Research Article

Descriptions of two new species of the genus *Scrobipalpomima* Povolný (Lepidoptera: Gelechiidae) and two new records of Gnorimoschemini from Chile

Descripción de dos nuevas especies del género *Scrobipalpomima* Povolný (Lepidoptera: Gelechiidae) y dos nuevos registros de Gnorimoschemini para Chile

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Abstract. Two new species of *Scrobipalpomima*, *S. manuscriptus* **sp. nov.** and *S. phalluspinosus* **sp. nov.** are described and illustrated from Chile. These new taxa were collected in northern and central Chile (Atacama and Metropolitan Region of Santiago). In addition, *Scrobipalpula densata* (Meyrick) and *Ochrodia* near *subdiminutella* (Stainton) are recorded from Chile for the first time.

Key words: Gelechiinae, *Scrobipalpula, Ochrodia*, Neotropical, Andean Region.

Resumen. Se describen e ilustran dos nuevas especies de *Scrobipalpomima* para Chile, *Scrobipalpomima manuscriptus* **sp. nov.** y *Scrobipalpomima phalluspinosus* **sp. nov.** Estos nuevos taxones fueron recolectados en el norte y centro de Chile (regiones de Atacama y Metropolitana de Santiago). Además, *Scrobipalpula densata* (Meyrick) y *Ochrodia* cercana a *subdiminutella* (Stainton) son registradas por primera vez para Chile.

Palabras clave: Gelechiinae, *Scrobipalpula, Ochrodia*, Neotropical, Región Andina.

Introduction

In Chile, the tribe Gnorimoschemini (Lepidoptera: Gelechiidae: Gelechiinae) is represented by 10 genera and 19 species (Cepeda 2017). In South America and the Andean region, *Scrobipalpomima* Povolný, 1985 together with *Eurysacca* Povolný, 1967, *Scrobipalpula* Povolný, 1964 and *Symmetrischema* Povolný, 1967 are the most diverse genera of Gnorimoschemini (Povolný 1994, 2002a; Lee and Brown 2010). During recent field work in northern and central Chile and, collecting with ultraviolet light traps, undescribed and hitherto unrecorded taxa were discovered. The aim of this contribution is to describe two new species of *Scrobipalpomima* Povolný based on morphological characters of adults, in particular the male genitalia. Additionally, *Scrobipalpula densata* (Meyrick) and *Ochrodia* near *subdiminutella* (Stainton) are recorded from Chile for the first time.

Materials and Methods

Genitalia structures were examined using the methodology of Pitkin (1986), modified in relation to the dorsal view of vinculum and tegumen. Descriptions of adults follow

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Huemer and Karsholt (2010) and Cepeda (2018). An EZ4E Leica stereomicroscope was used for observations and photographs of adults, and images were processed using the LAS-EZ 3.2.0 Leica Application Suite software. Forewing length, comprising the distance from the base to the apex of the forewing costa, including the fringe, was measured using the same program. Genitalia structures were examined using a DM500 Leica microscope, and photographs were taken with a 14 mega pixel resolution HD Movie Fujifilm digital camera. The photographs were processed with Adobe Photoshop CS5.1.

The specimens examined in this study, including permanent genitalia slides, are deposited in the Luis Peña Entomological Museum, Department of Plant Protection, College of Agronomic Sciences, University of Chile, Santiago (MEUC) and the Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria (TLMF).

Results

Scrobipalpomima manuscriptus **sp. nov.**
(Figs. 1-2)

Diagnosis. Based on its male genitalia, *Scrobipalpominia manuscriptus* is most closely related to *S. improbabilis* Povolný (1989b); both species lack spines on phallus. This new species can be differentiated from *S. improbabilis* by the prominent margin of the uncus, the dilated apex of the valva, a longer gnathos, an elongated saccus, and the phallus narrowed with an ovoid coecum.

