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Study the affectivity of some commercial insecticides on larvae and pupae of mosquitoe's *Culex* sp. at Basrah city

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دراسة فعالية بعض انواع المبيدات الحشرية التجارية على يرقات و عذارى بعوض الـ Culex

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الخلاصة

اجريت دراسة مختبرية لبيان فعالية سبعة انواع من المبيدات الحشرية التجارية مختلفة الصنع والرائجة في الاسواق المحلية. اختيرت الاطوار اليرقية الاربعة والطور العذري لبعوض Culex sp والتي جمعت من عدة برك في مناطق الجبيلة و كرمة علي لتنفيذ التجربة ، عرضت اليرقات لثلاثة تراكيز من كل مبيد هي (٢٥٠ و ٥٠٠ و ١٠٠٠ ppm) حيث تم حساب LT50 لكل تركيز ولكل مبيد ، بينت النتائج ان مبيد العسكري يتفوق على بقية المبيدات في القتل حيث كانت LT 50 (٧.٤٩ و ١٢.٨٨ و ١٩.٦٣) على التوالي والمبيد الاقل فعالية هو مبيد Flit Sole وكانت LT50 له (١٤.١٥ و ٢٥.٣١ و ٣٥.٥٣) للتراكيز الثلاثة على التوالي ، كما اضهرت الدراسة ان المبيدات التي يدخل المركب البايروثرويدي الـ Tetramethrin في تركيبها هي الاكثر امنا في الاستخدام المنزلي حيث تكون ذا سمية قليلة للثديات وفعالة بصورة كبيرة في مكافحة الذباب والبعوض حتى بجرعات صغيرة .

Summary

Laboratory study was preformed to demonstrate the effectiveness of seven commercial insecticides from different manufactures and widespread in local markets on larvae and pupae of ***Culex*** sp .

Four larval instars and pupae of the mosquito's ***Culex*** sp. were chosen and collected from several ponds in Aljubaila and Garmat- Ali regions for applying this experiment. The larvae were exposed to three concentrations for each insecticide 250 , 500 , 1000 ppm ,the LT50 was calculated for each concentration of each insecticide , results showed that ElAskari insecticide is outdo another insecticides in killing by LT50 (7.49 , 12.88 , 19.63) for three concentrations respectively , and the insecticide with lower effectiveness was Flit Sole by LT50 (14.15 , 25.31 , 35.53) for three concentrations respectively.

This study showed that insecticides which contain pyrethoids compound Tetramethrin in their structure are the most and preferred in houses because they have very low toxicity for mammals but they are highly toxic to insects and have a rapid knock- down effect even at very low doses .

Introduction

Mosquitoes taxonomically belong to Culicidae family, order: Diptera. In Iraq there are more than 18 types from Culicinae mosquitoes (1). Genus ***Culex*** spp is the most famous type in Iraqi cities, it is found in connection with human, widespread in cities, constituencies, and rural area, so it is called Houses Mosquitoes (2). The larval stages of ***Culex spp*** found in polluted water that high organic content like pool , swamp , digging , rivulet , deserted well, water barrels and small cans (3).The adult female of ***Culex*** mosquitoes are regarded carries several diseases like Filariasis Parasites, Virus Brain infection Louis Saint and Virus of Rift Valley Fever (4).

(5) reported that the Mosquito control can be very difficult but must be attempted to not only rid our homes of annoying bites but also to stop the spread of certain mosquito borne health problems. In a perfect world we need only eliminate the breeding grounds of these biting pests.

The insecticides used for killing mosquitoes and other insects, also have repellent properties that reduce the number of mosquitoes which enter the house and attempt to feed. In addition, if high community coverage achieve, the numbers and longevity of mosquitoes will be reduced (6). In spite of Mosquitoes, like other insects, may develop resistance, a capacity to survive contact with an insecticide. Since mosquitoes can have many generations per year, high levels of resistance can arise very

quickly. Resistance of mosquitoes to some insecticides has been documented within a few years after the insecticides were introduced. There are over 125 mosquito species were documented resistance to one or more insecticides (7). Since the mosquitoes are the most distributed than other insects in different environment and cause many problems for human being , it is possible to find large number of insecticide from various origins in markets and it became in forefront pesticide circulating in local markets more than by fungicide the herbicide , so that the purpose of this study is to test affectivity of seven types commercial insecticides which are outdo in our markets.

