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EFFICIENCY SOME METHODS OF CONTROL AGAINST FLESH FLY SARCOPHAGA CARNARIA (DIPTERA : SARCOPHAGIDAE)

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Abstract:
The results showed that the nanoparticles were more effective on the larvae , pupae and adults , from the plant extract and silica gel where the highest percentage of mortality was 100% , 90% and 76 % for the first , second and third larva stage after 72 hours when treatment at a concentration of 100 milligram \ ml , the same concentration caused a mortality rate of 63.3% for pupae and 80% for adults , Also, these factors caused an increase in the growth period for immature and the adult stages of the meat fly , the duration reaching 17.3 and 12.5 for larvae and pupae stage respectively at concentration 100 milligram / ml , the duration of the adult reached 13.5 at the same concentration .

Keywords: Nanoparticles, larvae, pupae , Meat fly

The meat fly *(Sarcophaga carnaria*) larvae cause myiasis in vertebrate animals. The medical importance of Myiasis larvae in human is that they are mandatory Parasites for living tissue indicate severe damage and distortion of tissues and organs which they invade (Hall,2001). Due to the medical and economic damage caused by the myiasis larvae, several insecticides have been used to combat them, but these compounds cause a strong damage to the human as well as animal because of its harsh poisoning in addition to the ability of these pesticides interlink with genetic material of living organisms (Kacmar et al 1999). Thus, repellents, feeding deterrents and insecticides natural origin are all rational alternatives to synthetic insecticide. Insecticide that composed of plant extract may proof to be alternative to the persistent synthetic pesticides (Chiasson *et al.*,2004). In this study the pesticidal activates of silica nanoparticle and leave extract of *A. halimus* were found to produced high activity against meat fly.

MATERIALS AND WORK'S STRATEGIES

1. Breeding and feeding the insect

Meat fly adults were collected in April/2020 and reared in University of Al-Qadisiyah. (Nasir and Alaa,2010) THe adults were put in glass cages with rectangular surfaces in 60 x 60 x 100 cm s which covered by Al-malmal cloth,. Plastic containers of (30) Cm diameter and (15)Cm depth used for the adults food. The adults food is minced meat and sugar solution. pieces of cotton which filled with distilled water are used for the adults to put their eggs on. for larvae, glass containers of 30Cm diameter and 10Cm depth were used to feed them. Inside these containers had been put the food medium which consist of minced meat and distilled water with some drops of formalin. The larvae put in these containers and kept in (37)C°. the third stage larvae had been moved to glass containers of 5 x 60 x 40 Cm dimensions, which contain corn powder. the Pupal had been isolated and moved to plastic containers of(9m diameter and 4m and contain wet sand in order not to be dried and kept in Containers with a temperature of 27 C° and and (60-70)% humidity until the adults exit

2. Collection of plant specimens

Atriplex halimus plant were collected and the leaves washed by water then they had been put on filtering paper in a suitable air stream with continuous flipping to dry them and prevent them to be moldy. Then these leaves had been smashed separately and dry powder kept in the fridge until use.

3. Preparing the water extracts

In followed In which (10)Cm from the dry powder of the plant had been taken and put in (500)Milli flask which contain distilled sterile water and mixed by using electric blender for (15) minute(Minjas and Sarda,1986). The mixture had been filtered by filtering paper and the leachate had been kept in sterile cans in (10)C° until use.

4. Synthesis of silica nanoparticles

For producing the Nano silica molecules, Parasher *et al.*,(2009) was followed

5.The Features of Nano Silica Molecules

To diagnose Nano silica molecules formed from the plant extract, the UV-UIS Spectroscopy measuring device had been used and the analysis using ray diffraction. imaging pack appeared (400)

6. Pesticidal Bioassay on Larval stage of meat fly

In order to know the effect on larvae stages, Debnath *et al.*(2010) way had been followed and the doom proportion had been calculated after (24,48,72) hour from the treatment

7. Pesticidal Bioassay on pupal stage of Meat fly

The resulting Pupal were collected from larvae which are treated by the water extract and Nano silica extract separately. For each concentration the doom proportion and the abnormal situations had been calculated in all its life.