Description. Male. Head: Frons and vertex covered by whitish scales, occiput covered with elongated dark brown scales. Labial palpus whitish, with ventral brush of dark scales on second segment, third segment strongly curved with some scattered dark scales. Antennae with dark scape and densely ciliate flagellomeres. Thorax: Nota and tegulae covered with dark brown scales. Forewing length 6-9 mm (n = 3), ashy gray, more or less densely dusted with black scales, with few yellowish scales at base of cell and continuing towards middle of wing. Hindwing whitish; fringe yellowish. Genitalia (Figs. 3-7) with uncus wide, subtriangular with prominent pointed margin. Gnathos elongated, digitate, slightly curved to apex. Valva elongated, with dilated apex bearing a row long stiff bristles. Sacculus U-shaped with media incision, saccular processes digititate, parabasal processes extending slightly beyond tip of saccular pair and moderately curved internally. Saccus longer than wide, prolonged, with acute apex. Phallus, narrowed, lacking elongate spines; coecum well defined, ovoid, approximately 1/4 length of phallus. Female. Unknown.

Host plant. Unknown.

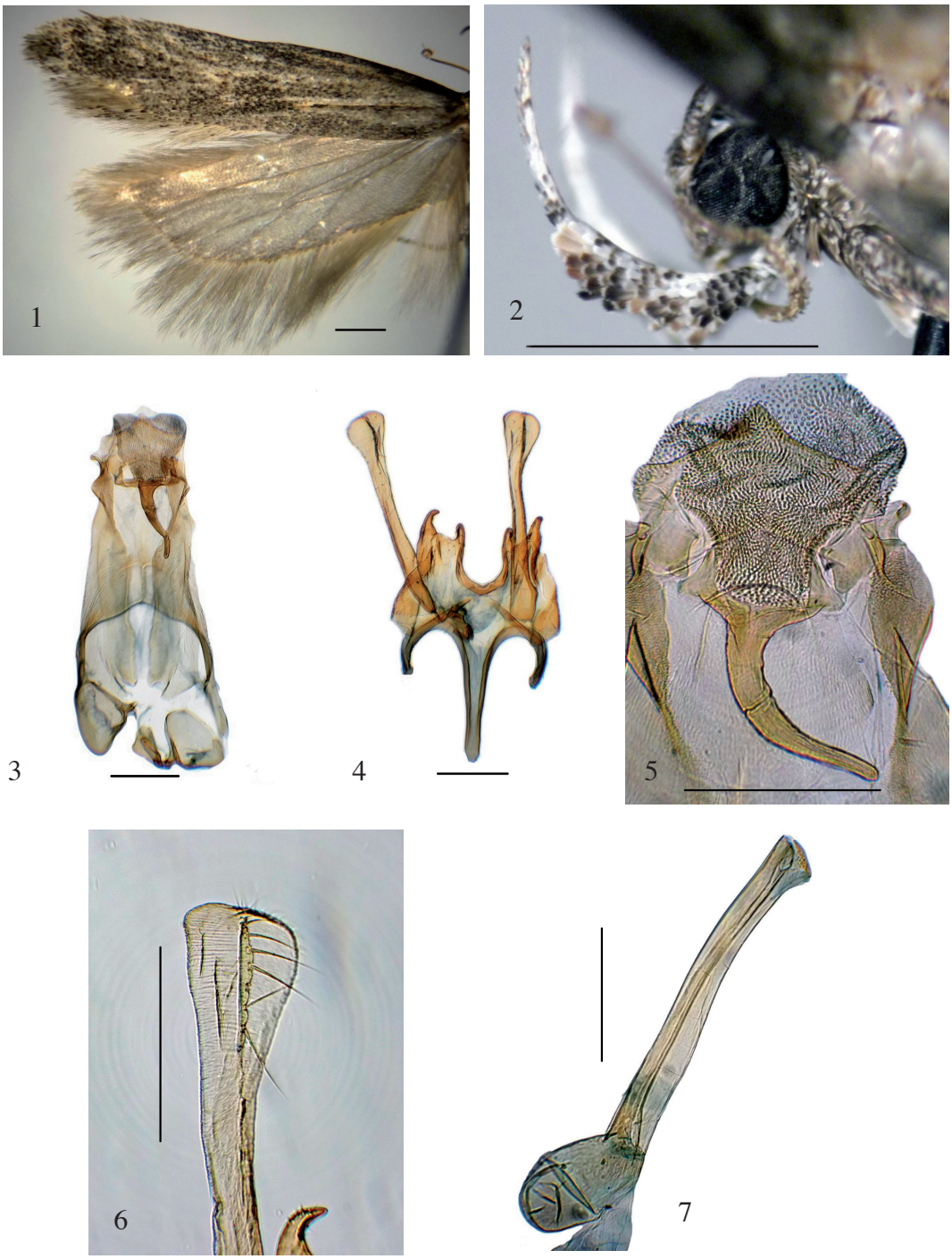
Intraspecific variation. The species varies in the male genitalia with subtle differences in the shape of the uncus, valva, and phallus length.

