



## Revalidation and redescription of *Feltia deprivata* (Walker) (= *bilitura* of authors) (Lepidoptera: Noctuidae), a pest species on South America

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### Abstract

*Agrotis bilitura* Guenée (Lepidoptera: Noctuidae) is cited on numerous works as a pest species in South America and as senior synonym of *Feltia deprivata* (Walker). Previous studies noted that both species were not synonymies, but valid species. The revision of type material of these species allow us to regard both species as valid species belonging to different genera. In the present work, we revalidate *F. deprivata*, giving a complete description of the morphological characters for male and female adults. As stated on previous works, we also support that *A. bilitura* belongs within the genus *Pseudoleucania* Staudinger, proposing the following nomenclatural changes: *Pseudoleucania bilitura* (Guenée) **stat. rev.**, also lectotypes of *Lycophotia atrifascia* Hampson were designated in order to definitely provide name-bearing types to the type material studied and to stabilize nomenclature. Finally, we carry out a revision of all the literature concluding that the actual pest species in South America is *F. deprivata* not *P. bilitura*, and updating and correcting the distributional and hosts plant information for *F. deprivata*.

**Key words:** Argentina, Chile, genitalia, distribution

### Introduction

*Agrotis bilitura* Guenée (Lepidoptera. Noctuidae) [= *Pseudoleucania bilitura* (Guenée)] is cited as a secondary pest for many crops in South America. (Parra *et al.* 1986; Jana-Sáenz 1989; Artigas 1994; Angulo & Weigert 1975). According to bibliography, it is distributed along the western side of South America, from Ecuador to Southern Chile and Argentina (Evans 1988; Angulo & Olivares 2005). Almost all works dealing with this species included *Feltia deprivata* (Walker) as a synonymy of *A. bilitura*.

Köhler ((1961) 1963, 1967), Poole (1989), and Lafontaine (2004) indicated that *F. deprivata* and *A. bilitura* were not synonymies, but valid species. Furthermore, Köhler (1967) and Poole (1989) cited *A. bilitura* as belonging to genus *Pseudoleucania* Staudinger. In this contribution, the study of the type material of both species (plus other species cited as synonyms) corroborated that both are valid species belonging to different genera. Analyzing the drawings and descriptions, we also find out that most of the works dealing with noctuid pests on South America, which cited *A. bilitura* as a pest for different crops, actually correspond to *F. deprivata*.

Although other redescriptions have been made through time (all of them identified the species as *bilitura*), most of them do not provide proper description or illustration of diagnostic morphological features. Therefore, in this work we revalidate *F. deprivata* with a complete description of its morphological characters for both male and female adults. In addition, we carried out a complete revision of all the bibliography dealing with both species, diagnosing the correct species to which these works were referring. In doing this task, we were able to update and correct the distribution and hosts data for *F. deprivata*.

## Material and methods

**Taxonomic methods.** Dissections of genitalia were conducted as in Lafontaine (2004). The stain used in the dissections was Chlorazol Black E for female genitalia and male aedeagus. Genital morphological terminology and nomenclature for types of antennae follow Lafontaine (2004). Size of the longest antennal segment and length of genital structures was measured as in San Blas (2014).

The images of adults were taken with a Canon Sx510 digital camera. Images of genitalia were taken with a Carl Zeiss AxioCam ERc5s digital camera attached to a Carl Zeiss Stemi 508 stereoscopic microscope. All images of genitalia were taken at multiple focal planes (at least five) and then combined into a single image (with all features in focus) with the free software CombineZP (Hadley 2017) and enhanced with image editing software. Distribution maps were made using Simplemappr (Shorthouse 2010).

## Abbreviations:

BMNH	British Museum Natural History (Natural History Museum), London
CNC	Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa
IPCN	Ex-Instituto Patagónico de Ciencias Naturales (loaned and placed in the IADIZA)
IADIZA	Instituto Argentino de Investigación de las Zonas Áridas, Mendoza
HNHM	Magyar Természettudományi Múzeum, Budapest
USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC

## Systematic treatment

### *Feltia deprivata* (Walker 1857)

(Figs 1–13)

*Agrotis deprivata* Walker 1857: 739; Berg 1882: 281–282 (as a doubtful synonymy of *Agrotis blanchardi* Berg); Köhler (1961) 1963: 59–60 (synonymic list and species variability); Hayward 1969: 41 (hosts); Poole 1989: 47 (world noctuid checklist); Whitfield *et al.* 2002: 154 (parasitoids); Pastrana 2004: 155 (hosts); León 2005: 26 (diagnosis and hosts); Parra *et al.* 2014: 100, fig. 1 (flight curve in Araucania region, Chile).

*Lycophotia atrifascia* Hampson 1907: 247; Draudt in Seitz 1924: 68 (diagnosis); Köhler 1945: 71, 119, 127 (key and distribution); Köhler 1967: 296 (synonymy of *Scotia deprivata* (Walker)); Poole 1989: 609 (as *Lycophotia* of authors).

*Lycophotia baeckstroemi* Aurivillius *et al.* 1922: 256, Plate 10, fig. 1; Carrera-Suárez *et al.* 2011: 88–89, figs 2, 12 (new synonymy of *A. bilitura* Guenée); San Blas 2014: 9 (new synonymy of *F. deprivata*).

Note: Aurivillius *et al.* (1922) described the species as *Lycophotia bäckströmi*. According to 32.5.2.1 ICZN article: “In the case of a diacritic or other mark, the mark concerned is deleted, except that in a name published before 1985 and based upon a German word, the umlaut sign is deleted from a vowel and the letter "e" is to be inserted after that vowel (if there is any doubt that the name is based upon a German word, it is to be so treated),” thus the correct spelling of this species is *baeckstroemi*.

*Scotia deprivata* (Walker): Köhler 1967: 301, figs 2, 55, 56 (synonymic list).

