

***Effect of some Vegetable Plant Hosts  
on the Biological Responses of  
Brevicoryne Brassicae (L) and Aphis Gossypii (Glover).***

by  
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**ABSTRACT**

The influences of these different vegetable plant hosts on the biological response of *Brevicoryne brassicae* (L) and *Aphis gossypii* (Glover) were studied.

The results obtained for *B. brassicae* (L) indicated that the lowest number of individuals produced per female was 11.50 when insects were fed on radich; this number was increased to 22.00 and 70.25 individuals when insects were fed on Garden rocket and cabbage, respectively.

In fact, this insect infested most vegetable crops in state of Qatar as cauliflower, cabbage, Radich, Garden rocket and certain ornamental causing considerable damage to all economic crops.

In case *A. gossypii* (Glover), squash was proved to represent the most suitable host production, followed in a descending order by cucumber and snake cucumber.

This insect infested all vegetable and other crops in State of Qatar and its infestation was higher on certain vegetable plants, of these. Tomoto, EGYPTIAN, Carrot, Cantaloupe, water melon, cucumber, squash, pepper, Onion, Lettuce, pumpkin, other vegetable, most of fruit trees and certain ornamental plants.

## Introduction

**Brevicoryne brassicae** (L) and **Aphis gossypii** are among the most important and destructive pests that attack several vegetable plants in state of Qatar. In the present work the biological response of these aphids were studied on different host plants as follows :

1. **Brevicoryne brassicae** (L): On cabbage, Radich (**Raphanus sativus**) and Garden rocket (**Eruca Sativa**).
2. **Aphis gossypii** Glover: On squash **cucurbita pepo** Cucumber (**Cucumis sativus**) and Snake cucumber (**cucumis melo var flexuosus**). The object of the present investigation is to study the biological response of **Brevicoryne brassicae** and **Aphis gossypii** Blover. On different vegetable plants in State of Qatar during the year (1980). These plants are cabbage (**B. ol. var capitata**). Local name of cabbage in State of Qatar is designated as El-Malfouf, Radish, Garden rocket, Squash, Cucumber and Snake cucumber. No studies were done regarding this problem in State of Qatar up till now. The results obtained reflect some light on the biological response of these Aphids on several vegetable hosts in State of Qatar. Several ecological, morphological and biological studies have been under-taken on these pests in different parts of the world by many investigators; of these, the studies of king (1932), Bedford (1936), Cartier (1960), Habid et al (1961), Nassar et al (1962) and (1963), Matalcalf (1962), Hassan (1963), Tapia (1968), Aboul-Nasr et al (1969), Bernardo (1969), Markula et al (1969), Saleh et al (1972), Low (1973), Robert (1978) AND Nayar and Calderon (1979).

## Materials and Methods

For each host, six individuals of the same age were chosen from the progeny of mature adult during the first 30 minutes of their production to ensure the homogeneity of age of the new generations. Each insect of the six selected nymphs was placed between two fresh leaves of each host-plant and kept separately in a 12 cms. diameter petridish covered with muslin. The diet was changed daily by a simple touch with a small brush until the insect withdraw its mouthparts from the tissues of the old leaf, then it was transferred gently to the new fresh leaf in the same manner. The inspection was carried out every 12 hours during the changes of the food. Observation records included number of moultings, nymphal period, number of progenies per day, period of pre-reproduction, reproduction, post-reproduction, and adult longevity, temperature and relative humidity (R. H.), in

the rearing laboratory were recorded twice daily with the help of thermometer and thermohygrograph.

## Results and Discussion

1. **Brevicoryne brassicae** (L): The obtained data shown in Table (1) revealed that the mean periods of nymphal stage lasted for 7.2 days on cabbage and 7.5 days on Garden rocket without any significant difference between them. It was prolonged significantly to 8.92 days by feeding on radish. The pre-reproduction period differed significantly according to the type of host. It was 0.6, 0.88 and 0.14 days on cabbage, radish and Garden rocket, respectively. The longest reproduction period was 21.00 days on cabbage. It was shortened significantly to 2.10, 1.00 days in case of insects reared on radish and garden rocket, respectively.

Table 1

Rate of reproduction and mean duration (in days) of various developmental stages of (*Brevicoryne brassicae*) reared on different hosts (Each figure denotes the average of two generations).

