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THE EFFECTIVENESS OF CERTAIN PLANT EXTRACTS AND CONVENTIONAL INSECTICIDES AGAINST HOUSE SPARROW AND PALM DOVE BIRDS

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ABSTRACT:The effectiveness of 13 plant extracts as repellent against house sparrow, *Passer domestica noliticus* and palm dove, *Streptopelia senegallus*, were determined under laboratory conditions by using one and two choice feeding methods. Blue gum tree leaves and seeds, Black pepper, Geranium and Greater ammi hexanic extracts exhibited repellent effect to house sparrow bird , while Black pepper, French cotton, Jimson weed, Blue gum tree and Greater ammi ehanolic extract showed the highest repellency effect than hexanolic. On the other hand, out of 13 wild plant extracts, only Blue gum tree leaves either extracted by hexane or ethanol exhibited repellent effect to palm dove birds.

Among all tested pesticides only methomyl and dithianon showed high repellent effect at tested levels. Only the carbamate had considerable repellent effect against palm dove.

Regarding, the repellent and toxic effect (R50 & LD50) on house sparrow birds, the obtained results showed that the highest performances were recorded with hexanic Blue gum tree leaves followed by black pepper seeds and Blue gum tree seeds. The same was recorded with ethanolic Black pepper seeds, Blue gum tree seeds, Greater ammi seeds, Blue gum tree leaves, Greater ammi seeds, French cotton leaves, Jimson weed leaves and Geranium leaves. Data also showed the house sparrow birds were more susceptibility to methomyl than to dithianon and ethanolic Blue gum tree leaves.

INTRODUCTION

Many agricultural crop damage problems caused by birds are extremely complex. In most cases bird species are desirable and protected. Accordingly damage must be reduced without destroying birds Babu (1988). In African countries, such as Egypt with a limited cultivating area, food insufficiency is the major problem that faces the over growing human population . The Egyptian government started to approach and solve this problem by the reclamation of desert lands.

Recently, in Egypt, the house sparrow, *Passer domesticus niloticus* are considered the most economic vertebrate pest in the agricultural land, particularly in the newly reclaimed areas. Chemical bird repellents have been used on crops to protect them from birds (Neff and Meanely, 1965). Several chemicals have been screened as avian repellents against different bird pest species and a soil insecticide methiocarb, emerged as one of the most promising chemicals tested (Ismail, 1997; El-Deeb *et al.*, 1990 and Abd-El-All *et al.*, 1995).

The massive application of pesticides, resulted in build-up pest resistance and also, in adverse effect on the environment. Such environmental problems, have focused increased interest on pesticides occurring naturally in plants. Such agents are biodegradable to non-toxic products and can be suitably implement in integrated pest management programs (IPM). During the last two decade many attempts have been done to insolate and identify various naturally occurring biologically active compounds possessing pesticidal properties.

However, several of these bioactive components were reported to exhibit synergistic properties to some traditional synthetic pesticides. In addition, several insect feeding deterrents have been isolated from certain plant species . Also, it was reported that many of these naturally occurring substance had arrestant effects on insect growth. The pesticidal and biological activities of plant extracts were extensively studied by several researchers, i.e. Zidan *et al.*, (1993 & 1994), Abd-El-All *et al.*, 1999, and Salama & Ahmed (1997).

The present investigation throw some light on the effect of certain avicides and wild plant extract on some biological aspects of noxious bird species (i.e. house sparrow, *Passer domesticus niloticus*) compared with another belonged to non target bird i.e., (palm dove , *Streptopelia senegallus*).

MATERIALS AND METHODS

1- Tested compounds :

1.1- Plant extracts :

Thirteen plants were selected for this study and listed in Table (1). All plants or their used parts were free from any avicidal contaminant .

Table (1) : Plant materials used :-

Family name	English name	Latin name	Tested part	Source
Compositae	Sea ambrosia	*Ambrosia maritime*	Leaves	Aswan
Compositae	Southern wood	*Artemisia cinae*	Fruits	Aswan
Solanaceae	Black pepper	*Pepper nigrum*	Fruits	Aswan
Solanaceae	Jimson weed	*Jimson weed stramonium*	Leaves	Helwan
Solanaceae	Henbane	*Hyoscyamus muticus*	Fruits	Aswan
Chenopodiaceae	Common lambsquarters	*Common lambsquarters album*	Fruits	Giza
Cucurbitaceae	Colocynth	*Citrullus colocynthis*	Fruits	Aswan
Geraniaceae	Geranium	*Pelargonium gravioulens*	Leaves	Dakahlia
Asclepidaceae	French cotton	*Calotropis procera*	Leaves	Helwan desert
Crucifera	Cauliflower	*Brassica oleracea*	Fruits	Giza
Myrtaceae	Blue gum tree	*Eucalyptus glbulus*	Leaves& fruit	Giza
Umbelliferae	Greater ammi	*Ammi majus*	Fruits	Fayoum
Zygophyllaceae	Syrian rue	*Peganum Syrian ru*	Fruits	Nubaria