Etymology. The specific name is dedicated to handwriting, word of Latin origin (conduct in danger of extinction).

Distribution. *Scrobipalpomima manuscriptus* is known from Huasco and Limarí provinces, from Atacama to the Coquimbo regions. According to Morrone (2015), this distribution belongs in the central Chilean Sub-region, Province of Coquimbo.

Material examined. Holotype ♂. Domeyko, 28°56´S, 70°53´W, 830 m. Provincia de Huasco, Región de Atacama, CHILE. 19 agosto 2017 Coll. J.F. Campodonico UV trampa (MEUC).

Paratypes (2♂). Domeyko, 28°56´S - 70°53´W, 830 m. Provincia de Huasco, Región de Atacama, CHILE. 19 agosto 2017 Coll. J.F. Campodonico UV trampa; Mineral de Talca, Provincia de Limarí, Región de Coquimbo, 23 de septiembre 2017 Coll. J.F. Campodonico trampa UV. Permanent genitalia slides n°: 762♂, 765♂ and 802♂ (MEUC, TLMF).



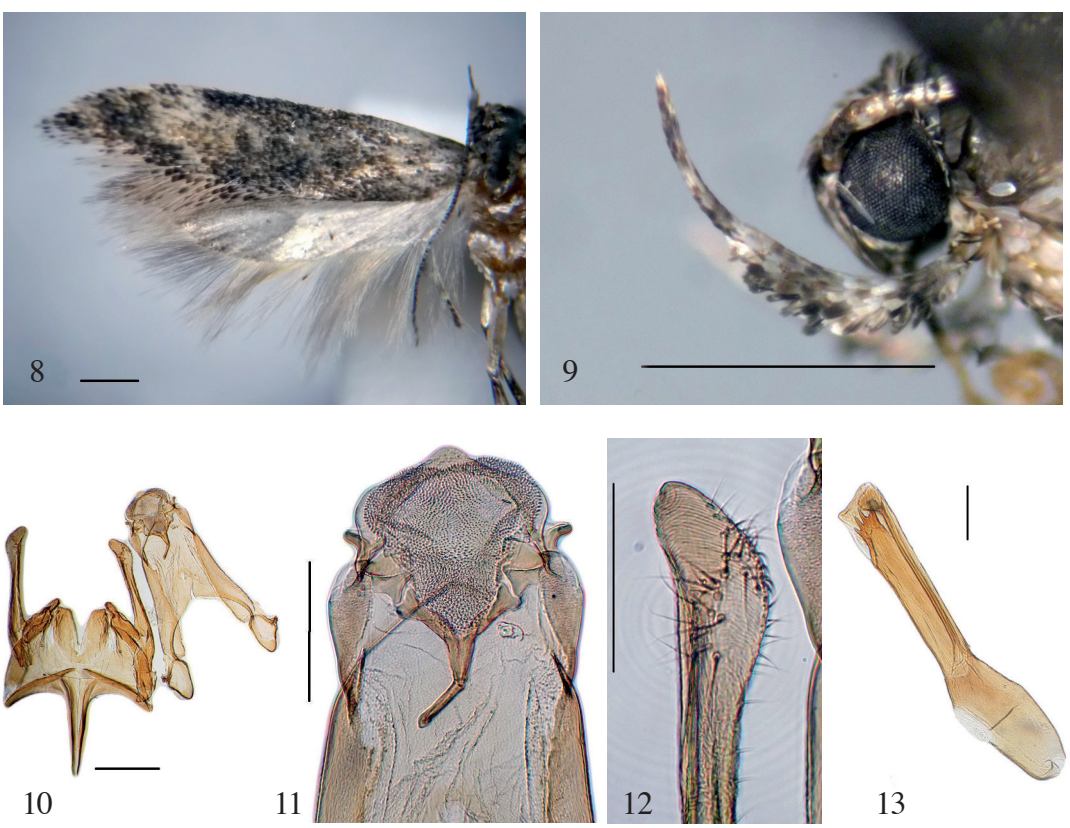
Figures 1-7. *Scrobipalpomima manuscriptus* **sp. nov.** 1. Forewing, 2. Palpus. Scale: 1.0 mm, 3. Genitalia male, 4. Saccular processes, 5. Uncus-gnathos, 6. Valva tip, 7. Phallus. Scale: 0.25 mm.