*Agrotis deprivata nuda* Köhler 1979: 16; Poole 1989: 52 (synonymy). According to description: “Holotype and allotype: author’s collection. Habitat: Los Tambillos, Mendoza, 2000m, Luetscher leg.” Type material not found.

*Agrotis backstromi* [sic] (Aurivillius *et al.*): Poole 1989: 44 (world noctuid checklist).

*Feltia deprivata* (Walker): Lafontaine 2004: 220 (new combination); San Blas 2014: 9 (checklist); San Blas 2015: 158, fig. 1 (*Agrotis* Ochsheimer and partially *Feltia* Walker phylogeny).

**Type material.** *Agrotis deprivata* Walker. Holotype: ♂ [Chile] Valdivia (BMNH). Image examined. *Lycophotia atrifascia* Hampson. Lectotype ♂ (**herein designated**): Argentina, Mendoza [sic], Bain, 1904-211/ *Lycophotia atrifascia* type ♂ Hmps/ ([gen. praep.] 1947-200 [Tams]), in BMNH. Paralectotypes: 2♀, Argentina, Mendoza [sic], Bain, 1904-211; 1♀, idem/*Lycophotia atrifascia* type F Hmps; in BMNH. Lectotype image examined. *Lycophotia baeckstroemi* Aurivillius *et al.* Holotype: ♂ Masatierra January (RN). Image examined.

**Diagnosis.** *Feltia deprivata* differs from other South American species of *Feltia* by the following combination of characters: 1) forewings with transversal lines generally undifferentiated, when present, not strongly marked; 2) discal cell black, being the most conspicuous spot on the forewing; 3) in male genitalia valve with characteristic

form, with basal fourth horizontal, then strongly curved posteriorly; 4) clavus club-shaped,  $8 \times$  as long as wide; 5) vesica without cornutus; 6) in female genitalia appendix bursae as long as anterior apophysis; and 7) antrum present, sclerotized,  $1/4 \times$  as long as ductus bursae.

**Redescription.** *Male* (Fig. 1). Forewing length 13.8–18.1 mm. Head. Palpus dark laterally and pale brown ventrally, segments with lamellar scales, first and second segments with ventral long and thin scales and with lateral wide and short scales, third segment only with wide and short lamellar scales; frons central projection with circular raised edge, surface smooth, projected anteriorly into a point of variable size. Antenna biserrate, doubly bifasciculate, widest at  $1/5$  its length, gradually tapering to apex, with apical  $1/2$  filiform, widest segment  $1.6 \times$  as wide as central shaft, anterior process as wide as posterior process. Thorax. Dorsally concolor with forewing ground color, ventrally light brown (even on dark specimens). Patagium and tegulum concolor with dorsal part of thorax, without differentiable lines. Forewing ground color from light grayish brown to dark grayish brown; subcostal band undifferentiated, on few specimens differentiated, lighter than ground color; transversal lines generally undifferentiated, when present, not strongly marked; basal line undifferentiated or blackish, double, from costa to CuA vein; antemedial line undifferentiated or blackish, double; claviform spot undifferentiated; orbicular and reniform spots undifferentiated or slightly lighter than forewing ground color; discal cell black; medial line undifferentiated; postmedial line undifferentiated or blackish, double, concave between veins, in some specimens as double darkish dots on veins; few specimens with one or two dark streaks between reniform spot and postmedial line, between M1–M2–M3 veins; subterminal line undifferentiated; terminal line a series of darkish lunulae between veins; fringe concolor with ground color, with whitish shine. Hind wing and fringe iridescent. Abdomen. Concolor with ventral part of thorax; sternum 8 sclerotized, subrectangular, with a wide oval almost membranous area located anteriorly, lateral projections of posterior margin reaching pleura but not tergum; tergum 8 sclerotized, longitudinally subrectangular, wide posteriorly and gradually narrowed anteriorly, anterior third slightly sclerotized. *Female* (Fig. 2). Differs from male as follow: forewing length: 13.9–18.6 mm; antenna filiform. Generally darker than males, but with specimens as light as males.



**FIGURES 1–2.** *Feltia deprivata* variation of color pattern in adults. 1, male. 2, female. Scale bars = 10 mm.

**Male genitalia.** (Figs 4–7). Uncus curved basally and widened on apical  $1/3$ , apex rounded, with long hair-like setae dorsally, tapering to apex, apical  $2/3$  with ventral tick spine-like setae. Tegumen without “shoulders”, anterior  $1/3$  strongly convex. Anal tube with two ventrolateral sclerotized bands. Transtilla sclerotized as two thin bands, widened apically, basally fused to valve and apically free, not joined together (Fig. 6). Juxta half-moon shaped, posterior margin indented, anterior margin projected into a point (Fig. 7). Clavus strongly sclerotized, cylindrical, club-shaped,  $8 \times$  as long as wide, with scattered long setae on apex. Valve subrectangular, basal  $1/4$  horizontal, then

strongly curved posteriorly, basal 1/2 narrow, then widened to  $1.5 \times$  its basal width, dorsal margin convex after costa apex and posterior margin slightly concave; costa extended along valve basal 1/4, with subquadrate apical pouch; cucullus apex strongly projected dorsally; saccus sclerotized, membranous close to clasper, with anterior margin differentiated and posterior margin undifferentiated and dorsally limited by clasper plate; ampulla inwards curved,  $1/4 \times$  as long as valve, basal 1/4 expanded, then narrowed to 1/2 its widest diameter, laying along a groove on valve; digitus as a sclerotized ventral area of valve groove, slightly projected apically; editum absent; saccus hemispherical, ventrally projected as a small spine, dorsal notch present. Aedeagus (Figs 8–9) fully sclerotized, projected onto base of vesica as follows: a dorsal strip with posterior 1/2 projected ventrolaterally through right margin; a thin right ventrolateral strip, raised between posterior 1/2 of the other strips; and a third strip close to latter, ventral, with an apical pouch close to right projection; vesica  $3 \times$  as long as aedeagus, with one basal tight loop, followed by a postbasal spin; diverticula, basal spined band, and cornuti absent; vesica conserving same diameter along its length.



