The Description of Platphalonia magdalenae (Tortricidae, Tortricinae, Euliini, Cochylina) Found Nectaring Diurnally on Centromadia pungens (Asteraceae) in the Central Valley of California Along with a List of Species of Platphalonia

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THE DESCRIPTION OF *PLATPHALONIA MAGDALENAE* (TORTRICIDAE, TORTRICINAE, EULIINI, COCHYLINA) FOUND NECTARING DIURNALLY ON *CENTROMADIA PUNGENS* (ASTERACEAE) IN THE CENTRAL VALLEY OF CALIFORNIA ALONG WITH A LIST OF SPECIES OF *PLATPHALONIA*

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ABSTRACT. *Platphalonia* Razowski, 2011 (Tortricidae, Tortricinae, Euliini, Cochylina) was proposed for *Saphenista mystica* Razowski & Becker, 1983 (type species) and several species previously assigned to *Platphalonidia* Razowski, 1985. However, with the exception of the type species, none of the other purported congeners have been listed. We formally transfer 16 species to *Platphalonia*, resulting in the following new combinations: *P. albertae* (Razowski, 1997), *P. assector* (Razowski, 1967), *P. californica* (Razowski, 1986), *P. campicolana* (Walsingham, 1879), *P. dangi* (Razowski, 1997), *P. decrepita* (Razowski & Becker, 2002), *P. dubia* (Razowski & Becker, 1983). *P. fusifera* (Meyrick, 1912), *P. galbanea* (Meyrick, 1917), *P. lavana* (Busck, 1907), *Platphalonidia luxata* (Razowski & Becker, 1986), *P. mendora* (Clarke, 1968), *P. ochraceana* (Razowski, 1967), *P. paranae* (Razowski & Becker, 1983), *P. plicana* (Walsingham, 1884), and *P. sublimis* (Meyrick, 1917). We describe *Platphalonia magdalenae* Metzler & Albu, **new species**, from a series of specimens that were discovered nectaring on *Centromedia* (=*Hemizonia*) *pungens* (Hook. & Arn.) Greene ssp. *pungens* (Asteraceae) during the day-time on 2 May 2011 in Tulare County, in the Central Valley of California. Adults and male and female genitalia of *P. magdalenae* are illustrated.

Additional key words: *Platphalonia magdalenae*, Tulare County, California native plants, *Platphalonidia*, Phalonidia

Based on the type species of *Platphalonidia* Razowski, 1985 (i.e., *Phalonia felix* Walsingham, 1895), Razowski (2011) synonymized that genus with *Phalonidia* Le Marchand, 1933 (Tortricidae, Tortricinae, Euliini, Cochylina). He concomitantly proposed *Platphalonia* Razowski, 2011 for *Saphenista mystica* Razowski & Becker, 1983 (type species) and the remaining species of *Platphalonidia* (i.e., all species formerly included in *Platphalonida*, except its type species). In his description of *Platphalonia*, Razowski stated that 29 unnamed species are transferrable to *Platphalonia*, but he did not list them

In 2011 Valeriu Albu collected a series of a previously unknown species of Cochylina found nectaring during the day in the Central Valley of California. Razowski (in litt. 2012) concurred that the new species from California's Central Valley belonged in the genus *Platphalonia*. Because there was no list of North American species of *Platphalonia*, there was no way to properly diagnose the new taxon.

The purposes of this paper are to transfer 16 species to *Platphalonia* and to describe a new species of *Platphalonia* from California's Central Valley.

MATERIALS AND METHODS

The classification Euliini, Cochylina comes from Regier et al. (2012). Józef Razowski from the Polish Academy of Sciences, Krakow, (in litt., 2012) provided a list of species that he referred to *Platphalonia*. We carefully compared published illustrations of male and female genitalia of species from the list to published illustrations of the type species, *Platphalonia mystica*. We examined the male and female genitalia of all other species listed in *Platphalonidia* in Brown (2005), and we made similar examinations of all species described in *Platphalonidia* subsequent to Brown (2005).

