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Abstract

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Prey stage preference and functional response of *Neoseiulus striatus* (Acari: Phytoseiidae) on *Tetranychus urticae* (Acari: Tetranychidae)*

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The two-spotted spider mite, *Tetranychus urticae*, is one of the most serious phytophagous mites affecting maize in China. Recently, a species of predatory mite, *Neoseiulus striatus* Wu (Acari: Phytoseiidae), was found on maize plants in Inner Mongolia. To understand the potential of *N. striatus* as a biocontrol agent agsinst *T. urticae*, prey stage preference of *N. striatus* for *T. urticae* and functional response of *N. striatus* to *T. urticae* were explored in a climate chamber set at 25 ± 1 °C, 60 ± 5% RH, and a 16:8 h (L:D) photoperiod. The immature stages (eggs, larvae and nymphs) of *T. urticae* were used to avoid the influence of oviposition of female adults on the experimental results. In the no-choice experiment, *N. striatus* consumed significantly more larvae than on the other prey stages of *T. urticae*. At same time, in the choice experiment, *N. striatus* also significantly preferred larvae, followed by eggs and then nymphs of *T. urticae*. *Neoseiulus striatus* displayed a type II functional response on all immature stages of *T. urticae.* The number of prey consumed by *N. striatus* increased with the increase in prey density. In contrast, the predation rate of *N. striatus* decreased with increasing prey density, indicating that the proportions of prey consumed by *N. striatus* were higher at lower prey densities. Meanwhile, the highest attack rate of *N. striatus* was recorded when it fed on larvae of *T. urticae*, whereas the shortest handling time of *N. striatus* was recorded when it fed on eggs of *T. urticae*. In conclusion, *N. striatus* appears to be a promising natural enemy against *T. urticae*, especially at low prey densities. Thus, releasing *N. striatus* at the early occurrence of *T. urticae* may be an efficient method for suppressing the population of *T. urticae* and prevent their establishment on maize.

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Keywords: predatory mites, spider mites, stage preference, functional response, biological control

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