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***Elhamma* Walker (Lepidoptera: Hepialidae) revisited: adult morphology, assessment of recently proposed synonyms and descriptions of two species**

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Abstract

I revise the Australian-New Guinean ghost moth genus *Elhamma*. Two recent synonymies are assessed, and two new species from New Guinea, *E. grehani* sp. nov. and *E. viettei* sp. nov. are described. I provide an updated diagnosis for the genus and conclude that the presence of only 2 M-veins in the hind wing in both sexes (when females are known) and a strongly cup-shape juxta in the male genitalia are unique diagnostic characters among Hepialidae. I give a detailed description of the adult morphology based on male *E. australasiae*, and provide a key to all known species based on adult male characters.

Key words: Exoporia, adult morphology, taxonomy, Australia, New Guinea

Introduction

The genus *Elhamma* Walker (Figs 1–12) was originally erected to accommodate five species of Hepialidae from Australia and New Zealand, all of which were subsequently transferred to other genera, either by Walker himself in the same publication (Walker 1856), or by Butler (1877) and Meyrick (1890). Meyrick (1890) also recognised that *E. inconcluso* Walker was the male, and junior synonym, of *Hepialus australasiae* Walker as the two names represented male and female of the same species (although Meyrick listed the author of the latter as 'Donovan'), and placed the species in the new genus *Perissectis*, recognised by Tindale (1935) to be a synonym of *Elhamma*. Kirby (1892) upheld *Elhamma* as a good genus and designated *E. inconcluso* as the type species. Tindale (1935) provided the first detailed descriptions and illustrations of *Elhamma* as well as an overview of the past taxonomy and synonymy of the genus, and treated the genus as part of the *Oxycanus* Walker genera group in his revision of Australian Hepialidae.

Nielsen (1996) in the Checklist of Australian Lepidoptera (Nielsen *et al.* 1996) synonymised the two New Guinea genera *Zauxieus* Viette and *Theaxieus* Viette with *Elhamma*, synonymies that were later upheld in a world catalogue on Exoporia (Nielsen *et al.* 2000). Likely as a consequence of the catalogue format of these publications, no justification was given for the synonymies, and sadly E. S. Nielsen died before such justifications could be published. *Zauxieus* and *Theaxieus* were both described based on material in the National Dutch Museum of Natural History, Naturalis (RMNH): *Zauxieus* comprised only a single species, *Z. toxopeusi*; *Theaxieus* comprised the two superficially very similar species *T. diakonoffi* and *T. roebkei* (Viette 1952).

During my ongoing systematic studies on Australian Hepialidae (T. J. Simonsen unpublished) it became clear that it would be desirable to justify these synonymies, especially as there has been a recent increase in studies of Australian Hepialidae (Edwards & Green 2011, Moore & Edwards 2014, Moore 2014) which is likely to continue in the future (T. J. Simonsen unpublished, M. D. Moore pers. comm.). Here I re-examine all known *Elhamma* species, describe two new species, *E. viettei* sp. n. and *E. grehani* sp. n. from New Guinea, and provide a detailed account of the adult skeletal morphology of *E. australasiae*. The synonymies proposed by Nielsen (1996) are evaluated based on the results, and a key to all species is provided. The morphological account presented here is more detailed than previous systematic treatments of Hepialidae, except Nielsen & Kristensen's (1989) highly