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**EFFECTIVENES OF CERTAIN PESTICIDES AGAINST THE DATE  
PALM SNAILS, *COCHILECELLA ACUTA*.**

**BY**

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**ABSTRACT**

Some laboratory experiments and field trials were conducted to study the effectiveness of four pesticides against the date palm snails, *Cochilecella acuta*. For the laboratory experiments, the gained results revealed that Molotov (3% RB) gave 97.5% mortality which followed by Gastrotax having 92.5%. Also, the results added that the LC50 of Gastrotax was 0.75% followed by Vertimec 0.91%, Molotov 1.49% and Neomyl 2.16%. Therefore, the efficiency of the investigated pesticides could be arranged descendingly according to their mortality percentages at the highest concentration of each after three days post treatment, as follow: Molotov 97.5% > Gastrotax 92.5% > Vertimec 75% > Neomyl 40% under laboratory condition. On the other side the obtained data of the field trails, which carried out in citrus orchards at Demitta Governorate Kafr Saed district, proved that the Gastrotax caused 92.9% population reduction for the tested animals followed by Molotov 91.9% when used 4 kg/fed. and 7.5 kg/feddan, respectively. Besides, the study cleared that Neomyl was the most effective one causing 90.4% reduction in *Cochilicella acuta* population; meanwhile, Vertimec gave 77.4% reduction under field condition.

**INTRODUCTION**

Land snails become recently and economic pests in Egypt, either on agronomic and horticulture or ornamental plants (Kassab, Daoud 1964, El-Okda 1981, Ghamry *et al.* 1993). It caused severe damage especially during the wetting seasons and when the humidity was raising and its activity increasing subsequently it damages. These pests were controlled chemically by synthetic molluscides or insecticides (Crowell, 1967 and El-Okda, 1981). Therefore the main goal of the present work is testing the different pesticides against the date palm snail *Cochilicella acuta* which considered one of the most common species in Egypt, to introduce some effective compounds for control it successfully under field conditions.

**MATERIALS AND METHODES**

**1- Pesticides used:-**

**A- Neomyl SL.**

**Common name:** Methomyl.

**Chemical name:** S-mthomyl N- (methomyl carbamoyloxy) thioacetimidate.

**Action:** Insecticide.

**B- Vertimec (1.8% EC):-**

**Common name:** Abamactin.

**Chemical name:** a mixture containing a minimum of 80% avermectin B1b (5-0 dimethyl avermectin A1a) and a maximum of 20% avermectin B1b (5-0 dimethyl-25- de- [1- methyl propyl-2, 5- (1-methylethyl) avermectin A1a] produced by the soil micro organism *Streptomyces avermitilis*.

**Action:** Biotic pesticides (Acaricides).

**C- Molotov 3% R.B.:-**

**Common name:** Metaldhyde.

**Chemical name:** Metaldhyde.

**Action:** Moulluscicide.

**D- Gastrotox 5% RB:-**

**Common name:** Metaldhyde.

**Chemical name:** Metaldhyde.

**Action:** Moulluscicide..

**2- Tested animals:-**

For the laboratory experiments, adult individuals of *Cohilcella acuta* were collected from the infested citrus orchards at Dommiatta Governorate, Kafer Saad district. Animals were transferred to laboratory in black cloth sacs. The collected snails were kept in glass boxes and fed on fresh lettuce leaves for one week. For each treatment, 40 healthy animals were allocated and divided into four replicates, 10 individuals for each.

On the case of the field trials, the different concentrations of pesticides were applied in the citrus orchards one feddan for each, at Dommitta Governorate, Kafer Saad district. Four replicates were chosen, each replicates contain 4 trees and numbered. The date palm snails were counted and registered for each tree. The poisonous bait was distributed around the investigated trees (4 trees) on a pieces of plastic sheets (20 x 20cm).

**3- Toxicity tests:-**

To study the toxic effect of each tested pesticides under laboratory condition, they must be in the suit formula to introduce them to the target animals. For the Neomyl (20% SL) and Vertimec (1.8 EC) their baits were prepared in three concentrations, 0.5%, 1% and 1.5% by admixing them thoroughly with brane and molasses. Meanwhile, Molotov (3% RB) and Gastrotox (5% RB) were introduced directly to the tested snails in their formula (Ready made) in three doses 1.5, 3 and 6 gram for Molotov and in 0.5, 1 and 2 gram for Gastrotox. Daily the killed animals were counted and removed for three successive days. The corrected mortality were done according to Finney (1971).

Whereas, the field experiments were carried out at the chosen areas (citrus orchards) it Dommiatta Governorate, Kafer Saad district to evaluate the pesticides activity against the date palm snails. The died individuals were

calculated and registered for 21 days post-treatment. The population reduction of snails was estimated according to formula of Handrson and Tilton (1955):-

$$\text{Reduction \%} = \frac{\text{Control} - \text{treated}}{\text{Control}} \times 100.$$

**RESULTS AND DISCUSSION**

The presented data in Table (1) showed the response of date palm snails, *Cochilcella acuta* to the tested pesticides. The LC<sub>50</sub> value and the mortality percentages at their highest concentration of Neomyl, Vertimec, Molotov and Gastrotox were; (2.16% and 40%), (0.91% and 75%), (1.46 gr/10sn and 97.5%) and (0.75 gr/10sn and 92.5%), respectively. The previous figures cleared that Molotov was the most effective one followed by Gastrotox, Vertimec and Neomyl against the tested land snails.

