

## COMPARATIVE SUSCEPTIBILITY OF SEEDS OF CERTAIN FABA BEAN VARIETIES TO *CALLOSOBRUCHUS* *MACULATUS* F. (COLEOPTERA : BRUCHIDAE)

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### Abstract

The present study was conducted to estimate the susceptibility of 10 promising faba bean varieties to infestation by the cowpea weevil, *Callosobruchus maculatus* F. Two pairs of insects were provided with 25g of seeds from each variety and replicated three times. The number of eggs deposited per female, the percentage of emerged adults and the developmental period were recorded.

Results showed obvious variation in the percentage of emerged adults, while the developmental periods did not vary significantly. Seeds of N.A. 12 variety were most tolerant, while those of Giza-3 variety were most susceptible.

### INTRODUCTION

Fourteen species of legume seeds are extensively cultivated for human consumption in different parts of the world including the faba bean, *Vicia faba* L. In many tropical developing countries, a number of legume seeds are cultivated and form a high proportion of the plant protein in the human diet.

In Egypt, improved varieties of faba bean *Vicia faba* were bred through plant breeding programmes and examined for their susceptibility to attack by storage pests. Fam and El - Sayed (1985) examined the susceptibility of some of these va-

ieties to infestation by the cowpea weevil, *Callosobruchus maculatus* F. The present work was carried out to determine the susceptibility of 10 new promising varieties of faba bean, *V. faba* to infestation by the most serious pest attacking faba bean seed in the store *C. maculatus*.

### MATERIALS AND METHODS

Cultures of cowpea weevils, *Callosobruchus maculatus* F. were reared in the laboratory at 30°C and 65% R.H. Two pairs of the test insect were confined with 25g of seeds from each variety in glass jars covered with muslin fixed in position by rubber bands. Three replicates were carried out for each variety. The jars were kept inside an incubator held constantly at 27°C and 65% R.H. The number of eggs deposited per female, the percentage of emerged adults and the developmental period were recorded.

The criterion for tolerance or susceptibility was calculated according to the following equation of Dobie (1974) as follows:

$$\text{Index of susceptibility} = \frac{\log. S}{T} \times 100$$

where S = Percentage progeny

T = Developmental period of the progeny

### RESULTS AND DISCUSSION

Table 1, shows the susceptibility indices of the tested ten faba bean varieties. The values demonstrate a differential response of various varieties. Giza 3, Giza 402 and Rena Bloura varieties proved to be highly susceptible. The respective indices were 6.73, 6.26 and 5.57. Variety N.A. 112 was most tolerant (index 3.90). The remaining varieties showed intermediate levels of susceptibility. The indices ranged between 4.70 and 5.17.

Table 1. Susceptibility of 10 faba bean varieties to infestation with the cowpea weevil, *Callosobruchus maculatus*.

| variety      | Eggs/female | % of emerged adults (S) | Log. S | Developmental Period in days (T) | Susceptibility Index* |
|--------------|-------------|-------------------------|--------|----------------------------------|-----------------------|
| Giza 3       | 46.7        | 26.05                   | 1.7486 | 26.00                            | 6.73                  |
| Giza 402     | 35.7        | 58.11                   | 1.7643 | 26.63                            | 6.62                  |
| 461/8371/83  | 10.9        | 31.05                   | 1.4921 | 33.47                            | 4.46                  |
| 461/841/83   | 10.1        | 32.30                   | 1.5092 | 31.84                            | 4.74                  |
| 461/845/83   | 46.0        | 28.05                   | 1.4479 | 29.71                            | 4.87                  |
| 461/847B/83  | 29.4        | 24.00                   | 1.3802 | 33.87                            | 4.07                  |
| 592/1848/86  | 13.8        | 24.36                   | 1.3867 | 26.82                            | 5.17                  |
| Rena Blura   | 18.7        | 53.18                   | 1.7257 | 31.00                            | 5.57                  |
| N.A. 112     | 30.0        | 17.67                   | 1.2472 | 32.00                            | 3.90                  |
| Triple white | 13.3        | 45.11                   | 1.6543 | 32.13                            | 5.15                  |

$$* \text{Susceptibility index} = \frac{\text{Log. S}}{T} \times 100$$



The factors responsible for the relative resistance of faba bean varieties were reported by Zacher (1952), Howe and Currie (1964), Gatehouse *et al.* (1979), Ishii and Urushibara (1951), Applebaum (1964), Applebaum *et al.* (1965), Applebaum *et al.* (1969), Rehr *et al.* (1973) and Janzen *et al.* (1976).

These factors were sucared as the thick coat, seed hardness, low nutritional content of cotyledons and materials toxic to pest but harmless to man.

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دراسة حساسية بعض أصناف بذور الفول  
للإصابة بحشرة خنفساء اللوبيا  
*Callosobruchus maculatus* F.

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تم فى هذا البحث دراسة حساسية ١٠ أصناف من بذور الفول للإصابة بخنفساء اللوبيا وقد وضع زوجان من الحشرات حديثة العمر على ٢٥ جرام من بذور كل صنف مختبر وكررت التجربة ثلاث مرات.

وتم حساب عدد البيض الذى تضعه كل أنثى وكذلك نسبة خروج الحشرات (الخلقة الجديدة) وكذلك المدة التى تقضيها الحشرة داخل البذور (مدة الجيل).

وتم حساب دليل الحساسية وذلك بمعرفة مدة الجيل ونسبة الخلقة الجديدة الناتجة من المعادلة الآتية :

$$\text{دليل الحساسية} = \frac{\text{لوغاريتم نسبة خروج الخلقة الجديدة}}{\text{مدة الجيل}} \times 100$$

وأثبتت النتائج أن هناك تفاوتاً فى حساسية الأصناف المختبرة وكان الصنف N.A. 112 أكثر الأصناف تحملاً للإصابة بينما بذور الصنف "جيزة ٣" من أشد الأصناف حساسية (إصابة) بحشرة خنفساء اللوبيا ولقد تفاوتت الأصناف المختبرة الأخرى لتعطى نسباً مختلفة بين الحساسية والتحمل.