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## Status of *Rhynchopalpus brunellus* in the Hawaiian Islands, With Comments on the Systematics of the Nolinae (Lepidoptera: Noctuidae)

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### *Rhynchopalpus brunellus* Hampson (1893) Resurrected combination, new island record

During a Bishop Museum field trip on 30 September 1989, the species referred to in Hawaiian literature as *Selca brunella* (Hampson 1893) was found at Schofield-Waikane Trail on Schofield Military Reservation, Oahu, at ultraviolet lights at both 370 m and 440 m elevation.

The species was introduced from Kuala Lumpur, Malaysia, and Singapore, for the control of *Melastoma candidum* (previously known as *M. malabathricum*; Almeida in Wagner *et al.* 1990: 910). It was released at Panaewa Forest, Hawaii, in 1965 (*Proc. Hawaii. Entomol. Soc.* 19: 202, 205) and Huleia, Kauai, in 1966 (*Proc. Hawaii. Entomol. Soc.* 19: 376, 378), and is considered to be well established on those islands (*Proc. Hawaii. Entomol. Soc.* 20: 27, 522). This species is considered successful in providing partial control of *Melastoma* (Clausen 1978: 398–99, Julien 1987: 53, Funasaki *et al.* 1988: 147).

Considerable variation among Hawaiian specimens in both size and wing maculation prompted us to verify the identification by comparison of male genitalia against the male syntype from Sri Lanka in The Natural History Museum, London (BMNH arctiid slide 450). The wings and male genitalia are illustrated in Figs. 1 and 2.

The species was described and illustrated as *Rhynchopalpus brunellus* by Hampson (1893: 89, pl. 158, fig. 31), but its taxonomic placement has been problematic. In Hawaiian literature it has been included in Arctiidae or Nolidae. It is currently placed in the subfamily Nolinae of the Noctuidae (Poole 1989). Poole (1989: 693) transferred *brunellus* to *Nola* Leach, but the male genitalia are atypical of this genus. This problem prompted a search for a better generic placement for *brunellus*, via an extensive program of dissection throughout the Nolinae, including the type specimens of type species of genera held at the BMNH and University Museum, Oxford (UMO). The results of these studies will be reported in detail elsewhere. The Nolinae are in great need of a comprehensive revision; we hope these notes will help fill the gap until such a revision can be undertaken.

### Notes on the Generic Classification of Nolinae

In his catalog of the Noctuidae, Poole (1989) retained the accepted synonymy (e.g., in Hampson 1900: 31, 46) for *Nola* and transferred all species under the generic concept of "Roeselia" (*Roeselia* Hübner is an isogenotypic synonym of *Nola*) to *Meganola* except

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those that were themselves type species of genera that had been placed as synonyms with *Roeselia*. These he treated as distinct, usually monobasic, genera. The majority of Nolinae were placed by Poole into 2 large genera: *Nola* Leach and *Meganola* Dyar. These can be diagnosed most reliably on characters of the male abdomen (Franclemont 1960: 53): *Nola* species have divided valvae, the uncus reduced or absent, and the eighth abdominal segment modified with apodemelike structures (see Holloway 1979: fig. 89.4). *Meganola* species have entire valvae, the uncus strong, and the eighth abdominal segment weakly modified if at all. A feature of *Meganola*, absent from *Nola*, is a pair of setose lobes associated with the anal tube (see Holloway 1979: fig. 94.1). Under these characters, *brunellus* should be placed in *Meganola*. However, genitalic and other characters show that the species and generic synonyms grouped under each of these genera in Poole are not monophyletic.

Generic synonyms attributed to *Nola* by Poole that are correctly placed, the type species having the apomorphic features mentioned above, or sharing the same type species, are: *Lira* Billberg, *Chlamifera* Hübner, *Roeselia* Hübner, *Celama* Walker, *Aradrapha* Walker, *Lebena* Walker, *Minnagara* Walker, *Argyrophyes* Grote, and *Epizeuctis* Meyrick. Five new synonyms of *Nola* have been located: *Pisara* Walker, *Necla* Walker, *Automala* Walker, *Neonola* Hampson, and *Idiocyttara* Turner.

