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A POTENTIAL PREDATOR OF CHILLI MITE, *polyphagotarsonemus LATUS* (Banks) (Tansonemidae: Acari)

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ABSTRACT

Chilli mite, *Polyphagotarsonemus latus* (Banks) causes severe damange to chilli crop at flowering and fruiting stages. Use of chemical insecticides induces resurgence of this mite in most cases, besides residue problems in green chillies. Attemps made to find out the natural enemies of this mite revealed the potential feeding nature of a predatory phytoseiid mite, *Amblyseius ovalis* (Evans). The predatory potential of *A.ovalis* worked out in the laboratory indicated that the adult predators were the most efficient in devouring the chilli mite at an average of 5.76, 4.64, 3.20, 3.12 and 2.12 eggs, first instar, second instar nymphs, pupae and adults respectively. The efficiency was gradually reduced in deutonymph and protonymph of the predator and the larva was the least effective in predatory potential against chilli mite.

Chilli mite *Polyphagotarsonemus latus* (Banks) also known as broad mite, yellow tea mite, tropical mite and chilli muranai mite was first described as murda disease of chilli from Northern parts of India by Kar (1926) and Ghai (1964). Feeding injury of this mite usually results in sudden curling and crinkling of leaves followed by blister patches. This mite infests the chilli crop at the flowering and fruiting stages and the crop fails to yield. Plants severely attacked stop growing and die. The commonly used insecticides *viz.*, mono crotophos, phosphamidon, methyl demeton, formothion, thiometon and neem cake extract caused resurgence of this mite to several folds besides causing residue problem in green chillies.

A predatory phytoseiid mite, *Amblyseius ovalis* (Evans) was found feeding on chilli mite. Hence, studies were conducted to determine its' relative feeding potential of *A. ovalis* on chilli mite *P.latus* at the Horticultural Research Station, Yercaud and the results are presented hereunder.

Table 1. Predatory potential of *A.ovalis* on *P.latus*

Stage of the predator	Stage of the prey-number consumed/day					
	Egg	First instar	Second instar	Pupa	Adult Male	Adult female
Larva	1.24^{d} (1.31)	0.84^{d} (1.15)	0.56^{d} (1.03)	0.00^{d} (0.71)	0.00^{c} (0.71)	0.00^{c} (0.71)
Protonymph	3.12^{c} (1.90)	2.56^{c} (1.74)	2.00^{c} (1.57)	1.56^{c} (1.43)	0.96^{b} (1.20)	0.96^{b} (1.20)
Deutonymph	4.46^{b} (2.27)	3.16^{b} (1.91)	2.40^{b} (1.70)	1.92^{b} (1.55)	1.04^{b} (1.24)	1.00^{b} (1.22)
Adult	5.76^{a} (2.50)	4.64^{a} (2.27)	3.20^{a} (1.92)	3.12^{a} (1.89)	2.12^{a} (1.62)	2.12^{a} (1.62)

Means followed by a common letter are not significantly different at 0.05 probability level
Figures in the parenthesis are $\sqrt{x + 0.5}$ transformed values

MATERIALS AND METHODS

The chilli leaf was placed with its lower surface facing upwards in a petridish containing absorbent cotton moistened with water. A small quantity of water was added daily to keep the leaf fresh. Egg, first instar, second instar, pupa, adult male or adult female at 10 each was introduced per leaf and the one larva of the predatory mite was introduced for feeding. This treatment was replicated five times. Similarly the predatory potential was studied for protonymph, deutonymph and adult predatory mites. The observations were made at 12 h interval for a period of one month.

RESULTS AND DISCUSSION

The results of the experiment indicated that the adult of *A.ovalis* was an efficient predator consuming an average of 5.76, 4.64, 3.20, 3.12 and 2.12 eggs, first instar, second instar, pupa and adult of the chilli mite, *P.latus* respectively (Table 1).

The adult predators were effective in feeding different stages of the prey followed by deutonymph and protonymph. The larva was the least effective in predatory potential feeding 1.24, 0.84 and 0.56 eggs, first instar and second instar prey respectively. The larvae of the predator were not effective against pupal and adult stages of the prey. The present investigation reveals the potential predatory nature of the adult *A.ovalis* followed by deutonymph and protonymph on different stages of

P.latus. Previously, the predatory nature of this phytoseiied mite on the carmine spider mite *Tetranychus cinnabarinus* (Boisd) was reported by Rao *et al.* (1970).

The observations recorded in the field showed that the chilli mite developed much faster than the predatory mite in the initial stage during the favourable climatic conditions of continuous humid cloudy weather. A fortnight later, the predatory mites were able to build up which brought down the population of the chilli mite and 1-2 predatory mite/leaf, in the field checked the build up of the *P.latus*.

During the early stage of attack of *P.latus*, the mass multiplication and release of predatory mite once or twice will be advantgeous to keep this phytophagous mite under check.

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EFFECT OF SEED TREATMENT WITH *Trichoderma Viride* AND MOISTURE LEVELS ON ROOT ROT DISEASE IN GROUNDNUT

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ABSTRACT

Trichoderma seed treatment reduced the root rot caused by *Macrophomina phaseolina* in groundnut at different moisture levels with maximum disease at 40per cent moisture holding capacity. The population of *M.phaseolina* in the rhizosphere of groundnut plants was highest at the same moisture level. The rhizosphere population of the antagonist *Trichoderma viride* was favoured at moisture levels of 40 to 60 per cent. Significant reduction in disease was observed with increasing moisture levels. At 100 per cent MHC all the plants survived, without any disease. The root rot incidence increased with increase in plant age. Higher moisture levels were not favourable for the pathogen as well as the antagonist.

Soil moisture is one of the major factor, that affect the distribution, survival, proliferation and subsequent establishment of *Trichoderma viride* in soil and in the rhizosphere. Adjusting the soil moisture to ideal/optimum level for the antagonists indirectly enhanced it's multiplication in the rhizosphere region, which inturn offered protection against soil-borne pathogens. Studies were undertaken to assess the influence of moisture levels on root-rot disease of groundnut and the rhizosphere population of the pathogen *Macrophomina phaseolina* and antagonist *T.viride*.

MATERIALS AND METHODS

T.viride multiplied in sand-maize medium served as an inoculum. It was applied in the sick soil at the rate of 5 grams/kg of soil. Eight groundnut seeds were sown in each pot and moisture levels were adjusted to 20%, 40%, 60%, 80% and 100% (Keen and Raczkowski, 1921). The rhizosphere population of *T.viride* and *M.phaseolina* were assessed at 15 days intervals by serial dilution plate technique using selective medium for *Trichoderma* (Elad and Chet, 1983) and *M.phaseolina*. The root-rot incidence was recorded simultaneously.

RESULTS AND DISCUSSION

The results revealed that seed treatment with *T.viride* reduced the root rot disease incidence at all moisture levels. The disease incidence was maxium at 40 per cent MHC (13.9%) and a significant reduction was observed at higher moisture levels (Table 1). Such a reduction in disease incidence has been reported in groundnut (Sharma and Bhowmik, 1989).

The rhizosphere population of *T.viride* was high at 40-60 per cent MHC. There was also a significant increase in *T.viride* population in the rhizosphere of groundnut plants with increase in