Materials and Methods

- **Sample collection** : Larvae of mosquitoes ***Culex*** spp. Were collection from some rain water pools in Aljubaila and Garmat-Ali region , isolated larvae were placed in aquarium and identified in parasite laboratory , collage of Veterinary medicine at Basrah university according to (8).
- **Preparation of test solution:** seven types of commercial insecticides were brought from market in Basrah city. The Concentration of insecticides are reduced with average 1 ml. /later distal water (1000 ppm), 0.5 ml /later (500 ppm) and 0.25 ml/ later (250 ppm) respectively. The table (1) show the structure of insecticides and the brand name :

Table (1) the structure and brand name of insecticides

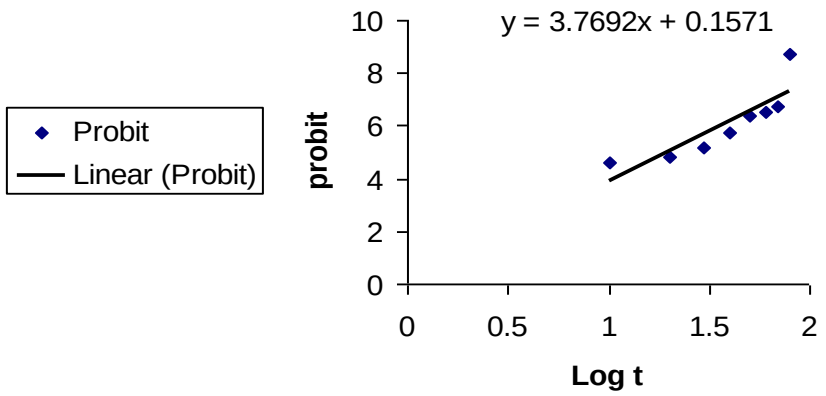
No.	The producer	Brand name	Structure of insecticide
1	Egypt	El Ascari	% 0.2 Tetremethrin % 0.5 Fenitrothin
2	UAE	Pif Paf	% 0.055 Parallethrin % 0.216 Tetramethrin % 0.095 Defenothrin
3	Turkey	Super Daytox	% 0.30 Cypermethrin

			% 0.20 Tetramethrin **% 1.50 Piperonly putuxid**
4	**KSA**	**Raid**	**% 0.10 Parallethrin** **% 0.10 Permethrin**
5	**Iran**	**Murat**	**% 0.05 Neopynamin** **% 0.15 Pierenil butaxyt**
6	**Egypt**	**Flit Sol**	**% 0.3 Tetramethrin** **% 0.07 Somethrin**
7	**China**	**Big Bond**	**% 0.279 Permethrin** **% 0.138 Tetramethrin**

- **The procedure** : Larvae of every four instars and pupa were isolated and exposed (10 larva from each instare) in to different concentrations of insecticides (250 ppm), (500 ppm) and (1000 ppm) in each replication . Larvae mortality were recorded every ten minutes, all experiments were conducted at room temperature (22-25C°). The lethal exposure time (LT) was calculated according to (9).

Results

Fig. 1 ,2,3 shown the time – mortality relationship of ElAskari insecticide of ***Culex*** sp. which were obtained by plotting Log of experimentation time against percentage probit of mortality .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Linear (Probit)
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Log t
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4
2
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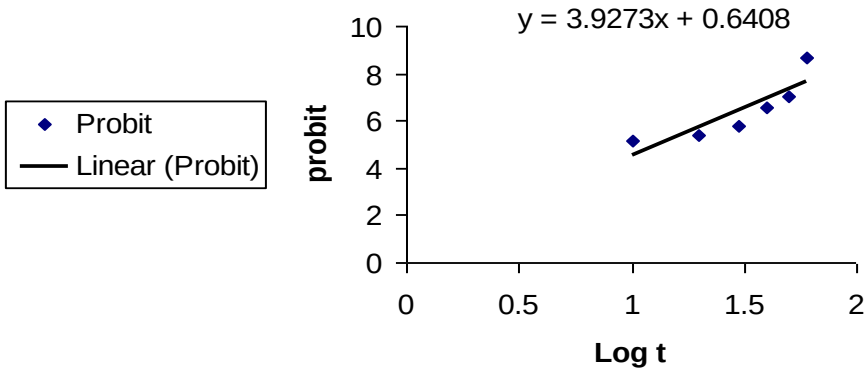
0.5
1
1.5
2

Fig. 1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Linear (Probit)
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4
2
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1
1.5
2