1.1.1. Preparation of the plant crude extract :-

Used part of each plant was air dried then ground in a food grinder and sieved through 400 µ sieve . 150 g..each of these ground materials was separately macerated consecutively in two solvents varied in their polarity, i.e. hexane and ethanol. Each solvent was used at 5 ml. / g plant material. After 72 hours, the extract were filtered through anhydrous sodium sulphate. All filtrates from hexane and ethanol were evaporated by a rotary evaporator at temperatures not exceeding 50 °C. The crude extract was weighed and adjusted to 10 ml with the solvent used and kept in a refrigerator until testing (Freedman *et al.*, 1979).

Conventional Pesticides :-

1- Sethoxydim (Nabu-S 12-5 % oil E.C.) (+-) - (EZ)-2- [1-(ethoxyimino butyl) 5 2-[2ethyl thiopropyl] ñ3-hydroxy cyclohex ñ2-enone..

2- Thiophanate-methyl (Topsin-M 70 % E.C.) 1,2 bis(3-methoxycarbonyl-2-thioureido)-benzene.

3- Carbaryl (Sevin 85 % W.P) 1-naphthyl methyl carbamate.

4- Methomyl (Lannate 90 % W.P.) S-methy N- (methyl carbamoyloxy) thioacetimidate.

5- Dithianon (Diathane) 5,10-dihydro-5,10dioxanophtho [2,3b]-1,4-dithi ñin- 2,3 dicarbonitrile.

6- Dicofol (Kelthane 18.5% E.C.) 2,2,2-trichloro- 1,1-bis (4- chloro-phenyl) ethanol.

7- Copper hydroxide (Kocide-101 W.P.) Cu $(OH)_2$ Metallic copper equivalent.

2- Bird acclimatization and adaptation procedures :

The laboratory trials were conducted against house sparrow, *Passer domesticus niloticus* and palm dove, *Sterptopdia senegallus*. Birds were trapped by parotrap adapted from the MAC trap. Birds were transferred directly in aviary (2.4 x 2.4 x 3.6 m.) to laboratory . All birds had access to water, grit and whole grain sorghum. Birds were housed in a comminal wire mesh holding cages (53 x 25 x 38 m.) with no more than two birds / cage for two weeks at room temperature before testing and allowed free assess to the same diet and water for acclimatization (Koehler *et al.*, 1987).

2-1- Repellency tests :

2-1-1- none choice method :

The one - choice method described by Bullard and Shumake (1979) and modified by Shefte *et al.*, (1982) was adopted in this work. These methods are based on the original methods of Starr *et al.* (1964) and Shafer and Brunton (1971). Five individually caged birds were used for each treatment. Each

bird was offered known number of sorghum grains for four successive days before treatment and consumption of diet was assessed daily. Treated sorghum was prepared by dissolving the amount of the candidate pesticide required to obtain the tested concentration in 5 ml of water. Serial concentrations were prepared for each on (i.e. 0.025 , 0.05 and 0.1 %) and added each concentration to 600 pieces of sorghum grain , then coated to mix and dryness. On the other hand, crude of each tested wild plant was thoroughly mixed with the required amount of sorghum grains. The used solvent was evaporated by the aid of ventitation . Each bird was offered the same amount of the treated sorghum grain for four consecutive days. Food consumption was daily estimated. The same procedure was done with the untreated ones.

The repellency potential was calculated by using the following equation according to Mason *et al.*, (1989).

$$\% \text{ Treated grain acceptance} = \frac{\text{Average No. consumption of treated grains}}{\text{Avergae No. consumption of untreated grains} + \text{Avergae No. of consumption of treated grains}}$$

Birds with food acceptance less than 40 % were considered repelled .