Hosts	Nymphal period	Nymphal instars				Pre-reproduction period	Reproduction Period	Post-reproduction period	Mean duration of adult stage	Longevity period	Average number of progeny per one female
		1st	2nd	3rd	4th						
Cabbage	7.20	2.14	1.63	1.45	1.99	0.60	21.00	5.50	27.20	36.10	70.25
Radish	8.42	3.00	1.50	1.88	2.40	0.88	10.18	2.10	14.00	22.00	11.50
Garden rocket	7.50	1.95	2.10	1.91	1.54	0.14	6.13	1.00	8.30	15.11	22.00

The longest mean period was 27.2 days for adults fed on cabbage. This was shortened significantly to 14.00 and 8.3 days for insects reared on radish and garden rocket, respectively. The complete developmental period lasted for an average of 15.11 days in case of insects reared on garden rocket. This was significantly retarded to 22.00 and 36.10 days for insects reared on radish and cabbage, respectively. Cabbage leaves proved to be the best host for rearing *Brevicoryne brassicae* (L) as the highest mean number of individuals was 70.25 produced per one female. Production of individuals dropped to 22 and 11.50 individuals when females were fed on garden rocket and radish, respectively.

2. *Aphis gossypii* Glov. The obtained data are summarized in Table (2). The mean duration period of nymphal stage was significantly influenced by the kind of host. Nymphs reared on snake cucumber, and squash lived for 7.75 and 8.10 days, respectively, and both figures with out significant difference from each other. The mean duration of nymphal stage was significantly shortened to 5.50 days when reared on cucumber. The pre-reproduction period was significantly influenced by hosts. The shortest mean of pre-reproduction period was 0.40 days for insects fed on cucumber. It was prolonged significantly to 0.65 and 0.61 days on squash and snake cucumber, respectively. The longest period of reproduction was recorded for insects reared on cucumber (15.61 days) and squash (13.55 days). It was significantly shortened to 9.98 days for insects reared on snake cucumber. The longest mean period of post-reproduction was 1.45 days for insects fed on snake cucumber. It was significantly shortened to 0.85 and 0.75 days on squash and cucumber, respectively. The mean durations (in days) of adult stage were 15.75, 15.00 and 11.5 for squash, cucumber and

Table 2

Rate of reproduction and mean duration (in days) of various developmental stages of (*Aphis gossypii* "Glov.") reared on different hosts (Each figure denotes the average of two generations).

Hosts	Nymphal period	Nymphal instars				Pre-reproduction period	Reproduction Period	Post-reproduction period	Mean duration of adult stage	Longevity period	Average number of progeny per one female
		1st	2nd	3rd	4th						
Squash	8.10	2.20	2.00	2.10	1.80	0.65	13.55	0.85	15.75	23.08	45.20
Cucumber	5.50	1.60	1.20	1.30	1.40	0.40	15.61	0.75	15.00	22.12	43.00
Snake cucumber	7.75	2.715	1.75	1.70	1.61	0.61	9.98	1.45	11.05	19.48	21.11

snake cucumber, respectively; **they without significant difference from each other**. The total development period was insignificantly influenced by the type of host. It lasted on the average for 23.08, 22.12 and 19.48 days for insects reared on squash, cucumber and snake cucumber, respectively. The first nymphal instar reared on snake cucumber lasted for an average of 2.71 days. It was shortened significantly to 2.2 and 1.60 days on squash and cucumber, respectively. No significant differences, however, were found between the other nymphal periods for instars fed on the three used. hosts. Generally, squash proved to be the most favourable host followed in descending order by cucumber and snake cucumber. The highest mean number of individuals produced per female was 45.20 for insects reared on squash. It was significantly reduced to 43.00 and 21.11 individuals for females fed on cucumber and snake cucumber, respectively. Its mean longevity was high at 20 c, 70 % R.H. with comparative mean longevity at 25 c, and 75 % R.H.