Valeriu Albu collected a series of 21 specimens of an undescribed species of *Platphalonia* nectaring on *Centromadia* (=*Hemizonia*) *pungens* (Hook & Arn.) Greene ssp. *pungens* (common spikeweed) (Asteraceae) during the day in Tulare County, California. The moths were common on the flower blossoms. He sent the specimens to Eric Metzler for study.

Identification was made by comparing the specimens to published illustrations of adults and genitalia. Photographs of adults were sent to Kevin Tuck (The Natural History Museum, London) who opined that the Tulare County species is different from *P. plicana* (Walsingham, 1884), to which the male genitalia structures bear some resemblance. Photographs of the adults and male genitalia were sent to Józef Razowski who confirmed that the species was undescribed.

Genitalia were dissected following procedures outlined in Hardwick (1950), Lafontaine (2004), and

Pogue (2002). Abdomens were removed from the moths, wetted in 95% ethanol, and soaked in 10% KOH for 1 hour at 50°C. Genitalia were dissected in water, dehydrated in 100% ethanol, cleared in oil of cloves, rinsed in xylene, and slide mounted in Canada balsam. The genitalia were stained with Chlorozol Black in water and/or Safranin O in 95% ethanol. Many authorities (e.g. Hardwick 1950, Lafontaine 2004, Pogue 2002) presented techniques for dissection and examination of genitalia. Not all authors agree on each technique and each author offered unique ideas. Over time Metzler assembled a collection of techniques from the several sources, not all of which can be found in any one source, yet when taken together the techniques provide an overview that makes the task of dissection and slide preparation easier for Metzler to accomplish.

Terminology for elements of wing pattern follows Horak (1991). Terminology for morphology and genital structures follows Horak (1991) and Razowski (1970, 2008). Forewing length was measured to the nearest 0.1 mm, from the base to the apex excluding fringe, using a stereo-microscope with reticle.

Specimens cited in this paper are deposited in the following collections:

VA Valeriu Albu, Friant, CA
MSU Albert J. Cook Arthropod Research Collection, Department of Entomology, Michigan State University, East Lansing, MI
UCB University of California Berkeley, Berkeley, CA
USNM US National Museum of Natural History (Smithsonian Institution), Washington, DC

RESULTS

We transfer 16 species to *Platphalonia*.