**FIGURE 3.** *Pseudoleucania bilitura* Holotype, male (Muséum National d'Histoire Naturelle, Paris, inventory number: MNHN EL n° 2016). Scale bars = 10 mm.

**Female genitalia.** (Figs 10–11). Papillae anal slightly sclerotized, laterally as long as wide, with hair-like setae; posterior apophysis  $3 \times$  as long as anterior apophysis; antrum present, sclerotized,  $0.25 \times$  as long as ductus bursae; ductus bursae  $1.5 \times$  as long as posterior apophysis, membranous, with postbasal and dorsal, small diverticulum; corpus bursae  $1.5 \times$  as long as posterior apophysis, signum absent, apex globose; appendix bursae as long as corpus bursae, strongly widened before half, then narrowed, apex rounded; ductus seminalis originating on appendix bursae apex.

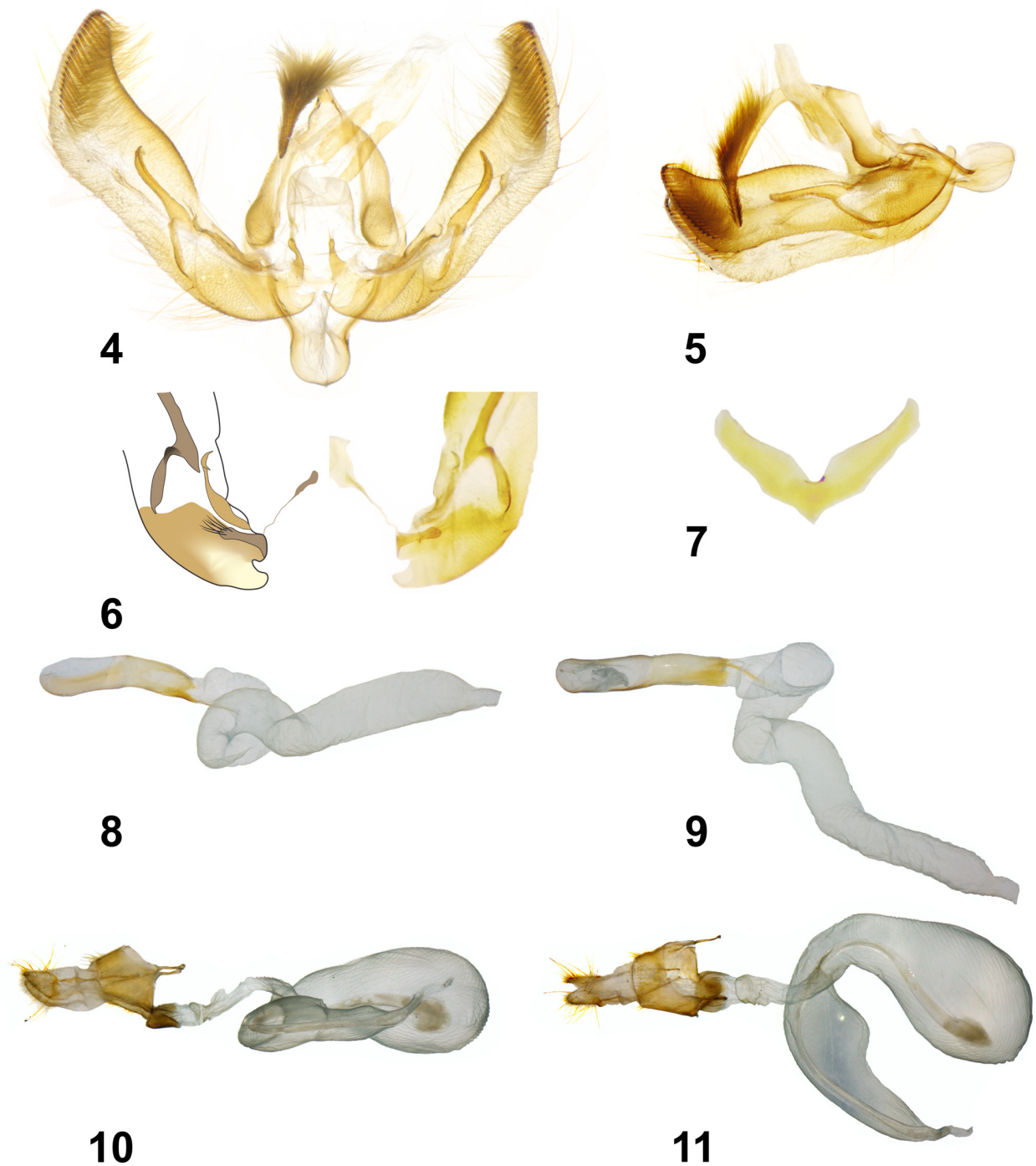
**Distribution.** This species is widely distributed in South America: Ecuador, Peru, Argentina, and Chile. In Argentina, from the northern province of Salta to the southern province of Chubut, and in Chile from Arica y Paríacota to Ríos regions, including Juan Fernández islands (Figs 12–13).

**Biology.** Angulo & Weigert (1975) described the egg, last instar larva, and pupa, giving also identification keys of those stages. Ripa (1979a, b) provided flight curve and oviposition preferences. Artigas (1972) and Parra *et al.* (2014) provided flight curve for South Chile and Carrillo *et al.* (1988) for Central Chile. Baudino (2004) presented a temporal distribution for Central Argentina. Artigas (1994) and Molinari (1942) described some general aspects of its biology in Chile and Argentina, respectively.

