



University of Zabol
Management of Graduate Education
Faculty of Agriculture
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Thesis for Master's degree in Agricultural Entomology

Title

**Effect of multi-diet feeding on life table,
reproduction and predation rate of predatory mite
Neoseiulus californicus (Acari: *phytoseiidae*)**

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Abstract

Predatory mite (Acari: Phytoseiidae) (McGregor) *Neoseiulus californicus* is a native species of the Mediterranean region and many regions of the world. For this purpose, a study on the important parameters of the life table of the predator mite on a basic diet and 8 diets containing pollen (AD1), homogenized tissue of black soldier fly larvae (AD2), dry mealworm food (AD3), cysts without *Artemia* capsules (AD4), tobifex worm (AD5), krill shrimp (AD6), *Daphnia magna* (AD7) and bloodworm (AD8) were done. The island method was used to breed this predatory mite. The breeding islands prepared as described above were transferred to the germinator with a temperature of 27 ± 1 degrees Celsius and a relative humidity of $65 \pm 5\%$ and 16 hours of light and 8 hours of darkness. The comparison of these statistics with artificial food was done based on the theory of age-stage bisexual life table, which considers both sexes (male and female) and variable growth and development between individuals and genders, age-stage-specific survival rate (s_{xj}) x = age, j = stage), age stage-specific fertility (f_{xj}), age-specific survival rate (l_x), age-specific fertility (m_x) were calculated using TWOSEX-MSChart software. Population parameters, including intrinsic population growth rate (r), finite population growth rate (λ), net reproduction rate (R_0) and the average length of one generation period (T) were calculated according to Goodman's method. The results of this study showed that *Neoseiulus californicus* mite completed its different developmental stages on all diets. The growth periods of eggs, larvae, and protonymph in all diets had significant differences. The developmental stage of the egg in the diet containing bloodworm, dry mealworm food and Tobifex cream took the highest growth time. The longest lifespan of the females was in Tobifex cream (60.65 ± 0.44) and diet containing cysts without *Artemia* capsules (57.43 ± 0.2), respectively. In this study, the highest value of the intrinsic rate of population increase was related to the third diets that contained dry mealworm food and Tobifex cream. The range of one generation period in this study varied from 28.08 in the basic diet to 35.39 in the diet containing Tobifex cream. The highest survival rates in diets 1 to 9 for the stage of males are 0.19, 0.21, 0.24, 0.32, 0.22, 0.37, 0.24, 0.18 and 0.24 respectively. The percentage was obtained. In general, the results of this study showed that the use of diets is effective on the predatory mite's biomarkers and can be a suitable alternative to real baits in order to reduce the cost and maintain more predators.

Keywords: fertility, generation, survival, life expectancy, population