

***Hadena ligata* Möschler (Lepidoptera: Noctuidae): distribution and revised taxonomy**

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Abstract

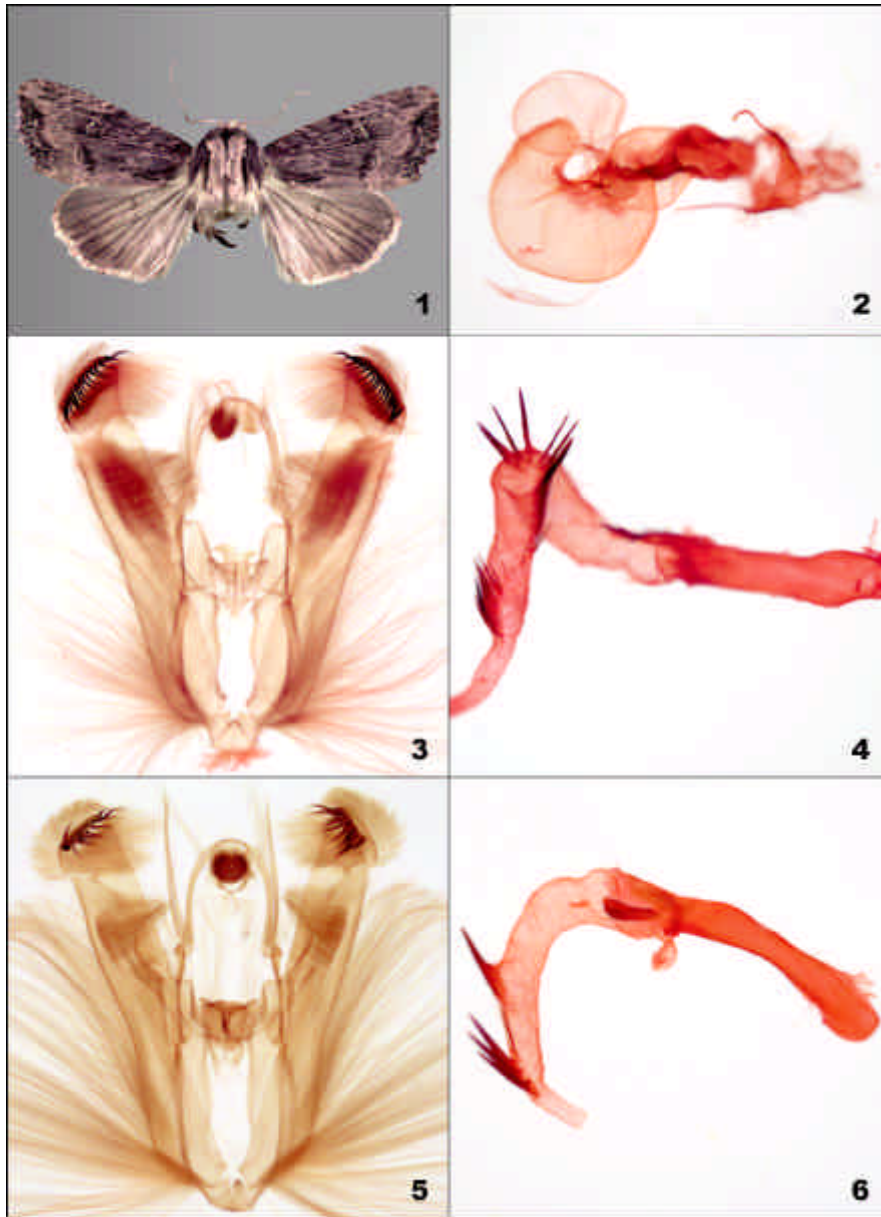
Hadena ligata Möschler, 1891 represents a previously unrecognized species of *Dypterygia* Stephens, 1829. This species was originally described from Puerto Rico and was collected in Florida. The adult habitus and the male and female genitalia are illustrated, and a lectotype is designated. The larvae of *Dypterygia rozmani* Berio, 1974 and *Trachea delicata* (Grote, 1874) are illustrated.

Key words: *Dypterygia*, *Hadena ligata*, Florida, identification, lectotype, new combination, *Rumex*, *Trachea delicata*, oxalic acid, oxalates, Puerto Rico, Lepidoptera, Noctuidae, caterpillar, larva

For many years lepidopterists knew about a species of *Dypterygia* Stephens, 1829 in Florida that was thought to be undescribed (Kimball, 1965). Three other species of *Dypterygia*, *D. patina* (Harvey, 1875), *D. rozmani* Berio, 1974, and *D. punctirena* (Walker, 1857), also occur in Florida; the last was reported only recently by Dickel (1991). An examination of photographs of the types of *Hadena ligata* Möschler, 1891, revealed that the moth is dissimilar to other *Hadena* Schrank, 1802 (tribe Hadenini) and is actually allied to *Dypterygia* (tribe Dypterygini) and conspecific with the previously unidentified Florida species

Dypterygia ligata (Möschler), **new combination**, was described from Puerto Rico. It was based on two female syntypes, both of which are in the Museum für Naturkunde, Humboldt-Universität Berlin. The better specimen of the two, the female with the left antennae lacking (see Fig. 7), is hereby designated the lectotype. The Lectotype is designated to ensure nomenclatural stability in this group of often misplaced species. The moth proves highly variable in size (27-37 mm).

