

Ecological interactions between phytophagous and predaceous mites in citrus agroecosystems in Taquari Valley, Rio Grande do Sul, Brazil

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Abstract

We examined the interaction between phytophagous and predaceous mites in Valencia orange (*Citrus sinensis*) orchards at different altitudes in the Taquari Valley, Rio Grande do Sul, Brazil. Mites were sampled monthly from February 2005 to January 2006 in three citrus agroecosystems: Arvorezinha, Encantado and Taquari. For each agroecosystem, twelve leaves were taken from each of ten citrus plants, plus ten fruits and leaves from five associated plants found in citrus orchards. Predaceous species considered important were *Agistemus floridanus* Gonzalez (Stigmaeidae), *Euseius ho* (De Leon) (Phytoseiidae) and *Pronematus anconai* Baker (Iolinidae). Other predators found were *Iphiseiodes zuluagai* Denmark & Muma (Phytoseiidae), in Taquari and *Homeopronematus* sp. (Iolinidae), *Parapronematus* sp. (Iolinidae), *Neoseiulus tunus* (DeLeon) (Phytoseiidae) and *Typhlodromips cananeiensis* Gondim Jr. & Moraes (Phytoseiidae), in Encantado. The most frequent phytophagous mites were *Brevipalpus phoenicis* (Geijskes) (Tenuipalpidae), *Lorryia formosa* Cooreman (Tydeidae), *Lorryia* sp. (Tydeidae), *Tegolophus brunneus* Flechtmann (Eriophyidae) and *Tetranychus mexicanus* (McGregor) (Tetranychidae). Other phytophages were *Eutetranychus banksi* (McGregor) (Tetranychidae) in Taquari and *Phyllocoptruta oleivora* (Ashmead) (Eriophyidae) in Arvorezinha. The predator *A. floridanus* had the strongest correlation to the presence of common phytophagous mites, followed by *P. anconai* that seemed to be associated with eriophyid and tetranychid mites. The least number of predators occurred in Arvorezinha, where mowing and phytosanitary treatments were frequent. The associated plants *Thelypteris dentata* (Forssk.) E.P. St. John and *Solidago chilensis* Meyen had the largest abundance of predatory mites. However, *Ageratum conyzoides* L. had the highest diversity of predatory mites.

Key words: Biological Control, *Citrus sinensis*, Phytoseiidae, Eriophyidae, weed plants, survey

Introduction

Agriculture causes the simplification of environmental structure, replacing a greater diversity of plants with a small number of cultivated plants and weeds (Altieri *et al.* 2003). This simplification process, as well as cultivation practices, alters food chains, consequently contributing to problems with pest species. The citrus plants (*Citrus sinensis* (L.) Osbeck.) are attacked by many mites, especially *Brevipalpus phoenicis* (Geijskes) and *Phyllocoptruta oleivora* (Ashmead) (Yamamoto *et al.* 1994; Busoli 1995) and more recently *Tegolophus brunneus* Flechtmann (Flechtmann 1999). In turn, these pest mites are preyed upon by predaceous mites, and with careful management these predators can control pest mites (e.g., Lofego & Moraes 2006; Gravena *et al.* 1999). Phytoseiidae and, to a lesser extent Stigmaeidae, are the most important families of predatory mites (e.g., Yaninek & Moraes 1991; Muma & Selhime 1971; Ferla & Moraes 1998) on plants. Ferla & Moraes (2002b) reported nine species of predatory mites in the state of Rio Grande do Sul, Brazil. Such surveys of pests and their likely predators are important for the development of a biological control program that includes the conservation of natural enemies (Silveira *et al.* 2005).