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# BIOLOGICAL EFFECT OF SOME AROMATIC PLANT OILS AGAINST APHIDS OLEANDER *APHIS NERII* (APHIDAE : HOMOPTERA)

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## Abstract

The main goal of this research was to assess the bioactivity the evaluate the biological effect of aromatic plant oils (Rumail oil, Black seeds oil, Anise oil, Cactus oil and Cardamom oil) of three concentration (1, 1.5, 3 MI/1 L) compared with two Insecticides using two different methods against Aphid Oleander *Aphis nerii* (Aphidae : Homoptera). In the petridishes experiment was experiment was no significant differences among all aromatic plant oils in day 3, 5 and 10 after spraying with for three concentration compared with two insecticides. The relative efficiency of oils at tenth day after spraying for all tested concentrations were 100% . In the experiment of the branches of Oleander showed no significant effects among each of Rumail oil (1 ml = 29.67 insect, 3 ml =29.67 insect), Anise oli (1ml = 17.34 insect), Cactus oil (1.5ml = 6.67 insect, 3ml =9 insect) and Cardamom oil (1ml =14 insect, 3 ml =25.34 insect) compared with two insecticides. The relative efficiency of these oils between 35.66- 93.33 % ate the tenth day of spraying.

***Key words***: Bioactivity, aromatic plant, insecticide aphids.

## Introduction

The medicinal and aromatic plants of the foot have played an important role in human life. They have been used in treatment, feeding and adornment. Several recent studies have pointed to the possibility of using aromatic plant extracts as an alternative to chemical pesticides manufactured in the fight against many pests (Zubaidi, 2008) Apple has a powerful effect in killing whitefly fowl mites on the tomatoes and lily seed on melon leaves and the two-spot dream on pistachios (Lin and others, 2009). Al-Jourani and others (2004) noted that the eggs, larvae and larvae of the large wax worm were clearly affected by exposure to the scent of eucalyptus leaf oil. The aromatic oils extracted from the plant Ailanthus altissima have strong antiviral and killer effect against four major insects infecting stored grains by contact and evaporation (Lin and Wn, 2010). While Ebadi and others (2008) found that the oil of cloves, acorn and celery had a fatal effect on the eggs of the similar flour beetle, ranging from 40-100%.The study of the biological activity of powder and some extracts and aromatic oils of garlic and onion plant showed that they can protect the cowpea seeds stored from *Callosobruchus maculatus* and reduce their damage (Denloye, 2010). Zubaidi and others (2008) noted that Zain seed black seed is the best among the tested oils to influence the percentage of the production of the beetle. In a study of 17 botanical plant oils, patchouli oil was found to be the most toxic of four insect species (Machial, 2010). The aromatic oils extracted from the roots of *Vetiveria zizanioides* have been found to be potent against the red flour beetle (Sujatha, 2016). Due to the effectiveness of aromatic oils extracted from the leaf of *Lantana camara* to kill Balagat different types of mosquitoes, Bachrouch and others (2010) noted that plant essential oils extracted from the plant *Pistacia lentiscus* have a strong effectiveness against larvae and adults red flour, as it reached 51% And 100% respectively. Tariq and others (2010) highlighted the importance of aromatic oils of the *Acorus calamus* L. plant in the killing of mosquito larvae of Dengue virus and found that the crude extract of *Ammi majus* and ginger plant has a good level of efficiency in killing white fly moths and insects of beans (Abou- Yousef *et al*., 2010).

## Materials and Methods of Research

Five essential oils from the local market is ((Rumail oil, Black seeds oil, Anise oil, Cactus oil and Cardamom oil), were tested them activity, as well as two insecticides (Acetamiprid 20% By contact and by stomach (5% lphacypermethrin). (Aphidae: Homoptera) Aphis nerii, collected from strongly infected oleanderplants in Baghdad governorate in 2010. The test was carried out in two ways:

A. Method for evaluating the effectiveness of aromatic plant oils in Petri dishes, if prepared glass dishes diameter 9cm and thickness 1.5 cm by placing a layer of medical cotton moisturized with water, on one sheet of plant oleanderin each dish. This transported 10 moving members of the insect of the turf. These dishes were left for an hour before the experiment was carried out.

