



Micropterigidae (Lepidoptera) of the Southwestern Pacific: a revision with the establishment of five new genera from Australia, New Caledonia and New Zealand

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Abstract

With the discovery of new taxa and developments in biogeography and molecular phylogenetics, it has become clear that the diversity of Micropterigidae in the SW Pacific region is inadequately represented by the current taxonomy. The existing taxonomy implies a single lineage in this region, while an unpublished molecular analysis reveals the presence of three distinct lineages in Australia, New Caledonia and New Zealand, hence the need for revision. Currently only three named species are described from eastern Australia, all placed within the genus *Sabatinca* Walker. This revision isolates *porphyrodes* Turner 1932, from northern Queensland, as a new monotypic genus *Austromartyria*, here recognised as a member of a diverse ‘southern sabatincoïd lineage’ distributed around the Southern Hemisphere. The bulk of the fauna covered in this revision includes: *S. calliplaca* Meyrick 1902, together with 6 new taxa in a new Australian genus *Tasmantrix*; *S. sterops* Turner 1921 plus a new species from New Caledonia, in another new genus *Aureopterix*. The New Zealand species *Sabatinca zonodoxa* Meyrick 1888, is synonymised with *S. rosicoma* Meyrick 1914 and placed in a new monotypic genus *Zealandopterix*. Finally, a new genus *Nannopterix* is erected for a new species from New Caledonia. The assemblage of four new genera (excluding *Austromartyria*) together comprise the basal lineage of Micropterigidae, previously referred to as the ‘Australian-group.’ All five new genera are distinguished from *Sabatinca s.str.*, the focus of diversity in the region (confined to New Caledonia and New Zealand), but not revised here.

Key words: Taxonomy, new species, new genera, mandibulate moths, phylogeny, biogeography, archaic fauna, Tasman Sea, tectonics

Introduction

The mandibulate moth family Micropterigidae (suborder Zeugloptera *auct.*), widely interpreted as the stem group of Lepidoptera (Kristensen 1998), play an important role in debates about biogeography and the evolutionary history of moths in general. With 140 described species (DC Lees, pers. comm. 2009) distributed world-wide on all continents (except India) and several continental islands (e.g. Madagascar, New Caledonia, Taiwan), together with a fossil record which includes some exquisite examples from 140 Ma Lebanese amber (Whalley 1977), 100 Ma Myanmar amber (Grimaldi & Engel 2005), and 55–54 Ma Baltic amber (Skalski 1995), these small moths represent a pre-angiosperm fauna that has survived almost unchanged for over 100 million years. Always associated with microhabitats of high humidity, their larvae feed on foliose liverworts in the forest periphyton layer or within rotten logs or soil (perhaps ingesting fungi) and on seedling angiosperm leaves (*Micropterix*), while adults fly actively in shade or dappled sunlight, normally close to the ground, feeding on fern and other lower plant spores or angiosperm pollen.

All Australian Micropterigidae, since their first description in 1902, have been included within the genus *Sabatinca* Walker 1863, *s. lat.* which also incorporated species from New Zealand (Dugdale 1988) and latterly from New Caledonia (Viette 1978; Minet 1985). However, in a review of the biogeography of the micropterigid fauna of the South-West Pacific, (Gibbs 1983) it was suggested that the generic diversity of these primitive moths across the region was far greater than is reflected by the current nomenclature. With the scaffold provided by a recent single-gene global-scale molecular analysis of Micropterigidae (Gibbs *et al.* 2004), the time is ripe for a representative taxonomy for SW Pacific taxa.

To set this regional fauna in context, it is necessary to consider the overall pattern of diversity in the family Micropterigidae as revealed by the ongoing molecular study and by previous morphological understanding. A primary dichotomy was recognised by Kristensen & Nielsen (1979), who delineated a *Micropterix*-group in the northern hemisphere and a *Sabatinca*-group which included the remainder of known taxa in both northern and southern hemispheres. Since then many new taxa have been discovered, especially in the southern hemisphere, leading to reassessment of this dichotomy. Although the post-1979 literature has not shaken the ‘*Micropterix*-group’, the integrity of the ‘*Sabatinca*-group’ has been challenged (Kristensen & Nielsen 1982, 1983; Kaltenbach & Speidel 1982; Minet 1985) and requires reassessment. However, apart from the recognition of a distinct ‘Australian-group’ within the *Sabatinca*-group (Gibbs 1983), and an evaluation of the validity of the *Sabatinca*-group in the Pacific region (Minet 1985), no further consideration of SW Pacific micropterigid lineages has been published. The molecular study, initiated by Yukimasa