TOXICITY OF SOME NATURAL PLANT EXTRACTS AGAINST SOME ORGANISMS AND THEIR EMBRYOTOXICITY AND TERATOGENICITY ON CHICK-EMBRYO

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ABSTRACT

The Toxicity of aqueous and oil extracts of anise, *Pimpinella anisum* and garlic, *Allium sativum* L., and the aqueous extract of chamomile, *Matricaria chamomilla* were evaluated against three different organisms in the environment, the two spotted spider mite *Tetranychus urticae*, the cotton leafworm *Spodoptera littoralis* (Boisd.) and Bolti fish *Tilapia Zilli*. The results indicated that, garlic and anise oily extracts were non toxic to adult female mite T. urticae were toxic to cotton leafworm, while aqueous extract of chamomile was non toxic to Bolti fish. Garlic and anise oily extracts exhibited moderate toxicity to Bolti fish but they were considered non toxic if compared to the synthetic pyrethroids.

Concerning the evaluation of embryo-toxicity and teratogenicity of aqueous and oil extracts of natural products, the data of all tested compounds either oil or aqueous extracts caused, continuous losses of egg-weight throughout the incubation period, but this loss of egg-weight was not dose-dependent and was not a good parameter for teratogenicity evaluation.

With regard to the effect of embryo-weight and embryotoxicity, the data revealed that, both extracts decreased significantly the weight of embryo and this effect was dose-dependent. Moreover, both extracts were significantly equitoxic and caused considerable mortality or even complete mortality when being administered at high concentration.

As for the teratogenic effect of the extracts tested the results indicated that, in case of anise the effect of oil extract on the proportions of embryos was much higher than that of the aqueous extract. At the lowest dose level no teratogenic malformations were observed except slight reductions in body size and weight. In case of garlic, both oil and aqueous extracts affected the body dimensions and this effect was dose-dependent. The lowest concentrations of both aqueous and oil extracts did not show any teratogenic signs, but the highest concentration resulted in severe malformations. It is of interest to mention that wing micromelia, leg

desmelia and spine abnormalities are among the most pronounced teratogenic symptoms of garlic extract. In case of aqueous extract of chamomile, the lowest concentration did not cause any teratogenic signs, but a high dose caused complete malformations.

INTRODUCTION

Teratogenicity from chemical agents is a very real hazard to humans. Some investigators believe that all natural products particularly those which are from edible crops are safe neglecting the fact that such of the natural products contain toxic substances in their early stage (i.e. tomatoes and potatoes) beside many of them might contain in their constituents some highly reactive groups (British pharmaceutical codex, 1949). Because of the many factors involved in chemical-induced teratogenesis extrapolation of the dose-response relationship from animals to humans is difficult and/or arbitrary.

Nowadays, we notice many people who suffer from cancer or liver hepatitice begin to drink the aqueous and/or oil extracts of some naturally medical plants as a safe method to cure such diseases. Many ladies might consume daily large quantity of such extracts during pregnancy and that might lead to develop malformed off-spring.

The aim of this study is to evaluate the embryo efficiency of aqueous and oil extracts of certain plant extracts namely Anise, chamomile and garlic against the cotton leafworm *Spodoptera littoralis* (Boisd.) and the two spotted spider mite *Tetranychus urticae* as well as their side effect on Bolti fish *Telapia zilli* in comparison to some conventional pesticides. The study also is concerned with the embryotoxicity and teratogenicity of such compounds on chick embryos as criterion for the degree of safety of such compounds.

MATERIALS AND METHODS

I- Natural plant extracts:

Three plant species were used in this study. Their names are: *Allium sativum* (Garlic), *Matricria chamomilla* (Chamomile) and *Pimpinella anisuum* (Anise). Their constituents are as described in the British pharmaceutical codex (1949). Aqueous, oil plant extracts and isolation were done as described by El-Hamady, 1989

II- Pesticides:

All tested pesticides were in the formulated form: Cypermethrin, Fenvalerate, Methamidophos (Tamaron), Dicofol, Fenpyroximate and 2,4-D.

III Tested organisms and treatment:

1. **The cotton leafworm *Spodoptera littoralis* larvae:** The insect was reared as described by El-Defrawi *et al.*, (1964). Toxicity evaluation was done by dipping method (Salama *et al.*, 1971).
2. **The two spotted spider mite *Tetranychus urticae*:** A colony of the spider mites *T. urticae* was reared as described by El-Defrawi *et al.*, (1965). Toxicity evaluation was done by the leaf-disk dip method (Siegler, 1974).
3. **Bolti fish *Telapia zilli*:** Rearing of the fish and toxicity bioassay was done according to Hegazi (2002).