Fig. 2

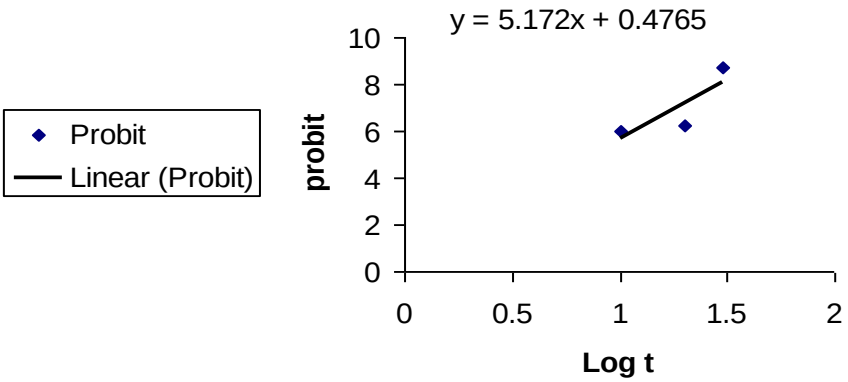


Fig. 3

Fig. 1 ,2,3 shown the time – mortality relationship of Elaskari insecticide of ***Culex*** sp in 250, 500, 1000 ppm concentrations respectively

LT50 of ElAskari insecticide in 250 ppm was lower than other insecticides as well as LT16 and LT84 are lower too in each concentrations table (1) .

The same Least Squares Method used to conduct relationship between the time of exposure to insecticide and mortality of ***Culex*** sp. larvae .