2-1-2-Free-choice method :

The two-choice method was in complete harmony with that described by Russel *et al.*, (1989). Treated whole grain sorghum was prepared by the same way mentioned above. Five birds were individually caged in wire mesh cage (15 x 23 x 15 cm.) for each treatment . Known number particles of treated and untreated sorghum grains were separately exposed to each bird in small petri-dishes for four successive days. The position of the two containers was altered daily to prevent preference for certain location. Consumed treated and untreated sorghum grains were recorded daily. The repellent potential was calculated according to the above mentioned equation.

2-2- R_{50} determination :-

A laboratory trials had been conducted to determine R_{50} values of tested plant extract and pesticide compounds which showed a noticeable bird repellent effect in the previous experiments . i.e. Black pepper, Greater ammi, Geranium, Jimson weed, French cotton Blue gum tree plant extracts and methomyl and diathianon. Five individually caged birds of house sparrow. Passer domesticus niloticus were used for each treatment. Serial concentrations from each tested extract or chemicals were prepared in water. While, in case of palm dove, Streptopelia senegallus, Blue gum tree leaves ethanolic extract was used with leaves and methomyl pesticides. Two choice method , similar to that described by Russel *et al.*, (1989), Consumption from untreated and treated sorghum grains were recorded after 24 hours. Birds that consumed less than half of the offered food was considered repelled. R50 means that 50 % of the presented treated food could be consumed by half the population of birds used in the test (Engaman *et al.*, 1989).

2-3- Toxicity test:

Test method for acute oral toxicity (LD_{50})was based on that followed by Shefte *et al.*, (1982). Birds were given propylene glycol solution of each chemical with the dose volume adjusted for the birds weight (the amount of solution equation to 0.5 % of bird weight). House sparrow and palm dove birds were given using a microsyrings with a short length of polyethylene tubing attached to a hypodermic needle . After dosing, birds were individually caged , provided with food and water and observed for 6 hrs for sings of toxicosis and 48 hrs for mortality . Depending upon the mortality at initial dose, LD50 values were calculated by the method of Thompson (1948) and Finny (1971).

Hazard factor was calculated from thr following equation (Schafer *et al.*, 1983)

$$\text{Hazard factor} = \frac{R_{50}\ (\text{mg/Kg.})\ (\text{maximum value})}{\text{LD50 (mg/Kg) (maximum value)}}$$

RESULTS AND DISCUSSION

1- Repellency screening tests:

1-1-Plant extracts:

Data presented in Table (2) show the repellent potenial of 13 plant extracts to the house sparrow, *Passer domesticcus niloticus* using none ñ choice method .

Results revealed that only hexane extracts Blue gum tree (leaves), champhor (seeds), Black pepper, Geranium and Greater ammi exhibited repellent effect to the bird with acceptability sorghum seeds each 7.10, 11.70 , 25.40, 29.60 and 34.30 %, respectively. Hexane extract of Cauliflower, French cotton, Common lambsquarters, colocynth, Sea ambrosia. Jimson weed, Syrian rue and santonic did not exhibit the required percentage of repellent (more than 60 %).

Regarding, the plant extracts with ethanol, only Black pepper, French cotton, Jimson weed, Blue gum tree (leaves), Blue gum tree (seeds) and Greater ammi showed a repellent effect against the house sparrow birds, i.e. 18.00, 6.40, 25.80, 38.00 , 37.30 and 37.50 % acceptance, respectively.

The same trend was observed when these extracts were tested using free choice methods. Data presented in the same Table (2) illustrated efficacy of the tested plant extracts with hexane and ethanol . Hexane extracts of Black pepper, Blue gum tree (leaves), Blue gum tree (seeds), Geranium and Greater ammi exhibited the highest repellent effect, as the birds accepted sorghum grains treated with them by 20.00, 9.53, 9.97, 32.80 and 6.65 % , respectively. Also, Black pepper, French cotton, Jimson weed , Blue gum tree (leaves), Blue gum tree (seeds) and Greater ammi with ethanol exhibited the highest repellent effect as the bird accepted sorghum grains treated with them by 6.30, 6.10, 26.90, 13.30, 16.00 and 9.00 % acceptance, respectively.

Table (2) : Repellency potential of some wild plant extracts against house sparrow, *Passer domesticus niloticus* under laboratory conditions .

