

THE IDENTITY AND DISTRIBUTION OF SPECIES OF *PSEUDALETIA* (LEPIDOPTERA: NOCTUIDAE) IN AUSTRALIA

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Abstract

The distribution in Australia of the two armyworms *Pseudaletia convecta* (Walk.), of which *P. australis* Franclemont is shown to be a synonym, and *P. separata* (Walk.) has been determined. The genitalia of both sexes are figured and the characters used for distinguishing the two species are discussed.

INTRODUCTION

Following Hampson's (1905) usage, the common armyworm in eastern Australia was for long known as *Cirphis unipuncta* (Haworth), a species considered by Hampson to have a very wide distribution in the Holarctic, Nearctic, Oriental and Australian regions. McDunnough (1937) first pointed out that North American species included by Hampson in *Cirphis* Walker were not congeneric with *C. costalis* Walk. from Tasmania, the type species of *Cirphis*. He therefore suggested that a series of North American species, including *unipuncta*, should be referred to *Leucania* Ochsenheimer. Franclemont (1951) separated the *unipuncta* group of closely related species as a new genus *Pseudaletia*. He showed that the type species, *Noctua unipuncta* Haworth, does not occur in Australia, but has a distribution in North and South America, Hawaii, the Azores, the Canaries, Madeira, and south-western Europe. He recorded two species from Australia, *P. separata* (Walk.) and a new species which he described as *P. australis*. *P. separata* was stated to have a distribution through the eastern Palaearctic and Oriental Regions to Australia, New Zealand and Fiji. *P. australis* was recorded only from New South Wales, Victoria, South Australia and Tasmania. The two species were separated primarily by characters of the male genitalia, and by the broad blackish distal band present on the under side of the hindwing in *P. australis*.

THE VALIDITY OF *Pseudaletia australis*

The only other Australian species included by Hampson (1905) in the synonymy of *unipuncta* was *Leucania? convecta* Walker (1857). The holotype of this species, which Walker stated was a male, was dissected by Dr. Elwood C. Zimmerman on Franclemont's behalf. However, from the genitalia Franclemont (1951) had no hesitation in stating that they did not belong to any species of the *unipuncta* group.