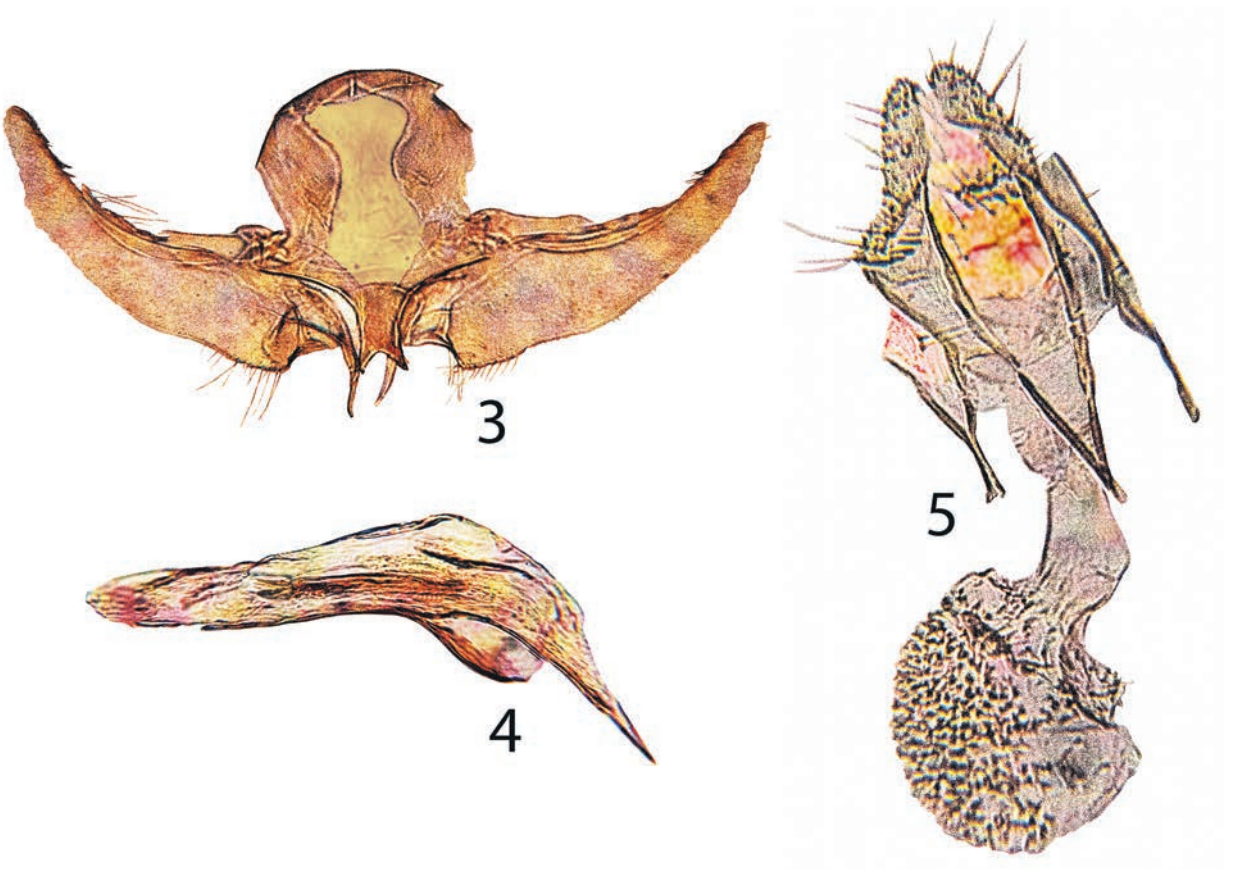
Platphalonia Razowski, 2011

Type species: *Saphenista mystica* Razowski & Becker, 1983 by original designation.
Platphalonia albertae (Razowski, 1997) [*Platphalonidia*] comb. n.
Platphalonia assector (Razowski, 1967) [*Cochylis*] comb. n.
Platphalonia californica (Razowski, 1986) [*Platphalonidia*] comb. n.
Platphalonia campicolana (Walsingham, 1879) [*Cochylis*] comb. n.
Platphalonia dangi (Razowski, 1997) [*Platphalonidia*] comb. n.
Platphalonia decrepita (Razowski & Becker, 2002) [*Platphalonidia*] comb. n.
Platphalonia dubia (Razowski & Becker, 1983) [*Saphenista*] comb. n.
Platphalonia fusifera (Meyrick, 1912) [*Phtheochroa*] comb. n.
Platphalonia galbanea (Merick, 1917) [*Phalonia*] comb. n.
Platphalonia lavana (Busck, 1907) [*Phalonia*] comb. n.
Platphalonia luxata (Razowski & Becker, 1986) [*Platphalonidia*] comb. n.
Platphalonia mendora (Clarke, 1968) [*Cochylis*] comb. n.
Platphalonia ochraceana (Razowski, 1967) [*Cochylis*] comb. n.
Platphalonia paranae (Razowski & Becker, 1983) [*Saphenista*] comb. n.
Platphalonia plicana (Walsingham, 1884) [*Conchylis*] comb. n.
Platphalonia sublimis (Meyrick, 1917) [*Phalonia*] comb. n.