Plant extracts	None-Choice feeding methods						Free-Choice feeding methods					
	Hexane extracts			Ethanol extracts			Hexane extract			Ethanol extract		
	Daily average of consumption Sorghum Grain/bird		% Acceptance	Daily average of consumption Sorghum Grain/bird		% Acceptance	Daily average of consumption Sorghum Grain/bird		% Acceptance	Daily average of consumption Sorghum Grain/bird		% Acceptance
	Pre- Treat.	Treated		Pre-Treat.	Treated		Pre-Treat	Treated		Pre-Treat	Treated	
Black pepper	100.0	34.00	25.40	89.80	19.80	18.00	74.80	19.20	20.00	74.60	5.00	6.30
Cauliflower	100.0	78.20	43.90	89.40	84.00	48.40	63.20	42.30	40.10	69.70	57.80	45.30
French cotton	98.00	77.00	44.00	100.00	6.80	6.40	45.50	85.50	65.30	85.30	5.50	6.10
Common lambsquarters	73.40	82.70	53.00	75.00	74.70	49.90	77.70	87.20	52.90	80.8	91.30	53.00
Colocynth	84.00	78.80	48.40	83.50	74.70	47.20	64.20	75.50	54.10	35.50	83.20	70.10
Sea ambrosia	100.00	79.30	44.20	87.60	45.70	57.90	73.70	88.00	54.40	73.50	84.80	53.60
Jimson weed	77.00	58.80	43.30	59.50	20.70	25.80	77.70	91.20	54.00	83.80	30.80	26.90
Camphor (L)	100.00	7.70	7.10	98.80	60.50	38.00	85.30	5.00	9.53	82.50	12.70	13.30
Camphor (F)	100.00	13.20	11.70	100.00	60.50	37.30	81.20	9.0	9.97	78.80	15.50	16.00
Geranium	90.00	37.80	29.60	88.60	84.30	48.80	84.70	41.30	32.80	70.50	86.50	55.10
Syrian rue	90.00	84.30	48.40	83.10	75.30	47.50	73.00	83.30	53.30	91.80	95.80	51.50
Henbane	83.80	88.80	51.40	84.00	94.00	52.80	82.30	88.70	51.90	69.50	86.70	55.50
Greater Ammi	83.10	78.70	34.30	81.50	48.80	37.50	84.20	6.00	6.65	84.20	8.00	9.00
Santonic	94.30	77.50	43.80	100.00	77.20	43.60	58.00	76.80	57.00	56.20	77.20	57.90

L = Leaves **F = Fruits**

Data presented in Table (3) show the repellent potential of the fourteen plant extract to the palm dove *Streptopelia senegallus* under laboratory conditions using one-choice feeding method. Using hexane and ethanol extract of each plant, result revealed that only Blue gum tree leaves exhibited repellent effect to the bird. The sorghum grains treated with those extracts were accepted by the bird by 35.5 and 27.7 % only. Hexane and ethanol extracts of Black pepper, Cauliflower, French cotton, Common lambsquarters, colocynth, Sea ambrosia, Jimson weed, Blue gum tree (seeds), geranium, Syrian rue, henbane, Greater ammi and santonica did not exhibit the required percentage of repellent .

The same trend was observed when these extracts , were tested using free-choice feeding method . Data presented in the same Table , illustrated that all hexane extracts failed to cause any repellent effect against the palm doves , while ethanolic Blue gum tree leaves extract among all ethanolic extracts, showed a noticeable repellent effect as hexanic and ethanolic plants extracts.

The aforementioned results showed that all the tested plant extracts exhibited repellent effects against house sparrows. Therefore, R50, LD50 and H.F. (hazard factor) of these extracts were determined .

Data in Table (4) illustrated the R50 values of plant extracts for the house sparrow birds. The compiled results showed that the repellent potential of these extracts obviously differed according to type of wild plant and parts from which extract extracted and solvent used . Black pepper seeds extract exhibited highly repellent against sparrows when extracted with hexane more than that from ethanol. R50ís were 0.116 and 0.184 ml./Kg. seeds, respectively. The highest repellent potential was recorded with hexanic Blue gum tree leaves (0.109mg. / Kg. Seeds), while the lowest effect was obtained when hexanic Geranium leaves extract was tested (1.710 mg./ Kg. seeds).

R50 values of ethanolic Jimson weed leaves, hexanic & ethanolic Greater ammi seeds, ethanol Blue gum tree leaves, hexanic & ethanolic Blue gum tree seeds and ethanol French cotton leaves extract were 0.770, 0.290, & 0.250, 0.261 , 0.157 & 0.204 and 0.450 mg./Kg seeds , respectively .

Table (3) : Repellency potential of some wild plant extracts against plam dove, *Streptopelia senegallus* under laboratory conditions .