While In the control treatment, the added extract and the nanoparticles were replaced by distilled water at (10) Pupal per duplicate.

8. Pesticidal Bioassay on adult stage of Meat fly

Dephath *et al.*(2010) way had been followed in which the adult Pupal had been treated by (2)milli from the plant extract and Nano molecules each on glass pot of (30)Cm diameter and (10)Cm Height which contain treated feeding medium and covered by sulfone bags perforated in order to prevent the adults exits.While in the control treatment, the extract and the Nano were replaced by distilled water. The doomed adults number had been calculated after (24,48,72) hour from the start of the treatment and the eggs number which was put by the female, hatching eggs proportion and their life period had been calculated also

9.Insecticidal activity against non-adults and adult longevity of meat fly.

Larvae which survived from all the control methods compared to untreated larvae were taken. An increase has been observed larvae duration pupae duration and adult longevity.

Statistical Analysis

The results had been analyzed according to (C. R. D) and the doom proportion had been collected according to the (Abbott,1925) equation

$$The\ corrected\ percentage\ mortality\% = \frac{percentage\ mortality\ in\ the\ treatment - percentage\ mortality\ in\ control}{100 - percentage\ mortality\ in\ control}$$

Results and discussion

1 Nano Silica Molecules

Mixing the plant extract with the aqueous solution of silica noticed the change of color after 72 hours. The color change is therefore signal for the formation of silica and silica Nanoparticles, because without treating it with silica and siliceous there was no change in the color of cell free extract of plant, while after the addition of silica and siliceous the colorless solution change into colored solution which has been described in the study (Salunkhe,2011).

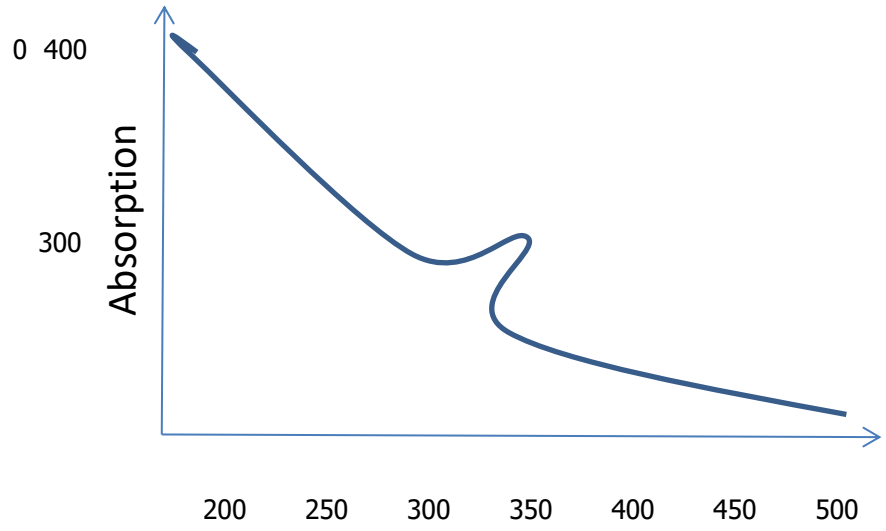

Figure (1) UV absorption free silica to nanoparticles

Effect of pesticides in larvae stage of Meat fly

The Nano silica Molecules were more effective from the plant extract and silica gel in the(table (1,2,3) the highest doom proportion reached to 100% for the first stage larvae after 72 hour from the treatment and in 100 Mg/Ml concentration from Nano silica molecules with clear significant differences from second and third stages. TheNano silica molecules cause impregnated in insect cuticle and effect of the cuticular barrier. This caused lose water from insects' bodies and their dead(Kumar *et al.*, 2009).

