



## 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 harrinahmani* 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, Celaenopsidea

### 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 Fedrizzidae (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