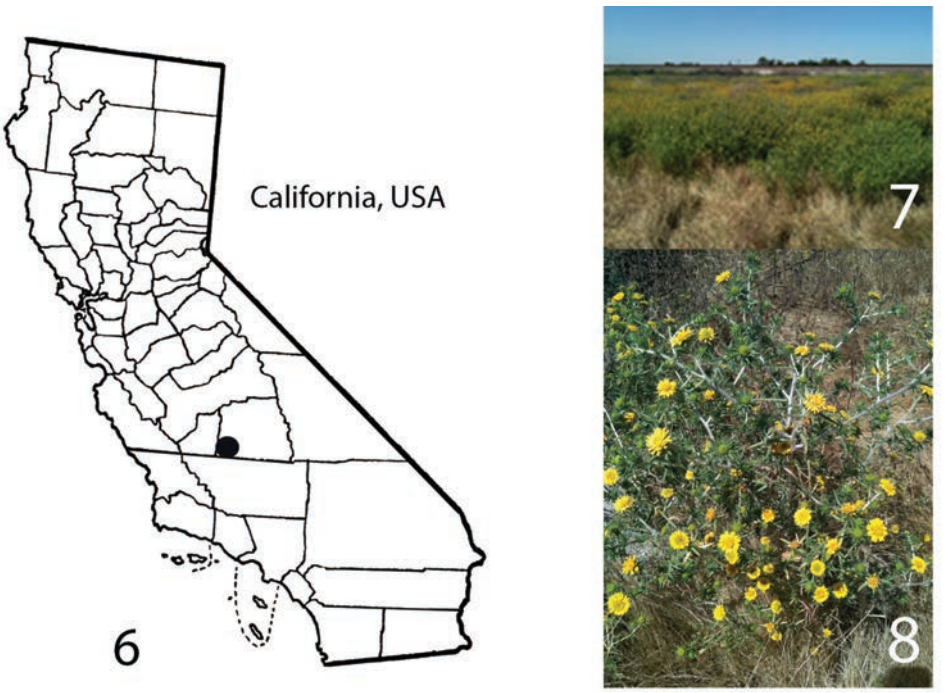
Platphalonia magdalenae Metzler & Albu, **new species**

(Figs 1–6)

Diagnosis. *Platphalonia magdalenae* is a small tan moth with a pale reddish-brown transverse fascia. The diagnostic features are the tan ground color, the slightly reflective nature of the fore wing scales, the curved reddish-brown postmedial fascia that extends from the inner margin to the costa, and the brownish-gray hind wings. As is typical with many species of *Cochylina*, the generic assignment of *P. magdalenae* cannot be determined from the external appearance of the adult moth. Superficially, *P. magdalenae* might be confused with several species, in several genera, of *Cochylina*. An examination of the male genitalia is required for positive assignment to a genus. Within the genus *Platphalonia*, the only other described species from California is *P. campicolana* (Walsingham, 1879). The fore wing of *P. campicolana* is cream-white, the reddish fascia extends from the inner margin to mid-wing, the postmedian fascia does not reach the costa, and the fringe is black. The fore wing of *P. magdalenae* is tan and the fringe is not black. *Platphalonia albertae, P. californica, P. dangi, P. lavana, P. luxata, P. parvimaculana*, and *P. plicana*, also occur in the Nearctic Ecozone. The width of the mesal process of the transtilla narrows subapically in *P. albertae*; whereas in *P. magdalenae* it is not narrowed subapically. The acutely pointed apices of the bifurcate terminus of the mesal process of the transtilla are distinctly pointed laterally in *P. californica*; whereas in *P. magdalenae* are not pointed laterally. The fore wing of *P. dangi* is dirty-white with an oblique dark colored fascia extending from just before the apex to outer margin 2/3 from the tornus; the fore wing of *P. magdalenae* is tan without an oblique dark fascia. The ground color of the fore wing of *P. lavana* is dirty-white, the fore wing has an excurved subterminal gray fascia extending from just



FIGS. 1–5. *Platphalonia* adults and genitalia. **1,** *P. magdalenae* male holotype. **2,** *P. magdalenae* female paratype. **3,** *P. magdalenae* male paratype genitalia. **4,** *P. magdalenae* male paratype aedeagus. **5,** *P. magdalenae* female paratype genitalia.