A. halmins leave extracts without silica gel did not show any change in color. (Raurajech *et al.*(,2009) reported to reduction of silica in to silica nanoparticles during expoucure of plant extract could followed by color change due to excitation of surface plasmon vibrations in silica Noparticles. Similar results were recorded when used silica

nanoparticle in reduction of first larval stage of *Anopheles stephensi* ranged 89.25% (Murugan *et al.*,2015).

Table No.1 Insecticidal activity of plant extract and silica particles against the first larvae stage of meat fly

Test: sample	Concentration	Mortality(%)		
		24h	48h	72h
Plant extract	100	56	66	86
	75	43.3	60	76
	50	34	40	60
	25	20	30	46
Free silica	100	70	80	89
	75	66	73	80
	50	46	63	73
	25	40	50	60
Silica Nano Particle	100	80	93	100
	75	76	86	97
	50	43	74	80
	25	50	60	70

L.S.D $_{0.05}$ 0f time = 5.13
L.S.D.$_{0.05}$ of concentration = 4.28
L.S.D $_{0.05}$ of overlap = 5.02

Table No.2 Insecticidal activity of plant extract and silica particles against the second larvae stage of meat fly

Test: sample	Concentration	Mortality %		
		24h	48h	72h
Plant extract	100	46	60	76
	75	40	53	70
	50	33	36	54
	25	16	24	40
Free silica	100	63	70	80
	75	53	63	73
	50	43	53	64
	25	30	40	51
Silica Nano Particle	100	76	80	90
	75	70	76	83
	50	53	66	73
	25	40	50	66.66

L.S.D $_{0.05}$ 0f time = 4.16
L.S.D.$_{0.05}$ of concentration = 5.62
L.S.D $_{0.05}$ of overlap = 6.08

Table No.3 Insecticidal activity of plant extract and silica particles against the third larvae stage of meat fly

Test: sample	Concentration	Mortality %		
		24h	48h	72h
Plant extract	100	36	53	60
	75	30	40	50
	50	19	33	44
	25	10	20	30
Free silica	100	50	56	63
	75	40	50	54
	50	36.6	40	46
	25	20	30	40
Silica Nano Particle	100	60	70	76
	75	50	63	70
	50	44	50	63
	25	33	40	50

L.S.D $_{0.05}$ 0f time = 3.78
L.S.D.$_{0.05}$ of concentration = 4.12
L.S.D$_{0.05}$ of overlap = 4.56

Patil *et al*,(2012) showed that 10 ppm of silica nanoparticles leading to larvae mortality by o 41% in *Drosophila melanogaster*, e. Through the exoskeleton in the inter cellular space silica nanoparticles bind with sulfur from protein leading to rapid denaturation of enzymes, the decrease in membrane permeable main cause loss of cellular function and cell death (Beneli,2016).

Effect of insecticides on Pupal stage of Meat fly

Table no.4 shows that Pesticides that are used had an obvious effect in meat fly pupal in which the doom proportion reached (63.3)% by using Nano silica in 100Mg/ML with significant differences from their similar plant extract and silica gel. (Barik *et al*.,2012) study shows that the Nano molecules had severe effect on *Aedes aegypti* pupal doomed proportion in 112.5 ppm concentration. Madhiyazhagan (2015) found that Nano silica molecules caused 70% doomed proportion of *An. stephensi* pupa in 10 ppm concentration. From this, it is clear that Nano silica molecules was more sufficient in decreasing the drosophila pupal member. Due to mechanical barrier that provided by deposition of elements of cell wall, this caused insect lose water from their body and dead (Beneli *et al*.,2016). The results also show the decreasing of pupal weight and produced deformed pupal as well as The delay of pupal stage.

Table No.4 Insecticidal activity of plant extract and Nano Silica Particle against Pupa of meat fly.