In fig. 4,5,6 for Raid insecticide

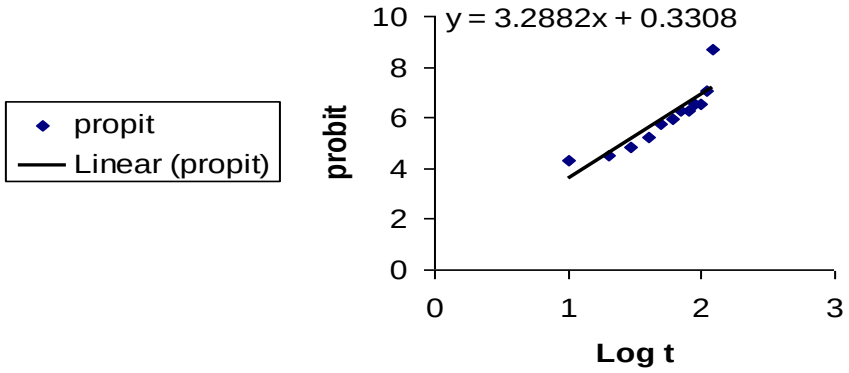


Fig. 4

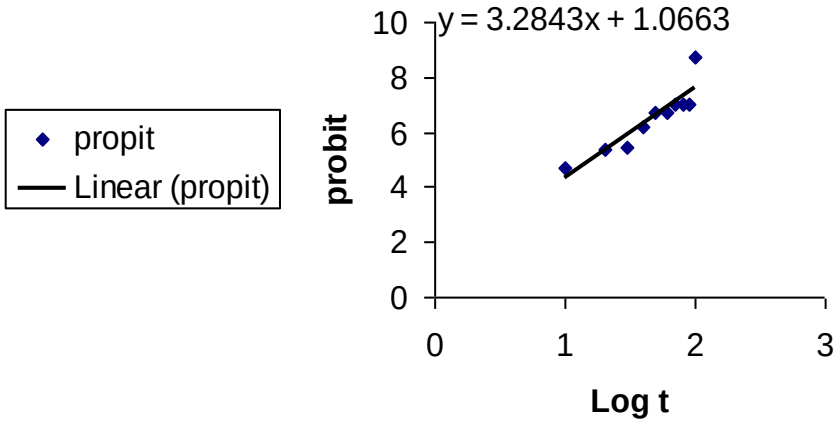


Fig. 5

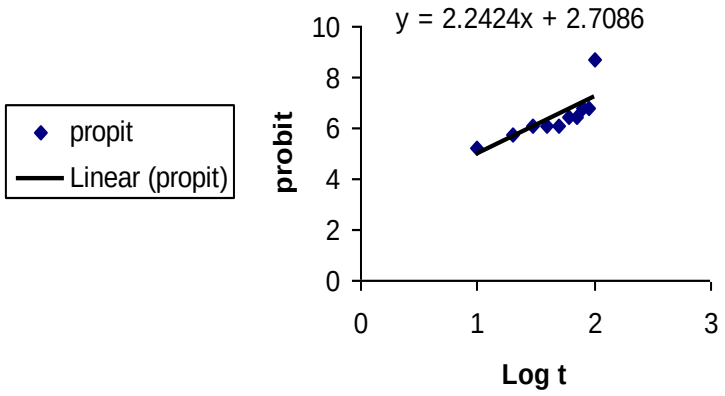
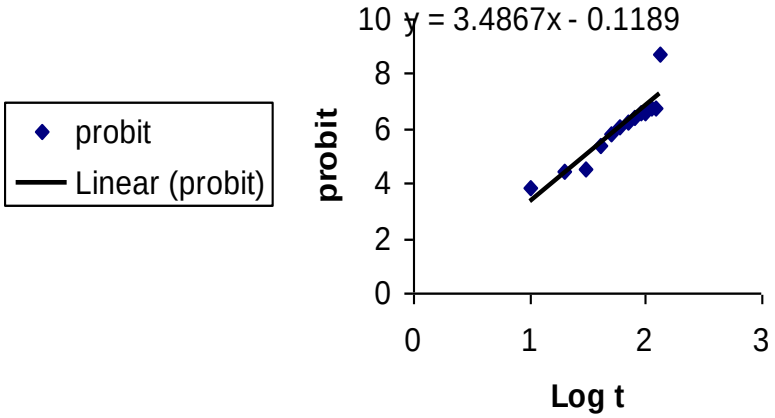


Fig. 6

Fig. 4,5,6 shown the time – mortality relationship of Raid insecticide of ***Culex*** sp in 250, 500,1000 ppm concentration respectively

Fig. 7,8,9 for Big Bond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Linear (probit)
probit
Log t
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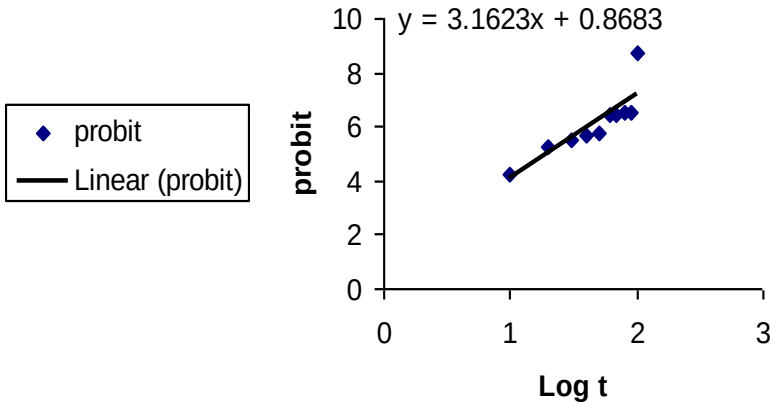
6
8
10
0
1
2
3

Fig. 7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probit
Linear (probit)
probit
Log t
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2
4
6
8
10
0
1
2
3

Fig. 8

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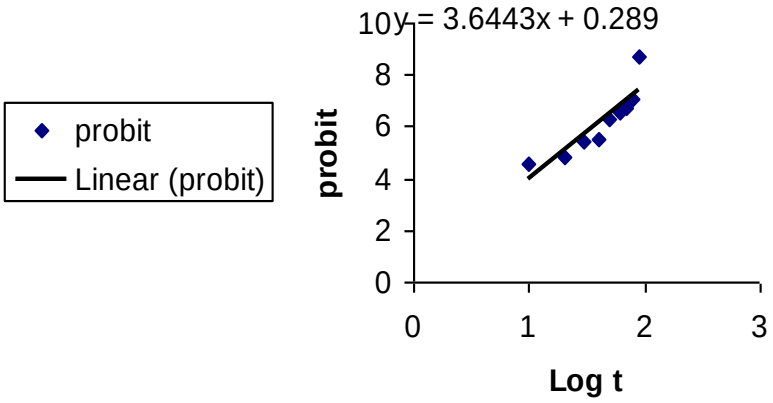


Fig. 9

Fig. 7,8,9 shown the time – mortality relationship of Big Bond insecticide of ***Culex*** sp in 250, 500, 1000 ppm concentrations respectively

Fig. 10,11,12 for Flit Sol insecticide shown the LT50 in 250 ppm was upper than other insecticides & LT16 , LT84 are upper too .