FIGS. 6–8. Distribution map and habitat of *Platphalonia magdalenae*. **6,** Distribution map for *P. magdalenae*. **7,** Habitat picture of type locality of *P. magdalenae*. **8,** *Centromadia pungens* ssp. *pungens*.

before the apex to the tornus, and the fringe is black; in contrast, the ground color of the fore wing of *P. magdalenae* is tan without a subterminal fascia, and the fringe is concolorous. The ductus bursae of *P. luxata* is ringed with sclerotization at the junction with the corpus bursae; the ductus bursae of *P. magdalenae* is encircled with linear rugosities at the junction with the corpus bursae. The ground color of the fore wing of *P. plicana* is dirty-white, the subterminal area contains a patch of contrasting dark-brown scales, the terminal line is black, the fringe is contrastingly dark brown, and the hind wing is gray; the fore wing of *P. magdalenae* is tan, there is no patch of dark-brown scales in the subterminal area, the terminal line and fringe are not contrastingly dark, and the hind wing is dark fuscous.

Description. Adult male (Fig. 1). *Head*: Front smooth, tan, with scattered tan-tipped orange scales; vertex pale-tan, with scattered dark-tan scales, smooth, posterior margin with scales erect. Labial palpus porrect, segments 1 and 2 mixed with tan and chamois-colored scales, lateral and mesal surfaces with scales appressed, dorsal and ventral surfaces weakly tufted, segment 3 directed anteriorly, with light tan, appressed scales. Antenna with dorsal surface scaled, tan, ventral surface naked with setae numerous, length = width of antennal segment. *Thorax*: Dorsum tan and chamois-color, smoothly scaled; underside with scales appressed, shining white and silver. Fore-leg femur with scales appressed, dorsal surface tan, with scattered brown and orange scales, ventral surface dirty-white, scales of tibia, femur and tarsi appressed, dorsal surface tan, scattered brown scales, ventral surface dirty-white. Mid-leg scales appressed, femur dirty-white, tibia, femur, and tarsi dorsal surface tan, scattered light-brown scales, ventral surface dirty-white. Hind-leg scales appressed, dirty-white. Forewing length 3.9–5.5 mm, mean 4.7 mm, n = 18. Upper surface of forewing reflective white (appears tan), anterior one half of basal 1/3 narrowly salmon, basal 1/3 of costa dark brown, distal 2/3 of costa tan; posterior one half of basal area chamois color; subbasal fascia angled outward from inner margin, chamois color; postmedial fascia angled outward from inner margin, bent at cell towards costa, pale horn color, at costa mixed with brown and salmon, brown scales at bend; subterminal fascia angled from cell to just before apex, pale horn color, subterminal area below apex with small patch of brown scales; fringe pale horn color mixed with salmon and brown scales; underside inner margin reflective white scales, area over cell brown-tipped reflective white scales, basal one half of costa brown, outer one half salmon; fringe reflective white. Hindwing with tan-gray tipped reflective white scales, base lighter, inner angle darker, fringe concolorous, reflective; underside reflective white, tan-gray tipped scales numerous, inconspicuous; fringe concolorous. *Abdomen*: Dorsum scales appressed, reflective silver-tan; underside scales appressed, mixed tan and pale gray. Genitalia (Fig. 3) with tegumen wide, prominent, apex flattened, suture mesially; uncus absent; socii appressed, membranous, broad, lightly sclerotized apically; transtilla robust, directed ventrally, mesally bent, mesal process drawn out, apex robust, bifurcate, each arm drawn to a blunt point, apex with tiny teeth laterally; juxta broad, elliptical; saccus obscure; valva simple, elongate, curved dorsally, with scattered setae apically, costa sclerotized; saccular region not produced, weakly sclerotized, with scattered setae; phallus (Fig. 4) longer than wide, gradually narrowing apically, bent 30° at 1/3 length; cornuti poorly defined, obscure, lightly sclerotized.