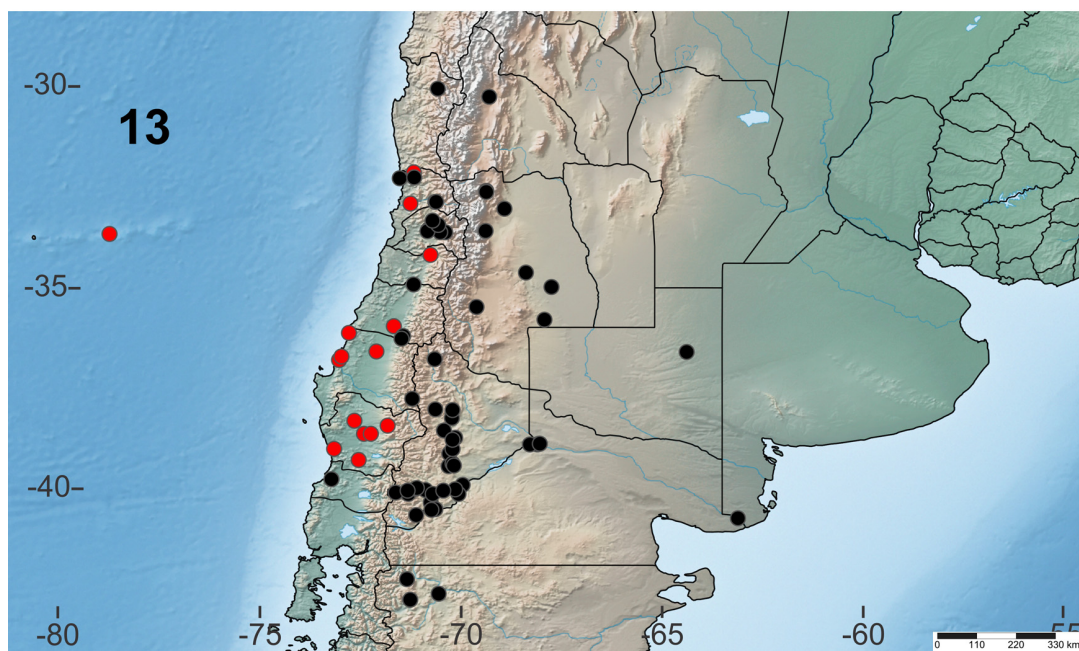
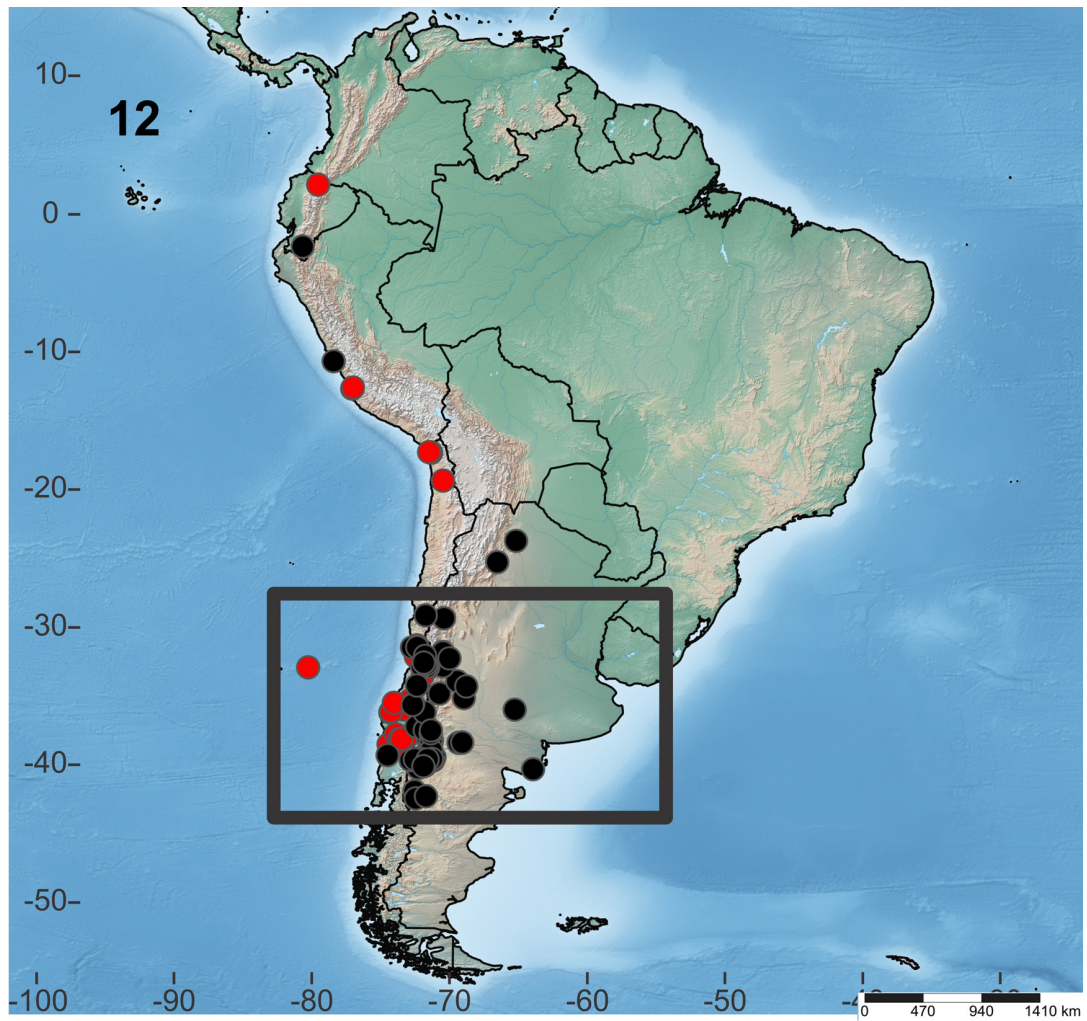
**Parasitoidism.** *Glyptapanteles bourqini* (Blanchard) (Whitfield *et al.* 2002) and *Meteorus* sp. (Valencia & Valdivia 1973) (Hymenoptera. Braconidae); *Punaclista fidelis* Reinhard, *Linnaemya comta* (Fallen), and “*Gonia pallens* (Wiedemann)” (Diptera. Tachinidae) (Valencia & Valdivia 1973). These authors cited “*Gonia pallens* (Wiedemann)” as belonging to the Tachinidae family, yet this species seems an incorrect identification, as it actually belongs to the genus *Copestylum* Macquart within the family Syrphidae (Diptera).

