

# Efficacy of Curcuma Longa and Cordia Myxa Plants on the House Fly *Musca Domestica* (Diptera: Muscidae)

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## Abstract

The effect of the aquatic extract of the leaves of the cordia myxa plant and the turmeric plant *Curcuma longa* was tested on the life cycle of the house fly insect *Musca domestica*. The results showed that superiority of the extract of the leaves of the cordia myxa plant in effect compared to turmeric in killing flies, as the extract led to the killing of the larval stages exposed to the extract and a decrease in the numbers and weights of pupae due to the high acidity of the leaves of the plant, which led to the shrinkage and death of the larvae, while the turmeric plant did not lead to any Mortality rates among larvae, and a large percentage of larvae changed to the pupa instar and turned into adults.

**Keywords:** housefly, *Curcuma longa*, cordia myxa

## 1. Introduction

Attention has drawn and increased interest in finding ways to combat house flies and reduce their presence in the environment, and many chemical pesticides have been produced that reduce the presence of the insect and it transmits diseases, whether in the form of a bait that attracts the insect to eat it and then eliminate it or in the form of a pesticide that can be sprayed, which leads to killing flies but strains of houseflies have shown resistance against many pesticides [1]. In addition to the effect of these pesticides on the environment and the beneficial insects they contain and lead to the killing of natural enemies and increase environmental pollution in addition to being highly toxic and remain in the environment without decomposition, which leads to their accumulation causing many problems in the environment [2]. It was also noted the ability of these insects to develop themselves and their systems to resist chemical pesticides and are not affected by them after repeated use [3, 4]. Physical control was also used as a method of control, as it was proven that the use of gamma rays causes sterility in flies [5]. Despite the rapid 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 using plants extracts and knowing their effect on insects because they do not leave an impact on the environment and are quick to decompose and target the insect to be eliminated and eliminated. And due to the insect's inability to form resistant strains [6], This study aimed to find types of extracts that can be sprayed with wastes as attractants to insects and then eliminate them, and to find types of extracts that can be sprayed on wastes to repellent insects and reduce their reproduction, and to identify On the types of materials that attract or repellent insects, know the effect of these compounds on the vitality and fertility of insects, reveal the preferred environments for flies for use in control programs, and devise new ways to

deal with waste to reduce the breeding of insects on them.

## 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 [7] Al-Mansour adapted from Harborne [8] 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 [9].

### 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), shows that average number of eggs in different food media, were significant differences ( $p < 0.05$ ), as the number of eggs laid by insects in different media varied significantly, the highest percentage of laying eggs was in the medium containing the cordia myxa (63.3 eggs) With a deviation of 12.47, the lowest percentage in the medium containing turmeric was 45.0 eggs, with a deviation of 4.08, comparing the eggs in the control (56.7 eggs), with a deviation of 10.27 This shows that the insect is attracted to the bamboo to lay eggs because of the smell emanating from it

#### Numbers of pupal

From the observation of Table 1, it was found that the highest number of pupal was in the medium containing turmeric, which reached 41.7 pupal, with a deviation of 20.13, as turmeric is considered a safe substance for humans and animals, and studies did not show any toxic effects [10]. While it decreased in the medium containing cordia myxa to 17.7 virgins, with a deviation of 9.17, while the normal number in the control cage was 39.3 pupal, with a deviation of 10.53. Before reaching the pupal stage, by measuring the pH of the Bamber, the percentage was 14, while in control and turmeric was seven, and in a study evaluating the effect of cordia myxa on a group of animals, gastric erosion of the surface of the epithelium and congestion of blood vessels was observed. A decrease in the area of inflammation was observed in the rabbits of the treated group, with a certain degree of mucosal regeneration (re-epithelialization) and parietal cells appeared on the Granular cytoplasm shape and proliferation of

connective tissue cells (granulation tissue) [11], The results of this study are in agreement with the findings of [12] where the effect of the hot aqueous extract of the cordia myxa plant on housefly showed that the leaves affected Significant effect on the life performance of flies, and the deformations increased in larvae and pupae, and all insects died during direct spraying of larvae. The results of the statistical analysis showed significant differences ( $p < 0.05$ )

#### Number of imagoes

It was shown from Table 1 for the number of emerging of the pupal stage that the highest rate was in the media containing turmeric, which amounted to 35.3 flies, with a deviation of 17.51. The increase in buds may be due to the presence of curcumin, which is the yellow biologically active component, as it is anti-inflammatory, antiviral, and germicidal and beneficial to fertility [13]. The lowest percentage of emergence was for the pupae resulting from the bamboo with a percentage of 11.0 flies and a deviation of 8.04, while the normal percentage in the control of germination was 33.3, with a deviation of 13.12. Chemicals and high acidity Extraction of crude phenolic compounds from leaves of C myxa plant in order to evaluate the potential effect of the extract on the biological performance of Culex pipines mosquitoes. C and it was found to have a significant effect on Culex mosquitoes, and an increase in the mortality of the larval stages of the insect and a decrease in the productivity of adults and the number of eggs was recorded and this is consistent with the results of this study.

nutritional medium	number of eggs		number of pupae		number of spores	
	average	standard deviation	average	standard deviation	average	standard deviation
control	56.7	10.27	39.3	10.53	33.3	13.12
Curcuma longa	45.0	4.08	41.7	20.13	35.3	17.51
cordia myxa	63.3	12.47	17.7	9.17	11.0	8.04
L.S.D = 0.05	23.008		32.81		33.48	
Prop	0.0007		0.0395		0.0868	



Effect of cordia myxa on housefly larva Effect of nutritional media on the weight and height of pupae

#### Pupae weights

The results of the statistical analysis showed that there were significant differences ( $p < 0.05$ ) from the observation of Table 2 which shows the weights of the pupae measured in grams (g) in the first generation resulting from the parents exposed to the nutritional media. These results are in agreement with the study [14], where the turmeric plant led to fattening and increased chicken weight compared with the control group, followed by the cordia myxa with a weight of 0.096 g and a deviation of 0.016, while in the control the weight of the pupae was 0.090 with a deviation of 0.083

#### Lengths of pupae

Table 2 shows the lengths of the virgins of the first

generation measured in centimeters (cm), and through it can be observed that the highest percentage recorded was for the virgins exposed to the turmeric-containing food media, as it reached 0.567 cm, with a deviation of 0.047. Turmeric is considered a medicinal plant and a natural antiseptic [15] while the lengths were equal in the bamboo and the control, reaching 0.500 cm with a deviation of 0.081 for the bamboo and 0.082 for the control. The results of the statistical analysis showed significant differences ( $p < 0.05$ )

nutritional medium	pupae's weights		lengths of pupas	
	average	standard deviation	average	standard deviation
control	0.090	0.083	0.500	0.082
<i>Curcuma longa</i>	0.173	0.031	0.567	0.047
<i>cordia myxa</i>	0.096	0.016	0.500	0.081
L.S.D = 0.05	0.114		0.096	
Prop	0.0426		0.00002	

## 5. Conclusions

Plant extracts contain effective compounds that can be used as insecticides and 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 cordia myxa plant in its effects on the life of housefly The *Curcuma longa* plant is a safe compound for humans and animals and contains anti-inflammatory substances.

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