

Modifying the Media of House Fly *Musca Domestica* (Diptera: Muscidae) by Plants Extracts as Insects' Repellent

Surayah Hamdi Al-Hadithi¹, Ezeddin A. A. Lbayyar²

¹Department of Life Sciences, College of Education for Girls, University of Anbar, Ramadi, Iraq

²College of Science, University of Anbar, Ramadi, Iraq

asalafahad@gmail.com

Abstract

The effect of the aqueous extract of *Datura innoxia* and *Moringa oleifera* leaves was tested on the biological performance of *Musca domestica*, results showed the superiority of datura leaf extract compared with the extract of the *Moringa* leaves plant in killing flies, the extract led to the killing of the larval stages exposed to the extract completely, and no larva reach to the pupal stage. While the extract of *Moringa* plant killed a large percentage of the larvae and reduced the number of pupae and adults to 16.7 pupae and 7.3 sprouted flies out of 70.0 eggs exposed to the extract and the occurrence of deformations and an increase in the weight and length of the pupae.

Keywords: housefly, repelling plants, moringa, datura

1. Introduction

Prepare the house fly *M. domestica* L It is one of the insects of medical and veterinary importance due to its nature in terms of its nutrition and its frequency on human food and excrement full of germs and dirt [1, 2], It affects human health by transmitting many pathogens, parasites and bacteria [3] and fungi [4] And germs such as cholera, eye diseases, diarrhea and anthrax are in a state of coexistence and close association with microorganisms [5], The larvae of houseflies also cause myiasis by ingestion of their eggs by humans and their entry into the alimentary canal, Attention has drawn and increased interest in finding ways to combat this insect and reduce its presence in the environment. Physical control has been used as a method of control, as the use of gamma rays causes sterility in flies [6] Many chemical pesticides have been produced that reduce the presence of the insect and the diseases it transmits, but it has begun to show resistance against it [7, 8] It also affects the environment and the beneficial insects it contains and leads to killing natural enemies and increasing environmental pollution in addition to being highly toxic and remaining in the environment without decomposition, which leads to its accumulation leading to many problems in the environment [9]. Despite the speed of the effect of pesticides in killing insects, it was necessary to find other ways to reduce the occurrence of side problems in the environment. Studies and experiments turned to the use of some plants and their extracts and to know their effect on insects by attracting or Expelling, killing or affecting the fertility of the insect and its eggs across generations or preventing its reproduction because it does not leave an impact on the environment and is quick to decompose and targets the insect to be disposed of and eliminated, and because of its high efficiency in combating insect pests in low concentrations and because it is less toxic to animals and the environment and because it is easy to produce and manufacture and because the insect is unable to Form resistant [10]. One of these plants is

Moringa oleifera and *datura innoxia* This study aims to find types of extracts that can be sprayed with waste as attractants to insects and then eliminate them, and to find types of extracts that can be sprayed on waste to expel insects and reduce their reproduction, and knowing the effect of these compounds on the vitality and fertility insects.

2. Materials and Methods

Insect collection and breeding

The housefly *Musca domestica* was collected on October, from a residential area of Anbar Governorate, by means of a net made of tulle, and the adult were placed in special breeding cages made of transparent fabric so that insects could be seen through them. The cage structure was made of wires, with dimensions of 30 x 20 x 20. He placed in the cage Petri dishes containing milk and a little sugar to feed the adult females and the other empty dish containing water. Plastic cups were placed inside the cage containing an industrial food medium to feed the larvae, which consisted of dried and ground poultry residues at a rate of 10 g mixed with the material or medium used As an attractant or insect repellent at a ratio of 2.5 gm and water and mix all the ingredients to become a wet fragile paste for the purpose of attracting adults to lay eggs on them and leave the eggs to hatch and small larvae emerge from them that feed on the same medium and know the effect of the materials used on them.

Preparation of aqueous extracts

The method [6] Al-Mansour adapted from [7]. Harborne [11] was adopted with some modifications by the researcher in preparing plant extracts using the hot water extraction method. Where 20 g of dry plant powders were taken and placed in a glass beaker containing 100 ml of hot distilled water 60°C and left for half an hour, then placed in an electric mixer for 15 minutes, then filtered with a tulle cloth, then placed in a centrifuge, and placed in the electric oven at a temperature of 40 for three days to obtain a dry powder that was kept in tubes in a place away from light.

The method of work

Food media was distributed to cages that contain one type of media and common cages. The number of flies that prefer to frequent any of the environments is calculated by counting the number of eggs in each cage. The effect of the media used on the insect is known by counting the number of larvae in each cage and calculating Number of pupae, calculating the emergence of adults and affected insects, to know which environments are more attractive and which are more repulsive, with three replications for each feeding medium and twenty insects in each cage. The insects were first collected from the environment and reared inside the laboratory in special cages made for this purpose containing media for feeding the whole insect and feeding the larvae. In addition, a place for the insect to be unable to provide the required preparations to carry out the experiment, and it consists only of the basic medium on which the insects grow

3. Statistical Analysis

After collecting and tabulating the data related to the study, it was statistically analyzed according to the factorial trials system using the Completely Randomized Design Factorial - CRDF, as well as by using the CRD design with the simple trials system using the statistical program Gen stat - Tenth Edition Version -10.3.0.0, and the significant differences of the averages were tested using a less test Significant difference L.S.D at the 0.05% probability level [12].