B. The method of evaluating the effectiveness of aromatic plant oils on the branches of the plant: collected the same branches of the plant Aldbala

length of 30 cm, removed the leaves of the lower half of each branch and left the leaves of the upper half (6-9 leaves). Then put each branch in a plastic bottle (height of 15 cm and diameter 6 cm) container on the water and then transferred 10 moving members of the insect from the buffer to each branch and left for two hours before the implementation of the experiment.

The aromatic plant oils studied were tested with three concentrations (1, 1.5, 3 ml / L) and insecticides at a concentration of 0.5 ml / liter (as recommended by the producer). The confetti was sprayed in the test of the dishes with these concentrations (2 ml / dish) and by three dishes per treatment with spraying dishes with water only as a comparison. The treated dishes were then incubated at 27±2 °C and 70±5% relative humidity. In addition, sprinklers were sprayed in the experiment of the plastic bottles at the above concentrations and until the wetness was achieved by three replicates for each treatment. I left the bottles behind in laboratory conditions until the experiment was completed. The ratio of live moving individuals of the isolates was calculated in both experiments after 1, 3, 5 and 7 days of spraying and corrected the ratio according to Abbot (1925). The experiments were carried out according to the CRD design. The results were analyzed and statistically compared with the Duncan test at a significant level 0, 05. The relative potency of aromatic and tested plants was calculated using the Henderson-Tilton equation (1955).

## Results and Discussion

**Evaluation of the efficacy of aromatic plant oils in the dishes experiment:**

The results of the evaluation of the effectiveness of aromatic plant oils (Rumail oil, Black seeds oil, Aniseoil, Cactus oil and Cardamom oil) were tested in the dishes experiment (Table 1). There has been a decrease in the rate of insect preparation of the mollusks clearly since the first day after spraying and in three concentrations 1, 1, 5, 3 ml 1 liter of water. No significant differences were observed in the first day after spraying in reducing the rate of insect preparation in each of the treatment of seed oil (1 ml = 26,67 insect), anise oil (3 ml = 15.67 insect), aloe oil (25, 16, 19 insect respectively) and cardamom oil (1.5 ml = 26,67 insect Compared to the insecticides. The decrease in the rate of insect counts continued during the other days of spraying in all the treatments. No significant differences were observed between all the aromatic botanical oils tested in the effect of reducing the rate of preparation of the insect and the three concentrations in days 3, 5, 7 after spraying compared to the effect of insecticides.

The result was agreed with several researchers who pointed to the effectiveness of aromatic plant oils in reducing the rate of insect production and impact on one of their life cycles (Jorani *et al*., 2004; Lin and others, 2009; Denloye, 2013).

The tested aromatic plant oils showed a very high relative efficacy against insect of salt in the table experiment (2). The efficiency of the tested aromatic plant oils ranged from 51.33 to 84.33%, and from the first day after spraying. The efficacy of these aromatic plant oils continued to be effective against the insect of the mullet on the third, fifth and seventh day after spraying until 100% on the seventh day with spraying of all the tested aromatic plant oils (1, 5, 3 ml / 1 liters of water) With a concentration of 1.5, 3 ml / 1 liters of water, if the relative efficiency (87.66%, 90%), respectively.

**Evaluation of the effectiveness of aromatic plant oils in the experience of the branches of the Aldbala:**

The results of the evaluation of the efficacy of aromatic botanical oils tested within the experiment of propagation of the dipella showed a decrease in the rate of insect preparation from the first day till the seventh day after the spraying (Table 3), with anise oil (1.5 ml = 13.34 insect) and oil On the seventh day after spraying, there was no significant difference between cactus oil (1.5 ml = 25 insect, 3 ml = 11 insect) ) And cardamom oil (3 ml = 29.3 insect) compared to insecticides. The effectiveness of aromatic plant oils tested in the height of the reduction of the number of insect of the dipla within the experiment of the branches on the tenth day after spraying. There were no significant differences between clove oil (0.5 ml = 27.67 insect, 3 ml = 27.67 insect), oil Anise (0.5 ml 17.34 insect), cactus oil 1.5 ml = 6.67 insect, 3 ml = 9 insect) and cardamom oil (0.5 ml = 14 insect, 3 ml = 25.34 insect) compared with insecticides. This is in line with many previous findings which indicate that some aromatic plant oils have a degree of effectiveness in influencing insects (Abadi and others, 2008, Machial, 2010, Dua et al., 2015, Bachrouch and others, 2010). The tested aromatic botanical oils gave relatively good efficacy against the insect of the dipella within the experiment of spore propagation (Table 4). This relative efficiency was between 16.66 - 65.65% at the first day after spraying and between 13.33 - 86.66% at the third day after spraying and between 26 - 89% On the seventh day after the spraying until it reached between 35.66 - 93.33% starting from anise oil at a concentration of 3 ml / 1 liters of water down to the cactus oil at a concentration of 1.5 ml / 1 liters of water, effectively approaching the insecticide on the seventh day after spraying. In view of the results of the effectiveness of aromatic plant oils (palm oil, caraway seed oil, anise oil, sweet bean),