Plant extracts	None-Choice feeding methods						Free-Choice feeding methods					
	Hexane extracts			Ethanol extracts			Hexane extract			Ethanol extract		
	Daily average of consumption Sorghum Grain/bird		% Acceptance	Daily average of consumption Sorghum Grain/bird		% Acceptance	Daily average of consumption Sorghum Grain/bird		% Acceptance	Daily average of consumption Sorghum Grain/bird		% Acceptance
	Pre-Treat.	Treated		Pre-Treat.	Treated		Pre-Treat	Treated		Pre-Treat	Treated	
Black pepper	97.2	119.0	55.0	93.0	106.0	53.3	120.0	93.0	40.9	120.0	90.0	42.9
Cauliflower	81.0	120.0	59.7	120.0	120.0	50.0	119.0	104.0	46.6	118.0	97.3	45.2
French cotton	120.0	113.8	48.7	120.0	116.8	49.7	117.0	113.2	49.2	112.0	112.0	50.0
Common lambsquarters	116.0	117.0	51.5	97.3	115.0	54.2	115.0	113.0	49.6	120.0	116.2	49.1
Colocynth	119.0	118.0	49.9	118.0	120.0	50.4	120.0	120.0	50.0	114.0	111.3	49.4
Sea ambrosia	100.0	97.2	49.6	100.0	112.0	52.8	116.0	112.0	49.5	112.0	109.2	49.6
Jimson weed	112.0	84.0	47.9	120.0	119.0	49.8	109.0	87.3	44.5	120.0	119.5	49.9
Camphor (L)	120.0	66.0	35.5	120.0	46.0	27.7	99.7	87.2	48.4	95.3	79.5	49.9
Camphor (F)	100.0	120.0	54.5	86.7	120.0	58.1	120.0	120.0	50.0	120.0	97.0	49.6
Geranium	120.0	118.0	49.7	120.0	119.5	49.9	120.0	97.2	49.7	119.0	110.0	48.8
Syrian rue	77.3	100.0	56.4	98.0	120.0	55.05	120.0	93.7	49.96	113.0	112.3	49.9
Henbane	98.7	110.0	52.7	98.2	113.0	53.5	88.5	73.3	45.3	93.3	69.7	26.5
Greater Ammi	114.0	113.7	49.9	119.8	117.3	49.6	120.0	116.0	49.5	110.0	108.0	49.7
Santonic	120.0	117.2	49.7	120.0	119.5	49.9	66.3	52.8	47.9	98.3	89.8	48.9

L = Leaves **F = Fruits**

The toxicity of both hexan Black pepper seed and ethanol Blue gum treen leaves extracts to the house sparrow was highly toxic as the LD50 values were 0.99 and 0.91 mg./Kg. b.w., respectivielly. A moderate tolerance was noticed with sparrows when administrated with ethanolic Black pepper seeds (1.016 mg./Kg. b.w.) hexanic geranium leaves (1.44 mg./Kg. b.w.), hexanic Blue gum tree leaves (1.25 mg./Kg. b.w.) and ethanolic Blue gum tree seeds (1.48 mg./Kg. b.w.) , while the highest tolerance was recorded with hexanic Greater ammi seeds extracts (4.09 mg./Kg. b.w.) followed with ethanolic French cotton leaves (3.70 mg./Kg. b.w.) Greater ammi seeds extract (2.79 mg./Kg. b.w.) , ethanolic Jimson weed leaves (2.37 mg./Kg. b.w.), and hexanic Blue gum tree seeds (2.01 mg./Kg. b.w.).

Regarding the repellent - toxicity index (hazard factor), the obtained data revealed that only hexanic Geranium leaves showed well accepted toxic potential in concern with acute poisoning episodes (i.e. H.F. = 1.190), while , ethanolic Jimson weed and Blue gum tree extract showed a possible potential as their value were 0.323 and 0.287, respectively. On the other hand, rest of the tested extracts had little or no potential to cause acute avian poisoning episodes. The values of H.F. were 0.117 & 0.181, 0.071 & 0.090, 0.088, 0.106, 0.101 and 0.121 for hexanic & ethanolic Black pepper, hexanic & ethanolic Greater ammi, hexanic Blue gum tree leaves, hexanic Blue gum tree seeds, ethanolic Blue gum tree seeds and ethanolic French cotton leaves, respectively.

Table (4) : Repellency , lethal effect and hazard factor of bioactive plant extracts to house sparrow , *Passer domesticus niloticus* .