Scrobipalpomima phalluspinosus **sp. nov.**
(Figs. 8-9)

Diagnosis. *Scrobipalpomima phalluspinosus* show no clear relationship with any specific congener (Povolný 1985, 1989b, 1990). The new species can be easy distinguished by the following character: phallus with 3-5 well-defined micro-spines at the apex (Figs. 14-16).

Description. Male. Head: Frons and vertex covered by brownish light scales, occiput covered with elongated brown scales. Labial palpus brownish, with ventral brush of dark scales on second segment, medial white band near middle, third segment strongly curved with weak medial band. Antennae dark, with densely ciliate flagellomeres. Thorax: Nota and tegulae covered with brown scales. Forewing length 5.5-7.5 mm (n = 3), brownish gray, more or less densely dusted with yellowish scales, with subapical fascia. Hindwing whitish; fringe yellowish. Genitalia (Figs. 10-16) with uncus wide, triangular, with prominent pointed margin. Gnathos slender and digititate. Valva elongated, moderately curved, with rounded apex, longer than saccus. Sacculus V-shaped with media incision, saccular processes with margin truncated anteriorly, parabasal processes extending slightly beyond tip of saccular pair, moderately lobed. Saccus longer than wide, prolonged, with acute apex. Phallus moderately short, narrowed, with 3-5 strongly defined spines in apex; coecum well defined, not bulbous, approximately 1/2 length of phallus. Female. Unknown.

Host plant. Unknown.



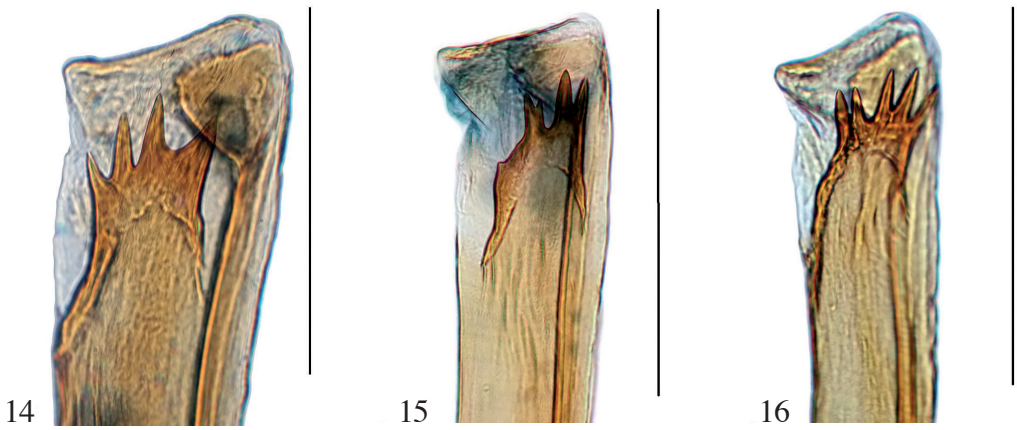
Figures 8-13. *Scrobipalpomima phalluspinosus* **sp. nov.** 8. Forewing, 9. Palpus. Scale: 1.0 mm, 10. Genitalia without phallus, 11. Uncus-gnathos, 12. Valva tip, 13. Phallus. Scale: 0.25 mm.

Intra-specific variation. The species varies in the male genitalia, with subtle differences in form and numbers (3-5) of spines at the apex of the phallus.

Etymology. The specific name refers to the micro-spines in the apex of the phallus.

Distribution. *Scrobipalpomima phalluspinosus* is known from a single locality in Chacabuco, Metropolitan Region of Santiago. According to Morrone (2015), this area belongs in the Central Chilean Sub-region, Province of Coquimbo.