Test: sample	Concentration	Mortality %		
		24h	48h	72h
Plant extract	100	16.6	30	46.66
	75	10	26.4	40
	50	6.66	20	30
	25	3.33	13.3	20
Free silica	100	20	33.3	50
	75	10	30	44
	50	6.66	20	36
	25	6.66	13.3	23
Nano Silica	100	23.4	50	63.3

	75	20	36.6	50
	50	13.3	30	43
	25	10	23.3	30
	Control	0.00	0.00	0.00

L.S.D 0.05 0f time = 3.52
L.S.D.0.05 of concentration = 3.34
L.S.D 0.05 of overlap= 5.66

Effect Of Insecticides On Adult Stage Of Meat Fly

Table No.5 shows the effect of insecticide on meat fly adults in which Nano silica molecules exceeded in decreasing adults member, while the plant extract and the free silica were less effective. The results showed that there were significant differences between the three groups of insecticides in comparison with each other and with control group. The highest doom proportion reached 80% in 100Mg/Ml concentration. The effect results showed that the Nano silica molecules changed the color of the body and reduce the number of abdominal rings. These changes could not be noticed when the plant extract and free silica were used. It had been found that by using *Eucalyptus* leaf extract and silver nitrate with its different concentrations, there was not any effect in the body color change proportion and the disappearance of the abdominal lines of the *Drosophila* insect *D. melanogaster* (Gehring,2002), Massey(2006) refer that Nano silica molecules caused 55.3% doom proportion for *Spodoptera littoralis* adults. Medhiazhagan *et al.*(2015) clarified that Nano silica molecules which consist of *Solanum nigrum* extract caused 61% doom proportion for *Aedes aegypti* adults in 112.5 ppm concentration. .

Table No.5 insecticidal activity of plant extract and silica nanoparticle against adult of meat fly.

Test: sample	Concentration	Mortality %		
		24h	48h	72h
Plant extract	100	16	44	68
	75	14	30	60
	50	6.66	23	36
	25	3.3	16.66	24
Free silica	100	19	46	70
	75	15	33	66
	50	10	24	40
	25	6.6	19	30
Nano Silica	100	19	53	80
	75	16	40	70
	50	13	36	53
	25	10	20	31
	Control	0.00	0.00	0.00

L.S.D 0.05 0f time = 3.06
L.S.D.0.05 of concentration = 3.14
L.S.D 0.05 of overlap = 3.82

Insecticidal Activity Against Immature And Adult Longevity Of Meat Fly.5

The shows that nano-silica particles prolonged the growth period of the immature stages of the meat fly , reaching 17.3 and 12.5 days for larvae and pupae respectively at concentration 100milligram \ Mel compared with the control treatment , which amounted to 12.1days table (6). The duration of the adult stage reached 13.5 at the same concentration ,.

Table.6 duration of the larvae, pupal and adults longevity (days) of treated of meat fly by plant extract and Nano silica particle.

Biological treatment	concentration	Larval duration(d)	Pupal duration(d)	Adult longevity
Plant Extract	100	17.1	13.3	13.5
	75	15.9	12.5	13.1

	50	15.3	10.9	12.9
	25	15.1	9.1	12.2
Silicgel	100	17.3	15.2	13.7
	75	17.1	15.1	13.5
	50	15.9	14.8	13.2
	25	15.1	14.3	12.8
Synthesis Silica Nano particle	100	16.4	13.4	13.3
	75	15.8	11.1	13.1
	50	15.3	10.9	12.4
	25	15.1	10.1	12.2
Control		15.1	9.1	13.3

L.S.D 0.05 0f time = 1.21
L.S.D.0.05 of concentration = 1.08
L.S.D 0.05 of overlap = 2.12

CONCLUSION :

The nano-silica caused greater mortality in different stage of meat fly insect , However insect may develop behavioral response to these particles , plant or their extracts can be used in the synthesis of nanoparticles seem to be very easy to use in control against different insect .

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