The polyphyletic nature of *Dypterygia* was recognized by Sugi (1954) who described *Dipterygina* for several of the Indonesian species previously included in *Dypterygia*. The remaining species of *Dypterygia* appear divisible into three lineages which might warrant generic status. A review of all the included species and several allied genera will be necessary to determine relationships. *Dypterygia ligata* fits into the lineage which includes *D. ordinarius* (Butler, 1879) and is compared with this very close relative (see Figs. 3 & 4 vs. 5 & 6). A good distinguishing species-level character consists of the differing arrangement of spines on the vesicae (compare Figs. 4 & 6).



FIGURES 1-6. **Fig. 1.** *Dypterygia ligata*, female habitus (expanse 37.0 mm). 7 May 1978, Fuch's Hammock nr. Homestead, Dade Co., Florida, T. Dickel. **Fig. 2.** *Dypterygia ligata*, female genitalia (length 5.0 mm) (gen. diss. McCabe 3466). Same data as Fig. 1. **Fig. 3.** *Dypterygia ligata*, male genitalia (expanse 4.0 mm) – valves (gen. diss. McCabe 3279). 15 January 1999, Key Largo Botanical Preserve, Munroe Co., Florida, T. McCabe. **Fig. 4.** *Dypterygia ligata*, male genitalia – same data as Fig. 3. **Fig. 5.** *Dypterygia ordinarius*, male genitalia – valves (gen. diss. McCabe 3543). 20 July 1986, Mt. St. Benedict, St. George's Co., Trinidad, H. Romack. **Fig. 6.** *Dypterygia ordinarius*, male genitalia – vesica – same data as Fig. 5.

The Nearctic *Dypterygia rozmani* Berio and the Palearctic *D. pinastri* L., 1761 (the type of the genus) are part of a separate lineage that is actually closer to *Trachea* Ochsenheimer, 1816 than either is to *D. ligata*. *Dypterygia rozmani* and *Trachea delicata* (Grote, 1874) have similar geni-

talic structures, particularly the cucullus of the male genitalia: the coronal setae originate on a raised plate that is distinct from that of the marginal setae. Their close, possibly congeneric, relationship was not recognized by the authors of evolutionary arrangements (Hampson, 1908; Forbes, 1954; Franclemont and Todd, 1983). Forbes (1954) treated *Trachea* as an isolated genus with features of the Septidini. According to Forbes, *Trachea* was “A curious type with the appearance, digitus and clasper-type of the first series, the tegumen and vinculum, and larva of the second.” Forbes’ first series included the tribe Septidini, his second series was comprised of tribes such as Apatelini and Stiriini.



FIGURE 7. *Dypterygia ligata*, female lectotype. Puerto Rico.

In the Nearctic fauna, *Dypterygia rozmani* and *Trachea delicata* (Grote) have similar caterpillars (Figs. 8 & 9). I reared both species on *Rumex crispus* [Polygonaceae]. *Rumex* contains oxalic acid and the ingestion of this plant has been known to kill sheep (Panciera *et al.*, 1990). Plants that contain oxalic acid are uncommon hosts for Lepidoptera perhaps because of this toxicity. The Oxalidaceae, with more than 800 species, has such a high titer of oxalic acid that it is a known food-plant for only one species of noctuid, *Galgula partita* Guenée, 1852 (Godfrey, 1981). Oxalates sometimes occur bound in calcium salts, but the free acid is less common, known in *Beta* [Chenopodiaceae], *Oxalis*, and *Rumex* (Gibbs, 1974).



FIGURES 8-9. **Fig. 8.** Larva of *Dypterygia rozmani*. 14 July 1989, reared ex ovo (coded: tlm 89-37) on *Rumex crispus*, Pine Bush, Albany County, New York. **Fig. 9.** Larva of *Trachea delicata*. 10 August 1989, reared ex ovo (coded: tlm 89-34) on *Rumex crispus*, Badlands, Slope County, North Dakota.

Polygonum represents another genus in the Polygonaceae containing high levels of oxalates. In the Palearctic, species of *Dypterygia* and *Trachea*, but not species of *Dipterygina*, were associated with *Polygonum* [Polygonaceae] (Sugi, 1987). In Japan and India *Dipterygina* was associated with *Callicarpa* [Verbenaceae] (Sugi, 1987; Gardner, 1947). Based on the absence of oxalates in

the hosts, combined with the dissimilar genitalic structures (Sugi, 1954), *Dipterygina* appears relatively distant from the remaining *Dypterygia* components. The biology is not known for any of the members of the *D. ordinarius/ligata* lineage.

In Florida, *Dypterygia ligata* was reported from Homestead (September) and Florida City (May) as *Dypterygia* sp. (Kimball, 1965). The male genitalia of a January specimen from the Key Largo Botanical Area and the female genitalia from a May specimen taken near Homestead (Fuch's Hammock) are illustrated (Figs. 3, 4 & 2, respectively).

Acknowledgments Dr. Wolfram Mey, Museum für Naturkunde, Humboldt-Universität Berlin (MNHU), kindly provided the photographs of the type material and affixed the Lectotype label to the designated specimen. I thank Dr. Renate Skinner and the Bureau of Parks for permission to collect on the Key Largo Hammocks Botanical Site (research permit 5-98-60). Mr. Ronald Barber of the New York State Museum assisted with the digital photography. Mr. Terhune Dickel (Research Associate, Florida Collection of Arthropods) and Mr. Howard Romack (Research Associate, New York State Museum) kindly provided specimens.

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