Material examined. Holotype ♂. Cerro las Vizcachas, Provincia de Chacabuco, Región Metropolitana, CHILE, 8-9 diciembre 2017, leg. J.F. Campodonico UV trampa. (MEUC) Paratypes (2♂). Same data as holotype. Permanent genitalia slides n°: 825♂, 832♂ and 856♂ (MEUC, TLMF).



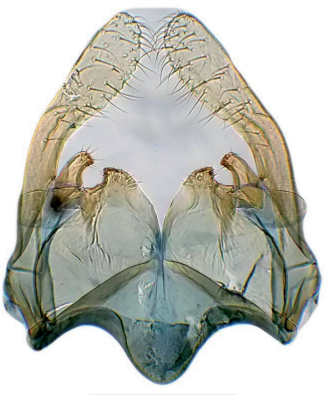
Figures 14-16. *Scrobipalpomima phalluspinosus* **sp. nov.** 14-16. Intra-specific variation of phallus spines. Scale: 0.25 mm.

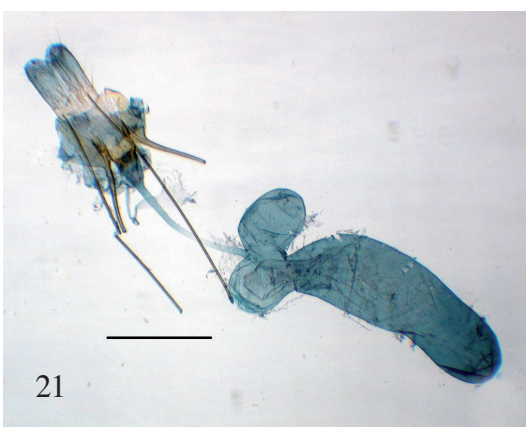
New records for Chile

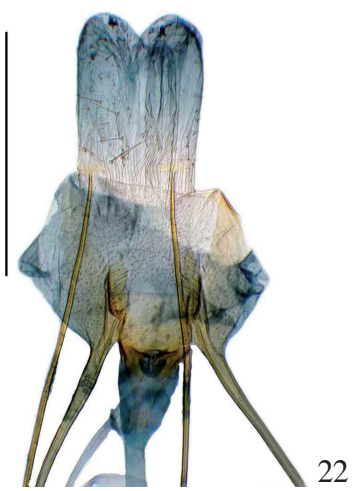
Scrobipalpula densata (Meyrick)
(Figs. 17-22)

Remarks. *Phthorimaea densata* was described by Meyrick (1917) based on specimens from Lima, Peru. Povolný (1967) provisionally assigned the species to *Scrobipalpula* and treated *Phthorimaea laciniosa* Meyrick 1931 as a synonym of *S. densata*. Subsequently, Povolný (1989a) transferred *P. laciniosa* to *Symmetrischema*, treating it as a valid species and describing males from several Argentinean localities. Povonlý (1990) reiterated that *S. densata* could belong in a different genus, but the female remained unknown, hindering convincing placement. Landry and Roque-Albelo (2010) recorded this species from the Galapagos Islands, based on two specimens reared from *Cacabus miersii* (Hook. f.) Wettst. (Solanaceae), a plant that is endemic to and widespread and occur in most of Galapagos Islands. They also figured the female genitalia of *S. densata*, although with reservations due to the paucity of material. Specimens from Chile were collected with ultraviolet light traps in two different localities in the Atacama region and are associated with desert and coastal scrubland. The Chilean specimens compare well with the descriptions and figures in Meyrick (1917) and Povolný (1967, 1990), and especially with the figure of the female genitalia in Landry and Roque-Albelo (2010). Based on morphological characters of the male and female genitalia (e.g., trilobed gnathos and slender phallus in the male, lobed corpus bursae lacking a signum in the female), *S. densata* requires a new genus, as suggested by Povolný (1967, 1990).