**Hosts.** Molinari (1942), Artigas (1972, 1994), Koch & Waterhouse (2000), Pastrana (2004), León (2005), and Baudino & Villarreal (2007) cited numerous hosts for this species. We present below a summary list of hosts cited on those works: apple (*Malus pumila* Miller), artichoke (*Cynara scolymus* L.), asparagus (*Asparagus officinalis* L.), beet (*Beta vulgaris* L.), beetroot (*Beta vulgaris* subsp. *vulgaris* L.), cabbage (*Brassica oleracea* var. *capitata*

L.), canola (*Brassica napus* L.), carrot (*Daucus carota* L.), cauliflower (*Brassica oleracea* var. *botrytis* L.), clover (*Trifolium* spp.), common bean (*Phaseolus vulgaris* L.), corn (*Zea mays* L.), cotton (*Gossypium herbaceum* L.), field marigold (*Calendula arvensis* (Vaill.) L.), flax (*Linum usitatissimum* L.), insigne pine (*Pinus radiata* D. Don), lettuce (*Lactuca sativa* L.), Lucerne (*Medicago sativa* L.), melon (*Cucumis melo* L.), onion (*Allium cepa* L.), pepper (*Capsicum annum* L.), potato (*Solanum tuberosum* L.) either on tubercle or leaves, silverbeet (*Beta vulgaris* var. *cicla* L.), spinach (*Spinacia oleracea* L.), strawberry (*Fragaria ananassa* Duchesne), "sweet cucumber" (*Solanum muricatum* Ait.), tobacco (*Nicotiana tabacum* L.), tomato (*Lycopersicon esculentum* L.), watermelon (*Citrullus lanatus* (Th.)), wild strawberry (*Fragaria vesca* L.), fruit plants in nurseries and numerous forage and weeds.



**FIGURES 4–11.** Genital morphology of *F. deprivata*. 4, male genitalia (ventral view, aedeagus omitted). 5, male genitalia (lateral view, aedeagus omitted). 6, median area of male genitalia (ventral view, vinculum and tegumen omitted), with detail on transtilla. 7, juxta (ventral view). 8, aedeagus (lateral view). 9, aedeagus (dorsal view). 10, female genitalia (lateral view). 11, female genitalia (dorsal view).



**FIGURES 12–13.** Distribution map of *F. derivata*. 12, distribution. 13, enlargement of squared area on 11. Black dots = data from material revised, red dots = data from bibliographical resources.

**TABLE 1.** Works dealing with *F. deprivata*, but using incorrect identifications.

*Note:* (\*) indicates that the work states working with *P. bilitura* and do not present photos or drawings, yet, either the diagnosis or information provided indicate that they were working with *F. deprivata*, or these works deals with pests in Southern South America, thus it is very likely that they were working with *F. deprivata*, not with *P. bilitura*.

Citation	Remark
Angulo 1978: 14, 16 (*)	Some characters of larva and pupa.
Angulo 1994: 56, 60–61, figs 1, 2	Female genitalia.
Angulo & Olivares 2001: 58 (*)	Key for pupae.
Angulo & Olivares 2002: 57 (*)	Noctuids at the Museum of the Universidad de Concepción, Chile.
Angulo & Olivares 2005: 131, 135 (*)	Redescription
Angulo & Weigert 1975: 65–67, 98, 103–104, 133, 135, figs 10, 29–30, 44, 55, 64, 83, 90, 108, 117, 132–133, 157, 188	Description of egg, last instar larva, and pupa.
Artigas 1972: 7, 34–36, figs 14–15, 50, 55	Redescription of larva and adult, biology, and flight curve.
Artigas 1994: 560–562, plate 27, fig. 4	Adult and larva diagnosis, life cycle, hosts, and parasitoids.
Baudino 2004: 35, table 1 (*)	Presence and importance in La Pampa, Argentina.
Baudino & Villarreal 2007: 13, 15, 33–37 (*)	Hosts
Butler 1889: 378 (*)	Diagnosis
Carrera-Suárez <i>et al.</i> 2011: 88–89 (*)	Diagnosis and hosts
Carrillo <i>et al.</i> 1988: 37–38 (*)	Flight curve in Valdivia, Chile
Carrillo <i>et al.</i> 2001: 27–31 (*)	Presence in winter in Valdivia, Chile
Forbes 1933: 18, 21, figs 14, 19	Male genitalia, fig. 14 is cited as male genitalia of <i>Agrotis annexa</i> Treitschke but it corresponds to <i>F. deprivata</i> .
Hampson 1903: 290, plate 66, fig. 4	Diagnosis.
Jana-Sáenz 1989: 65, 68, figs 3, 19–20, 24–25	Redescription and key for Chilean <i>Agrotis</i> and <i>Feltia</i> pests.
Koch & Waterhouse 2000: 45, 52, 56, 59, 60, 63, 65, 67, 74, 77, 88, 99, 101, 122, 127, 129, 131, 133, 135, 137, 144, 147, 161, 173, 175, 219, 224–226 (*)	Economic importance in Chile
Köhler 1945: 70, 71, 86–87, figs 2, 6d–d'	Redescription.
León 2005: 20–23, 63, 67–69, 71, figs 9–11, 49–52, 87–91	Redescription with hosts, keys, and cladistic analyses for Chilean <i>Agrotis</i> .
Molinari 1942: 329–330, fig. 276	Adult diagnosis, life cycle, and control.
Olivares & Angulo 1989: 24–25, figs 7–8 (*)	Some larval characters
Parra <i>et al.</i> 1986: 88, 96, 100, figs 19, 72–73	Redescription and key for economic important Lepidoptera of Chile.
Pastrana 2004: 159–160 (*)	Hosts
Ripa 1979a: 139–144 (*)	Flight curve and oviposition preferences
Ripa 1979b: 38–41 (*)	Biology and oviposition.

