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Study of the effect of some alcoholic plant extracts in the control of adult domestic flies. *Musca domestica*

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Abstract

In this study, the toxic effect of the plant extracts *of Mentha Piperita, Datora innoxia, Olea europea*, and Dichlorvos (DDVP) were investigated in the domestic flies of Musca domestica. The domestic flies were treated with plant extracts and diclorophosphate with a fine spray method at 30 ± 2 ° C and 70 ± 5% relative humidity. Results were observed 24 to 48 hours of treatment respectively.

The results obtained from the present study showed that the vegetal extracts of Datura and Olives were given the highest corrected mortality rates (75.6 and 74.2) for the extracts of Datura and Olives respectively, and through these arithmetic averages, The insect also did not differ statistically but differed in the rates of killing from the ethanol extract of mint leaves and the Dichlorvos (DDVP) used in the experiment.

1- Introduction

There are more than one million species of insects in nature. There are about 5000 species of insects that are harmful to humans, animals and plants in general[1]. These insects are closely related to human health and have an important role in transmitting many human pathogens [2,3], as well as severe problems in the field of animal production and public health, and thess Insects feed on animals, including cattle, reduce production of milk and meat [4] (Diptera), which is a blood absorbent such as Horus and Lupus Black flies, horse flies and mosquitoes are important in terms of health, where humans and animals are attacked for the purpose of obtaining food, which causes great discomfort and is physically injurious to their blood absorption [5,6]. These insects also cause itching, A nuisance to man and his domestic animal [7,8].

The Muscular family, which belongs to the Diptera family, is one of the most important species of medical and veterinary importance. It is one of the most important vector carriers [9] its high ability to transmit pathogens mechanically It has wide spread throughout the world [10] its spread in rural areas more than urbane because of the spread of barns and cattle [11]. and also causes sump cancer in horses as well as polio and fly eggs of some worms, tapeworms and worms [12,13].

2- Materials and methods of work

2-1- Collection, diagnosis and breeding:

The house fly or was collected. from the of Tikrit city The insect was collected by wooden cages for the cultivation of insects, which placed inside the food groups prepared in advance to feed the insect. The insects were then placed in wooden cages (50 x 50 x 50 cm) in the opposite direction. (1: 1) and melted in 20 ml of distilled water and placed in petri dishes and placed in the center of the dish a piece of cotton to prevent insect adhesion [14,15]. And placing the soil crate in appropriate laboratory conditions at 30 ± 2 ° C and relative humidity (70 ± 5%). After the days, the insect adapted to its new environment. After the period of mating the insect was placed eggs in the clusters form in the middle, which was prepared to lay eggs.

2-2-Preparation of alcoholic extracts

the alcoholic extracts prepared in the graduate laboratories of biology Department of Sciences - college of Education - University of Samarra.[16] where the dried plant leaves are transferred to powder by using an electric mill. Then put 30 g dry powder for each of the plants mint, datura, olives by three experiments in the extraction thimble of the Soxhlet extractor and using 400 ml of organic solvent Ethanol at 99.9% where the heating lasted between 8 - 10 hours until the color of solvent dyed by the natural color of the plant powder, and this indicates that the substance has been extracted. The solvent was evaporated from the extract by the vacumrotary

evaporator at a temperature of 40 ° C in order to obtain an alcoholic extract which is in the form of a sticky substance. This substance was then collected and stored in dark and sterile bottles at 5 ° C until it is used in experiments[17,18]. The values resulting from the extraction process are calculated according to the following law:

$$\text{Proportion of the extract} = \frac{\text{The weight of the viscous material obtained}}{\text{total weight of the powder extract}} \times 100$$

2-3-Treatment of adult *musca domestica* by ethanolic extraets

In this method, 10 insects were placed in 20 x 20 x 20 cm wooden cages and treated with 100 ml of alcohol mixed with different concentrations of plant extracts,2000, 5000, 8000, 10000, 12000, 15000 ppm, The insect treated in the laboratory at 30 ± 2°C and 70 ± 5% relative humidity, mortality percentages were recorded after 24 and 48 hours of treatment and corrected by Abbott formula [19].

$$\text{Corrected mortality Percentage} = \frac{\text{mortality percentage in treatment} - \text{mortality Percentage in control}}{100 - \text{mortality Percentage in control}} \times 100$$

After taken the results LC50 was calculated as a half-killer concentration of 50% of the individuals treated with plant extracts using Log-Probit Paper [20], one of the methods of biostatical analysis [21].