Material examined. 19 specimens. Chile, Huasco province, Tamarico, 28°21'S, 71°46'W, 568 m, 22-IX-2017, J.F. Campodonico leg.; Chile, Huasco province, Caleta Los Bronces, 28°38'S, 71°16'W, 200 m, 21-IX-2017, J.F. Campodonico leg. Permanent genitalia slides 778♂, 779♀, 791♂, 792♀, 799♂ and 800♂ (MEUC)



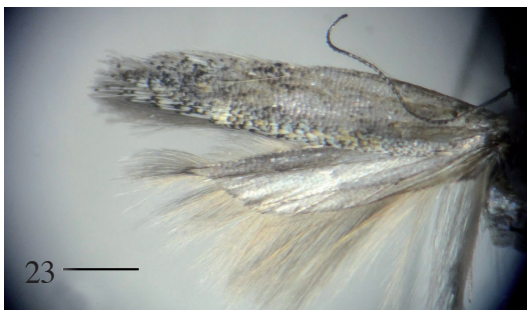


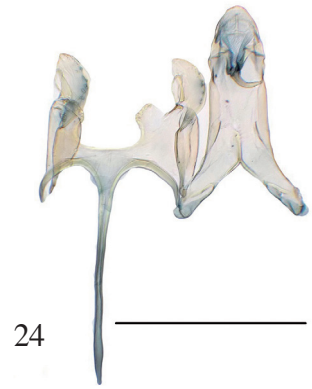


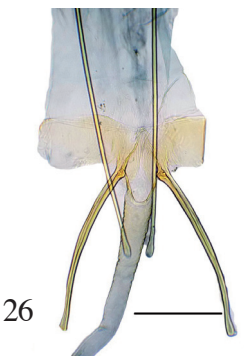
Figures 17-22. *Scrobipalpula densata* habitus. 17. Forewing. Scale: 1.0 mm, 18. Genitalia male, 19. Valva-saccus, 20. Phallus, 21. Genitalia female, 22. VIII segment-antrum. Scale: 0.25 mm.

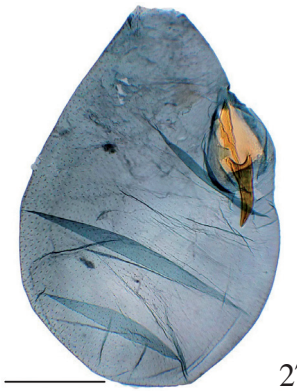
Ochrodia near *subdiminutella* (Stainton)
(Figs. 23-28)

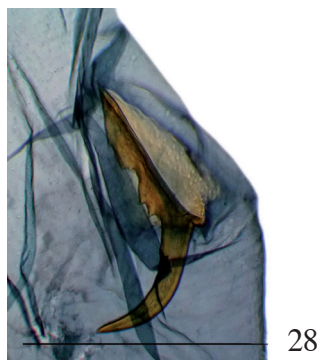
Remarks. *Gelechia subdiminutella* was described by Stainton (1867) from various specimens from Jordan River (Middle East). Povolný (1966) transferred the species to *Ephysteris* (subgenus *Ochrodia*). Subsequently, Povolný (2002b) redescribed *Ochrodia* and presented figures of the male and female genitalia. Several *Ochrodia* species were described over a wide geographic range, and because Povolný (2002b) was unable to separate them, he merged them all into one species, *O. subdiminutella*. Later, Huemer and Karsholt (2010) included *Ochrodia* genus in their revision of European Gelechiidae and redescribed the species. In addition, they mentioned the confusing systematic position of the genus in Gnorimoschemini. The larvae of *Ochrodia subdiminutella* are recorded from *Balanites* Del.,











Figures 23-28. *Ochrodia* near *subdiminutella* habitus. 23. Forewing. Scale: 1.0 mm, 24. Genitalia without phallus, 25. Phallus, 26. VIII segment, 27. Corpus bursae, 28. Signum. Scale: 0.25 mm.

Tribulus L., and *Zygophyllum* L. (Zygophyllaceae) Povolný (2002b). The species is widely distributed in Europe, tropical Africa, Australasia, and Indo-Malaysia, and has been reported from Jamaica and Mexico in the New World (Huemer and Karsholt 2010; Nazari 2017). Landry and Roque-Albelo (2010) placed *O. subdiminutella* in *Ephysteris* Meyrick based on three male and female specimens from Galapagos Islands. They identified the species based on the figures in Povolný (2002b). However, it should be noted that there are differences in the figures of the male genitalia among the contributions of Povolný (2002b), Huemer and Karsholt (2010), and Landry and Roque-Albelo (2010). Due to the confusion in the identity of *O. subdiminutella* (see Huemer and Karsholt 2010), I assign the Chilean specimens to "*O.* near *subdiminutella*." The Chilean specimens were collected with ultraviolet light traps in four different localities in Atacama and Coquimbo regions where they are associated with the interior desert and coastal scrubland.