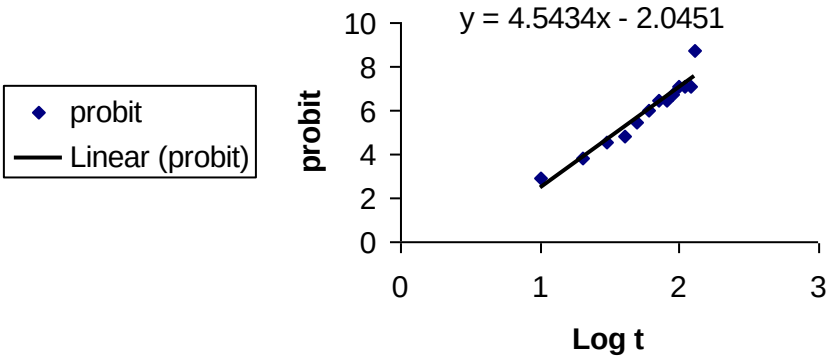
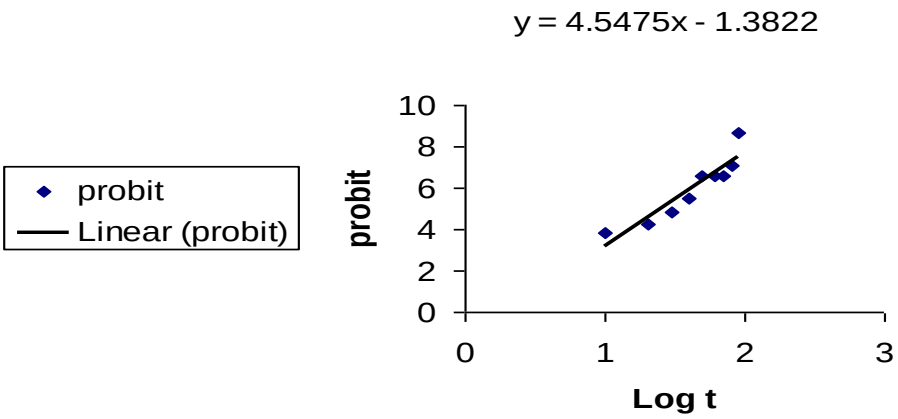


Fig. 10



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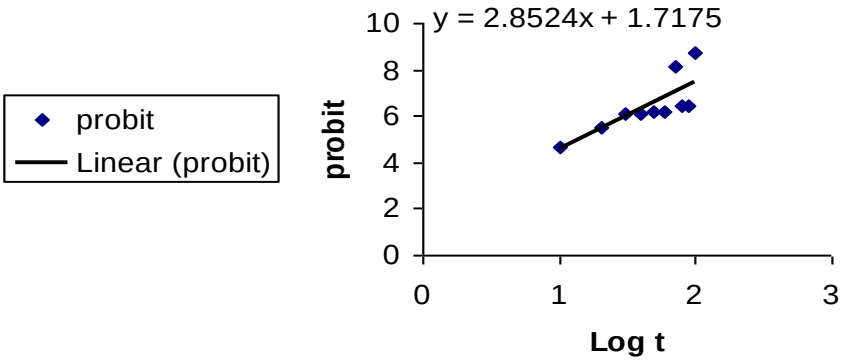

Fig. 12

Fig. 10,11,12 shown the time – mortality relationship of Flit Sol insecticide of ***Culex*** sp in 250, 500,1000 ppm concentration respectively