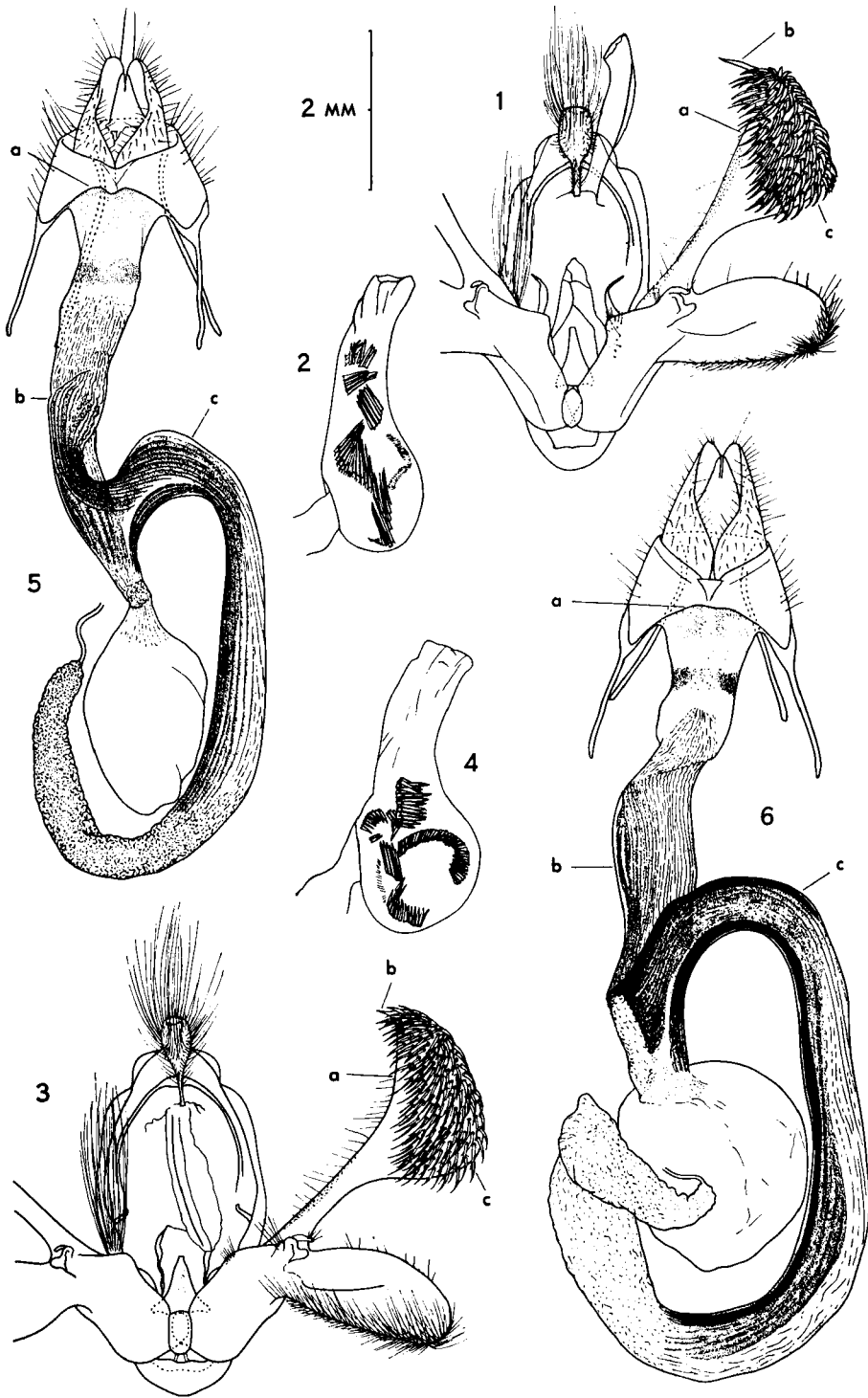
At the British Museum (Natural History), I examined both the pinned holotype specimen of *L. convecta*, labelled "N. S. Wales, Moreton Bay, Diggles, 57-1", and the genitalia mount made by Zimmerman (Genitalia slide Z182). The male genitalia certainly do not belong to a species of *Pseudaletia*, but I at once recognized the pinned insect itself as the Australian species described as *P. australis*. A microscopic examination of the frenulum, which proved to have several bristles, showed that the specimen is in fact a female, not a male as stated by Walker and as the genitalia mount would indicate. It is presumed that at some time the original abdomen became detached and a male abdomen of another species was inadvertently substituted. No traces of glue could be discerned on the posterior margin of the thorax of the type specimen, but this could have been removed with the abdomen for dissection by Zimmerman.

It is concluded therefore that *P. convecta* (Walk.) is the valid name of the common Australian armyworm, and that *P. australis* Franclemont is a synonym of it.

DISTRIBUTION

The distribution in Australia of *P. separata* and *P. convecta* overlaps considerably, and both species appear to be confined to the eastern half of the continent. *P. separata* is now known to occur in eastern coastal Queensland and northern and

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FIGS. 1-6.—(1-4) Posteroventral view of male genitalia and lateral view of aedeagus: (1, 2) *Pseudaletia separata* (Walk.); (3, 4) *P. convecta* (Walk.). (5-6) Ventral view of female genitalia: (5) *P. separata* (Walk.); (6) *P. convecta* (Walk.).

central eastern New South Wales. *P. convecta* is known from Queensland, New South Wales, Victoria, Tasmania and South Australia. It has not been recorded from Western Australia or the Northern Territory.