Material examined. 8 specimens. Domeyko, CHILE, 28°56´S, 70°53´W, 830 m, Provincia de Huasco, Región de Atacama, 19 agosto 2017 Coll. J.F. Campodonico; Monte Patria, CHILE, Prov. de Limarí, Región de Coquimbo, 20 septiembre 2017, Coll. J. F. Campodonico; Chile, Huasco province, Caleta Los Bronces, 28°38'S, 71°16'W, 200 m, 21-IX-2017, J.F. Campodonico leg; Chile, Huasco province, Tamarico, 28°21'S, 71°46'W, 568 m, 22-IX-2017, J.F. Campodonico leg. Permanent genitalia slides n°: 764♀, 766♀, 774♂, 785♀, 786♀, 787♂, 796♂ and 797♀ (MEUC).

Discussion

The known fauna of the Gnorimoschemini in Chile includes few species, most of which belong to genera with a Neotropical distribution; only five species are considered to be endemic (Clarke 1965; Cepeda 2017). The paucity of specimens and the minimal studies on the group in this region strongly suggest that additional new species and new records will be discovered in the four biogeographical sub-regions in Chile as defined by Morrone (2015).

The first record of two previously known species, *Scrobipalpula densata* and *Ochrodia* near *subdiminutella*, is presented for northern Chile. The new record of *S. densata* expands its known distribution from Peru and Galapagos Islands (Povolný 1994; Landry and Roque-Albelo 2010) to northern Chile. It should be noted that in Chilean specimens, tergum 2-4 have two small yellowish spots, as in the Meyrick type specimens of *Phthorimaea densata* Meyrick (see Meyrick 1917 and Fig. 1). In his redescription and illustrations of the male genitalia, Povolný (1967, 1990) did not mentioned the trilobed gnathos; perhaps the specimens examined by Povolný did not show these characters. However, in the figure of male genitalia presented by Landry and Roque-Albelo (2010), it is possible to differentiate the trilobed gnathos. Also, the figure of the female genitalia is similar to Chilean specimens (corpus bursae lobed, without signum, see Fig. 5). In the absence of molecular studies, the Chilean specimens are assigned to *Scrobipalpula* on the basis of morphology.

The new record of *O.* near *subdiminutella* may expand its known distribution to continental South America; in the New World it was previously recorded from Jamaica (Huemer and Karsholt 2010) and recently Mexico (Nazari 2017). The Chilean specimens were collected in a different ecosystem on desert coastal scrubland. This information suggests that its distributional range is wider than previously known and that hosts include other species from the Zygophyllaceae family than those presented by Povolný (2002b), Huemer and Karsholt (2010), and Landry and Roque-Albelo (2010), as in Chile, this group is represented by the genus *Bulnesia* C. Gay, *Fagonia* L., *Larrea* Cav., *Metharme* Phil. ex Engler, *Pintoa* C. Gay and *Porliera* Ruiz y Pavon (Marticorena and Quezada 1985). The *Ochrodia*-complex is difficult, and as many genera with broad distribution, undoubtedly requires a systematic revision including molecular support.

The two new species described herein, *Scrobipalpomima manuscriptus* and *Scrobipalmpomima phalluspinosus*, are considered endemic from Chile. *Scrobipalpomima* Povolný, which is relatively well defined morphologically, comprises 20 recognized species that are entirely South American, however a further phylogenetic analysis may be needed. Unfortunately, the host of all these species are unknown, and their immature stages have not been described (Povolný 1994; Lee and Brown 2010). The new species are included in this genus based on the following characters of the male genitalia: uncus wider than long, gnathos slender, digitiform and symmetrical saccular processes, phallus with or without spines. All these features are in agreement with the descriptions presented by Povolný (1985, 1989b, 1990). These two new species rise the number of species in *Scrobipalpomima* Povolný to 22, with an evident Andean distribution. With these new addition, the Chilean gelechiids reach a total of 32 species classified in 17 genera (Cepeda 2017, 2018).

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