IV Embryotoxicity and teratogenicity tests:

The embryotoxicity and teratogenicity tests were done on fresh fertile white leghorn eggs of the average of 55.68± 2.42g each were supplied from the Experimental Station Farm, Department of Poultry, Faculty of Agriculture Kafr El-Sheikh, Tanta University. The tests were described by Abdallah (1989).

RESULTS AND DISCUSSION

I-Toxicity of some natural plant extracts to different organisms in the environment:

Three plant extracts were tested for stomach and contact effects on *S. littoralis*, *T. urticae* and *T. zilli*. The LC_{50} values and their confidence limits for the different extracts and slope values were calculated according to Litchfield and Wilcoxon method (1949) and are presented in Table (1).

From the practical point of view, the present extracts of garlic oil, anise oil and aqueous extract of chamomile are considered non toxic materials against *T. urticae*. The third extract (chamomile) may be of promising effect if it is used as formulating compound, the emulsifying agents may improve acaricidal activity.

Table (1): Relative toxicity of some naturally occurring components and synthetic convention pesticides (as standards) to different organisms in the environment

Chemicals	*Tetranychus urticae*			*Spodoptera littoralis*			*Telapia zilli*		
	LC_{50} ppm	LC_{50} (C.L.)	Slop	LC_{50} ppm	LC_{50} (C.L.)	Slop	LC_{50} ppm	LC_{50} (C.L.)	Slop
Garlic oil	5000	3906-6400	1.84	7000	5691-8610	0.38	98	64.5-149.0	1.74
Anise oil	7987.8	6492-11114	2.41	8625	759-9578	3.50	150	101.4-222.0	1.89
Aqueous extract of Chamomile	2671.0	1772-4180	1.21	20000	--	--	--	--	--
Dicofol	37.0	--	--	--	--	--	--	--	--
Fenpyroximate	43.3	--	--	--	--	--	--	--	--
Cypermethrin	--	--	--	1.0	0.65-1.55	1.21	0.082	0.06-0.11	1.56
Tamaron	--	--	--	150.0	121-186	2.50	--	--	--
Fenvalerate	--	--	--	1.5	1.2-1.9	2.71	0.06	0.056-0.064	1.72
2,4-D	--	--	--	--	--	--	8.70	5.78-10.53	2.44

C.L. = confidence limits.

The data also showed that the three plant extracts are considered non toxic compounds if compared with the pyrethroid or organophosphorus compounds. However, precise investigation of the data presented in Table (1), could fairly conclude the following points:

1. Garlic and anise oily extracts are considered non toxic to adult female mite *T. urticae* comparable to dicofol toxicity as standard acaricide.
2. Aqueous extract of chamomile may be considered of promising acaricidal activity if a suitable formulation that has effective adjutants is involved.
3. Garlic and anise oily extracts are of toxic effect if compared with the two synthetic pyrethroids cypermethrin and fenvalerate against leafworm *Spodoptera littoralis* (Boisd.) while aqueous extract of chamomile was not of serious toxicity.
4. The synthetic pyrethroids cypermethrin and fenvalerate exhibited apparent toxicity to cotton leafworm and have advantages such as low toxicity to higher animals and their limited persistence that make them ideal for such use.
5. Garlic and anise oily extracts exhibited moderate toxicity to Bolti fish *Tilapia zilli* but they are considered non toxic if compared with fenvalerate and cypermethrin.
6. The synthetic pyrethroids, fenvalerate and cypermethrin are highly toxic to Bolti fish *Tilapia zilli*.
7. The herbicide 2,4-D can play an important role in Bolti fish *Tilapia zilli* production due to its wide use , its herbicidal properties and its physical and chemical behavior through soil especially near water resources.

II- Evaluation of embryotoxicity and teratogenicity of natural plant extracts:

Pesticides are used on a large scale throughout the world as a major mean for pest management and control. Although pesticidal chemicals provide numerous benefits in term of increased production and quality of the product, their use in the environment are of concern. Moreover, the wide spread use of synthetic insecticides possess a serious hazard to both man and wildlife because of their adverse effects on the environment. As a solution of these problems, a large number of alternatives known usually as non-conventional pesticides has been produced and applied for crop protection. Of these, biologically active natural plant products are thought to be much safer and suitable as a new generation of insecticides.

