

**Effect of *Amblyseius mckenziei*
(Acarina:Phytoseiidae) on *Thrips tabaci*
(Thysanoptera: Thripidae) on onion crop in
Uzbekistan**

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Introduction

- At present the area under onion and garlic production in Uzbekistan is expanding. This increased production requires effective measures for protecting the crops from pests and diseases.
- Important insect pests of onion and garlic crops include *Dizygomyza cepa*, *Delia (Hylemia) antiqua*, *Agrotis segetum*, *Autographa gamma*, *Tibicen linnei*, [*Gryllotalpa gryllotalpa*](#), *Agriotes obscurus* and *Thrips tabaci*.
- The most spread and dangerous pest is *Thrips tabaci* Lindeman, a common and serious pest of many greenhouse and field crops.
 - Cause loss of yield and reduction in storage quality of bulb onions.
 - most damage during the early bulb development stage.
 - Infested plants may have leaves that are scarred (stippled appearance) and do not elongate properly resulting in twisted or crinkled leaves
- In the Tashkent region, development from egg to adult takes 20-25 days, with 6 to 8 generations per year.
- Thrips prefer to feed on the newest leaves, usually concealed in the leaf sheaths. As the leaf expands, the damage enlarges. Feeding results in leaves with a whitish or tan appearance.
- According to our observations thrips come out of overwintering places at the beginning of April, first occupying weeds and then moving onto winter onions leaves.
- The highest thrip population occurs in April, averaging 50 individuals per plant, on onion leaf sheaths.

Biological control of *Thrips tabaci*

- *Neoseiulus* (*Amblyseius*) *mckenziei* (Barkeri) Hughes (Acarina: Phytoseiidae) is an oligophagous predatory mite.
- It has been mass-reared with storage mites such as *Acarua farris* (Oudemans), as prey (Ramakers & van Lieburg, 1982) for control of thrips (*Thrips tabaci* Lindeman on cucumbers and peppers in many parts of the world (Hansen 1988; Ramakers *et al.*, 1989).
- In 1981 Beglyarov & Suchalkin (1983) introduced the predator in the former Soviet Union and in 1983 *A.mckenziei* colonization started in Central Asia.
- At present, in Kyrgyzstan biocenter, mass production of this predator is being commercially done for control of onion thrips and spider mites on various crops.

Methodology of this study

- Biological control of *Thrips tabaci* using the predator *Amblyseius mckenziei* was studied during spring time on onion in field plots.
- Plots consisted of 3 roads and 30 plants for each predator release.
- *Amblyseius mckenziei* was successfully colonized on grain mites *Acarua farris* and plant pollens in 3l glass jars that were maintained in growth chamber at a temperature of $25\pm 1^{\circ}$ C and relative humidity $60\pm 10\%$.
- At different densities of *Thrips tabaci* ranging from 5 to 50 per square meter we introduced *A.mckenziei* 2-3 times in different rates.

Results

- The results showed that the predator was effective at different pest densities.
- Even at a very high pest density of 50/m² the efficiency was 77.6±3 % on the 17th day after predator release.
- A high predator efficiency of 90.2 ± 3% was observed when pest attack was commencing (mean pest density of 0.3 individuals per leaf) which indicates that the predator can adequately prevent or suppress pest build up if applied early enough.
- The predator was more effective if released when the pest density is still low, predator: thrips ratio 1:3 and at temperature of 25° C.
- When pest density is very high the predator can suppress pest if applied at a ratio of 1:1, repeated 3 times every 12 days.

Thrips tabaci damage



Fig 1 - (A) Adult *Thrips tabaci* on the surface of onion leaf



(B) Onion leaves damaged by thrips

Amblyseius mckenziei

Photo by– A.K.Ahatov

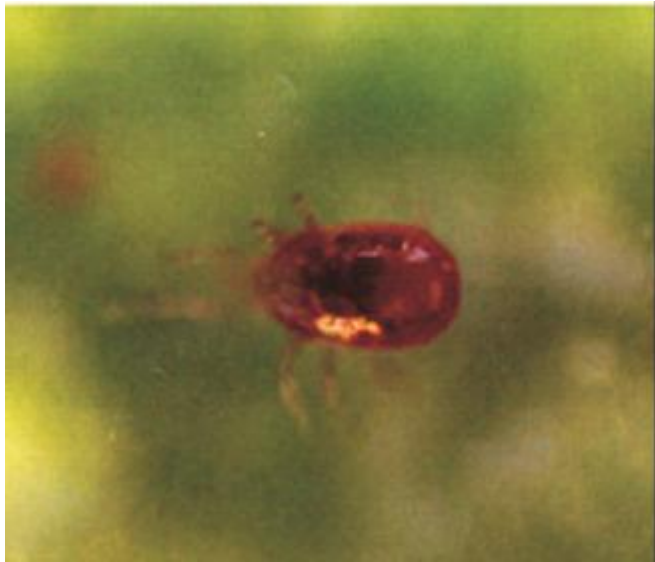


Fig 2 - (A) Adult *A.mckenziei* fed on *A. farris*.



(B) Adult *A.mckenziei* fed on onion thrips.

Fig 3 - Onion plants in spring time in Tashkent region (Kibray district)

Uzbekistan



Conclusions

1. The predator mite *Amblyseius mckenziei* Sch. & Pr. presented by Kyrgyzstan biocenter was successfully reared in Uzbek Research Institute for Plant Protection on flour mites *Acarua farris* as a prey.
2. The predator mite *A. mckenziei* can suppress onion thrips population at temperature of 25° C and relative humidity of 65-70%. It can therefore be used as a biological control agent for *Thrips tabaci* in Uzbekistan onion fields.
3. A high predator efficiency of $90.2 \pm 3 \%$ was observed if applied at a ratio of 1:7 (predator: prey) when pest build up is starting (0.3 individuals per leaf). At a high pest density (50 individuals per plant) the predator should be applied three times at a rate of about 50 individuals (predator mites) per plant, ratio of 1:1.

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