The above distribution is based on the examination of specimens in several Australian collections. In the summary of the label data of these specimens, the collections are abbreviated as follows: Australian Museum, AM; Australian National Insect Collection, ANIC; British Museum (Natural History), BM; National Museum of Victoria, NM; New South Wales Department of Agriculture, NSWDA; Queensland Museum, QM; Tasmania Department of Agriculture, TDA.

P. separata (7 ♂, 3 ♀).—QUEENSLAND: Brisbane, Apr., May, Nov., C. Wild, 3 ♂ QM. Cardwell, Sept., 1 ♀ ANIC. Lake Barrine, June, 1 ♂ ANIC. Yungaburra, 1 ♂ ANIC. NEW SOUTH WALES: Brunswick Heads, Jan., IFBC, 1 ♂ ANIC. Glen Innes, E. Lowry, 1 ♂ 1 ♀ AM. Manly, May, 1 ♀ AM.

P. convecta (64♂, 77♀).—QUEENSLAND: Aramac, June, 1♀ ANIC. Brisbane, Sept., H. Hacker, C. Wild, 2♂ QM; Diggles, 1♀ (holotype) BM; Jan., Feb., Apr., July, Nov., 4♂, 3♀ ANIC; Cunnamulla, May, C. J. Wild, 1♂ QM; Oct., 1♀ ANIC; Apr., N. Geary, 1♀ AM. Herbert River, Aug., 1♀ AM. Ingham, Mar., May, K. L. Harley, 2♀ ANIC. Jandowae, 1♂ QM. Kuranda, F. P. Dodd, 1♂ QM. Lamington National Park, 3000 ft, Oct., Dec., 2♀ ANIC. Mareeba, Apr., P. Macnicol, 1♀ ANIC. 63 miles N. of Marlborough, May, IFBC, 1♂, 2♀ ANIC. Rockhampton, Sept., IFBC, 1♂ ANIC. Stanthorpe, Mar., W. B. Barnard, 2♀ ANIC. Toowoomba, June, Nov., W. B. Barnard, 3♂ QM. NEW SOUTH WALES: Barrington Tops, 4200 ft, Jan., IFBC, 1♀ ANIC. Colo Vale, May, reared ex. grass, A. Dyce, 1♂, 1♀ ANIC. Jervis Bay, Dec., L. M. Mosse Robinson, 1♂, 1♀ ANIC. Kiama, Mar., L. Cody, 1♀ NSWDA. Lismore, May, reared ex. grass, IFBC, 2♀ ANIC. Maryland, Apr., W. B. Barnard, 1♂ QM. Murwillumbah, Apr., B. Braithwaite, 1♂, 2♀ NSWDA. Narara, Dec., Feb., Mar., Apr., L. M. Mosse Robinson, 12♂, 3♀ ANIC. Sydney, Feb., Mar., Apr., Sept., Oct., Nov., Dec., 12♂, 5♀ AM; 3♀ ANIC. Yass, Nov., K. English, 1♂ ANIC. Yetman, Sept., IFBC, 1♂ ANIC. AUSTRALIAN CAPITAL TERRITORY: Mt. Gingera, 5500 ft, reared ex. grass, May, IFBC & M.S. Upton, 1♀ ANIC. Canberra, Feb., G. A. Currie, 1♀ ANIC; Mar., S. Dee, 1♀ ANIC; Oct., M. Fuller, 1♂, 1♀ ANIC; Nov., W. H. Hughes, 1♀ ANIC; Jan., IFBC, 4♂, 9♀ ANIC. VICTORIA: Ashburton, Jan., Wilson, 2♀ NM. Beaconsfield, Dec., 1♀ NM. Blackrock, Mar., 1♀ NM. Carnegie, Feb., 1♂, 2♀ NM. Castlemaine, Jan., 1♀ NM. Cowes, Feb., 1♀ NM. Gisborne, Jan., Mar., Oct., Nov., Dec., G. Lyell, 11♂, 10♀ NM. Little Desert, Feb., IFBC, 1♀ ANIC. Mt. Buangor, Feb., IFBC, 1♂ ANIC. Murrubit, Mar., 1♀ NM. TASMANIA: 2♀ NM. Cressy, reared ex. oats, Jan., J. W. Evans, TDA. Leith, Jan., reared ex. barley, 1♂, 1♀ TDA. 10 miles E. of Marawah, Feb., IFBC & M.S. Upton, 2♀ ANIC. Sassafras, Feb., 1♀ TDA. Strahan, Dec., 1♀ TDA. 13 miles S. of Westbury, Mar., IFBC & M.S. Upton, 1♂ ANIC.