From the practical point of view, natural plant extracts such as anise, garlic and chamomile are currently used all over the world even for new born infant without complaining from any toxic or adverse side effects. But man intensified the efforts to develop toxic chemicals from these natural products by concentrating their active components either by aqueous or oil extracts in an attempt to gain more biocide activity. The question now arises as to what extent these natural products under these circumstances of concentration are safe to man and the environment. To answer this question, the following experiments were conducted.

1.Effect on percent loss of egg-weight

The effects of different concentrations of both aqueous and oil extracts of anise, garlic and chamomile on the average weight and percent loss of egg-weight during incubation are presented in Tables (2 and 3). The data revealed that all treatments, including the untreated control, showed continuous losses of egg-weights throughout the incubation period. The percent egg-weight losses ranged between 10.18 to 11.60%; 10.13-12.45 and 10.56-11.839 for aqueous extracts of anise, garlic and chamomile respectively, but the losses ranged between 9.86 to 11.00% and10.26-12.55 for oil extracts of anise and garlic respectively.

It is of interest to mention that in the aqueous and oil extracts treatments, the percent eoo-wei,,lit losses are almost so close and are within the normal loss resulted from natural evaporation during incubation (Shanaway, 1994). Moreover, this trend of results agreed with our previous finding (Salama *et al.*, 2006) observed in case of conventional pesticides and confirmed that loss of egg-weight is not a good parameter for teratogenicity.

2. Effect on embryo-weight and embryotoxici

The effects of aqueous and oil extracts of tested natural products on chick embryo weight and embryotoxicity were studied and the data are presented in Tables (4 and 5). The data showed that both extracts of the three natural plant extracts decreased significantly the weight of embryos and this effect was dose-dependent. Moreover, the oil extract of anise was more effective on decreasing the embryo-weight.

In term of figures, the percent reduction in embryo-weight with respect to control resulted from egg treated with the first 3 concentrations of anise oil extract are 9.29, 33.59 and 38.75% compared with 5.6, 17.3 and 27.1 % for the first corresponding concentrations of aqueous extract. In

addition, the two highest concentrations of both aqueous and oil extract caused complete mortality of embryos at early stage of development (Tables 4 and 5).

Concerning the embryotoxic effect of both extracts, the data revealed that both extracts are significantly equitoxic and caused considerable mortality or even complete mortality when being administered at high concentrations.

In case of garlic, the data presented in Tables (4 and 5) showed that the average body weights of the embryos on the twentieth day of incubation were significantly smaller than those of the control group either in aqueous or oil extracts treatments.

Moreover, this effect was dosage-dependent. In term of figures, the percent reductions of chick embryo-weight with respect to the untreated control were: 2.92, 13.04, 23.72, 48.23 and 68.68%, for 9375, 18750, 37500, 75000 and 150000 ppm of aqueous extract of garlic per egg, respectively.

With regard to the effects of both -garlic extracts on chick embryotoxicity, results presented in Tables (4 and 5) clearly indicate that both extracts were embryotoxic and this effect was dose-dependent. In other words, the observed percent mortalities were 10, 30, 40, 60 and 80% for 9375, 18750, 37500, 75000 and 150000 ppm of aqueous garlic extract, respectively. However, the British Pharmaceutical Codex (1949) published by direction of the Council of the Pharmaceutical Society of Great Britan concerning the action and uses of garlic *Allium sativum* Linn. there was a restriction of administration of garlic to children because it was dangerous and fatalities have been recorded.

With regard to the effect of the aqueous extract of chamomile an embryo-weight and embryotoxicity, the data presented in Table (4) revealed that the aqueous extract of chamomile affected the embryo-weight and this effect was dose-dependent. In term of figures, the percent reductions in embryo-weight with respect to the control were: 7.13, 32.96, 36.48, 42.85 and 69.51% for 10000, 20000, 40000, 80000 and 160000 ppm, respectively.

Concerning the effects of aqueous extract of chamomile on chick embryotoxicity, the current results presented in Table (4) showed that this extract had moderate embryotoxic effect and this effect was also dosage-dependent. However, these data revealed that chamomile had relatively low toxic effect against chick embryos.

Table (2): Average egg-weight (gm) and percent loss of egg-weights during incubation after being injected on the sixth day with aqueous extracts of anise, garlic and chamomile.

