A Novel Study in Iraq Changing The Behavior of Food Preference for Adult Ladybirds on Aphis Fabae Scopoiliwhen Spraying Prey with Plants Extracts

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Abstract

During the present study, the method of attracting the predator (Ladybird) to one of its preference food (Aphis fabae Scopoili) was sprayed with three extracts of plants (Radish, Corn and Nerium) at a concentration of 75% extract / distilled water. Mile Ladybird adult with eleven points (*Coccinella undecimpunctata*) To measure the increase of (Aphis fabae Scopoili) *A. fabae* when spraying the extracts of these plants on the leaves of prey. The results showed a predilection of adult predator during all stages of the study to consume the highest percentage of Aphis fabae Scopoiliinsect when sprayed with a solution of the solution and then repeated the experiment when applying potted plants infected with Aphis fabae Scopoili and were treated the same way the three above By 5%.

Key word: Ladybird, plant extracts, Aphid.

Introduction

ladybirds is considered one of the effective elements in biological control (Mushtaq *et al.* 2015), most of which prey on important insect pests such as whiteflies, Aphid, scale insects, mealy bugs and some types of Mites. ladybirds belong to family: Coccinellidae [Kundoo and Khan (2017)].It contains more than 6000 species most of which are fed to the Aphids insect except under the family: Epilachninae that feeds on plants [Ślipiński (2007)].Among the most important types of insect predators prevalent in Iraq is ladybird(*C. undecimpunctata*), Because they feed on different types of Aphids[Jasman *et al*.(2013)]. It is noteworthy that the predatory of the Aphids differ in their degree of preference for a certain type of Aphids insect, but not other types of Aphids,This may be due to the prey color, ease of grabbing, or the suitability of that species for predator growth[Ferrer, *et al*.(2008)].Hodek (1956-1957) demonstrated aphids are species *A. sambuci* not suitable for species ladybird *C. setempunctata*, but it is not harmful for species ladybird *C. undecimpunctata*. Several other researchers have indicated that some types of aphids are not appropriate, Aphids for one type of disorder and its suitability for the other type[Blackman (1967), Lyashova (1980)]. did not mention of any sources, that the type of host on which aphids are feeding may be the reason for this preference.

Hagen et al. (1999) reported Most of the predatory insects, including predators, are aphids, they are generally considered to be heterotrophic,They eat prey that may belong to multiple taxonomic ranks, However, for a number of years, entomologists have realized that not every prey devoured by a predator is a suitable food for it. Hodek and honek (1996) explain, The common difference between basic food and alternative food. They indicated that the basic food is important for growth and productivity while the alternative food is important for the purpose of maintaining survival to a specific time in the absence of the basic food source.

As for how you can predatory predators, Hunting and locating their appropriate prey is a matter of difference between different researchers, Storch (1976) reported Ladybirds can respond to prey only at close distances, range of olfactory and visual sensory recipients used is unknown, time when it was common knowledge that Al-Diqaqq would respond to the presence of prey only after physical contact with it.Ladybird choose their available prey of high nutritional quality positively and reject prey of poor quality indicating the role of the predator's experience and expertise in this field [Dixon (2000)].

Toft (1995) reported The black bean aphid was the least palatable of several poor quality aphid.Among them *R. padai*. While it was genus (*R. maidis*) most palatable.

As for the current study, we shed light on the predator's preference*C. undecimpunctata*, For feeding on Aphis fabae Scopoili, Located incity of Muthanna/ Iraq, When sprayed with leaf extracts of three different plant families are Radish, Corn and Nerium, Where two methods were used to study the food preference process in this study, random squares method and the breeding cages method. With the aim of diversifying in style in terms of the size and shape of the spatial space that includes both predator and prey.

