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Predatory mites from crops and pastures in South Africa: potential natural enemies of redlegged earth mite *Halotydeus destructor* (Acari: Penthaleidae)

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Abstract

A survey was conducted in crops and pastures in the Western Cape Province of South Africa, in a search for predatory mites that could have potential for introduction into Australia as biological control agents of redlegged earth mite *Halotydeus destructor* (Penthaleidae). A total of over 1200 specimens was examined, and 56 species of predatory mites belonging to 14 families were found. Information is presented for 33 known species, including synonymy and bibliography, geographic distribution, and biology where known. Eight species in six families are described as new—*Bdellodes edentata* sp. nov. (Bdellidae), *Hypoaspis calcarata* sp. nov. (Laelapidae), *Hypoaspis muellerae* sp. nov. (Laelapidae), *Macrocheles propinquus* sp. nov. (Macrochelidae), *Gamasiphoides lootsi* sp. nov. (Ologamasidae), *Gamasiphoides rykei* sp. nov. (Ologamasidae),

Pachylaelaps meganalis sp. nov. (Pachylaelapidae), and *Rhagidia meyerae* sp. nov. (Rhagidiidae). Fifteen species could not be fully identified because suitable specimens were not available. Of the 41 species that could be identified, nine are already present in Australia. A further 20 species are not known from Australia, but were rare in South Africa and therefore unlikely to be useful predators. Twelve species occurred in significant numbers in South Africa and are not known from Australia. Most of these are known or believed to be generalist predators, and are therefore unlikely to be approved for introduction into Australia. *Chaussieria capensis* (Anystidae) was considered to have potential and has been studied further. The survey did not identify any other species that were considered to be suitable as biological control agents.

Key words: Acari, predator, biological control, *Halotydeus destructor*, South Africa

Introduction

The redlegged earth mite or black sand mite *Halotydeus destructor* (Tucker) (Acari: Penthaleidae, RLEM) was accidentally introduced into Australia from South Africa some time before 1917 (Otto & Halliday, 1991). It is now known that the native range of the Australian population of *H. destructor* is in the Western Cape Province of South Africa, specifically the area around Cape Town (Qin, 1997). Since its introduction it has spread throughout the agricultural and pastoral areas of southern Australia, where it is now a very damaging pest of many crop and pasture plants (Ridsdill-Smith, 1991). Attempts to control this pest have included the use of a wide variety of chemical pesticides (*e. g*. Norris, 1943), cultural techniques (Norris, 1948), and the introduction of mite-resistant plant varieties (reviewed by Ridsdill-Smith, 1997). RLEM in Australia is attacked by a variety of endemic natural enemies, including at least 19 species of predatory mites and a pathogenic fungus, and these, combined with the selective use of pesticides, form some of the components of an integrated pest management program (James, 1995; James *et al*., 1995). Control attempts have also included the introduction of a biological control agent, the predatory mite *Anystis wallacei* Otto (Wallace, 1981; Otto & Halliday, 1991; Otto, 1992; Michael, 1995), but the effectiveness of this predator has been equivocal at best (Otto & Halliday, 1991; Michael *et al.*, 1993). The introduction of *A. wallacei* into Australia in 1965 followed an earlier attempt to identify biological control agents for this pest (Womersley, 1933a). However, neither of these attempts to locate natural enemies of *H. destructor* were based on extensive studies of its biology in its home range in the Western Cape.

The present paper reports the results of recent surveys of the predatory mites of crops and pastures in South Africa, which were conducted in order to make a more comprehensive search for natural enemies of *H. destructor*. The intention is not to present a revision or a thorough study of the South African fauna of the species concerned, using material from diverse sources. Instead, the purpose of this study is to detail the results of collecting conducted for this specific purpose.