Pesticides	Treatment Concentrations* (ppm)	Average of egg-weights during incubation**					Average % loss of egg-weight relative to fresh weight**			
		Days of incubation					Days of incubation			
		0	7	11	14	18	7	11	14	18
Anise	11250	54.70	52.26	51.11	50.10	49.13	4.46	6.56	8.41	10.18
	22500	58.10	55.30	54.30	53.10	51.83	4.82	6.54	8.61	10.79
	45000	55.84	53.39	52.21	51.29	49.86	4.39	6.50	8.15	10.71
	90000	53.55	51.30	49.99	48.70	47.33	4.20	6.65	9.06	11.60
	180000	56.10	53.39	52.24	50.95	49.90	4.68	6.73	9.03	10.91
	Control	55.80	53.40	52.11	51.02	49.66	4.30	6.61	8.57	11.00
Garlic	9375	57.80	55.48	53.52	52.78	51.74	4.01	7.40	8.69	10.48
	18750	57.96	55.58	54.26	52.88	51.70	1.44	6.38	8.76	10.80
	37500	58.30	55.84	53.90	53.02	51.04	4.22	7.55	9.06	12.45
	75000	56.32	54.10	52.70	51.52	50.16	3.94	6.43	8.52	10.94
	150000	56.08	53.80	52.12	51.22	50.40	4.07	7.06	8.67	10.13
	Control	57.23	54.72	53.50	52.45	51.36	4.38	6.52	8.35	10.26
Chamomile	10000	56.86	54.32	53.10	51.60	50.36	4.47	6.61	9.25	11.43
	20000	56.40	54.04	53.38	50.98	50.00	4.18	5.35	9.61	11.35
	40000	55.28	53.00	51.56	50.06	48.74	4.12	6.73	9.44	11.83
	80000	56.20	53.94	53.02	51.62	50.10	4.02	5.66	8.14	10.85
	160000	56.62	54.16	53.02	51.86	50.64	4.34	6.36	8.41	10.56
	Control	57.35	54.93	54.00	52.72	51.00	4.22	5.84	8.07	11.07

* Each group includes 20 fertile eggs with an average weight of 55.68± 2.42 g.

** Average percent loss of egg-weights up to the sixth day of incubation.

Table (3): Average egg-weight (gm) and percent loss of egg-weights during incubation after being injected on the sixth day with oil extracts of anise and garlic.

Pesticides	Treatment Concentrations* µl/egg	Average of egg-weights during incubation**					Average % loss of egg-weight relative to fresh weight**			
		Days of incubation					Days of incubation			
		0	7	11	14	18	7	11	14	18
Anise	1 µl	58.82	56.06	55.04	53.62	52.46	4.69	6.43	8.84	10.81
	2 µl	58.74	55.98	54.66	53.54	52.50	4.70	6.95	8.85	10.62
	3 µl	57.82	55.18	54.08	52.88	52.12	4.57	6.47	8.54	9.86
	4 µl	56.76	54.15	53.24	51.92	50.70	4.60	6.20	8.53	10.68
	5 µl	58.14	55.76	54.54	53.30	52.06	4.09	6.19	8.32	10.46
	Control	55.80	53.40	52.11	51.02	49.66	4.30	6.61	8.57	11.00
Garlic	1 µl	55.50	53.02	51.98	50.90	49.66	4.47	6.34	8.29	10.52
	2 µl	55.40	53.14	51.80	50.66	49.52	4.08	6.50	8.56	10.61
	3 µl	59.42	57.02	55.24	54.02	51.96	4.04	7.03	9.05	12.55
	4 µl	56.54	54.16	52.78	51.82	50.08	4.21	6.65	8.38	11.43
	Control	57.23	54.72	53.50	52.45	51.36	4.38	6.52	8.35	10.26

* Each group includes 20 fertile eggs with an average weight of 55.68± 2.42 g.

** Average percent loss of egg-weights up to the sixth day of incubation.

Accordingly, it is of interest to re-emphasize that embryotoxicity might not be a good parameter for teratogenicity. The trend of the current results agreed fully with the previous finding of Khera *at al.*, (1982) and Hodgson and Levi (1997).

Table (4): Teratogenic symptoms of chick embryos hatched from eggs injected on the sixth day of incubation with different concentrations of aqueous extracts of anise, garlic and chamomile (Examination was done one the twentieth day of incubation).