Fig. 13,14,15 for Daytox insecticide

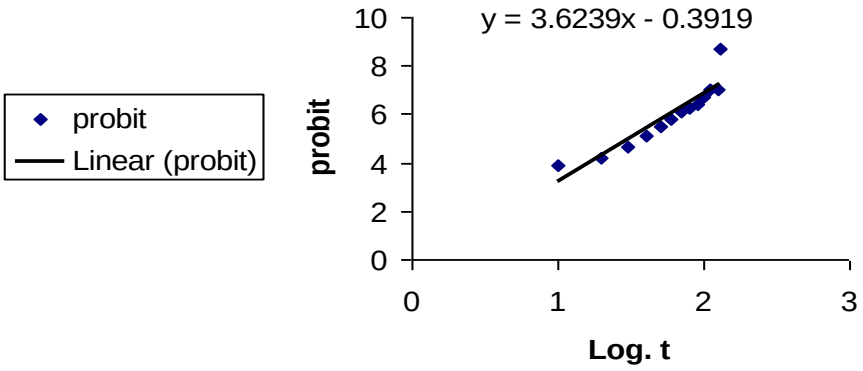

Fig. 13

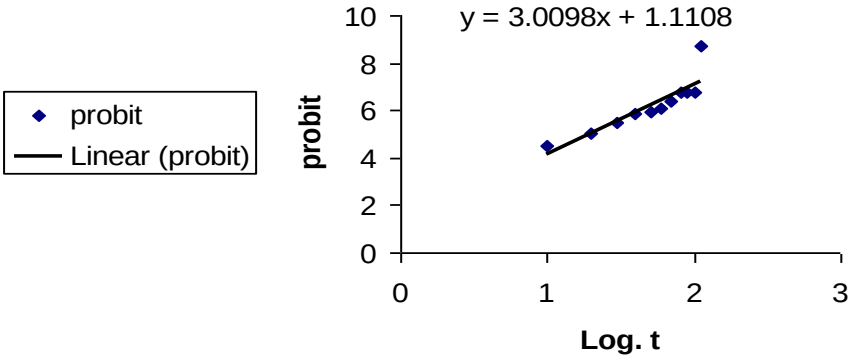

Fig. 14

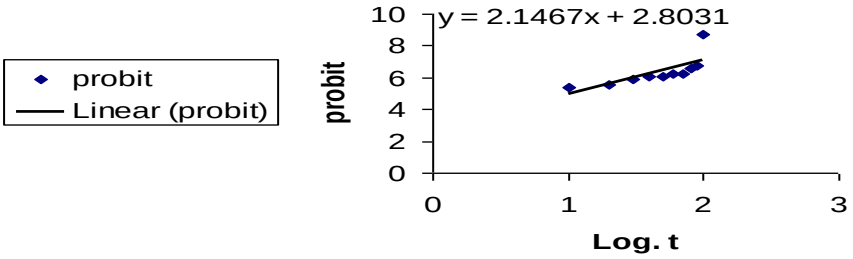

Fig. 15

Fig. 13,14,15 shown the time – mortality relationship of Daytox insecticide of ***Culex*** sp in 250, 500,1000 ppm concentration respectively

Fig. 16,17,18 for Pif Paf insecticide .

