

Comparing flower nectar and artificial diet on the longevity and progeny production of *Trichogramma turkestanica*

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Abstract

The efficacy of natural enemies as biological control agents is sometimes limited by phenological asynchrony with their host or prey populations or by climatic intolerance during portions of the season. In some circumstances, such limitations can be overcome by augmentative releases of insectary-reared natural enemies. Nectar and honeydew usually function as fuel for adult metabolism or as complementary food rather than as complete diets.

To test the capacity of *T. turkestanica* individuals to parasitize when reared on different food sources, a recently emerged (0-24h) *T. turkestanica* females introduced and held for 24 h. In order to test palatability of nectar from flowers, we offered different floral nectars (dead nettle, willow, dog-fennel, plum, dandelion,) in glass tubes. Control tubes contained water only and this experiment was repeated on artificial diets (honey, grape molasses, raisins which wetted with water before offering to parasitoid, beet molasses, glucose%10 and sucrose%10 syrups, egg yolk + honey (1:1, w/w) and egg yolk+honey+water (1:2:1, w/w). Flowers were collected daily and spread on white paper to check insects under a lamp and then offered to the parasitoid. These flowers were offered simultaneously to a single female of *T. turkestanica* for 24 h in glass vials (together with an egg card).

The mean fecundity or parasitism (offspring of both sexes), directly observed, was between 15,5 and 30,9 per female; the values diet 12 (Sucrose) was significantly different from diet 5, 9, and 15. All of the diets had nutritional qualities that allowed complete development of the parasitoid, indicating that there is a potential for rearing this insect on artificial and floral nectars. Adult emergence was greater on the diet 12 (99,5%), it was significantly different from diet 9 and 15.

Female emergence differed significantly among diets, especially diet 12 which significantly differ from diet 5 and 15. The greatest female emergence was found on diet 12 and 14 with 87.8 and 86.8% female emergence. Male emergence did not differ significantly among diets. It was greater on diet 5 (without food) (46.6%). The number and sex ratio of progeny emerging from hosts parasitized by either fed or unfed females did differ significantly.

The longevity of males and females of *T. turkestanica* was influenced by the diet used. Females lived longest when provided honey, live adults were evident for 14 days, but, shortest when provided only water; all adults of *T. turkestanica* eclosed from host eggs died within 4 d. Therefore, we conclude that all diets are the most adequate for rearing *T. turkestanica*, except diet 5, 9 and 15, based on the biological parameters of parasitization, adult emergence, and female longevity.

Keywords: *Trichogramma turkestanica*, Flower nectar, Artificial diet, Parasitization, Insect nutrition longevity, Fecundity.