Treatment Concentrations mg/egg	% Morta-lity	Chick embryo weight		Teratogenic signs (cm) Lengths of:					
		(g)	%R	Body	Leg	Foot	Thigh	Wing	Neck
Anise									
11250	20.0	42.1	5.6	8.2	6.5	2.4	3.0	3.4	3.5
22500	40.0	36.9	17.3	7.9	6.2	2.2	2.8	3.2	3.3
45000	60.0	32.5	27.1	7.5	6.0	2.0	2.5	3.0	3.2
90000	100*	--	--	--	--	--	--	--	--
180000	100*	--	--	--	--	--	--	--	--
Control	0.0	44.6	0.0	8.72	7.2	2.5	3.1	3.7	3.6
Garlic									
9375	10.0	42.00	2.92	8.5	6.8	2.3	3.0	3.4	3.2
18750	30.0	37.62	13.04	8.1	6.4	2.5	3.0	3.0	3.8
37500	40.0	33.00	23.72	7.5	6.0	2.0	2.3	3.1	3.1
75000	60.0	22.40	48.23	6.7	5.6	1.8	1.8	2.8	2.7
150000	80.0	13.55	68.68	4.85	4.03	1.23	1.6	2.5	2.3
Control	0.0	43.26	0.0	8.6	7.0	2.5	3.0	3.5	3.7
Chamomile									
10000	0.0	39.90	7.13	8.6	6.8	2.6	3.0	3.4	3.5
20000	10.0	28.80	32.96	7.4	5.7	2.0	2.2	3.0	3.0
40000	20.0	27.29	36.48	7.3	5.7	1.9	2.1	2.9	3.0
80000	20.0	24.55	42.85	6.5	5.7	1.9	2.0	2.8	2.8
160000	40.0	13.10	69.51	4.7	3.97	1.23	1.53	2.3	2.3
Control	0.00	42.96	0.0	8.5	7.0	2.5	3.0	3.5	3.5

%R=% Reduction in emberyo weight with respect to control.
*All emryos died at carly stage of development.

3. Teratogenic effect of natural products on chick embryo:

3-1. Effect on growth status:

The external features of chick embryos such as lengths of body, leg, foot, thigh, wing and neck as well as straight legs, short spine, wry neck, parrot beak, abnormal feathering, visceral hernia,...etc., were taken in consideration as teratogenic signs. Tables (4 and 5) showed the various

growth parameters of the chick embryo resulted from eggs treated with different concentrations of aqueous and oil extracts of tested natural products, respectively.

In case of anise, the data revealed that there is a continuous decrease in the proportion of the embryos growth with increasing anise concentrations showing arrested growth at an early stage of development, particularly at higher concentrations (Figures 2-D and 2-F). The percent reductions of the body dimensions of the chick embryos at a dose level of 45000 ppm aqueous extract of anise/egg with respect to the untreated group were: 14.0, 16.7, 20.0, 19.4, 18.9 and 11.1% for the total body, leg, foot, thigh, wing and neck, respectively. Moreover, most of the reductions of the body dimension are dosage-dependent as the embryos which resulted from the eggs treated with high doses showed highly significant decrease in their body weights and sizes as compared to the control. In addition, the effect or oil extract of anise on the proportions of the embryos is much more higher than that of the aqueous extract.

With regards to the effect of different concentrations of aqueous and oil extracts of garlic on different parameters of body dimensions the data presented in Tables (4 and 5), showed that both extracts affected the body dimensions and this effect was dosage dependent. In other words, the effects of the different concentrations of aqueous extract on the percent reduction of body length for instance with respect to, the control were: 1.2, 5.8, 12.8, 22.1 and 43.6% for 9375, 18750, 37500, 75000 and 150000 ppm, respectively. The same trend of results was observed with the other tested body dimensions. Moreover, this effect was also quite pronounced in case of oil extract of garlic, with percent reduction of body length for instance with respect to the control of: 1.2, 7.0, 7.0, 15.1 and 100%, respectively.

The data also revealed that the response of the different dimensions differed significantly from one treatment to another. In other words, the aqueous extract concentration level of 18750 ppm/egg reduced all body dimensions except foot and neck while half of this concentration (9375 ppm/egg) reduced both foot and neck with percentage of 8.0 and 13.5%, respectively. The logic interpretation for such result could be explained as mentioned before (Salama *et al.*, 2006) by the fact that in each specie, there is a relative short critical period of sensitivity to teratogens, when early organogenesis is in progress (Harbison and Becker, 1969).

