

FIELD EVALUATION OF SOME PLANT OILS AGAINST WHITEFLY *Bemisia tabaci* (GENN.) AND APHID *Brevicoryne brassicae* (L.) INFESTED CABBAGE PLANTS

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ABSTRACT

Three plant oils were prepared as emulsifiable concentrate (thyme oil, clove oil and lemon grass oil) and evaluated at concentration 1.5% (v./v.) against nymphs of sucking insects : aphid (*Brevicoryne brassicae* (L.) and Whitefly (*Bemisia tabaci* Genn.) that infested cabbage plants.

Results obtained indicated that lemon grass oil and clove oil were succeeded for controlling this aphid species since they gave suitable initial and residual effects, while thyme oil alone succeeded against whitefly.

INTRODUCTION

Although chemical control using pesticides give speed and effective control against pests, but unfortunately pesticides are danger to human, animals and beneficial insects, therefore, it is very important to find out other local safe, cheap and effective materials against pests as a solution of problems appeared of using chemical pesticides.

Plant oils proved high suitable effects against sucking pests (Salem 1983; Mostafa and El-Attar, 1985 Ishaaya *et al.*, 1986 ; El-Sisi and El-Hariry, 1989 ; Jothi *et al.*, 1990; Iskander and El-Sisi, 1998; El-Hariry *et al.*, 1998 and Rizk *et al.*, 1999).

Therefore, it is very valuable to use those safe and cheap oils for controlling the piercing sucking pests infesting cabbage crop. The aim of the present work is evaluating three plant oil thyme oil, clove oil and lemon grass oil against piercing sucking insects; aphids, whitefly that attack and cause high lost in cabbage crop.

MATERIALS AND METHODS

1- Plant oils :

Three different plant oils produced by pressing of plant seeds of thyme, clove and lemon grass then the obtained oils were prepared as emulsifiable concentrate contained 93% (V/V.) base oil.

2- Treatments :

Field experiment was carried out according to Ministry of Agriculture Protocol (1998) by spraying those formulated plant oils at 1.5% V./V using knapsack sprayer in October 2008 on cabbage plants cultivated in El-Sharkia Governorate highly infested with insects: aphid, and whitefly.

3- Samples :

Pesticidal efficiency was determined by collecting 30 plant leaflets aged 40 days from each plot before spraying and After 2, 3, 5 and 7 days of spraying.

Collected leaflets were inspected using binocular, and number of each alive insect nymphs were counted. Reduction percentages were determined by using Henderson and Tilton (1955) equation.

RESULTS AND DISCUSSION

According to the Ministry of Agriculture recommendations for using the natural products and safe materials in controlling pests, effective material should give initial effect not less than 70% reduction and residual effect not less than 40% reduction. According to these recommendations results shown in Table (1) about the effect of the tested oils against aphid *B. brassicae* indicated that lemon grass showed the highest initial effect followed by clove and thyme oil. Also, all tested oils, except of thyme oil showed suitable residual effect, since they gave reduction percentage 40%. It should be mentioned that although thyme oil showed suitable initial effect, it did not give suitable residual effect.

Table (1): Insecticidal efficiency of the tested oils against aphid *B. brassicae* on cabbage plants.

| Treatment | Initial effect after 2 days % R | Residual effect % R after | | | Mean % R |
|----------------|---------------------------------|---------------------------|------|--------|----------|
| | | 3 | 5 | 7 days | |
| Thyme oil EC | 70 | 54.1 | 44.7 | 12.1 | 36.96 |
| Clove oil EC | 71 | 70.7 | 47.5 | 18.5 | 45.57 |
| Lemon grass EC | 75.1 | 70 | 53.6 | 25.6 | 49.73 |

Table (2): showed that the effect of the tested oils against whitefly, *B. tabaci* only thyme, gave suitable initial and residual effects. While results of both clove and lemon grass oils were less than recommendations in both initial and residual effect, therefore they should be tested and used at concentration higher than 1.5%.

Table (2): Insecticidal efficiency of the tested oils against whitefly *B. tabaci* on cabbage plants.

| Treatment | Initial effect after 2 days % R | Residual effect % R after | | | Mean % R |
|----------------|---------------------------------|---------------------------|------|--------|----------|
| | | 3 | 5 | 7 days | |
| Thyme oil EC | 75.4 | 67.1 | 57.3 | 33.5 | 52.33 |
| Clove oil EC | 67.8 | 63.4 | 35.7 | 16.4 | 38.5 |
| Lemon grass EC | 61.9 | 52.1 | 36.3 | 8.2 | 32.2 |

Results of the effect plant oils against aphid and whitefly is agree with Jothi *et al.* (1990).

The made of action the effect plant oils was as a result of their antifeedant action (Deshpande and Sharma 1990) and (Magd El-Din *et al.* 1993).

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تقييم حقلى لبعض الزيوت النباتية ضد الذبابة البيضاء ومن الصليبيات على محصول الكرنب

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**** المعمل المركزى للمبيدات – مركز البحوث الزراعية – الدقى – جيزة**

تم تقييم ثلاثة زيوت نباتية محلية حضرت فى صورة مركبات قابلة للاستحلاب وهى : زيت الزعتر- زيت القرنفل – زيت الطيب وذلك بتركيز ١,٥ % ضد كل من الذبابة البيضاء ومن الصليبيات التى تصيب محصول الكرنب ودلت النتائج المتحصل عليها أن زيت القرنفل والطيب أعطت نتائج ناجحة لمكافحة المن تحت التركيز المختبر وعلى العكس فكان زيت الزعتر هو الوحيد الذى أعطى نتائج ضد الذبابة البيضاء سواء فى التأثير الأولى أو المتأخر.