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Revision of the Australian Eviphididae (Acari: Mesostigmata)

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Abstract

The Australian fauna of the mite family Eviphididae (Acari: Mesostigmata) is revised. A total of 14 species is recorded, 10 of which are described as new: *Alliphis halleri* (G. & R. Canestrini), *A. transversus* **sp. nov.**, *Evimirus pentagonius* Karg, *E. scutellatus* **sp. nov.**, *E. uropodinus* (Berlese), *Scarabaspis masani* **sp. nov.**, *S. orientalis* (Berlese), *S. sternalis* **sp. nov.**, *S. victoriensis* **sp. nov.**, *Thinoseius helenae* **sp. nov.**, *T. jarretti* **sp. nov.**, *T. papillatus* **sp. nov.**, *T. peltatus* **sp. nov.**, and *T. variabilis* **sp. nov.**. These species occur in soil, leaf litter, dung, compost, and seaweed, where they appear to prey on nematodes. A key for identification of these genera and species is provided. Several of the new species have character states that are unusual for their genera. In *Alliphis transversus*, the first pair of sternal lyrifissures are large, and oriented transversely to the long axis of the body, instead of obliquely, as is normal for the genus. *Scarabaspis sternalis* is unusual in having the third pair of sternal pores on the sternal shield. It also shows extensive geographic variation in the amount of ornamentation of the dorsal shield. *Scarabaspis victoriensis* has only one of the setae on coxa I modified into a flat oval-shaped disc instead of both, as is usual for the genus. *Scarabaspis masani* has normal setiform setae on both coxae I and II, but otherwise appears to be a typical member of the genus. The five species of *Thinoseius* described here show strong sexual dimorphism, which makes it impossible to associate the males and females of some species. Deutonymphs of an unidentified species of *Thinoseius* sp. are recorded as phoretic on flies of the genus *Thoracochoaeta* (Sphaeroceridae). The eviphidid fauna of Australia is much smaller than that of Europe. This appears to be the result of the absence of small or monotypic genera, and the fact that Australian native mammals do not produce large quantities of wet dung suitable for the development of a rich fauna of coprophilous mites and dung beetles.

Key words: Eviphididae, *Alliphis*, *Evimirus*, *Scarabaspis*, *Thinoseius*, Australia, sexual dimorphism, phoresy, seaweed

Introduction

The Eviphididae is a family of small to medium-sized free-living Mesostigmata that are common in soil and decomposing organic matter. Many species are phoretic on insects, especially scarab beetles. Most species are yellow to brown, but some have developed a spectacular bright pink or orange-red coloration. Apart from their intrinsic interest as components of soil biodiversity, some eviphidids are of special interest because they are predators of harmful nematodes. *Alliphis halleri* (G. & R. Canestrini) feeds only on nematodes (Karg 1971, 1983; Karg & Grosse 1983; Sardar & Murphy 1987) and can help protect field crops from damage by plant parasitic nematodes. *Alliphis halleri* also feeds on a nematode parasite of rodents, a bacterial-feeding nematode, and potato cyst nematode *Globodera rostochiensis* (Wollenweber) (Murphy & Sardar 1991).

The last general revision of the family Eviphididae was in a thesis by Shoemake (1970), which attempted to review and key the entire world fauna as known at that time. The new names in that work are not available for nomenclatural purposes, but it does contain a very useful review of the family and a key to the genera known to that time. Partial keys to genera of Eviphididae may be found in Karg (1963, 1976, 1993), Evans (1969), Bregetova (1977), Evans & Till (1979), Krantz & Ainscough (1990), Mašán (1994), and Walter (2006). Kazemi *et al.* (2008a) described a new genus, and Mašán & Halliday (2009) described three new genera and provided a complete worldwide key to genera. That key to genera was used to identify the taxa described here. Mašán & Halliday (2010) have provided a detailed review of the systematics and biology of the European species.

Walter & Proctor (2001) gave a diagnosis of the family and a summary of its biology, and illustrations of some of the genera. Hallan (2004) attempted an inventory of the world fauna, and listed 77 species in 13 genera, while a more recent search of the literature showed that the number of available species names now exceeds 120. That information came from a variety of sources, including internet searches of formal and informal databases, the thesis by Shoemake (1970), the catalogue of the Berlese collection by Castagnoli & Pegazzano (1985), the checklist of Hallan (2004), and the literature resources of the Australian National Insect Collection. It is difficult to be precise about the number of species in the family, because of unresolved synonymies, the inadequate descriptions and uncertain placement of some species, the inclusion of some taxa