Table (5): Teratogenic symptoms of chick embryos hatched from eggs injected on the sixth day of incubation with different concentrations of oil extracts of anise and garlic (Examination was done on the twentieth day of incubation).

Treatment Concentrations mg/egg	% Morta-lity	Chick embryo weight		Teratogenic signs (cm) Lengths of:					
		(g)	%R	Body	Leg	Foot	Thigh	Wing	Neck
Anise									
1 µl	20.0	40.25	9.29	8.6	6.8	2.4	2.8	3.4	3.5
2 µl	20.0	29.60	33.59	7.3	5.8	1.9	1.7	2.5	2.5
3 µl	40.0	27.30	38.75	7.0	5.8	1.9	2.2	2.9	2.8
4 µl	100*	–	–	–	–	–	–	–	–
5 µl	100*	–	–	–	–	–	–	–	–
Control	0.0	44.60	0.0	8.72	7.2	2.5	3.1	3.7	3.6
Garlic									
1 µl	40.0	39.73	8.16	8.5	6.5	2.4	3.0	3.2	3.6
2 µl	60.0	36.95	14.59	8.0	6.3	2.1	3.0	3.2	3.0
3 µl	60.0	34.50	20.25	8.0	6.2	2.0	2.8	3.0	3.0
4 µl	80.0	20.30	53.07	7.3	6.0	1.7	2.2	2.7	2.7
Control	0.0	43.26	0.0	8.6	7.0	2.5	3.0	3.5	3.7

%R=% Reduction in emberyo weight with respect to control.
*All emryos died at carly stage of development.

Concerning the effect of different concentrations of aqueous extract of chamomile on different parameters of body dimensions the data presented in Table (4) are quite clear that the aqueous extract of chamomile affected the different body dimensions and this effect was dosage-dependent. Moreover, the percent reductions of the body dimensions of the chick embryo at a dose level of 160000 ppm with respect to the untreated group were: 45.1, 56.7, 50.8, 49.0, 34.3 and 34.3% for the total body, leg, foot, thigh, wing and neck, respectively.

3-2. Morphological abnormalities :

The morphological malformations in natural products treated chick-embryos were observed in groups either treated with aqueous or oil extracts of different concentrations as illustrated in Figures (1,2, 3 and 4).

In case of anise at the lowest dose level no teratogenic malformations were observed (Figure 2-A) except slight reductions in body size and weight. Similarly, at a dose level of 22500 ppm/egg of the aqueous extract (Figure 2-B) embryos showed reduced body size and weight accompanied by short limbs and leg hemimelia, while the corresponding

concentration of oil extract showed abnormal feathering and wry neck (Figure 2-E). Increasing the concentration of the aqueous extract to a level of 45000 ppm per egg resulted in severe reduction in body size and weight, wing micromelia, desmelia and other malformations (Figure 2-C). However, both oil and aqueous extracts of anise at higher concentrations resulted in complete sessation of chick embryo at an early stage of development (Figures 2-D and 2-F).

As for garlic, several morphological malformations were observed in case of treated groups either treated with aqueous or oil extracts. Howevei the most pronounced malformations were: reduction in body size and weight, abnormal feathering, micromelia and desmelia. These abnormailites are dosage dependent. In other wordes, the lowest concentrations of both aqueous and oil extracts did not show any teratogenic signs (Figures 3-A and 3-C). On the other hand the highest concentrations resulted in severe malformations (Figures 2-C and 3-D). It is of interest to mention that wing micromelia, leg desmelia and spine abnormalities are among the most pronounced teratogenic signs (Figures 3-A, 3-B and 3-D).

The teratogenic effect of different concentrations of aqueous extract of chamomile on chick embryo was studied and the data are presented in Table (4) and illustrated in Figure (4). In figure (4-A) Showed that the lowest concentration (10000 ppm) did not cause any teratogenic effect at the embryo developed normally. However, increasing the concentration level up to 20000 ppm/egg caused abnormal feathering, parrot beak and wry neck (Figure 4-B). Moreover, this teratogenic effect was dosage-dependent. In other words, increasing the concentration to a level of 80000 ppm/egg resulted in slight reduction in body weight and size accompanied by straight leg and deformed toe (Figure 4-C). A dose level of 160000 ppm/egg caused complete malformations (Figure 4-D).