4. Results and Discussion

The effect of different media on the fertility of the first generation.

The number of eggs laid by housefly before exposure to food

The results of the study (Table 1) showed significant differences ($p < 0.05$), as the number of eggs laid by insects in different media varied significantly, the highest percentage of laying eggs in the medium containing the datura reached 106.7 with a deviation of 32.99, and this is consistent with the results of what the

researcher reached that the aqueous extracts of *Datura* plant attract female *Anopheles* mosquitoes to lay eggs, while the lowest percentage of eggs in the control medium was 56.7 with a deviation of 10.27. These figures indicate that there are many significant differences in the number of eggs laid by insects in different food media

Number of pupas

From Table 1, it was found that the highest number of pupa was in control, as it reached 39.3 with a deviation of 10.53, while it decreased in the mean containing *datura* to zero, as no number of pupa emerged. The reason for this may be due to the presence of toxic substances that killed the insect in larval instar before it reached the pupal stage. Through previous studies, concluded that the compounds isolated from the *datura* plant had led to the death of the larvae and a decrease in the weight of the pupae of the housefly. phenolic and tropane alkaloids [13].

Numbers of imago

Table 1 show the number of emerging insects from the pupal stage, the highest rate was in the control medium, as the ratio was 33.3 flies, with a deviation of 13.12, followed by the media containing *Moringa* with a percentage of 7.3 flies and a deviation of 4.49. It negatively affected the nutritional physiology of insects, which can have long-term effects, as it was used on the maize weevil *Sitophilus zeamais* [14]. While the lowest percentage of *datura*-containing media was 0.0, the results of this study are in agreement with what was found by that the aqueous extract and secondary compounds of *Datura innoxia* significantly affected the growth of the house fly, which caused an increase in the rates of egg destruction, increased deformities of adults and decreased productivity. The results of this study agree with Khan et al. [15] where the vegetable oil of *Datura* led to direct mortality of the red flour beetle *Tribolium castaneum*.

Table (1) Number of eggs, pupae and spores in food media for control, moringa and datura

nutritional medium	number of eggs		number of pupas		number of images	
	average	standard deviation	average	standard deviation	average	standard deviation
control	56.7	10.27	39.3	10.53	33.3	13.12
moringa	70.0	24.49	16.7	10.27	7.3	4.49
datura	106.7	32.99	0.0	0	0.0	0
L.S. D=0.05	64.29		48.966		43.45	
Prop	0.0139		0.1900		0.2588	



Larvae and pupae exposed to *Moringa* (2) Larvae of flies that feed on the medium containing *datura*

Effect of nutritional media on the weight and height of pupa pupae's weights

From the observation of Table 2, which shows the weights of pupae measured in grams (g) in the first generation produced from parents exposed to food media, the highest weight was for pupae produced from *Moringa* media, as the ratio was 0.2 g with a deviation of 0.09, and

the lowest percentage was in *Datura* 0.0 because the larvae exposed to this medium They did not reach the pupae stage, as their exposure to the severe toxicity of the *datura* plant led to their death, while the proportion of the resulting pupae from the control, which did not contain any additives, was 0.1 g with a deviation of 0.083.

lengths of pupas

Table 2 shows the lengths of the pupa measured in centimeters (cm) and through it can be observed the highest percentage recorded was for the pupas exposed to the nutritional media containing *Moringa*, which reached 0.6 cm with a deviation of 0.094. In one study, it was shown that treatment with aqueous extracts of *Moringa* in albino rats caused an increase in body weight [16], The lowest percentage was in *Datura*, which was 0.0

for the absence of pupae, as the toxic substances in *Datura* led to the death of the larvae due to the presence of toxic tropane alkaloids, including atropine, scopolamine, and hyosamine, which killed the larvae before they reached the pupae stage [17] While the lengths of the control pupas were 0.5 with a deviation of 0.082.

Table (2) weights and lengths of pupas

nutritional medium	pupae's weights		lengths of pupas	
	average	standard deviation	average	standard deviation
control	0.090	0.083	0.500	0.082
moringa	0.192	0.09	0.633	0.094
datura	0.000	0	0.000	0
L.S.D = 0.05	0.238		0.828	
Prop	0.2962		0.0885	

5. Conclusions

Plant extracts contain effective compounds that can be used as insecticides, there is a direct relationship between the rates of murder and the concentrations used, the force of attraction, and expulsion varies according to the type of plant extracts the superiority of the *datura* plant in its effects on the life of houseflies.

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