**Solving a persisting problem.** To our knowledge the first citation of *F. deprivata* as a junior synonymy of *A. bilitura* corresponds to Butler (1882: 128). From his work onwards, *F. deprivata* has been in general confused with *A. bilitura* in several works. In table 1, we list those works dealing with *F. deprivata*, yet treating it as *Agrotis*, *Pseudoleucania*, or *Euxoa bilitura*. We have corrected the identification using photos or drawings published on each work.

In addition to the references listed in table 1, the following works cite *A. bilitura* as a different species from *F. deprivata*, including *A. bilitura* (Walker 1856: 337), *Paranicla bilitura* (Köhler (1961) 1963: 60), and *Pseudoleucania bilitura* (Köhler 1967: 297, fig. 157; Poole 1989: 850). The revision of photographs of the holotype (Fig. 3) and genitalia clearly indicates that the correct identification for this species is *Pseudoleucania bilitura* (Guenée) **stat. rev.** Finally, it is worth to point out that Seitz (1924: 48, fig. 8c) gives a diagnosis for *Euxoa bilitura*, but both diagnosis and the figures corresponds to *Feltia hispidula* (Guenée).

**Material examined.** (230 ♂, 255 ♀). ARGENTINA. Chubut. Epuyen (106), 680m, 1♀ 11-III-1986 (M. Gentili) (IPCN); Escuela La Hoya (132), 900m, 1♂ 19-III-1991 (M. Gentili) (IPCN); Gualjaina (30), 550m, 3♂ 1♀ 19-XII-1981 (M. y P. Gentili) (IPCN); Sierra Cuadrada, 1♀ III-1959 (M. Gentili) (IPCN). La Pampa. Santa Rosa. Univ. Nac. De La Pampa, Campus Universitario, Trampa Luz, 36°33'08.20"S, 64°18'8.24"O, 215m, 3♂ 13-X-2016 (GSB) (UNLPam), 2♂ 4♀ 18-X-2016 (GSB) (UNLPam), 1♂ 1♀ 29-X-2016 (GSB) (UNLPam), 1♂ 31-X-2016 (GSB) (UNLPam), 11♂ 6♀ 23-X-2016 (GSB) (UNLPam), 1♂ 13-X-2016 (GSB) (UNLPam), 8♂ 5♀ 21-X-2016 (GSB) (UNLPam), 1♀ 10-X-2016 (GSB) (UNLPam), 2♂ 23-III-2016 (GSB) (UNLPam), 1♂ 1♀ 24-III-2016 (GSB) (UNLPam). Mendoza. Cátedra de Zoología Agrícola, UNC, 1♀ 1968 (IFML); Malargüe, 1♀ 18-XI-1961 (IFML); Pismata, 5♀ 19-X-1966 (IFML); San Rafael, 5♂ 5♀ I-1963 (IFML), 2♂ 2♀ III-1963 (IFML); General Alvear, 2♀ 20-III-1961 (IFML), Soitue, 3♂ 16-XI-1961 (IFML); Tambillos, 2000m, 5♂ I-1966 (IFML), 4♂ II-1964 (IFML), 8♂ 16♀ (IFML), 1♂ 23-V (IFML); Tunuyán, 1500m, 2♀ I-1963 (IFML); Uspallata, 6♂ (IFML). Neuquen. 1♂ (IFML); San Martín de Los Andes, 640m, 1♂ 7-III-1983 (M. Gentili) (IPCN), 1♂ 10-III-1982 (M. Gentili) (IPCN); Chapelco, Techos, 1400m, 1♀ 25-XI-1981 (M. y P. Gentili) (IPCN); Aeropuerto Chapelco (22), 780m, 2♂ 6-XII-1981 (M. y P. Gentili) (IPCN), 2♂ 12-XII-1981 (M. y P. Gentili) (IPCN), 1♀ 9-XII-1981 (M. y P. Gentili) (IPCN), 1♀ 11-IV-1982 (M. y P. Gentili) (IPCN), 1♂ 7-IV-1982 (M. y P. Gentili) (IPCN), 1♀ 2-XII-1981 (M. y P. Gentili) (IPCN), 1♀ 8-XII-1981 (M. y P. Gentili) (IPCN), 1♀ 1-XII-1981 (M. y P. Gentili) (IPCN), 1♀ 30-XI-1981 (M. y P. Gentili) (IPCN); Aguada Florencio (59), 870m, 3♂ 17-XII-1982 (M. y P. Gentili) (IPCN); Bajada Los Molles, 5♀ 26-XI-1961 (M. Gentili) (IPCN); Bajada Marucho, 1♂ 21-XI-1965 (M. Gentili) (IPCN), (25), 870m, 5♂ 7♀ 27-X-1981 (M. Gentili) (IPCN), 1♂ 24-III-1981 (M. Gentili) (IPCN); Collón Curá, Carro Quebrado, (198), 780m, 6♂ 3♀ 19-III-1996 (M. Gentili) (IPCN), 1♂ 27-XII-1995 (M. Gentili) (IPCN), 3♂ 8♀ 6-IV-1995 (M. Gentili) (IPCN), 1♂ 6-II-1995 (M. Gentili) (IPCN), 2♂ 3♀ 27-XI-1995 (M. Gentili) (IPCN); Collón Curá, Rincón