Of the other synonyms of *Nola* listed by Poole, several names representing taxa lacking *Nola* features were described earlier than *Meganola* and should therefore be regarded as **revived genera**. The oldest is *Manoba* Walker (1863: 62), type species *implens* Walker. The holotype (UMO) is a female lacking head and abdomen (illustrated by Hampson 1900: pl. 19, fig. 22). A male and female collected by J.D.H. in the Gunung Mulu National Park, Sarawak, in 1978 have been matched with the type and dissected (BMNH noctuid slides 14460, 14568). *Rhynchopalpus* Hampson, **revived genus**, is allied to *Meganola* and *Manoba*. Holloway (1976: 1-2, fig. 727) referred to the type species, *argentalis* Moore, and described the closely related species *harthani* Holloway, which must therefore be transferred to *Rhynchopalpus* as a **new combination**. *Rhynchopalpus* (1893) is an older name than *Meganola* (1898) and resembles the type species of that genus more closely in facies than does *Manoba*. It may therefore have to take precedence over *Meganola* and is, of course, the genus of original description for *brunellus*. Thus *brunellus*, with "*Meganola*" features of male genitalia (valvae undivided), the derived state of the signa (strongly invaginated to form a ridge-, thorn- or bladelike process within the bursa; usually 2, sometimes reduced to 1), trifine hindwing venation, and no larval modifications (see below), belongs to the suite of genera paraphyletic in relation to *Nola* that includes *Manoba*, *Rhynchopalpus*, and *Meganola*. The ultimate placement for *brunellus* must await revision of the subfamily, but we feel the most conservative alternative is to associate *brunellus* with its original genus, *Rhynchopalpus*.

A feature of potential relevance to the higher classification of the group is the tendency in some taxa for the larva to stack its old head capsules in a hornlike structure attached to the thoracic hairs. This feature is usually accompanied by the presence of mats of flocculent white fluff among the verrucae. McFarland (1980) reviewed instances of head capsule stacking by Nolinae in conjunction with a detailed description of the feature in the Australian noline *Uraba lugens* Walker (also illustrated by Campbell 1963: pl. 10, fig. 9; Scott & Scott 1988: 111; Common 1990: fig. 54.8). The head capsule stack is usually found subsequently attached to the outside of the cocoon. Rearing of *brunellus* in



Fig. 1. *Rhynchopalpus brunellus*, wing pattern, Hawaii I (Bishop Museum).

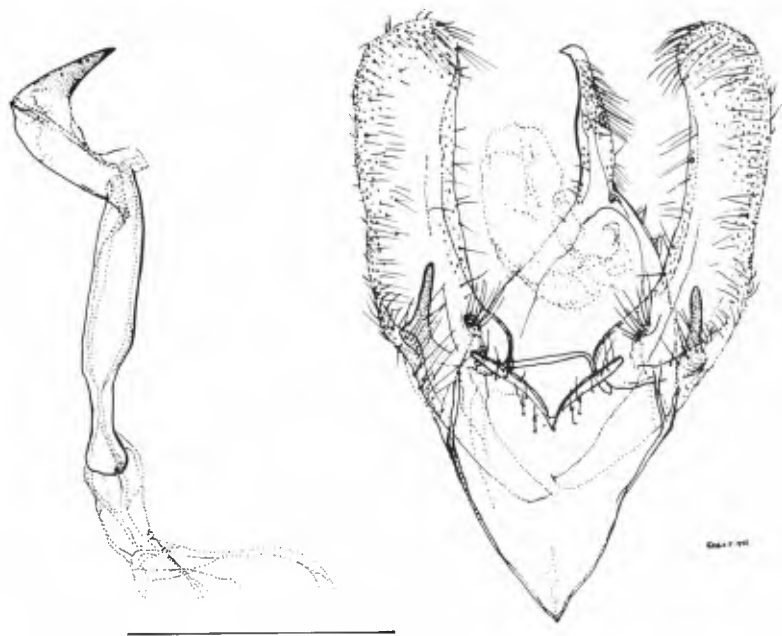


Fig. 2. *Rhynchopalpus brunellus*, male genitalia, Oahu (Bishop Museum). Line is 0.5 mm.

Hawaii has revealed that the larvae lack flocculent downy hairs and do not stack head capsules. Almost all taxa in which head capsule stacking has been recorded have the pleisiomorphic, quadrifine hindwing venation. The trifine exception is the eastern Palaearctic *Evonima mandschuriana* (Oberthür).

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