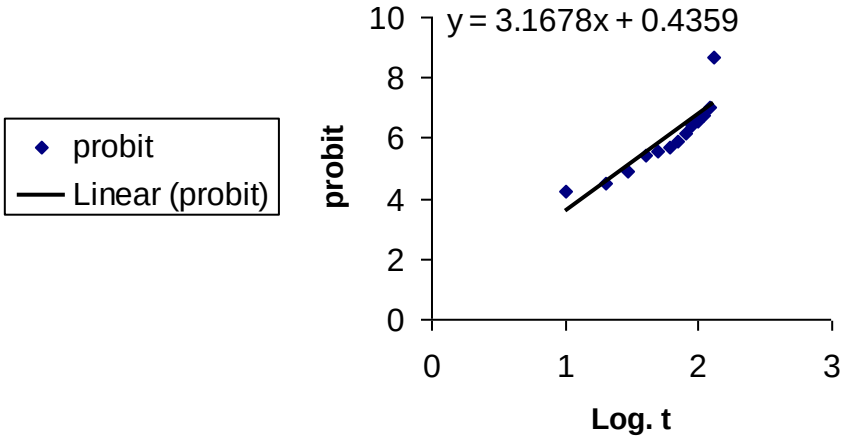

Fig. 16

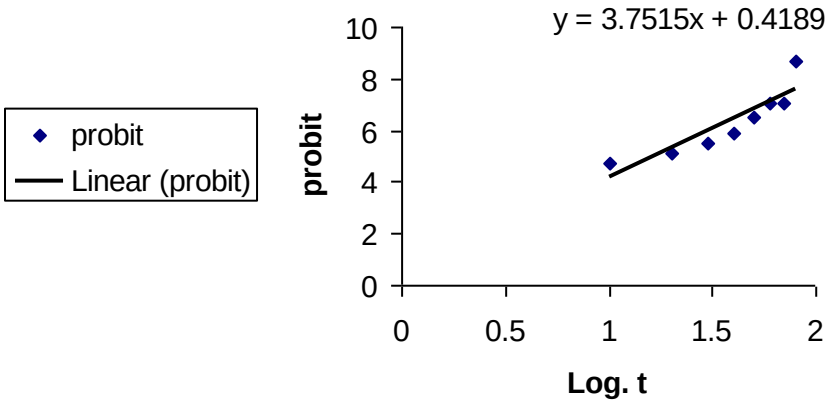

Fig. 17

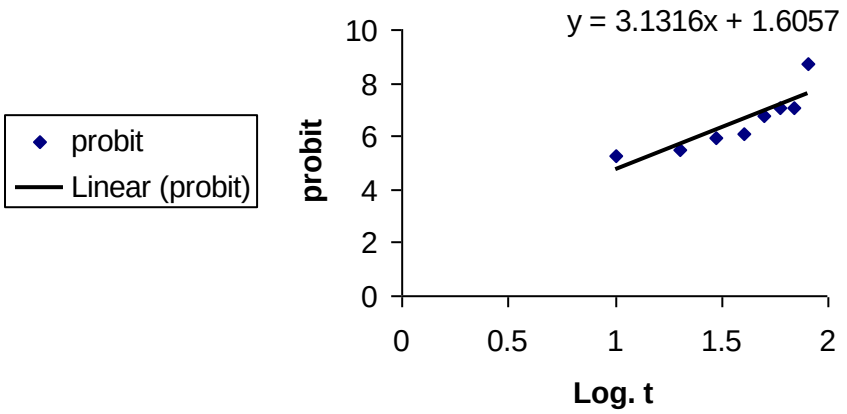

Fig. 18

Fig. 16,17,18 shown the time – mortality relationship of Pif Paf insecticide of ***Culex*** sp in 250, 500,1000 ppm concentration respectively

The LT50 value not appear remarkable deference but show approach one another .

LT50 of Murat insecticide in 1000 ppm reach to minimum standard fig. 19,20,21 .

