

Book Review

Raphignathoidea (Acari: Prostigmata)

Qing-Hai Fan and Zhi-Qiang Zhang

Fauna of New Zealand No. 52, Manaaki Whenua Press, Lincoln, N.Z. 400pp. Price \$89.00.

Mites in the Raphignathoidea are largely free-living predators but their biology is virtually unknown, and literature on their taxonomy or ecology is sparse. Yet predatory mites have been recognised as an important ecological component of New Zealand's economic landscapes for a long time. Species in the family Phytoseiidae (Acari: Mesostigmata: Phytoseioidea) such as *Typhlodromus pyri* and *Phytoseiulus persimilis* are well known from fruit crops. They are quite readily identified and their ability to regulate populations of pest Tetranychidae have been well documented both in New Zealand and elsewhere. Predators in at least two genera of Raphignathoidea are also regularly found during field studies of pest mites. However, it has rarely been possible to identify the species with any degree of certainty, and their potential value as biological control agents has virtually been ignored. This monograph unlocks the door to further study of a significant group of mites in New Zealand, including economically important species in the Stigmaeidae.

The work begins with an overview of the world Raphignathoidea, and the place of the New Zealand species within it. Five of the 11 known families occur in New Zealand, with 76 species in 20 genera. One genus and 21 species are described as new, and three new combinations are proposed. Keys to all 11 world families and to the genera of New Zealand families are provided. Where appropriate, keys to the New Zealand species and even life-stages within the species are also included. This is especially handy for species of the Raphignathidae which, unusually (at least for phytoseiid researchers), include a tritonymph.

Overall, the volume follows the standard *Fauna of New Zealand* format, and contains 100 pages of taxonomic descriptions and keys, followed by 240 pages of illustrations, 10 pages of images from the microscope and nine pages of distribution maps of species in New Zealand. The taxonomic descriptions are an impressive volume

of work, with very detailed measurements of characteristic features. However, neither they nor the keys are for the faint hearted or amateur. The descriptions and keys make use of the position and relative size/lengths of about 85 characters on the gnathosoma, idiosoma and legs. Each character is coded or abbreviated, and effective use of the keys requires not only a detailed knowledge of mite taxonomy and a good memory to keep track of the descriptions, but also a good microscope, skills in preparing mites for slide mounting and the ability to measure accurately in micrometers (μm). Nevertheless, the combination of full descriptions, keys and many figures have resulted in an excellent account of the current knowledge of New Zealand's Raphignathoidea, and will provide the taxonomic backbone of research on the superfamily for many years to come.

The authors are renown teachers and mite ecologists as well as taxonomists. Their backgrounds are shown by the attention they also give to the biology and ecology of species, and their value in biological control programmes. New Zealand mite ecologists – at least those working in the horticultural field on Phytoseiidae – regularly encounter species in the Stigmaeidae. However, I can vouch from personal experience over many years, that species of *Agistemus* and *Zetzellia* are usually recorded simply as that – with little confidence that the specimens encountered were, or could be, reliably identified to species. Such a taxonomic impediment has made it almost impossible to determine whether the species were native or exotic, or the same as or different to those identified occasionally in overseas reports. One consequence of our ignorance has been the almost complete absence of ecological research into these mites in New Zealand, and their possible economic impact has been almost ignored.

This contribution to New Zealand's biodiversity literature will bring some certainty to an important but neglected group of tiny arthropods, and will

hopefully stimulate further research into these mite species—both in native and economic environments. In the latter, as calendar applications of broad spectrum pesticides are increasingly consigned to the history of insect pest control, generalist predators are becoming increasingly recognised as valuable, “free” and sustainable resources for pest management. *Raphignathoidea* (*Acari: Prostigmata*) illustrates yet again how taxonomy and the description of New Zealand’s biodiversity contributes so much to our economic future.

John Charles,
HortResearch
Private Bag 92 169,
Auckland