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Allotanaupodidae, a new family of early derivative Parasitengona (Acari: Prostigmata)

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Abstract

A new family of early derivative Parasitengona (Acari: Prostigmata), Allotanaupodidae fam. nov., is described from New Zealand based on adults and deutonymphs of two new genera and five new species and a new superfamily Allotanaupodoidea is erected to accommodate it. The new family is characterized by the absence of prodorsal trichobothria and sensory areas, the presence of one or two pairs of plates with multiple setae on C to PS rows of dorsal hysterosoma, the presence of only two pairs of genital acetabula in adults, and short, distally inserted palptarsus on the palptibia. The family consists of two subfamilies (Allotanaupodinae subfam. nov. and Paratanaupodinae subfam. nov.), with the former endemic to New Zealand. Allotanaupodinae subfam. nov. has a single genus, *Allotanaupodus* gen. nov., which is represented by three new species from New Zealand: *Allotanaupodus williamsi* sp. nov. (type species) from Kawau I., Auckland, *Allotanaupodus orete* sp. nov. from Orete Forest, Te Puia Hut and *Allotanaupodus winksi* sp. nov. from Mt. Messenger, Taranaki. The eyeless Paratanaupodinae subfam. nov. consists of two genera: *Nanotanaupodus* gen. nov. and *Paratanaupodus* Andre & Lelievre-Farjon, 1960. The type genus *Paratanaupodus* Andre & Lelievre-Farjon, 1960 was previously placed in the Tanaupodidae and is represented by a single species, *Paratanaupodus insensus* André & Lelievre-Farjon, 1960, from South America. *Nanotanaupodus* gen. nov. is represented by two new species from New Zealand: *Nanotanaupodus andrei* sp. nov. (type species) from Waituhi Saddle and *Nanotanaupodus gracehallae* sp. nov. from Orete Forest, Te Puia Hut. A key to superfamilies of terrestrial Parasitengona (post-larval stages) is provided, along with keys to subfamilies, genera and species of the new family.

Key words: taxonomy, descriptions, phylogeny, early derivative taxa, Gondwanan elements

Introduction

The Parasitengona is one of the most successful monophyletic lines of the Trombidiformes. With 15 superfamilies, over 60 families and 8000 species, it accounts for over half of all species of the Trombidiformes. The majority of the described species of the Parasitengona are highly specialized water mites (about 5000 species, mostly known from adults) and chiggers (over 2000 species of Trombiculidae and Leewenhoekiidae, mostly known from larvae parasitic on vertebrates). Terrestrial Parasitengona other than chiggers were mostly described as adults in early years but larvae have been more and more commonly described in the last few decades.

Although the monophyly of Parasitengona is not questioned, the high level phylogenetic relationships within the Parasitengona are in a state of flux, especially with regard to the relationships between water mites and terrestrial Parasitengona. The traditional view is that water mites form a sister group to the rest of the terrestrial Parasitengona (Krantz 1978; Smith & Cook 1991; Witte 1991). A radical departure from this view is that of Welbourn (1991), who proposed a hypothesis of relationships based on a cladistic analysis of 51 genera, using primarily morphological characters of the larval stage: water mites and Trombidiina are considered sister groups, and together they form a sister group to Erythraeina (Erythraeoidea + Calyptostomatoidea). A subsequent molecular phylogentic analysis based some morphological data and mtCOI sequence data failed to resolve the relationships within terrestrial Parasitengona because the results from morphological data and molecular do not agree (Sller et al. 2001). This study is focused on terrestrial Parasitengona and includes only one species of water mites. Much needed are studies examining samples from all superfamilies of both water mites and terrestrial Parasitengona.

The divergent classifications based on larvae for some taxa and post-larval stages for other taxa are major problems for any progress towards understanding the phylogeny and development of a stable classification system for this diverse group. Correlations between larval and post-larval stages through life history studies or molecular analyses (DNA sequencing) will be very important for solving this problem. Detailed studies of early derivative groups will be crucial for understanding the phylogenetic relationships within Parasitengona at the family level and helping to fill gaps in higher level classification of this large group. There are still undescribed early derivative taxa at the family level and these missing links are important for understanding