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## Cannibalism in *Scolothrips longicornis* (Thysanoptera: Thripidae), *Neoseiulus californicus* and *Typhlodromus bagdasarjani* (Acari: Phytoseiidae)

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### Abstract

Cannibalism is an important factor in biology and ecology of many species of insects and mites. The structure and dynamics of populations of predators used in biological control programs might be affected by cannibalism. The objective of the present study was to determine cannibalism by adult females of the generalist phytoseiids, *Neoseiulus californicus* (McGregor) and *Typhlodromus bagdasarjani* Wainstein & Arutunjan and the specialist predatory thrips, *Scolothrips longicornis* Priesner. The experiments were conducted under laboratory conditions at 25°C, 65% RH and a photoperiod of 16h light: 8h dark. The larval stages, prepupae and pupae of the thrips and the immature stages (eggs, larvae and protonymphs) of the phytoseiids were used as prey. For this purpose, two types of experiments were carried out. In the first experiment, cannibalism of *N. californicus*, *T. bagdasarjani* and *S. longicornis* on their immatures were studied in the absence of the two-spotted spider mite (TSSM), *Tetranychus urticae* Koch as an extraguild (EG) prey. The second experiment determined the cannibalism of each adult female of the predatory mite and predatory thrips in presence of EG prey. Both phytoseiid species had ability to consume their conspecific prey and the predatory thrips had ability to consume conspecific larvae. Each female of *N. californicus* and *T. bagdasarjani* consumed the eggs (0.09 and 0.06 egg/female/day, respectively), larvae (0.78 and 0.70 larva/female/day, respectively) and protonymphs (0.89 and 0.69 nymph/female/day, respectively). Also, *S. longicornis* consumed its first and second instar larvae (0.33 and 0.25 larva/female/day, respectively). When TSSM was presented as an extraguild prey, the intensity of cannibalism in *N. californicus* and *T. bagdasarjani* on their larvae 0.32 and 0.22 per day, respectively and on protonymphs 0.03 and 0.15 per day, respectively decreased and *S. longicornis* did not feed anymore on its own larval stages. Therefore, it is concluded that cannibalism is very limited in the three examined species and the lack of TSSM as the main prey can intensify this behavior.

**Key words:** predatory thrips, *Tetranychus urticae*, predatory mites, biological control, specialist, generalist, multiple predator release

### Introduction

Cannibalism, the consumption of conspecific individuals, is a common phenomenon that occurs in the animal kingdom (Schausberger 2003). In case of prey scarcity, feeding on conspecifics can be a choice for some species, as alternative food source in order to survive, and eventually reproduce. By opting for cannibalism, individuals can thus avoid mutual interference for food and egg laying sites (Polis *et al.* 1989; Elgar & Crespi 1992; Blayneh 1999). This phenomenon is an important factor in the biology and ecology of species and can affect the distribution and structure of populations (Walzer *et al.* 2001; Negloh *et al.* 2012). The two-spotted spider mite (TSSM), *Tetranychus urticae*