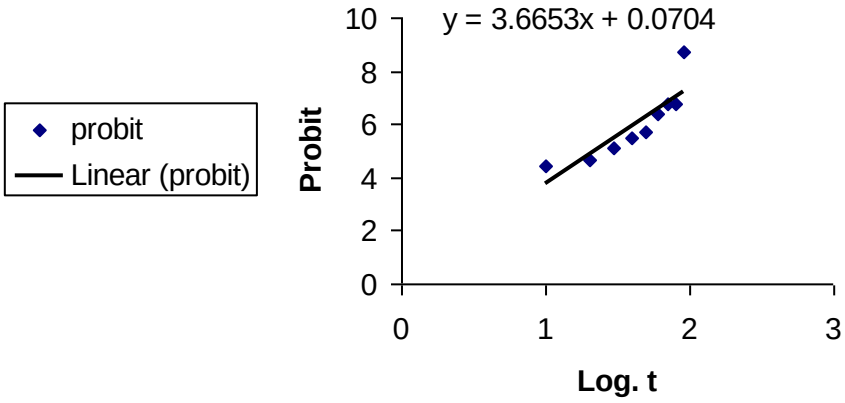

Fig. 19

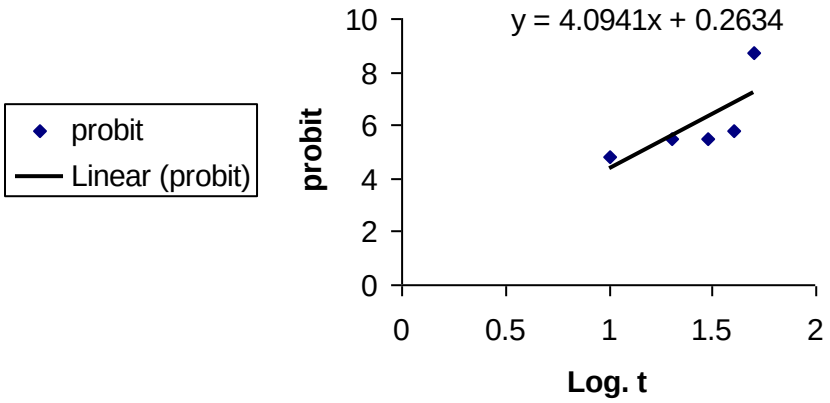

Fig. 20

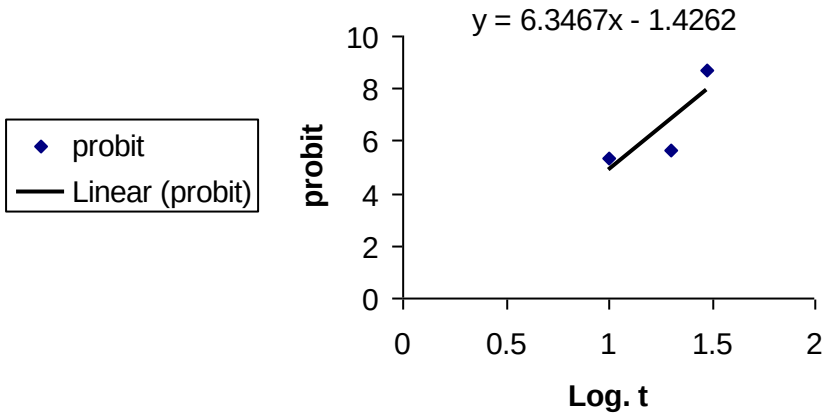

Fig. 21

Fig. 19,20,21 shown the time – mortality relationship of Murat insecticide of ***Culex*** sp in 250, 500,1000 ppm concentration respectively

The lethal time for 16% (LT16) , 50% (LT50) and 84% (LT84) of ***Culex*** sp. larvae in each concentration of insecticide 250 , 500 , 1000 ppm respectively , and a & b values were shown in table (2) .

Table (2) lethal time for 50% (LT50) of Culex sp. & the concentration of insecticide quantity of (a , b)

Insecticide	Con. ppm	Lt16 (min)	Lt50 (min.)	Lt84 (min)	a *	b **
ElAskari	250	10.52	19.63	35.28	0.1571	3.7692
	500	7.21	12.88	23.50	0.6408	3.9273
	1000	4.83	7.49	11.64	0.4765	5.172
Raid	250	13.15	26.3	52.61	0.3308	3.2882
	500	7.87	15.76	31.56	1.0663	3.2843
	1000	3.80	10.5	29.06	2.7086	2.2424
Big pond	250	15.28	29.38	56.50	- 0.1189	3.4867
	500	11.85	20.25	41.65	0.8683	3.1623
	1000	10.49	19.62	36.37	0.289	3.6443
Flit Sol	250	21.51	35.53	58.68	- 2.0451	4.5434
	500	15.33	25.31	41.79	- 1.3822	4.5475
	1000	6.36	14.15	31.46	1.7175	2.8524
Daytox	250	16.39	30.75	57.68	- 0.3919	3.6239
	500	9.19	19.59	41.79	1.1108	3.0098
	1000	3.65	10.55	30.52	2.8031	2.1467
Murat	250	11.88	22.12	41.21	0.0704	3.6653
	500	8.22	14.35	25.04	0.2634	4.0941
	1000	1.96	10.29	14.74	- 1.4262	6.3467
Pif paf	250	13.43	27.59	56.66	0.4359	3.1678
	500	9.06	20.97	30.55	0.4189	3.7515
	1000	5.85	12.13	25.12	1.6057	3.1316

*** a : a crossing with vertical axis .**

**** b : slope .**

Discussion

Insecticides used for treatment kill mosquitoes and other insects it's also have repellent properties that reduce the number of mosquitoes that inter to house and attempt to feed. In addition if height community coverage is achieved, the numbers and longevity of mosquitoes will be reduced (6).

Data which represented in table (2) refer to different susceptibility of ***Culex*** sp. larvae to insecticide used in this experiment , whereas LT16 ,

LT50 , LT84 of ElAskari for three concentrations , imply to this insecticide outdo to other insecticides , were 10.52, 19.63, 35.28 respectively , that may be return to presence a good relatively concentration from Tetramethrin and Fenitrothin (0.2 , 0.5) , this characterized by non being competence for resistance influence of light but it is a good effective in pest insect controlling (9).

The average of LT50 was different from each insecticides to another, that return to the nature of every insecticide work and variety of its chemical structure (10). Because of the low concentration of action matter in the Flit Sole structure (Tetramethrin 0.3 , Somethrin 0.07) , LT50 in 250 ppm reach to higher level . Murate insecticide realized lower LT50in 1000 ppm concentration due to existence the DDVP in high concentration (0.5) , this effect on stomach and attachment , this insecticide used in Mosquito , Aphids , Thrips , White Flies and Mites control , but it is very toxic for bees and mammals .

The Pyrethoids material recognized by short residual effect , it is impossible storage in body , whereas the vitality influences in body change it to simple substances in quickly to dissent from the body with the urine , as well as this structures analysis in quickly and do not stay in environment for long time , or collect in fat and do not out with milk (1).

(11) reported that necessary rationalization uses of chemical insecticide and the harmony with other control methods like using Botanical Pesticide that characterize with desired specification such as rapid analyze , decreased their toxicity for humans and animals for example the plants extracts or increased and decreased some of environment factors like pH and salinity.

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