Reviewing the current results concerning the safety of oil and aqueous extracts of some naturally occurring products, unfortunately, little is known particularly in the area of teratogenic effects of such products. However, some investigators studied the side effects of some naturally occurring toxic alkaloids in foods. Consumption of potatoes containing high amounts of glyco-alkaloids has caused severe illness and, on some occasions, death or malformations (Jadhav *et al.*, 1981)

Fig (1): (A) 21-day chick, saline-treated group, (B) 20-day chick untreated control (hole only) and (C) 20-day chick, saline-treated group, showing complete and fully developed embryo.

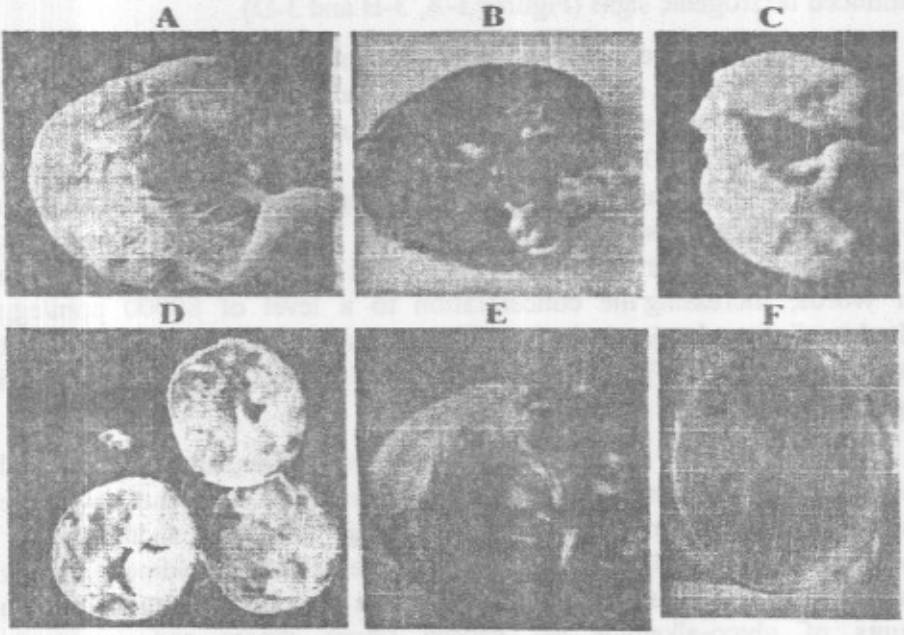

Fig (2): Aqueous and oil extract of anise-treated group (A) 11250 ppm/egg, (B) 22500 ppm/egg, (C) 45000 ppm/egg, (D) 90000 and 180000 ppm/egg, (E) 2 µl/egg and (F) 4 µl/egg.

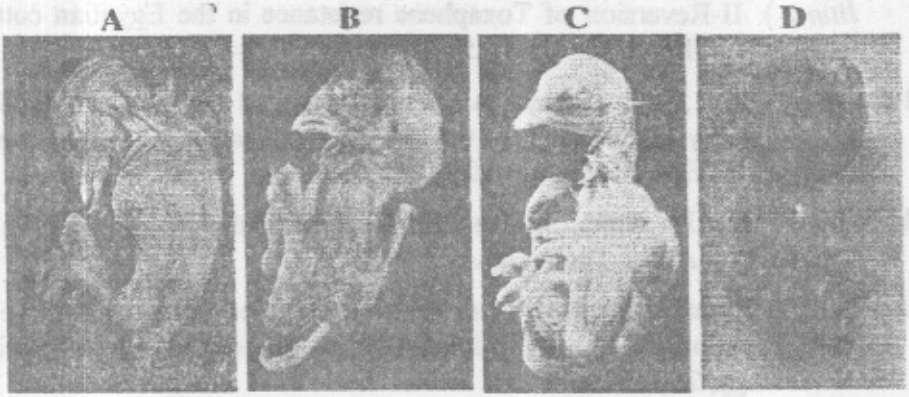

Fig (3): Aqueous and oil extract of garlic-treated group (A) 9375 ppm/egg, (B) 150000 ppm/egg, (C) 1 µl/egg and (D) 4 µl/egg.

