An overview of flat bug genera (Hemiptera, Aradidae) from New Zealand, with considerations on faunal diversification and affinities[1]

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Abstract: Nineteen genera and thirty-nine species of Aradidae have been described from New Zealand, most of which are endemic (12 genera, 38 species). An overview of all genera and an identification key to subfamilies, tribes, and genera are presented for the first time. Species included in each genus are listed for New Zealand. Concise generic descriptions, illustrations emphasizing key diagnostic features, colour photographs representing each genus, an overview of the most relevant literature, and notes on distribution are also given. The biology and diversification of New Zealand aradids, and their affinities with neighbouring faunas are briefly discussed.

Key words: Aradidae, biogeography, Hemiptera, New Zealand, taxonomy.

Introduction

The Aradidae, also commonly referred to as flat bugs or bark bugs, form a large family of Heteroptera containing over 1,800 species and 210 genera worldwide (Schuh & Slater 1995). They are classified within the Pentatomomorpha and are seen by most authors as the sister group of Termitaphididae, but unlike other pentatomomorphans, Aradidae lack trichobothria (seta-bearing spots on the abdominal venter).

Most aradid species range from 3-11 mm, are flattened dorsoventrally, and share the following diagnostic features: two-segmented tarsi (except in some taxa); four-segmented antennae; ocelli absent; elongate feeding stylets (modified mandibles and maxillae) that are coiled within the clypeus when withdrawn – a characteristic shared with Termitaphididae – and usually broadly exposed connexivum around the edge of relatively small-sized hemelytra (when present).

Aradids are highly cryptic animals living either under the bark of decaying trees, or on twigs or wood debris on the floor of wet forests, and using their stylets to extract liquids from fungal hyphae associated with decaying wood. Many ground-dwelling species of rainforest environments are wingless – a condition thought to have evolved several times in the phylogeographic history of the group (e.g., see Monteith 1969b, 1982, 1997) – and have become highly modified morphologically and very strangely shaped. It now seems amazing that before 1938 most micropterous and apterous aradids were thought to be only nymphs. It was Miller (1938) who first realised the phenomenon of aptery in adult Aradidae, a discovery that opened a totally new dimension to aradid taxonomy and accelerated the descriptive effort in many groups.

New Zealand and Australia are the only land masses so far known to harbour all eight recognised aradid subfamilies which, as far as their higher classification is concerned, have remained more or less the same since the comprehensive world revision of Usinger & Matsuda (1959). As for tribes, Kormilev & Froeschner (1987) defined two tribes within each of the Chinamyersi-

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