Adult female (Fig. 2). *Head* and *thorax*: Essential as described for male. Forewing length 5.0–5.3 mm, mean 5.1 mm, n = 3. Hindwing with frenulum of one, two, or three bristles, asymmetrical. *Abdomen*: Genitalia (Fig. 5) with papilla analis membranous, narrow, setose; posterior apophysis extending to anterior margin of 8th segment; anterior apophysis divided basally, extending to anterior end of ductus bursae; antrum weakly sclerotized; ductus bursae lightly sclerotized posteriorly, mesally membranous, anteriorly sclerotized, fluted and widening at junction with corpus bursae; corpus bursae short, round, membranous, densely covered with spicules in patches; signa absent.

Holotype. Adult male, pinned with labels as follows: "Legit Val Albu, Tulare Co/California, Rt. 43 @ Allensworth, 2 V 2011"

"HOLOTYPE USNM *Platphalonia magdalenae* Metzler & Albu" [red handwritten label] (USNM).

Paratypes. 20 ♂, 3 ♀: same data as Holotype. Depositories: VA, MSU, UCB, USNM.

Systematics. This new species is placed in the genus *Platphalonia* based on comparison of the female genitalia with the holotype of *Saphenista mystica* Razowski & Becker, 1983, which is the type species of *Platphalonia*. Our analysis was confirmed by Józef Razowski (in litt., 2012).

Etymology. The species is named after Magdalena Albu, who, as the wife of the second author, lovingly and dutifully followed and helped with his entomological excesses. The name is in the genitive case.

Distribution and biology. The diurnal nectaring behavior of adult Cochylina is unusual, and we call attention to it here with the idea that the behavior could be present, and as yet unobserved, in other species of Cochylina.

Platphalonia magdalenae occurs in the Central Valley of California. Its distribution outside Tulare County is unknown. Nothing is known about its life history, however, an association with *Centromadia pungens* ssp. *pungens* is reasonably inferred.

The adults of *P. magdalenae* were collected in early May. The habitat is in the intensively farmed Central Valley, along California State Route 43, in the vicinity of Allensworth, CA at 60 m elevation (Fig. 7). The plant upon which the adults were found, *Centromadia pungens* ssp. *pungens* (Fig. 8), is found in the U.S. from Washington south through Oregon, California, Nevada, and southern Arizona (USDA 2012). The plant is not recorded from Canada, and the Mexican distribution is unknown. The plant's distribution in California (Baldwin et al. 2012) is extensive at lower elevations, from the Sierra Nevada foothills to the coast. It is not recorded from the eastern deserts of the state. In Tulare County it occurs abundantly in disturbed areas, along roads and rail road tracks. It has a long blooming period, from April to September.

Remarks. Some specimens are slightly darker. They have scattered dark-brown scales on the head, the palpi, and an increased number of dark-brown scales on the legs.

DISCUSSION

Our study examined the published illustrations of the genitalia of the 24 species included in *Platphalonidia* (Brown 2005), the list of species provided by Józef Razowski (in litt. 2012), and all species described in the genus *Platphalonidia* subsequent to Brown (2005) We were able to confirm the congeneric status of 16 species which we transferred to *Platphalonia*. We transferred species where the genitalia were in agreement with the type species *Platphalonia mystica*. Razowski (2011) indicated that 29 species are referable to *Platphalonia*. This paper is not a revision of the genus *Platphalonia*, and we do not resolve the correct generic assignments of the remaining 13 species because such an endeavor falls outside the scope of this paper.

The many species of Cochylina, even within a single genus, e.g. *Aethes* Billberg, 1820, often have forewing patterns that are incongruous. Several references (e.g. Horak 1991, Razowski 1970, 2008) illustrate the variety of forewing patterns of Cochylina. We reference Horak (1991) in this paper because her illustration on page 6 has wing pattern elements, sub-basal and postmedial fascia, represented in *P. magdalenae*.

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