Plant extracts	R_{50} (mg./Kg. seeds)	Repellecy index	LD_{50} mg./Kg b.w.	Toxicity index	H.F.
Black pepper (H)	0.116	105.6	0.990	108.8	0.117
Black pepper(E)	0.184	167.9	1.016	111.7	0.181
Jimson weed (E)	0.770	698.8	2.370	260.4	0.323
Geranium (H)	1.710	1562.2	1.440	158.2	1.190
Greater ammi(H)	0.29	263.0	4.090	449.7	0.071
Greater ammi (E)	0.250	229.1	2.790	306.6	0.090
Blue gum tree, L (E)	0.261	238.4	0.910	100.0	0.287
Blue gum tree,L(H)	0.109	100.0	1.250	137.4	0.088
Blue gum tree,S (E)	0.157	142.9	1.480	162.6	0.106
Blue gum tree,S (H)	0.202	184.3	2.010	220.9	0.101
French cotton (E)	0.450	408.7	3.700	406.4	0.121

H.F. = Hazard factor
E = Ethanol H = Hexane S= Seeds L= Leaves

1-2- Conventional Pesticides :

Data illustrated in Table (5) show the repellent effect of tested pesticides when one and two feeding methods were followed. Only,ethomyl and diathianon exhibited noticeable and high repellent potential at all tested levels against the house sparrow. Sorghum grains treated with 0.25, 0.5 and 0.1 % of methomyl and diathianon were accepted with 38.1, 34.9 & 33.1 and 33.2 ,22.5 & 14.0 and 39.8 , 36.0 & 30.4 and 38.3, 29.3 and 23.9%, respectively .The repellent of the same tested pesticides was studied against palm dove bird and the data are compiled in Table (6). Data of one-choice method revealed that the lower level (0.025) of all pesticides did not cause any repellent effect for doves, while 0.05 and 0.1 % methomyl showed considerable repellent potential birds as they accepted treated grains only with 39.4 and 29.0 % , respectively.

Regarding the effectiveness of tested compounds as repellents with the two-choice feeding method , data in Table (6) showed that among all tested pesticides, only methomyl acheived considerable repellent effects against doves when mixed with sorghum grains at 0.025, 0.05 and 0.1 % as they accepted the treated grains only with 38.6, 38.0 and 30.8%, respectively. Also, dithianon and dicofol when added to grains with higher concentration (0.1%) reduced its acceptance to doves to be 37.7 and 38.8 %, consequently

Data in Table (7) summarized the repellent and toxic potential of two pesticides and one plant extract, that promised to be avicides, against both house sparrows and palm doves. Both methomyl, dithianon and ethanolic Blue gum tree leaves extract showed obvious repellent against sparrows with values of 0.01375, 0.037 and 0.261 mg./Kg seeds, while their toxic potential were in middle orders , i.e. LD50s were 2.82, 12.48 and 0.91 mg./Kg. b.w, respectively. The calculated hazard factors reaching, 0.0049, 0.0003 and 0.287, respectively, indicated that these compounds have no potential to cause acute avian poisoning episodes.

Regarding the response of palm dove to pesticides and plant extracts, methomyl, dithianon and ethanolic Blue gum tree leaves extracts showed repellent and toxicity effects where R50, LD50 and H.F. values reached 0.095, 3.99, 0.024 & 0.066, 14.67, 0.0045 and 0.072, 2.64, 0.0270, respectively.

Table (5): Repellency of tested pesticides against house sparrow , *Passer domesticus niloticus* under laboratory conditions

Concentration % / Pesticides	None – choice feeding methods									Free-Choice feeding methods								
	0.25			0.05			0.1			0.25			0.05			0.1		
	A	B	% Acceptance	A	B	% Acceptance	A	B	% Acceptance	A	B	% Acceptance	A	B	% Acceptance	A	B	% Acceptance
Sethoxydim	98.7	78.6	44.3	77.1	58.0	44.2	97.7	73.6	43.0	51.8	42.7	45.2	52.9	41.3	43.8	33.6	22.2	39.8
Thiophanate Methyl	100.0	86.4	46.4	100.0	82.2	45.1	100.0	80.7	44.7	34.9	34.7	49.9	53.2	42.6	44.5	98.0	67.3	40.7
Carbaryl	92.6	90.5	49.4	100.0	87.8	48.2	86.5	60.5	41.2	69.7	57.8	45.3	72.5	54.0	42.7	57.1	39.0	40.6
Methomyl	82.5	50.7	38.1	96.4	51.7	34.9	101.0	50.0	33.1	67.5	33.6	33.2	71.2	20.7	22.5	22.9	3.74	14.0
Diathianon	80.4	53.1	39.8	95.5	53.8	36.0	86.5	37.8	30.4	58.2	36.1	38.3	47.9	20.2	29.3	69.0	21.7	23.9
Dicofol	88.1	64.7	42.3	90.7	64.4	41.5	116.2	78.2	40.2	50.7	39.2	43.6	62.9	46.0	42.2	60.5	39.5	39.5
Copper Hydroxide	93.6	85.3	47.7	96.9	76.5	44.1	102.6	70.8	40.8	64.7	46.8	41.97	60.1	40.4	38.8	39.3	20.8	34.6

