Zoosymposia 6: 135–138 (2011)
www.mapress.com/zoosymposia/

ISSN 1178-9905 (print edition)
ZOOSYMPOSIA
ISSN 1178-9913 (online edition)

Management of the two spotted spider mite on carnation with the use of biopesticides and the predator *Neoseiulus longispinosus* (Evans) (Acari: Tetranychidae, Phytoseiidae)*

USHA CHAUHAN[1], PREM R. GUPTA & AJAY SHARMA
Department of Entomology and Apiculture, Dr Y.S. Parmar Universitry of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh;
[1]*Corresponding author: E-mail: uchauhan97@rediffmail.com*

* *In:* Moraes, G.J. de & Proctor, H. (eds) Acarology XIII: Proceedings of the International Congress. Zoosymposia, 6, 1–304.

Abstract

Carnation holds a prominent place and a good market among the various cut flowers in Himachal Pradesh, India, but it can be severely attacked by the two spotted spider mite, *Tetranychus urticae* Koch. Indiscriminate use of pesticides has led to development of resistance in this species, affected human health and caused environmental pollution. The determination of safer and more cost effective and eco-friendly alternative approaches for the management of this pest is desirable. Different combinations of three weekly applications of a predator [the phytoseiid *Neoseiulus longispinosus* (Evans)], a fungus [a commercial formulation of *Lecanicillium* (= *Verticillium*) *lecanii* (Zimmerman)], a plant extract (a commercial neem formulation), a conventional chemical mitecide (Profenofos) or water (control) were tested in 2008 and 2009. In both years, the best results were obtained by three subsequent weekly releases of *N. longispinosus* and three subsequent applications of Profenofos. These results show the potential of this predatory mite as a control agent of two spotted spider mite on carnation under greenhouse conditions in Himachal Pradesh.

Key words: Biological control, natural products, pest management.

Introduction

Carnation holds a prominent place among the cut flowers in Himachal Pradesh, India. It can be grown successfully under greenhouse conditions, it is highly appreciated for ornamental purposes and it has adequate market value. *Tetranychus urticae* Koch, the two spotted spider mite, is a pest of a large number of field and greenhouse crops, including carnation (Kumar *et al*., 1996), turning its leaves first yellowish and then bronze, stunting growth and reducing yield and quality of marketable flowers (Pal, 1956; Sandhu & Gupta, 1977).

Indiscriminate use of pesticides has led to development of resistance of *T. urticae* to those products (Gopal, 2000), affected human health and caused environmental pollution. To avoid long term adverse effects of these chemicals, the determination of safer and more cost effective and eco-friendly alternative approaches for the management of this pest is desirable. One of he best available options to be exploited is the use of botanicals as such or in combination with natural enemies. Botanicals have either repellent (Schauer & Schmutterer, 1981; Reda *et al*., 1990; Sharma *et al*., 2010) or lethal (Amer *et al*., 1991) effects on that pest, and in this study we were interested on evaluating the possible effect of a commercial neem extract for the control of *T. urticae*. Amongst the natural enemies, we were interested on the evaluation of the possible effect of the predatory phytoseiid mite *Neoseiulus longispinosus* (Evans) and of the fungus *Lecanicillium* (= *Verticillium*) *lecanii* (Zimmerman) as control agents of *T. urticae*. Promising results for the use of these natural enemies for the control of different tetranychid mites have been reported in the literature by Ho *et al*. (1995), Zhang *et al*. (1998, 1999) and Gerson *et al*. (2003) as well as by Chandler *et al*. (2005), respectively.

Accepted by G. J. de Moraes: 30 Jul. 2011; Published: 20 Dec. 2011