León (48), 650m, 1♀ 15-III-1997 (M. Gentili) (IPCN); Loncopué, Catán Lil, Estancia Santa Isabel, 900m, 1♀ 24-III-1973 (M. Gentili) (IPCN); Collón Curá, 1♂ 18-XII-1959 (M. Gentili) (IPCN); Confluencia Trafal, 1♂ 18-XI-1966 (M. Gentili) (IPCN), (21), 700m, 1♂ 17-X-1981 (M. Gentili) (IPCN); Copahue, 9♀ II-1964 (IFML); Cordón Chapelco (16), 1750m, 1♀ 22-I-1985 (M. y P. Gentili) (IPCN); Covunco (usina), 1♀ 29-X-1962 (M. Gentili) (IPCN), 1♀ 24-XI-1964 (M. Gentili) (IPCN); Cuchillo Curá (109), 900m, 1♂ 7-I-1987 (M. y P. Gentili) (IPCN); Estancia Alicura, 650m, 1♂ 2♀ 20-III-1972 (M. Gentili) (IPCN); Laguna Blanca (26), 1270m, 2♂ 3-III-1984 (M. y P. Gentili) (IPCN), 2♀ 15-II-1993 (M. Gentili) (IPCN), 2♀ 3-III-1984 (M. y P. Gentili) (IPCN); 1♂ 11-XI-1973 (M. Gentili) (IPCN); Loncopué, 4♂ 1♀ 14-XI-1959 (M. Gentili) (IPCN); Marucho, Colorada (124), 900m, 2♂ 1♀ 11-III-1989 (M. y P. Gentili) (IPCN); Neuquén (Capital), 2♀ 29-IX-1962 (M. Gentili) (IPCN); Pampa Puttkamer (125), 975m, 2♂ 4♀ 5-XII-1988 (M. y P. Gentili) (IPCN), 1♀ 2-I-1989 (M. y P. Gentili) (IPCN); Piedra del Águila (130), 730m, 4♂ 22-XI-1990 (M. y P. Gentili) (IPCN), 4♂ 15-II-1991 (M. y P. Gentili) (IPCN), (131), 525m, 1♂ 22-XI-1990 (M. y P. Gentili) (IPCN), 1♂ 7-II-1972 (M. Gentili) (IPCN), 3♂ 2-XII-1991 (M. y P. Gentili) (IPCN), 1♀ 3-I-1992 (M. Gentili) (IPCN), 525m, 1♂ 2♀ 5-XI-1966 (M. Gentili) (IPCN); Piedra del Águila, Dique (132), 640m, 7♂ 8♀ 8-XI-1991 (M. y P. Gentili) (IPCN), 2♀ 2-XII-1991 (M. y P. Gentili) (IPCN), 2♂ 2♀ 7-II-1992 (M. Gentili) (IPCN), (130), 730m, 11♀ 22-XI-1990 (M. y P. Gentili) (IPCN), 1♂ 15-II-1991 (M. y P. Gentili) (IPCN); Pilmatue, 1♂ 25-XI-1964 (M. Gentili) (IPCN); Pucará, 1♀ 15-III-1952 (IFML); Quilquihue (23), 750m, 1♂ 1♀ 21-III-1983 (M. y P. Gentili) (IPCN), 1♂ 1♀ 23-IV-1983 (M. y P. Gentili) (IPCN), 1♀ 6-XII-1963 (M. Gentili) (IPCN), 3♀ 7-XII-1980 (M. Gentili) (IPCN), 1♂ 28-III-1981 (M. Gentili) (IPCN); Río Collón Curá (48), 650m, 1♂ 1♀ 26-XI-1987 (M. y P. Gentili) (IPCN), 2♂ 3♀ 15-XII-1993 (M. Gentili) (IPCN), 6♂ 3♀ 29-XII-1994 (M. Gentili) (IPCN), 3♂ 9-XI-1994 (M. Gentili) (IPCN); San Martín de Los Andes, 1♂ 3-XII-1959 (M. Gentili) (IPCN), 1♂ 20-XII-1962 (M. Gentili) (IPCN), 1♀ 28-II-1960 (M. Gentili) (IPCN), 2♂ 1♀ 12-III-1963 (M. Gentili) (IPCN), 1♀ 1-III-1962 (M. Gentili) (IPCN), Arrayán, 950m, 1♀ 31-X-1980 (M. Gentili) (IPCN), Trurán Kurá (92), 900, 1♂ 7-IV-1997 (M. Gentili) (IPCN), (93), 1000m, 1♀ 22-III-1990 (M. y P. Gentili) (IPCN); Sañicó, 950m, 1♀ 13-III-1972 (M. Gentili) (IPCN), 900m, 1♀ 14-III-1972 (M. Gentili) (IPCN); Tipiliuque, 1♀ 6-XII-1960 (M. Gentili) (IPCN); Varvalco, 1200m, 1♀ 12-XI-1968 (M. Gentili) (IPCN); Zapala, Los Catutos, 6♀ XII-1961 (M. Gentili) (IPCN), 1♂ 1♀ 20-III-1965 (M. Gentili) (IPCN), 1♂ 1♀ 11-III-1964 (M. Gentili) (IPCN), 1♂ 1♀ 25-XI-1961 (M. Gentili) (IPCN), 1♂ 4♀ 12-III-1962 (M. Gentili) (IPCN), 1080m, 1♀ 17-II-1968 (M. Gentili) (IPCN), 1♂ 19-VI-1967 (M. Gentili) (IPCN). Río Negro. 1♂ 31-IV-1952 (IFML), 1♀ 5-V-1952 (IFML); Cipolletti, 1♂ 2♀ 23-XI-1965 (M. Gentili) (IPCN), El Cuy, 1♀ XII-1933 (IFML); Paso Flores, 575m, 1♀ 23-XII-1967 (M. Gentili) (IPCN), (105), 570m, 2♂ 1♀ 23-XI-1986 (M. y P. Gentili) (IPCN), Puesto (117), 600m, 3♂ 3♀ 12-XI-1987 (M. y P. Gentili) (IPCN); Viedma, 1♀ 12-XI-1965 (IPCN), 4♀ XI-1968 (IFML). Salta. Anta, Barrialito, 1♂ 22-XII-1955