cactus oil and cardamom oil in the experience of dishes and the experience of the branches of dipella, which we found in this research, it is clear to us the possibility of obtaining chemicals from This plant facilitates the study of the introduction of such environmental materials, which will be safer than the chemical pesticides manufactured because of its negative effects on humans, animals, plants and the environment.

**Table 1 :** Evaluation of the effectiveness of aromatic plant oils in the experience of petri dishes.

| Treatments* | Concentration | Rate of insect of Aphids Oleander *Aphis nerii*** | | | |
|---|---|---|---|---|---|
| | | 1 day | 3 day | 5 day | 7 day |
| Rumail oil | 1 | 45.34 bcd | 00.00a | 00.00a | 0.00a |
| | 1.5 | 48.67bc | 7.34a | 17.34 a | 0.00a |
| | 3 | 34.00 b-e | 3.67a | 00.00a | 0.00a |
| Black seeds oil | 1 | 26.67b –f | 00.00a | 00.00a | 0.00a |
| | 1.5 | 46.67bc | 12.00a | 12.34 a | 12.34b |
| | 3 | 34.34 b- e | 12.00a | 10.00 a | 10.00ab |
| Anise oil | 1 | 53.67 b | 00.00a | 0.00a | 0.00a |
| | 1.5 | 38.00b-e | 00.00a | 0.00a | 0.00a |
| | 3 | 15.67 ef | 00.00a | 0.00a | 0.00a |
| Cactus oil | 1 | 25.00 c-f | 00.00a | 0.00a | 0.00a |
| | 1.5 | 16.00 ef | 8.34a | 0.00a | 0.00a |
| | 3 | 19.00def | 00.00a | 0.00a | 0.00a |
| Cardamom oil | 1 | 34.00b-e | 7.34a | 16.67 a | 0.00a |
| | 1.5 | 26.67 b-f | 3.67a | 0.00a | 0.00a |
| | 3 | 35.67 b-e | 00.00a | 0.00a | 0.00a |
| Acetamiprid | 0.5 | 00.00a | 00.00a | 00.00a | 00.00a |
| Alphacypermethrin | 0.5 | 00.00a | 00.00a | 00.00a | 00.00a |

* Each number in the table represents the rate of three replicates.
** The numbers of insects that carry similar letters in each column are not significantly different according to the Duncan test at 0.05 levels.

**Table 2** : Evaluation of the relative efficacy of aromatic effectiveness plant oils in the experience of petri dishes

| Treatments* | Concentration | The relative efficacy of insect of Aphids Oleander% | | | |
|---|---|---|---|---|---|
| | | 1 day | 3 day | 5 day | 7 day |
| Rumail oil | 1 | 54.66 | 100.00 | 100.00 | 100.00 |
| | 1.5 | 51.33 | 92.66 | 82.66 | 100.00 |
| | 3 | 66.00 | 96.33 | 100.00 | 100.00 |
| Black seeds oil | 1 | 73.33 | 100.00 | 100.00 | 100.00 |
| | 1.5 | 53.33 | 88.00 | 87.66 | 87.66 |
| | 3 | 65.66 | 88.00 | 90.00 | 90.00 |
| Anise oil | 1 | 46.33 | 100.00 | 100.00 | 100.00 |
| | 1.5 | 62.00 | 100.00 | 100.00 | 100.00 |
| | 3 | 84.33 | 100.00 | 100.00 | 100.00 |
| Cactus oil | 1 | 75.00 | 100.00 | 100.00 | 100.00 |
| | 1.5 | 84.00 | 91.66 | 100.00 | 100.00 |
| | 3 | 81.00 | 100.00 | 100.00 | 100.00 |
| Cardamom oil | 1 | 66.00 | 92.33 | 83.33 | 100.00 |
| | 1.5 | 73.33 | 96.33 | 100.00 | 100.00 |
| | 3 | 64.33 | 100.00 | 100.00 | 100.00 |
| Acetamiprid | 0.5 | 100.00 | 100.00 | 100.00 | 100.00 |
| Alphacypermethrin | 0.5 | 100.00 | 100.00 | 100.00 | 100.00 |

