



## Parasitism of *Apteropanorpa tasmanica* Carpenter (Mecoptera: Apteropanorpiidae) by larval *Leptus agrotis* Southcott (Acari: Erythraeidae) and *Willungella rufusanus* sp. nov. (Acari: Microtrombidiidae)

OWEN D. SEEMAN<sup>1</sup> & CHRISTOPHER M. PALMER<sup>2,3,4</sup>

<sup>1</sup> Queensland Museum, PO Box 3300, South Brisbane, 4101, Queensland, Australia; E-mail: owen.seeman@qm.qld.gov.au

<sup>2</sup> School of Botany and Zoology, The Australian National University, Canberra ACT 0200, Australia

<sup>3</sup> CSIRO Entomology, GPO Box 1700, Canberra ACT 2601, Australia

<sup>4</sup> Biodiversity Conservation South, Department of Natural Resources, Environment, and the Arts, PO Box 1120, Alice Springs NT 0871, Australia

### Abstract

The Apteropanorpiidae is a family of wingless scorpionflies endemic to Tasmania, comprising four described species in the genus *Apteropanorpa* Carpenter. Intensive field surveys for adult *Apteropanorpa* conducted from April to May 2002 revealed the presence of ectoparasitic mites, parasitising many individuals of *Apteropanorpa tasmanica* Carpenter at four localities. Laboratory investigations revealed the presence of one species from each of the Erythraeidae and Microtrombidiidae parasitising adults: *Leptus agrotis* Southcott and *Willungella rufusanus* sp. nov., respectively. The larvae of *W. rufusanus* are described. Laboratory investigations of attachment sites and parasite loads of male and female scorpionflies are described and discussed. Results show neither sex was parasitised more than the other, and that up to four mites parasitised individual scorpionflies, although most adults supported one or two mites. Like many other *Leptus* species, all *L. agrotis* larvae attached to sclerites, whereas all *W. rufusanus* larvae attached to membranous areas. Larval *W. rufusanus* were predominantly attached to the scorpionfly abdomen; however, larval *L. agrotis* were more evenly distributed on the scorpionfly body. These data are the first records of parasitism in the Apteropanorpiidae, and the first report of parasitism of Mecoptera in Australia. Parasitism of *A. tasmanica* by *W. rufusanus* is the first record of a mecopteran as a host for larval microtrombidiine mites. Parasite records for the Mecoptera are summarised.

**Key words:** mites, parasites, scorpionflies, alpine, Tasmania, Australia, attachment sites

### Introduction

The Apteropanorpiidae is a family of wingless scorpionflies endemic to Tasmania, comprising four described species belonging to the genus *Apteropanorpa*. Three species (*A. tasmanica* Carpenter, *A. evansi* Byers & Yeates, and *A. hartzi* Palmer, Trueman & Yeates) occupy alpine habitats (Byers & Yeates 1999), and *A. warra* Palmer, Trueman & Yeates is found at lower elevations (Palmer *et al.* 2007). Adults are saprophagous, feeding on dead and decaying invertebrates (Palmer & Yeates 2005).

Intensive field surveys for *Apteropanorpa* were conducted from 2001 to 2003 in many parts of Tasmania, and these yielded a large number of adult specimens. Also observed during this fieldwork was a large variety and abundance of other invertebrates associated with *Apteropanorpa* species on shrubs in alpine habitats, including adults and immatures of species from many insect orders. Non-insect invertebrates co-occurring with *Apteropanorpa* included representatives of the orders Isopoda, Araneae, and Acari. Although ecological interactions between *Apteropanorpa* and most associated invertebrates were usually not apparent, field collecting from April to May 2002 revealed a parasitic association between larvae of two species of Parasitengona and adult *Apteropanorpa* at some localities.

Parasitism has been reported in adult and immature members of three other families of Mecoptera *s. lat.*: the Bittacidae, Boreidae, and Panorpidae (see Table 1). Scorpionflies are parasitised by a variety of organisms: fungi,