(IFML). San Juan. Tudcun, 12♀ 20-III-1960 (IFML). Tucumán. San Pedro de Colalao, 2♂ XII-1954 (IFML). CHILE. 12km NW Curico, Teno, 1♂ 12-I-1982 (USNM); Aconcagua, Los Molles, ca. 10km S Pichidangu, 1♀ 15-XI-1981 (USNM); Aconahua 67, Los Andes, Curimon, 700m, 1♀ 28-III-1979 (Misión Científica Danesa) (IPCN); Coquimbo, Ribadavia, 1♂ 16-V-1953 (CNC); Curico, 1km N Curico, 9♂ 29-XI-1982 (USNM); Linares, Puente Malcho, 600 meters near Longavi River, 8♀ 13-I-1979 (USNM); Linares, Tranque de Bullileo, 800m, 36°17'45.97"S 71°24'41.31"W, 3♂ 3♀ 10-I-1979 (USNM); Petorca, Valparaiso (V), 30 km N La Ligua, 5 km S Las Palmas, 800m, 1♀ 22-I-2001 (HNHM); Santiago, Guayacán, 16♂ 8♀ X-1952 (CNC), La Granja, 2♂ 2♀ 28-XII-1982 (USNM), La Obra, 1♀ X-1952 (CNC), Los Maquis, 1♀ (CNC); Padre Hurtado, 1♀ 26-XI-1982 (USNM); Portezuelo, 7km N Santiago, 4♂ 4♀ 22-X-1981 (USNM); Valdivia, Valdivia, 4♂ 4♀ 22-II-1979 (USNM). ECUADOR. (Equateur) Environs de Loja, 1♀ 1886 (USNM), 4♀ 1887 (USNM); Guachayacu, 6♂ Sep-Oct-1926 (HNHM). PERU. Lima, 1♂ 29-VI-1932 (IFML), 2♂ 11-III-1941 (IFML), 3♂ 1-VII-1964 (IFML), 3♂ 19-VII-1964 (IFML).

Bibliographical information. CHILE. I Region, Tarapacá. Pica, 2-XII-1966, (R. González y R. Charlin coll.) (León 2005). IV Region, Coquimbo. El Naranjo, Tilaza, IV-1968 (J. Molina coll.) (León 2005). V Region, Valparaíso. Archipelago Juan Fernández, Robinson Crusoe Island, 25-26-X-2008; Cerro Yunque, 17-XII-2008 (Carrera-Suárez *et al.* 2011); Quillota, La Palma (Parra *et al.* 1986); Los Andes, Aconcagua, IV-1975 (C. Merino coll.) (León 2005). VI Region, Libertador Bernardo O'Higgins. Rancagua (Parra *et al.* 1986). VII Region, Maule. Longavi, 4-XII-1987 (E. Arias coll.) (León 2005). VIII Region, Bío-Bío. Chillán, Concepción, and Penco (more or less from 36° 36' S–72° 07' W to 36° 50' S–73° 03' W) (Artigas 1972); Chillan and Concepción (Parra *et al.* 1986); Ñuble, Cobquecura, 12-29-I-1972 (Ramírez coll.); Chillán, 20-XI- 1958, 16-V-2001, 24-V-2001; Fac. Agronomía Universidad de Concepción, 30-V-2001, 19-VI-2001; Concepción, 29-x-1959, 21-i-1960; Sta. Julia Km. 25, C. Bulnes, 18-x-1981 (León 2005). IX Region, Araucania. Comuna de Curacautín, fundo La Estrella (38° 28' 39" S–71° 49' 09" W); comuna de Loncoche, fundo Catrimaitén (39° 20' 33.50" S–72° 33' 01.15" W); comuna de Toltén, predio El Budi (39° 03' 45" S–73° 10' 10" W); comuna de Traiguén, sector Chufquén (38° 21' 14" S–72° 39' 28" W); comuna de Vilcún, sector General López (38° 41' S–72° 25' W); comuna de Vilcún, fundo El Alambrado (38° 40' 56" S–72° 14' 36" W) (Parra *et al.* 2014). XV Region, Arica. Azapa (Parra *et al.* 1986); Arica 18-IX-1974; Tarapacá, 5-XII-1966 (R. Charlin) (León 2005). Metropolitana Region. Santiago, Rinconada and Maipú (Parra *et al.* 1986); Rinconada, Maipú, 450 m 33° 31' S - 70° 47' 22 W, 26-IV-1966; Rinconada Maipú Santiago, 15-V-1963, 19-IV-1963, 1-V-1963, 10-XI-1965 (León 2005). ECUADOR. Imbabura province (Evans 1988). PERU. Ica. Arrabales, 2-IX-1970, 3-IX-1970, 5-IX-1970, 9-X-1970, 7-IX-1971; Hacienda Chavalina, 19-IX-1979; Hacienda Santa Rita, 10-I-1971; Hacienda Santa Rosa, 9-XII-1970 (Valencia & Valdivia 1973).

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