CHARACTERS USED TO SEPARATE *Pseudaletia separata* AND *Pseudaletia convecta*

As stated by Franclemont (1951), the two species may be readily distinguished by the broad blackish distal band present on the under side of the hindwing in both sexes of *P. convecta*. In *P. separata* this band is replaced by some slight dark suffusion near the margin and a series of very small black marginal spots between the veins.

The genitalia (Figs. 1-6) provide valuable structural characters which separate the two species. In the male, the cucullus of the valva in *P. separata* (Fig. 1a) is smaller than in *P. convecta* (Fig. 3a) and bears a much longer apical spur (Figs. 1b, 3b). The apical spurs in *P. separata* tend to be slightly asymmetrical, that of the left cucullus being rather longer than the other. The corona of the cucullus in *P. separata* (Fig. 1c) consists of stouter spines than in *P. convecta* (Fig. 3c). Other differences will be noticed by comparing the figures.

The female genitalia of *P. separata* (Fig. 5) are smaller than in *P. convecta* (Fig. 6), the lamella antevaginalis is more deeply notched (Figs. 5a, 6a), the ductus bursae is shorter and less heavily sclerotized (Figs. 5b, 6b), and the large arm of the corpus bursae is shorter, with the sclerotization less extensive (Figs. 5c, 6c).

COMMENTS ON PEST STATUS OF *Pseudaletia* IN AUSTRALIA

Little attempt has been made in the Australian literature to distinguish between the economic damage caused by *P. separata* and *P. convecta*, although *P. australis* was stated to be involved in armyworm attacks in New South Wales (Zeck 1954) and Victoria (Common 1954). There seems little doubt that most outbreaks in south-eastern Australia attributed to *Cirphis unipuncta*, *Leucania unipuncta* or *Sideridis unipuncta* have in fact been due to *P. convecta*. For example, Froggatt (1904) reported widespread damage to pastures and crops in the Sydney, Singleton and Tamworth areas of New South Wales during October 1903, and near Bombala, on the Southern Tablelands of New South Wales, during the following January. He also stated that outbreaks had occurred the same season near Melbourne and in Gippsland, Victoria, and on the Darling Downs, Queensland, where field crops had been damaged during October and November, 1903. At intervals since then further accounts of outbreaks or damage to pastures and field crops have been reported in New South Wales (Froggatt 1907, Gurney 1918, Allman 1949), South Australia (Davidson 1932) and in southern Queensland (Smith 1939, Smith and Caldwell 1947, Passlow 1952, May and Passlow 1954). May and Passlow stated that widespread outbreaks of *Leucania unipuncta* occurred in southern Queensland in 1931, 1938, 1948 and 1952.

The name *P. separata* has not appeared in the Australian economic literature, and this may in fact mean that it is never involved in attacks on economic plants. However, Dumbleton (1952) confirmed Franclemont's record of *P. separata* from New Zealand and Hamblyn (1959) reported that it contributed to an extensive denudation of pasture in the autumns of 1956 and 1957. It is probable therefore that it also causes damage to pastures, field crops or sugar cane in Queensland, such as that attributed to *Cirphis unipuncta* by Jarvis (1926) and Mungomery (1933, 1950). The information provided here may enable a more critical examination to be made of the species involved in future outbreaks.

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