A = Daily Average number of consumptionmed grains / bird before treatments.
B = Daily Average number of consumptionmed grains / bird during treatments.

Table (6): Repellency of tested pesticides against plam dove, *Streptopetia senegallus* under laboratory conditions

Concentration % / Pesticides	None – choice feeding methods									Free-Choice feeding methods								
	0.25			0.05			0.1			0.25			0.05			0.1		
	A	B	% Accept-ance	A	B	% Accept-ance	A	B	% Accept-ance	A	B	% Accept-ance	A	B	% Accep-tance	A	B	% Accept-ance
Sethoxydim	95.0	117.0	55.2	100.0	113.0	53.0	119.0	119.0	50.0	86.0	69.0	44.5	92.0	71.0	43.6	116.0	79.0	40.5
Thiophanate Methyl	95.0	114.0	54.5	109.0	119.0	52.2	116.0	119.0	50.6	83.0	71.0	46.1	92.0	66.0	41.8	95.0	64.0	40.3
Carbaryl	102.0	93.0	44.9	114.0	74.0	39.4	119.0	50.0	29.6	117.0	115.0	49.6	103.0	78.0	43.1	114.0	83.0	42.1
Methomyl	71.0	92.0	56.4	95.0	119.0	55.6	112.0	114.0	50.4	97.0	61.0	38.6	93.0	57.0	38.0	119.0	53.0	30.8
Diathianon	85.0	110.0	56.4	98.0	119.0	54.8	119.0	97.0	44.9	110.0	97.0	47.1	112.0	94.0	45.6	109.0	66.0	37.7
Dicofol	90.0	112.0	55.4	104.0	119.0	46.6	119.0	95.0	44.4	78.0	72.0	48.0	83.0	60.0	42.0	98.0	62.0	38.8
Copper Hydroxide	100.0	119.0	54.3	76.0	83.0	52.2	119.0	117.0	49.6	102.0	95.0	48.2	117.0	105.0	47.3	107.0	81.0	43.0

A = Daily Average number of consumptionmed grains / bird before treatments.
B = Daily Average number of consumptionmed grains / bird during treatments.

Table (7): Repellency, lethal effect and hazard factor of ethanolic Blue gum tree leaves , methomyl and diathianon to house sparrow, *P. domesticus niloticus* and plam dove, *Streptopelia senegallus* .

Compounds	House sparrow			Plam dove		
	R_{50} (mg./Kg. seeds)	LD_{50} (mg.lKg. b.w.)	Hazard factor	R_{50} (mg./Kg. seeds)	LD_{50} (mg.lKg. b.w.)	Hazard factor
Methomyl	0.01375	2.82	0.0049	0.095	3.99	0.0240
Dithianon	0.0037	12.48	0.0003	0.066	14.67	0.0045
Ethanolic Blue gum tree leaves	0.261	0.910	0.287	0.072	2.64	0.0270

Many investigators have reported the phenomenon of repellent of some tested compounds against bird species. Watkins *et al.*, (1994) found that chemical repellent derived from the natural chemical of plants offer effective, non-lethal means of preventing vertebrate damage to crops Furthermore , if incorporated into potentiality toxic applications, such as seed dressing , repellents provide a means of improving the environmental safety of such materials. One derivative "Cinnamamide" is an effective repellent for a range of vertebrate species Omar *et al.*, (1994) found that plant extract treated grains showed lower palatability to bird than plant products, worm wood, colocynth, francincese, red pepper and cinnamon are potential sources for plant repellents as they gave more than 90 % repellent. A physiological effect caused by methiocarb is probably responsible for its repellent to birds. Birds can detect this effect and associate with the taste or some other sensory identification of the chemical (Schafer, 1981). Plant extracts and pesticides which achieved a satisfactory repellent potential were subjected to LD50 trials to determine the hazard factor to avoid the toxic effects of these compounds on the non target birds when used under field conditions. Ethanolic Blue gum tree extract exhibited the high toxic effect to house sparrow (LD50 = 0.9 mg/Kg b.w.), while hexanic Greater ammi extract was the lowest one (4.09mg/Kg b.w.). On the other hand, all plant extract and pesticides, except ethanol Blue gum tree leaves extract, did not cause any poison

