sp. nov.**, holotype. 13) Wings dorsal view. 14) Head side view. Scale: 1.0 mm (13, 14). 15) Male genitalia. 16) Valva-vinculum and phallus. Scale: 0.5 mm. 17) Female genitalia. 18) VIII segment and antrum. 19) Ductus and corpus bursae. Scale: 0.25 mm.

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Description. Holotype male (Figs. 20-21). Forewing 5.0 mm. Head with frons covered by tight white scales, vertex and occiput covered with elongate whitish scales. Labial palpus white, with dark scales at the base of the second segment, in the posterior half with a dark middle band and a few yellow scales; third white with two dark bands, a basal one and another apical. Antennae with white scape, banded flagellomera. Thorax and tegulae covered with whitish scales, with dark ones intermixed. Forewing whitish brown, with 3 dark fascia; an oblique basal, a medial with a "V" shape, and another apical diffuse dark; a few yellow scales intermixed in the center of the middle fascia. Hindwing bright white and fringed by elongate yellowish scales.

Male genitalia (Figs. 22-23). Uncus broad, with narrower base, gnathos shaped as a curved hook, with articulate ventral part sub-equal the gnathos. Tegumen width more than three times length of gnathos, pedunculus sclerotized and at an obtuse angle. Vinculum with two elongate medial processes and ending in sharp spines. Valva thin, sharp apex, longer than the phallus. Phallus with lobed fulcrum, well developed, slightly curved, with rounded apex.

Female (Fig. 24). Wings similar in coloration to the male. The females have the anterior wings with 3 groups of raised scales yellow, more distinctive and the banded antennas more outstanding.

Female genitalia (Fig. 25). Apophysis anteriores in the form of rod-like, VIII segment membranous. Antrum not developed. Ductus bursae short, without spiniform processes. Corpus bursae small, signum absent.

Etymology. The name is a tribute to the South American mountain chain, Los Andes.

Host plant. Species obtained by rearing of larvae on fruits of *Schinus* sp. (Anacardiaceae).

Distribution. Species known in the Province of Choapa, Coquimbo Region, and Province of Maipo, Metropolitan Region, Chile.

Material examined. 11 specimens. Holotype 3° En frutos de *Schinus* sp., 6 km N. de los Vilos, Coquimbo CHILE, nac. VII- 1966 reared by R.H. González (MEUC); 7 Paratypes 5 3° , 2 9° En frutos de *Schinus* sp., 6 km N. de los Vilos, Coquimbo CHILE, nac. VII- 1966 reared by R.H. González; El Escorial, Provincia de Maipo, Región Metropolitana CHILE, 25 diciembre 2015. leg. D.E. Cepeda; El Escorial Provincia de Maipo, Región Metropolitana, CHILE, 23 diciembre 2017. leg. D.E. Cepeda. Permanent slides n° 749 3° , 756 3° , 758 9° , 843 3° and 848 9° (MEUC); 3 Paratypes 3° . El Escorial Provincia de Maipo, Región Metropolitana, CHILE, 23 diciembre 2017. leg. D.E. Cepeda (TLMF).



Figures 20-21. *Amplusuncus andes* **sp. nov.**, holotype. 20) Adult dorsal view. 21) Head side view. Scale: 1.0 mm.



Figures 22-25. *Amplusuncus andes* **sp. nov.** 22) Male genitalia. 23) Valva-vinculum and phallus. Scale: 0.25 mm (22, 23). 24) Forewing with tufts of raised scales. Scale 1.0 mm. 25) Female genitalia. Scale: 0.5 mm.

Discussion

This paper contributes to taxonomic knowledge and bio-diversity of the tribe Litini in the Neotropical region. The few known antecedents for Neotropical region are partial, for example the genus *Berticeja* proposed by Povolný (1967), although with many doubts with respect to its systematic position, which he considered it belonged to Gnorimoschemini tribe. Later, Clarke (1969) catalogued and photographed the genitalia of some the species described by Meyrick (1914, 1917, 1923, 1926, 1931). The Litini are characterized by the presence of small patches of raised scales in forewing, gnathos with a tendency to reduction, without culcitula, phallus fused with part of the genital capsule and extremely elongate posterior apophyses (Huemer and Karsholt 1999). Lee and Brown (2008a) added new characters: the presence or absence of ocellus; male gnathos variable in shape; bulbous valva at the base, divided into a costal internal duct and a saccular internal duct; usually a rhomboidal signum with serrate margins; and a pair of transverse processes, a broad or narrow rhomboid base, sometimes at rounded or square obtuse angles. *Amplusuncus* gen. nov., was included in the tribe since it shares large part of the general characteristics of the group, for example: absent ocellus, a tufts of raised scales on forewing, bulbous

basal valva with internal part and elongate anterior apophyses. It is also similar to several genera of Litini that do not display distinctive external characteristics whereas genitalia characters are important for diagnosis (Lee and Brown 2008a). *Amplusuncus* gen. nov., is a bio-geographically isolate endemic genus and defined by morphological differences in the male-female genitalia (detailed in the description genus diagnosis, and Table 1). The most evident diagnostic features are the shape of the uncus, the gnathos, valva-vinculum complex, phallus, and absence of signum. Anacardiaceae as host-plant records for Litini is already known, but not for the Neotropical genus *Schinus* spp. The previously records of insects cited for *Schinus* spp. include diverse species of *Calophya* spp. (Calophyidae) (Burckhardt and Basset 2000) and *Acalyptris* spp., *Stigmella* spp. (Nepticulidae) (Stonis and Remeikis 2017). The new taxa increase the number of known species of Gelechiidae for Chile to 28, represented by 16 genera. In additional contribution a new record host plant are provided (Cepeda 2017).

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