Systematics and Biogeography of the New Zealand Sub-Family Crambinae (Lepidoptera: Pyralidae)

Volume I - text.

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SUMMARY

The status of the Sub-family Crambinae is examined in relation to other taxonomic units of the Super-family Pyraloidea. Relationships within the Sub-family have been studied using Hennig's system of phylogenetic analysis of apomorphic characters.

On the basis of a study of 37 revised world genera containing some 800 species, the Crambinae are divided into four tribes; the Crambini, with two sub-tribes, Crambina, with greatest development in the Palaearctic, and the Corynophorina which are Australasian; the Acigonini centred in the Ethiopian-Oriental regions, but with one genus strongly developed in South America; the Chiloini with moderate development in the Old World tropics but dominant in Australian grasslands; and the Diptychophorini which have a largely pan-tropical distribution.

The New Zealand crambine fauna has been completely revised. It consists of 80 known species: 48 of these are placed in Orocrambus Purdie, including the following new species; Orocrambus philpotti, O.jansoni, O.lewisi, O.ordishi and O.lindsayi. Twentyfive specific names are synonymised. A new genus Maoricrambus, is erected to contain a single species oncobolus Meyrick. Angustalius Marion and Kupea Philpott have one each. These 3 genera are all Crambina. Two species of Corynophorina are present, both placed in the genus Tawhitia Philpott. Eighteen species of Pareromene Osthelder of the tribe Diptychophorini, are re-described, including one new species Pareromene gurri.

The Acigonini are not represented in New Zealand. The Chiloini are weakly represented by Tauroscopa Meyrick and Gadira Walker with 3 species each, and a new genus Paragadira which contains one species. Two species of Protyparcha Meyrick are confined to Campbell Island and the Auckland Islands in the subantarctic.

Phylogenetic analysis of these genera shows the following: Maoricrambus is a segregate of Orocrambus, as is probably Kupea. Orocrambus, Angustalius and Pareromene show clear affinities with Palaearctic groups, and presumably reached New Zealand via the Melanesian Arc. New Zealand Pareromene also have sister species in New Guinea. Angustalius may have been accidentally introduced. The affinites of Paragadira and Protyparcha are not known. Tawhitia, Tauroscopa and Gadira all show sister-species or sister-genus relationships with Australian groups,and are assumed to have become assembled in New Zealand by aerial dispersal across the Tasman Sea.

Biogeographical literature relating to dispersal of taxa to New Zealand is reviewed, and major biotic routes beyond the Australasian Region are briefly discussed. It is stressed that the New Zealand crambine fauna shows no indication of trans-Antarctic relationships. The time of arrival of Orocrambus in New Zealand is postulated as the Eocene, that of Pareromene as the Middle Miocene.

Crambine distributions within New Zealand are reviewed; 15 species have distributions correlating with Pleistocene biotic refuge regions postulated by phytogeographers. The age of Orocrambus species is briefly considered. It

is suggested on evidence of relict distribution patterns and the semi-apterous adaptations found in most of the species with these distributions that some peri-glacial region survival has occurred.

Success of Orocrambus in radiating into the New Zealand alpine sector in the late Pleistocene is attributed to pre-existing adaptation to conditions of physiological drought, possibly developed in savanna-arid conditions in the earlier Tertiary, reinforced by selection for advantageous morphological adaptations during the early Pleistocene cool-climate conditions.

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