Diplogyniidae (Acari: Mesostigmata) associated with *Panesthia* cockroaches (Blattodea: Blaberidae)

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Abstract

Five new Australian species of *Paradiplogynium* and one new species of *Lobogyniella* are described from *Panesthia*, a genus of subsocial wood cockroaches. *Paradiplogynium panesthia* Womersley, originally collected from *Panesthia cribrata* in New South Wales, is redescribed. The new mite species are *Paradiplogynium caitlinae* sp. nov., *Paradiplogynium damieni* sp. nov. and *Paradiplogynium elizabethae* sp. nov. from *Panesthia tyroni* tryoni; *Paradiplogynium isaaci* sp. nov. from *Panesthia cribrata*; *Paradiplogynium kaii* sp. nov. from *Panesthia sloanei*; and *Lobogyniella harrynahmani* sp. nov. from *Panesthia ancaudellioides*. *Paradiplogynium* and *Lobogyniella* are re-diagnosed and a key to *Paradiplogynium* is provided. Each *Panesthia* species has a large and a small species of diplogyniid mite associated with it. In two instances, geographically distant host populations had different species of mite. Mites are restricted to a single host, except the widespread species *Paradiplogynium nahmani*, which is now known from *Titanolabis colossea* (Dermaptera), *Pan. ancaudellioides*, *Pan. cribrata* and *Pan. sloanei*.

Key words: Host associations, identification key, morphology, Trigynaspida, Celaenopsoidea

Introduction

The Diplogyniidae is the most diverse family of Trigynaspida, with 66 species and 40 genera, of which 26 are monotypic (Hallan, 2005; Kazemi et al., 2008). Like most trigynaspid mites, the adult stage is associated adult arthropods (e.g., Trägårdh, 1950; Elsen, 1974, 1975, 1981; Seeman, 2007), on which they are almost certainly phoretic. Immature stages are not described, but are presumably free-living in their host’s larval habitat (usually wood), similar to the immature stages of Fedrizziidae (Seeman, 2000) and Celaenopsidae (Kinn, 1971). I have collected and reared immature life stages of the passalid beetle associate Cryptometasternum derricki Womersley from rotting logs. All active life stages fed on nematodes, similar to the fedrizziid mite Neofedrizzia camini Womersley (Seeman, 2000).

*Paradiplogynium* Womersley was first described from specimens collected from the subsocial wood cockroach *Panesthia cribrata* Saussure, with *Paradiplogynium panesthia* as its type – and then only – species (Womersley, 1958). The type material was collected from Porter’s Retreat, approximately 120 km inland from Sydney, but also included supplementary material from *Pan. cribrata* collected from Dalby, approximately 200 km inland from Brisbane. A second species, *Paradiplogynium nahmani* Seeman, was described from three specimens collected from the Colossus Earwig *Titanolabis colossea* (Seeman, 2007). This second species differed in several respects from *Par. panesthia*, but most notably bore one pair of setae on the latigynal shields instead of two (Seeman, 2007). Here, I describe another six new species of *Paradiplogynium* and one species of *Lobogyniella*, all collected from *Panesthia* cockroaches.

Materials and Methods

Cockroaches were collected from rotting logs and killed in 80% ethanol. Mites were removed from their hosts, cleared in Nesbitt’s solution and slide-mounted in Hoyer’s medium. Specimens were examined and measured