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New observations on *Amblyseius perlongisetus* (Acari: Phytoseiidae) inhabiting chilli leaves in New Zealand

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Abstract

Amblyseius perlongisetus Berlese (Acari: Phytoseiidae) was recorded for the first time from leaves of chilli (*Capsicum frutescens*) in Auckland, New Zealand. Adults and immature stages of this predatory mite were sometimes found near the vein axils on the undersurface of the leaves but were more often found nesting in small feeding pits created by young green looper *Chrysodeixis eriosoma* (Doubleday) (Lepidoptera: Noctuidae) near the mid-vein. This is the first report on the use of insect feeding pits as nests by phytoseiids. Remarks on the morphological variation among adult female mites (i.e. relative length of setae on the dorsal shield) are also given.

Key words: Acari, Phytoseiidae, *Amblyseius perlongisetus*, *Chrysodeixis eriosoma*, *Capsicum frutescens*, nest.

Introduction

The predatory mite *Amblyseius perlongisetus* Berlese (Acari: Mesostigmata: Phytoseiidae) is distributed mainly in the Americas (Chant 1959). Collyer (1964) first recorded it in Auckland, New Zealand from apple, *Araucaris* sp, *Leptospermum scoparium* and thistle. Later, she collected it from pastures in Canterbury, Nelson and Wellington, and also from many species of native plants including trees (podocarps and

Nothofagus spp.), broadleaf shrubs, and low-growing plants such as *Hymenanthera* sp. and *Coprosma acerosa*, in Northland, Hawke's Bay, Nelson and West Coast areas (Collyer 1982). Nothing is known about the biology of this species. This short note reports the recent first finding of *A. perlongisetus* on chilli (*Capsicum frutescens*) in Auckland, New Zealand, and presents new observations about its habits and morphological variation.

Observations on habits and habitats

The chilli leaves observed in this study were from plants grown in a greenhouse in Silverdale, Auckland. The leaves had some hairs near the vein axils on the undersurface, where *A. perlongisetus* adults and immatures were sometimes found (Fig. 1). The leaf hairs were loose and quite different from the typical domatia which occur near vein axils on leaves in many plant species (Walter 1996), and which usually have dense hairs and provide better protection for predatory mites.

FIGURE 1. *Amblyseius perlongisetus* Berlese on leaves of chilli near the vein axils on the undersurface, showing mite adults and immature stages (including many eggs) and loose leaf hairs.

The chilli leaves examined also had feeding holes and pits of different sizes created by the green looper *Chrysodeixis eriosoma* (Doubleday) (Lepidoptera: Noctuidae). The predatory mites were found in some of the small pits, which they used as nests where eggs were laid and offspring developed (Fig. 2). These small pits (with diameters only several times the length of an adult mite) were created by young loopers. Among the 43 pits examined, 14 (or 41%) were occupied by predatory mites: five of these had eggs only, one of them had an adult, three of them had larvae only, and five of them had a mixture of eggs, larvae and nymphs. Pits near the mid-vein were deeper because leaf tissue was thick here. Deeper pits near the main vein were occupied by more mites than shallow ones far away from the main vein.

Two of the pits had loose webbing covers. This was evident in Figure 2 showing the female standing on the webbing cover with her dorsum facing the bottom of the pit, with a larva and a few eggs.

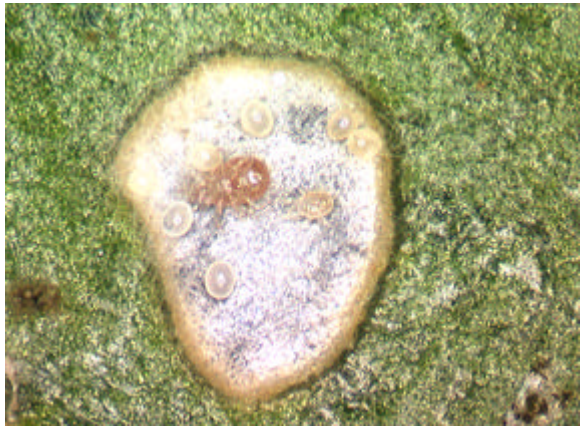

FIGURE 2. *Amblyseius perlongisetus* Berlese in a small pit created by the green looper, showing an adult female, a larva and a few eggs. Webbing could not be seen in this photograph but is suggested by the posture of the adult female standing on it with its dorsum facing the bottom of the feeding pit.

It was not known what created the webbing over this pit, because neither spider mites nor other phytophagous mites were found on the leaves. The apparent absence of mite or insect prey on the leaves suggests that these mites possibly feed on pollen, fungi or other microbes.

The small pits clearly provided much better protection for the predatory mites than the loose hairs near the vein axils, because more mites were found in them than near the vein axils.

Natural leaf domatia can comprise pits in which plant mites hide (e.g on coffee leaves; O'Dowd 1994). However, the use by phytoseiids of pits created by insects (not domatia) as nests has not been reported.

Notes on variation in morphology

Chant (1959) redescribed Berlese's holotype of *A. perlongisetus* and synonymized *Amblyseius musae* Garman, 1958 with this species. Chant's concept of *A. perlongisetus* is relatively broad, especially concerning the relative length of setae on the dorsal shield. Among the setae on the dorsal shield, three are much longer than the others and Chant (1959) broadly characterized them as "setae L_4, L_9 and M_2 whiplike and long". His description (fig. 162) showed that M_2 is slightly longer than L_4 but slightly shorter than L_9. However, Garman's description of *A. musae* (fig. 5) showed that M_2 is slightly longer than L_4 but slightly less than half as long as L_9. Collyer (1982) described New Zealand specimens of *A. perlongisetus*, and accepted the broad concept of this species. She characterized these three long setae as "L_4 and M_2 are elongate ..... and L_9 is long and whiplike, twice as long as M_2" in her description (p. 194) but as "L_4 and M_2 also long, more than half as long as L_9" in her key to species (p. 187). In specimens from chilli in Auckland examined in this paper (slide ZQZ20010123-1 in New Zealand Arthropod Collection, Auckland), L_9 is slightly more than twice L_4 but slightly less than twice M_2. Another notable variation is the length of L_1 relative to L_4: L_1 is less than one-third of L_4 in Chant

(1959; fig. 162), slightly more than half of L_4 in Garman (1958; fig. 5) and in specimens examined in this paper, and slightly less than half of L_4 in Collyer (1982). In should be noted that differences in the relative length of dorsal setae were used to differentiate species in some species-groups in this genus (e.g. Chant 1959; Collyer 1982).

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