3. Generally : virus diseases were always transmitted by most kinds of aphids. It was found that the insect **Brevicoryne brassicae** (L) infested most vegetable crops in Qatar; these vegetables are cabbage (**Brassica oleraceae var capitata**), with the local name in Qatar (El-Malfouf), cauliflower (**Brassica oleraceae botrytis**), with the local name in Qatar (El-Zahra), radish (**Raphanus sativus**) with the local name in Qatar (El-Rowyid), turnip (**Brassica rapa**), with the local name in Qatar (El-Shalgham), garden rocket (**Eruca Sativa**), and certain ornamental plants. Such infestation causes a considerable damage to all economic crops. This insect was disappeared from most vegetable and certain ornamental plants during the winter and the summer seasons. **Aphis gossypii** Glover, was found to possess the highest infestation when compared with the previously mentioned aphid. It was recorded on all vegetable plants, fruit trees, ornamental plants and other crops. Its infestation was high on certain vegetable plants along all the year. Except few months during the summer season. The vegetable plants, which are greatly infested, included: tomato (**Lycopersicum esculentum**), EGYPTIAN PLANT (**Solanum melogena**), carrot (**Dacus carota**), cantaloupe (**Cucumis melo var aegyptiacum**), water melon (**Citrullus vulgaris**), with the local name in Qatar (El-geh), cucumber (**Cucumis sativus**), snake cucumber (**Cucumis melo var flexuosus**), squash (**Cucurbita pepo**), potato (**Solanum tuberosum**), onion (**Allium cepa**), lettuce (**Lactuca sativa**), okra or ladies fingers (**Hibiscus esculentus**), pepper (**Capsicum annum**), pumpkin, with local name in Qatar (El-baubar), other vegetable plants, most fruit trees, including: citrus fruits, grapes, other fruits, ornamental plants and other crops. Generally insects of family Aphididae represent the most important pests in all farms of State of Qatar.

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٢ - وجد ان الكرنب انسب العوائل حيث أن الانثى التي ربيت عليه انتجت في المتوسط ٢٥ر٧٠ فرداً بينما التي تربت على الجرجير والفجل انتجت في المتوسط ٢٢ ، ١١٥ فرداً على التوالي .

ب - من البطيخ : تصيب هذه الحشرة في دولة قطر البطيخ وانواع المقات الأخرى ومعظم محاصيل الفاكهة وبعض نباتات الزينة وهي من أشد وخطر الآفات الحشرية عموماً .

وقد تم تربية هذه الحشرة على الكوسة والخيار والقتاء ويمكن تلخيص النتائج في النقاط التالية :

١ - وجد ان الكوسة هي أنسب العوائل حيث بلغ متوسط ما انتجته الأنثى ٤٥٢ فرداً بينما نقص ذلك عند تربيتها على الخيار والقتاء .

٢ - فترة الحورية تطول عند تربيتها على الكوسة والقتاء بالمقارنة مع فترة الحورية عند تربيتها على الخيار حيث كان متوسط هذه الفترة ٨١ ، ٦٧٠ ، ٥ يوماً عند التربية على الكوسة والقتاء والخيار على التوالي .

٣ - تأثرت ايضاً تأثراً طفيفاً فترة ما قبل الولادة بالتربية على العوائل الثلاثة الكوسة والخيار والقتاء .

٤ - طالت فترة الولادة عند التغذية على الخيار والكوسة وقصرت عند التربية على القلاء والعكس كان صحيحاً في فترة ما بعد الولادة وتأثرت ايضاً طول حياة الطور الكامل . ونتج عن كل ذلك اختلاف في حياة الحشرة باختلاف العائل لها .

# تأثير بعض نباتات الخضر (كعوائل) في قطر على بيولوجي حشرتي « من » الكرنب و « من » البطيخ

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## ملخص

يعتبر المن من الآفات الخطيرة التي تصيب كل محاصيل الخضر بدولة قطر ( وفصيلة المن ( قمل النبات ) متعددة العوائل ، ولما كانت محاصيل الخضر وحدها اهم المحاصيل في الزراعة القطرية اذ تبلغ مساحتها ٤٢٪ من المساحة الكلية الزراعية بالدولة فان هذا البحث يلقي بعضاً من الضوء على النواحي البيولوجية لنوعين من أنواع المن وهما ( من الكرنب ومن البطيخ ) ويطلق على الأخير من البصل أو من القطن - كما تهدف هذه الدراسة إلى معرفة تأثير نوع الغذاء على فترات ( ما قبل الولادة والولادة وبعد الولادة والطور الكامل وطول حياة الحشرة واطوار الحورية ) وكذلك معرفة الاعداد الناتجة من انثى واحدة لكل من النوعين السابق الاشارة لهما على عوائلهما المفضلة .

## وتتلخص النتائج المتحصل عليها فيما يلي :

- ١ - من الكرنب « الملفوف » تصيب هذه الحشرة في قطر نباتات الفصيلة الصليبية كالكرنب « الملفوف » والقرنبيط « الزهرة » والفجل واللفت والجرجير وبعض نباتات الزينة . وقد تم تربية الحشرة على الكرنب والفجل والجرجير ووجد مايلي :
- ١ - فترات الحورية وفترة ما قبل الولادة والولادة وما بعدها . وفترة الطور الكامل وطول مدة حياة الحشرة اختلفت وتأثرت بدرجة كبيرة بنوع العائل الذي ربيت عليه .