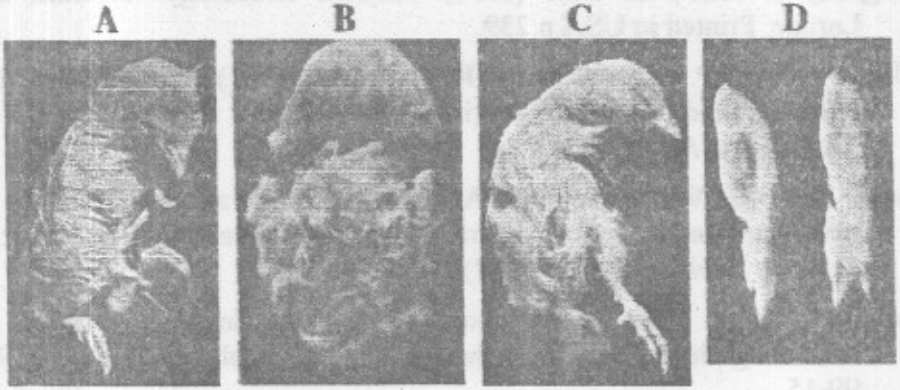

Fig (4): Aqueous extract of chamomile-treated group (A) 10000 ppm/egg, (B) 20000 ppm/egg, (C) 80000 ppm/egg and (D) 160000 ppm/egg.

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الملخص العربى

السمية لبعض المستخلصات النباتية ضد بعض الكائنات الحية والتاثيرات السامة والتشويهية لها على اجنة بيض الدجاج

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لقد تم تقيم سمية كل من المستخلص المائى والزيتى لليسون والثوم وكذلك المستخلص المائى انبات شيح البابونج على ثلاثة كائنات مختلفة من عناصر البيئة وهى العنكبوت الاحمر ودودة ورق القطن وسمك البلطى. واوضحت النتائج عدم سمية المستخلص الزيتى للثوم واليسون على الاناث البالغة لافة العنكبوت الاحمر ولكنهما ذو تاثير سام على دودة ورق القطن بينما كان المستخلص المائى لنبات الشيح البابونج عديم السمية على هذه الافة. وسمية متوسطة على سمك البلطى. المستخلص الزيتى لكل من الثوم واليسون اعطى سمية متوسطة على سمك البلطى بينما يعتبران عديمى السمية وذلك بالمقارنة المركبات البيرثرويدية المخلقة. تقيم الفعل العام والتشويهى للمواد المستخلصة من اصل نباتى. أظهرت نتائج كل المركبات المختبرة سواء مستخلصات مائية او زيتية فقد مستمر فى وزن البيض المخصب ولكن هذا الفقد لا يعتمد على التركيز مما يؤكد عدم اعتباره مقياس جيد لتقيم الفعل التشويهى للمركبات على الاجنة. التاثير على وزن ونسبة وفيات الاجنة ، ادت المعاملة بكلا المستخلصين (الزيتى والمائى) حدوث انخفاض معنوى فى وزن الاجنة وهذا الانخفاض يعتمد على التركيز. علاوة على ذلك لقد اظهر كلا المستخلصين سمية متكافئة واحدثا موت لجميع الاجنة فى حالة التركيزات المرتفعة.

بالنسبة للتاثيرات التشويهية للمركبات المختبرة اوضحت النتائج الاتى.

- المستخلص الزيتى لليسون اعطى تاثير اعلى من المستخلص المائى، فى التركيزات المنخفضة لم تظهر اى علامات لتشوهة الاجنة فيما عدا ظهور انخفاض بسيط فى حجم ووزن الجسم.
- اوضحت النتائج ان المستخلص المائى او الزيتى لنبات الثوم ادى الى حدوث انخفاض فى ابعاد الجسم وهذا التاثير يعتمد على التركيز. التركيزات المنخفضة من المستخلص المائى او الزيتى لم تحدث اى تشوهات فى الاجنة بينما التركيزات العالية تسببت فى ظهور تشوهات حادة لجميع اعضاء الجسم ومن الجدير بالذكر ان اهم التشوهات التى تظهر عند المعاملة بمستخلص الثوم صغر فى الجناح وتشوه فى الارجل وانحناء فى العمود الفقرى.
- اوضحت النتائج ان المعاملة بالتركيزات المخفضة من المستخلص المائى لنبات الشيح البابونج لم توثر على نمو الاجنة ولكن استخدام الجرعة العالية ادى الى حدوث تشوهات متعددة فى جميع اعضاء الجسم.