3- Results and discussion

3-1- Effect of *Mentha Piperita* leaves extract in *Musca domestica* after 24, 48 hours of treatment

The results of this study Shawn that the plant alcoholic extracts has the killing effect against the insect in present study. This is due to the plant content of the active compounds dissolved in alcohol. Table 1 shows that treatment with a concentration of 2000 ppm given lowest mortality percentage 3.300% while the concentration of 15000 ppm complete for 48 hours has achieved 100% mortality percentage and this percentage is higher than the other concentrations, which varied the killing rate among them.

It was found that the effect of the ethanolic extract on the insect had a significant effect. It was found that the treatment of the insect for 48 hours of treatment resulted in an increase in the percentage of killing significantly when compared with its treatments within 24 hours, giving mean averages of (43.3, 46.7) Respectively. These results are in line with what [22] found in his study on the effect of some plant extracts of mint leaves, eucalyptus leaves, and alfalfa leaves. The study showed that the extract of mint leaves on the other extracts in the extruding effect of domestic flies was more than 5000.7000 ppm.

The results showed after 24, 48 of the treatment that the LC50 value amounted to 8900, 9200 ppm/ complete respectively as in Table (5) for the ethanol extract of mint leaves.

Table (1) Effect of ethanol extracts of *Mentha Piperita* leaves after 24 and 48 hours of treatment

Plant type	Time	Concentrations ppm						Average time	Average transaction	Average Plant
Mentha Piperita Leaves		2000	5000	8000	10000	12000	15000			
	24	3.3 f	16.7 E	33.3 D	33.3 D	73.3 B	100 a	43.3 BC	45 B	39.8 C
	48	3.3 f	20 E	36.7 D	43.3 C	76.7 B	100 a	46.7 B		
Concentra rate		3.300 f	18.35 E	35 D	38 C	75 B	100 a			

Values under the same letters in the same column or row are not significant differences according to the test of Duncan polynomial at 5%

3-2-Effect of *Datora innoxia* leaves extract in adult *Musca domestica* after 24, 48 hours of treatment:

Table (2) shows that treatment at the concentration of 2000 ppm/complete gave the lowest mortality percentage of the insect 16.70% while the concentrations of 10000, 12000, 15000 ppm/ complete for 48 hours has achieved a 100% mortality percentage and this percentage is higher than the rest of the other concentrations, between them .

It was also found that the effect of ethanolic extract on diuretic leaves on the insect had a significant effect. It was found that treatment of the insect for 48 hours of treatment resulted in an increasing in the percentage of mortality percentage significantly if compared with its treatments within 24 hours, Respectively. These results are consistent with the findings of [23] in their study of the effect of the licorice extract of Ricinus communis L. on the larvae from larvae to adults. Four solvents (methanol, chloroform, ether The results showed a direct effect on the insects' eggs through their effect on the body of the insect, the body wall, as well as through the mouth of the insect. Also, its effect was clear on the larval stage, causing damage to the lining of the intestine. The highest mortality percentage was LC50 (1.5, 2.5, 3, 5.5) g (100 ml). This indicates that the higher the concentration, the higher the mortality percentage.

The results showed after 24, 48 of the treatment that the LC50 value was 6000, 6,200 ppm / complete respectively as in Table (5) of the ethanolic extract of the Datura leaves.

Table (2) Effect of ethanol extracts of *Datora innoxia* leaves after 24 and 48 hours of treatment

Plant type	Time	Concentrations ppm						Average time	Average transaction	Average Plant
		2000	5000	8000	10000	12000	15000			
Datora innoxia leaves	24	16.7 D	63.3 C	70 B	100 A	100 A	100 a	75 A	75 A	59.3 A
	48	16.7 D	63.3 C	76.7 B	100 A	100 A	100 a	76.1 A		
Concentra rate		16.70 D	63.30 C	73.35 B	100 A	100 A	100 a			

Values under the same letters in the same column or row are not significant differences according to the test of Duncan polynomial at 5%

3-3-Effect of *europea Olea* leaves extract in adult *Musca domestica* after 24, 48 hours of treatment:

Table (3) shows that the treatment at the concentration of 2000 ppm / complete gave the lowest mortality percentage of the insect 33.30% while the concentrations of 12000, 15000 ppm / complete for 48 hours has achieved 100% mortality percentage and this percentage is higher than the rest of the other concentrations, .

It was also found that the effect of the ethanolic extract on olive leaves on the insect had a significant effect. It was found that treatment of the insect for 48 hours of treatment resulted in an increasing in the mortality percentage significantly if compared with its treatments within 24 hours. Respectively. These results are in line with what was found by [24] in a study on the effect of some plant extracts, including olive and fodder, on the spores of the domestic fly bug. (44.44 and 50.55%) respectively in the control. The higher concentration gave the highest mortality percentage in the treatment.