Materials and methods

1. Knowing the food preference by cage method

The peripheral parts of the Broad Bean plants were taken 20-25 cm in length. On each plant, he placed 20 aphid nymphs in the last stage, Use the number of 4 plants, The vegetable branches are fixed by medicinal cotton in the 500ml plastic bottle nozzles containing distilled water to sustain the greenery. Each vial containing a specific type of plant is placed in the corner of a wooden breeding cage (60cm×60cm×60cm). Its upper sides and sides are covered with clear glass. As for its back and front sides, it was covered with muslin cloth. Provide the front cover with an oval slot of 25 cm diameter on which a sleeve of 30 cm is installed. It is possible to control the opening and closing of the box. The bottom of the box was blocked by a piece of fine wood. A lighting source at a height of 25 cm from the surface of the box to ensure that light is distributed equally to all parts of the plant. 20 females released from ladybird*C. decimpunctata*at the age of 13 days, At the center of the base of the box, These females are collected 24 hours ago and are enclosed in ventilated glass bottles. The number of predators was calculated on each plant, After 1-6-12 hours have passed, repeated the experiment ten times. Attribution of adult ladybirds to each plant.

2. Food preference by random squares method

took a piece of clear plastic (20cm×20cm) thickness 3 mm, Divided by a thin black marker pen into 100 square,The side length of each side is 2 cm, 20 nymphs have been distributed from the last phase of Aphis fabae Scopoili, 5 of them were sprinkled with radish extract, 5 sprinkled with a nerium, 5 sprinkled with cornAnd 5 remained Control for comparison.

one nymphs randomly in the middle of each square. All nymphs killed by cryogenic temperature at 0 ° C before starting the experiment, female ladybird was released for one day from the midpoint, calculated the number of insects for each type of aphid, Consumed after the lapse of 15, 30, 45 and 60 minutes from the time of predator launch, repeated the experiment 20 times, used to replace the predator with another with the same age (12 days) each time.

Results:

The results of the study showed that the fastest time for the predator to reach the first prey was recorded with the aphid of the treatment with corn leaves extract (1.24 minutes)compared to 15.7 minutes with Aphis fabae Scopoili untreated with extracts and 10.5 minutes with aphid treated with oleander extract and 1.39 minutes with aphid treatment with radish extract (Table 1).

The reason may be due to the fact that the predators used in these tests are accustomed to feeding on the aphid of the leaves of the corn on the wild reed before the start of the experiments.

The gravitational attraction of ladybirds toward the aphid of the treatment with corn extract or common reed or to the Aphid of the treatment with radish extract and their preference over the untreated insect, it was confirmed again when using spatial cages of breeding where the insect ratios of corn extract consumed by the ladybirds reached its highest percentage during all experiment hours (1 - 8 hours).

The lowest aphid consumption rates were recorded with untreated Aphis fabae Scopoili, while the aphid consumption ratios treated with radish extract and the aphid treatment with oleander extract did not present significant differences between them during all hours of the experiment. Note that they came second in terms of ratios.

When aphids were randomly distributed among small squares, with the treatment of plant extracts included in the experiment, 5 of them were left without treatment for the purpose of comparison.

,It was noted that there is a strong tendency for adult ladybirds to attract and consume aphid sprayed with corn leaf extract first. Followed by aphids sprayed with radish plant extract, then aphids sprayed with extract of oleander and the lowest percentage was recorded with non-sprayed aphids (Figure 1). Table (3) also indicates that the fastest time for the arrival of ladybirds was (5.34 minutes).

The treated aphids recorded corn leaves and the highest time was (26.52 minutes). The untreated aphids were recorded by any plant extract. This experiment showed that the tendency of ladybirds with eleven points to favor the treated aphids corn and aphids for radish plants over the rest of the aphids in the experiment may have the smell or flavor that it left The extract on the body of the prey when sprayed on it, which helped to attract the predator to it.

Table1:time taken by the profound ladybird with eleven points*C. undecimpunctata*, To reach the first prey aphid(type of extract).

Plant extract(leaf)	**Time of first prey arrival (min)**
control	15.7
radish	10.5
Corn	1.39
Nerium	1.24

*$LSD_{0.05}$= 3.57

Table2:time spent by an adult ladybird with one point live *C. undecimpunctata*, To reach aphids in distributed Broad Bean plants.

Broad Bean plants	**Minimum arrival time for each plant (min)**
ControlBroad Bean	6.16
Nerium	6.78
radish	0.31
Common Reed	0.59

*$LSD_{0.05}$= 5.71

Table 3:time spent by an adult ladybird with one point live *C. undecimpunctata*, To reach the first prey by random squares (without the plant).

Plant extract(leaf)	**Time of first prey arrival (min)**
control	26.52
Nerium	14.32
radish	10.3
corn	5.34

*$LSD_{0.05}$= 10.87

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