symptoms to birds of the two tested bird species. Hazard factor (a repellent ñ toxicity index) was calculated by dividing R50 value by acute oral LD50 (Schafer and Jacobson, 1983). An index value > 1.00 indicates well accepted toxic agents that have definite potential for causing acute poisoning episodes, an index value > 0.25 < 1.00 indicates these compounds with a possible potential for cause acute avian poison episodes (Schafer *et al.*, 1983).

On the base of H.F. value , most of the tested extracts and pesticides had little or no potential to cause acute avian poisoning episodes. Zidan *et al.*, (1994) found that under laboratory conditions, cyanphos and fenthion showed a higher repellent action than alpha-chloralose to house sparrow and stock pigeon. From the repellent - toxicity index (hazard factor) , it seemed that the three tested chemicals have a slight or no potentiality to cause acute avian episode . The avicidal activity differed due to chemical type , mode of entry and bird species. Stock pigeons were more tolerant to the three tested compounds compared with house sparrow.

Finally, it is needless to say that natural repellents are preferred over synthetic ones for their safety, selectivity, degradability, applicability and cost effectiveness. This bird repellent technology is very simple and easy to be transferred to farmers . However, the physiological and biochemical mechanisms responsible for their repellent are still to be thoroughly investigated .

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التأثير الضار لبعض المستخلصات النباتية والمبيدات التقليدية ضد عصفرو النيل الدورى واليمام.

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تناولت هذه الدراسة إختبار التأثير الضار لبعض المستخلصات النباتية التى تم إستخلاصها بنوعين من الذيبات هما المكسان والإيثانول لكل من (الفلفل الأسود – الكرنب – العشار – الزربيح – الحنظل – الدمسيسة – الداتورا – بذور وأوراق الكافور – العتر –الحرمل – السكران – الخله – الشيح) و بعض المبيدات التقليدية مثل (سيتوكسيديم، ثيوفانات – ميثيل ، كاربارايل ، ميثوميل ، دايثيانون، ديكوفول ، هيدروكسيد النحاس) وذلك بإستخدام طريقتى التغذية الإختيارية و اللاإختيارية و كذلك تقدير الجرعة اميتة النصنية (LD 50) والتركيز الطارد (R50) لكل من عصفور النيل الدورى و اليمام حيث أظهرت النتائج أن مستخلصات الكافور (أوراق وبذور) و الفلفل الأسود و العتر والخله أعطى تأثيرا طاردا ضد عصفور النيل الدورى وكان التأثير الطارد للمسيتخلص الأيثانولى أعلى من مستخلص الهكسان لهما وكانت أوراق الكافور المستخلصه بالهكسان أو الإيثانول هو المستخلص الوحيد الذى أعطى تأثير طاردا لليمام . أما بالنسبة للمبيدات فقد أظهرت النتائج أن مبيدى الميثوميل والدايثيانون فقط أعطى تأثيرا طاردا بإستخدام التركيزات (٠,٢٥، ٠,٥ / ٠,١ ٪) ضد عصفور النيل الدورى، بينما كان مبيد الميثيوميل فقط هو الذى أعطى تأثير اطاردا ضد اليمام بنفس التركيزات.

وبالنسبه لتقدير الجرعة المميتة (LD 50) والتركيز الطارد (R50) فقد أعطى مستخلص الهكسان لأوراق الكافور أعلى تأثير طارد وأعلى تأثير سام يليه مستخلص الهكسان للفلفل الأسود وبذور الكافور ثم يليه المستخلص الإيثانولى للفلفل الأسود وبذور الكافور والخله و أوراق الكافور و العشار ثم أوراق الداتوراو أخيرا أوراق العتر. ومن ناحيه أخرى فإن أوراق الكافور المستخلصه بالإيثانول هى المستخلص الوحيد الذى أعطى تأثيرا طاردا أو ساما لليمام.

كما أوضحت النتائج أيضا أن مبيد السيثوميل كان أكثر حساسية للعصفور النيل الدورى من مبيد الديثيانون و المستخلص اللإيثانولى لأوراق الكافور.