***Each number in the table represents the rate of three replicates.**

**Table 3 :** Evaluation of the effectiveness of aromatic plant oils in the experience of branches of Aldbala

| Treatments* | Concentration | The relative efficacy of insect of Aphids Oleander% | | | |
|---|---|---|---|---|---|
| | | 1 day | 3 day | 5 day | 7 day |
| Rumail oil | 1 | 80.00ab | 60.00 bcd | 64.00abc | 27.67 c-f |
| | 1.5 | 66.00a –e | 63.34 bcd | 53.67 a-d | 34.00 b-c |
| | 3 | 46.67de | 50.00 de | 39.00cde | 27.67 c-f |
| Black seeds oil | 1 | 76.67 abc | 93.34 a | 74.00 a | 41.34 a-d |
| | 1.5 | 63.34a-c | 43.34 de | 46.67 a-d | 48.00 abc |
| | 3 | 66.67a –e | 70.00 a-d | 64.34 abc | 60.34 ab |
| Anise oil | 1 | 73.34a-d | 53.34 cde | 42.00 bcd | 17.34 def |
| | 1.5 | 43.33e | 13.34 f | 31.67 de | 51.00abc |
| | 3 | 63.34a-e | 46.67 de | 45.67 a -d | 64.34 a |
| Cactus oil | 1 | 66.67a –e | 56.67 cd | 67.34 abc | 40.00 a-d |
| | 1.5 | 66.67a –e | 70.00 a-d | 25.00 aef | 6.67 ef |
| | 3 | 43.34 e | 43.34 de | 11.00ef | 9.00 ef |
| Cardamom oil | 1 | 83.34 a | 86.67 ab | 71.34ab | 33.00 b-e |
| | 1.5 | 50.00 cde | 80.00abc | 67.67 abc | 14.00 def |
| | 3 | 53.34 b-e | 26.67ef | 29.34 def | 25.34 c-f |
| Acetamiprid | 0.5 | 00.00 f | 00.00 f | 00.00 f | 00.00 f |
| Alphacypermethrin | 0.5 | 00.00 f | 00.00 f | 00.00 f | 00.00 f |

*** Each number in the table represents the rate of three replicates.**

**Table 4 :** Evaluation of the relative efficacy of aromatic effectiveness plant oils in the experience of ranches of Aldbala

| Treatments* | Concentration | The relative efficacy of insect of Aphids Oleander% | | | |
|---|---|---|---|---|---|
| | | 1 day | 3 day | 5 day | 7 day |
| Rumail oil | 1 | 20.00 | 40.00 | 36.00 | 72.33 |
| | 1.5 | 40.00 | 36.66 | 46.33 | 66.00 |
| | 3 | 53.33 | 50.00 | 61.00 | 72.33 |
| Black seeds oil | 1 | 23.33 | 6.66 | 26.00 | 58.66 |
| | 1.5 | 36.66 | 56.66 | 53.33 | 52.00 |
| | 3 | 33.33 | 30.00 | 35.66 | 39.66 |
| Anise oil | 1 | 26.66 | 46.66 | 58.00 | 82.66 |
| | 1.5 | 56.67 | 86.66 | 68.33 | 49.00 |
| | 3 | 36.66 | 53.33 | 54.33 | 35.66 |
| Cactus oil | 1 | 33.33 | 43.33 | 32.66 | 60.00 |
| | 1.5 | 33.33 | 30.00 | 75.00 | 93.33 |
| | 3 | 65.65 | 56.66 | 89.00 | 91.00 |
| Cardamom oil | 1 | 16.66 | 13.33 | 28.66 | 67.00 |
| | 1.5 | 50.00 | 20.00 | 32.33 | 86.00 |
| | 3 | 46.66 | 73.33 | 70.66 | 74.66 |
| Acetamiprid | 0.5 | 100.00 | 100.00 | 100.00 | 100.00 |
| Alphacypermethrin | 0.5 | 100.00 | 100.00 | 100.00 | 100.00 |

***Each number in the table represents the rate of three replicates.**

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