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

Volume I - text.

A thesis presented in partial fulfilment
of the requirements for the degree of
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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 ^{Osthelder}Pareromene, 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 affinities 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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CONTENTS

Introduction -----	p.	1
Materials and methods -----	p.	5
Considerations on genitalia terminology and function -----	p.	11
The Status of the Crambinae -----	p.	21
Sub-Family Crambinae -----	p.	28
Relationships within the Crambinae -----	p.	30
Tribe Crambini -----	p.	32
Tribe Diptychophorini -----	p.	35
Tribe Chiloini -----	p.	37
Tribe Acigonini -----	p.	43
Characters of immature stages -----	p.	45
Conclusions -----	p.	52
Key to mainland genera of New Zealand Crambinae (practical key by external characters, male and female genitalia -----)	p.	55
Tribe Crambini: diagnosis -----	p.	57
Key to Sub-tribes -----	p.	59
Sub-tribe Crambina -----	p.	59
Genus <u>Orocrambus</u> Purdie: Diagnosis; Systematic revision -----	p.	59
Species Groups -----	p.	64
Systematic key to Groups -----	p.	66
Synonymic list of species -----	p.	68
Synonymies -----	p.	71
Key to external characters -----	p.	73
Key to female genitalia -----	p.	80
Species Group 1 -----	p.	85

Species Group 2 -----	p. 89
Species Group 3 -----	p. 126
Species Group 4 -----	p. 146
Species Group 5 -----	p. 151
Genus <u>Maoricrambus</u> gen.nov. Diagnosis p.	218
Genus <u>Angustalius</u> Marion: Diagnosis--	p. 220
Genus <u>Kupea</u> Philpott: Diagnosis-----	p. 222
Sub-tribe Corynophorina-----	p. 224
Genus <u>Tawhitia</u> Philpott: Diagnosis---	p. 224
Genus <u>Corynophora</u> Berg: Diagnosis----	p. 231
Tribe Diptychophorini: diagnosis-----	p. 234
Genus <u>Pareromene</u> Osthelder: Diagnosis p.	235
Systematic revision-----	p. 235
Species Groups -----	p. 235
Synonymic list of species-----	p. 238
Key to species groups by genitalia p.	242
Key to female genitalia of New Zealand species -----	p. 244
Species Group 1 -----	p. 246
Species Group 2 -----	p. 248
Species Group 3 -----	p. 250
Species Group 4 -----	p. 250
Species Group 5 -----	p. 261
Species Group 9b -----	p. 286
Tribe Acigonini: diagnosis -----	p. 289
Tribe Chiloini: diagnosis -----	p. 291
Genus <u>Tauroscopa</u> Meyrick: Diagnosis--	p. 292
Key to New Zealand species-----	p. 293

Species Group 1 -----	p. 294
Species Group 2 -----	p. 297
Species Group 3 -----	p. 299
Genus <u>Hednota</u> Meyrick: Diagnosis-----	p. 304
Genus <u>Gadira</u> Walker: Diagnosis-----	p. 307
Systematic list of species -----	p. 311
Key to New Zealand species -----	p. 312
Species Group 1 -----	p. 313
Species Group 2 -----	p. 316
Species Group 3 -----	p. 322
Species Group 4 -----	p. 326
Genus <u>Paragadira</u> gen.nov.: Diagnosis-	p. 331
Genus <u>Protyparcha</u> Meyrick: Diagnosis-	p. 334
Western Pacific Biogeography,with Special Reference to New Zealand -----	p. 338
Geographical Distribution of the Crambinae: Origins of the New Zealand Crambine Fauna ----	p. 361
Arrival of crambine taxa in New Zealand -----	p. 370
Comments on major biotic migration routes beyond the Australasian Region	p. 377
Distribution of Crambinae within New Zealand--	p. 379
Summary of New Zealand distributions-	p. 379
Reliability of apparent patterns-----	p. 382
The Quaternary in New Zealand -----	p. 384
Effects of Pleistocene Climates on the New Zealand fauna,flora -----	p. 387
The problem of speciation -----	p. 393
Conclusions -----	p. 399
Bibliography -----	p. 400
Appendix: catalogue of genitalial mounts ----	p. 421