The results showed after 24, 48 of the treatment that the value of LC50 was 5,100,6700 ppm / complete respectively as in Table (5) for ethanol extract of olive leaves extract .

Table (3) Effect of ethanolic extract of *europea Olea* leaves after 24 and 48 hours of treatment

Plant type	Time	Concentrations ppm						Average time	Average transaction	Average Plant
		2000	5000	8000	10000	12000	15000			
europea Olea leaves	24	33.3 f	60 E	66.7 D	73.3 C	100 A	100 A	72 A	74.2 A	55.3 AB
	48	33.3 f	60 E	76.7 C	86.6 B	100 A	100 A	76.1 A		
Concentra rate		33.30 e	60 D	71.70 C	80 B	100 A	100 A			

Values under the same letters in the same column or row are not significant differences according to the test of Duncan polynomial at 5%

3-4-Effect of chemical insecticide Dichlorvos in *Musca domestica* after 24, 48 hours of treatment

Table (4) shows that treatment with a concentration of 40 ppm / complete gave the lowest mortality percentage of the insect 10% while the concentration 90 ppm / full for 48 hours of treatment has led to 100% mortality percentage and this percentage was higher than the rest of the other concentrations.

The effect of the was Dichlorvos insect significantly affected. It was found that the treatment of the insects for 48 hours resulted in an increasing the mortality percentage significantly if compared with its treatments within 24 hours, where the mean of the calculations of 46.7 and 50.5 respectively.

The results also showed that the Dichlorvos insecticide had a clear effect on the insect in present study. It was found that this has a high poisonous effect on the insects by inhibiting CHE on the nervous system, leading to an accumulation and increase in the secretion of acetylcholine [25].

Results after 24, 48 hours of the treatment showed that the LC50 value reached 61, 69 ppm / complete respectively as in Table (5).

Table (4) effect of Diclorvos insecticide in *Musca domestica* after 24, 48 hours of treatment

Type of pesticide	Time	Concentrations ppm							Average time	Average transaction
Dichlorvos		30	40	50	60	70	80	90		
	24	0 i	6.7 h	26.7 f	40 E	73.3 D	80.3 c	100 A	46.7 B	48.6 BC
	48	0 i	13.3 g	30 f	43.3 E	76.7 Cd	90 b	100 A	50.5 B	
Concentra rate		0 i	10 f	28.4 e	41.7 D	75 C	85.2 b	100 A		

Write the statistical test , Dank or ANOVA One-Way Analysis of Variance

Table (5) Values of LC50 of alcoholic extracts and Dichlorvos after 24, 48 of treatment

Plant	LC50 24	LC50 48
Mentha Piperita	**9200**	**8900**
Datora innoxia	**6200**	**6000**
europea Olea	**6700**	**5100**
Dichlorvos	**69**	**61**

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دراسة تأثير بعض المستخلصات النباتية الكحولية في مكافحة يرقات الذباب المنزلي *Musca domestica L.*

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الملخص

أجريت في هذه الدراسة اختبار مدى التأثير السمي للمستخلصات النباتية الكحولية لكل من أوراق النعناع *Mentha Piperita* ، أوراق الداتورا *Datora innoxia* ، أوراق الزيتون *Olea europea* كما استخدم في هذه الدراسة المبيد الفسفوري الدايكلورفوس Dichlorvos (DDVP) في كاملات الذباب المنزلي *Musca domestica* . وتمت معاملة كاملات الذباب المنزلي بالمستخلصات النباتية ومبيد الدايكلورفوس بطريقة الرش الدقيق بدرجة حرارة 2±30مْ ورطوبة نسبية 5±70 % وتمت ملاحظة النتائج بعد 48, 24 ساعة من المعاملة على التوالي.

من خلال النتائج التي تم الحصول عليها من الدراسة الحالية تبين ان المستخلص النباتي لأوراق (الداتورا و الزيتون) قد أعطيا اعلى نسب قتل مصححة والبالغة (75.6 ، 74.2) لمستخلصي اوراق الداتورة والزيتون على التوالي ومن خلال هذه المتوسطات الحسابية تبين أن لها تأثيرا واضحا في كاملات الحشرة وكذلك لم يختلفا فيما بينهما احصائيا ولكنهما اختلفا في نسب القتل عن المستخلص الايثانولي لأوراق النعناع والمبيد العضوي الفسفوري الدايكلورفوس Dichlorvos (DDVP) المستخدم في التجربة، وأيضا اتضح في هذه الدراسة أنه كلما زاد التركيز في المعاملة زادت نسب القتل.