**Table (1): LC<sub>50</sub> values mortality of certain pesticides against *Cochilcella acuta* under laboratory conditions.**

Pesti- cides	Neomyl 20% SL				Vertimec 1.8% EC				Molotov 3% RB			Gastrotox 5% RB		
	0.5%	1.0%	1.5%	2.0%	0.5%	1.0%	1.5%	2.0%	1.5 gr/10 small	3.0 gr/10 small	6.0 gr/10 small	1.5 gr/10 small	3.0 gr/10 small	6.0 gr/10 small
Concen- tration Item	75	22.5	35	40	35	45	55	75	55	65	97.5	37.5	57.5	92.5
Morta- lity														
LC <sub>50</sub> value	2.16%				0.91%				1.46 g/10s			0.75 g/ 10s		

This results agree with Khider *et al.* (2005) who stated that Vertimec exhibited the highest toxic action against *M. cartasiana* and *H. vestalis* than biofly. Also the results agree with Keshta *et al.* (2006) who mentined that the mortality went up to 100% for *T. pisana* and *E. vermeculata* when 0.11% concentration of Vertimec was used under laboratory conditions. The results are in agreement with Daoud (2004) who reported that LC<sub>50</sub> values after 4 days exposure period for Vertimec 1.8 EC against *M. cartusiana* and *E. vermeculata* were 0.54% and 0.64% under laboratory condition respectively.

Moreover, the tabulated data in Table (2) illustrated effect of Neomyl, Vertimec, Molotov and Gostrotox on the population reduction of *C. acuta* under field conditions. The reduction of population percentages after one day from treatment and 21<sup>st</sup> day post-treatment both at the highest concentration of the fore mentioned pesticides were (26.1% and 90.04%), (30.7% and 77.4%), (37.5% and 91.9%) and (42.6% and 92.9%), respectively. These results revealed that Gastrotox was the most effective one against *C. acuta* after one (42.6%) and 21 (92.9%) day post-treatment. On the opposite side, the lowest ones on 1<sup>st</sup> day and 21<sup>st</sup> day post-treatment were respectively Neomyl (26.1%) and Vertimec (77.4%). Finely, the effectiveness of the tested pesticides against *C. acuta* under field

conditions could be aeranged descendingly according to their abilities to reduce the population of the tested animals at the highest concentration after 21<sup>st</sup> day from beginning of the treatment as follow: Gostrotox (92.9%) > Molotov (91.9%) > Neomyl (90.4%) Vertimec (77.4%). In addition the gained figures cleared that the highest concentrations 3% (for Neomyl and Vertimec) and 7.5 kg/ feddan (for Molotov) and 4 kg/feddan (for Gastrotox) gave the highest population reduction than the others.

The results agree with Gabr *et al.* (2006) who found that the Cekumata 5% was the most toxic for *Monacha abstracta* and *Eobania vermiculata* followed by Vertimec 1.8% EC. Also the results are in harmony with Daoud (2004) reported that Neomyl 90% exhibited the highest toxic action against *E. vermiculata* snails followed by Vertimec 1.8% EC as poisonous bait in the field cultivated with clover.

Table (2): Effect of certain pesticides on the population density of the Date palm snail *Cochilcella acuta* under field conditions (Citrus orchards)

Pesticides	Concentration %	No of the treated snails	Average of indi reduction percentage after									
			1 <sup>st</sup>		3 <sup>rd</sup>		7 <sup>th</sup>		14 <sup>th</sup>		21 <sup>st</sup>	
			No of indi R	%	No of indi R	%	No of indi R	%	No of indi R	%	No of indi R	%
SI Neomyl 20% EC	1 10 kg/feddan	107	12	15.9	22	20.15	39	36.8	51	47.2	65	60.7
	2 10 kg/feddan	112	24	21.4	38	33.9	62	55.4	72	64.3	82	73.2
	3 10 kg/feddan	115	30	26.1	71	61.7	83	72.2	94	81.7	104	90.4
Vertimec 1.8% EC	1 10 kg/feddan	127	26	20.5	42	33.1	51	40.2	59	46.5	67	52.8
	2 10 kg/feddan	119	35	29.4	42	35.3	49	41.2	64	53.8	72	60.5
	3 10 kg/feddan	137	62	30.7	75	54.7	83	60.6	89	65.0	116	77.4
RH Molotov 3%	2.5 kg/feddan	136	34	25.0	67	49.3	82	60.3	89	65.4	113	83.1
	5 kg/feddan	125	43	34.4	70	56.0	83	66.4	92	73.6	110	88
	7.5 kg/feddan	160	60	37.5	100	62.5	119	74.4	142	88.8	147	91.9
RB Gastrotox 5%	1 kg/feddan	137	42	30.7	62	45.3	80	59.1	92	67.2	104	75.9
	2 kg/feddan	145	52	35.9	79	54.5	91	62.8	112	77.2	123	84.8
	4 kg/feddan	155	66	42.6	92	59.4	112	72.3	138	89.0	144	92.9

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كفاءة بعض مبيدات الآفات ضد قواقع النخيل *Cochilecella acuta*

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لدراسة كفاءة مبيدات النيومايل (20SL) والفيرتيمك (1.8EC) والمولوتوف (RB) (3%) والجاستروتكس (RB) (5%) على قواقع النخيل *Cochilecella acuta*، أجريت بعض التجارب المعملية والحقلية. أوضحت التجارب المعملية أن المولوتوف أعطي نسبة موت 97,5% أتبعه الجاستروتكس بنسبة موت 92,5%. وبالإضافة الي ذلك فإن قيمة التركيز النصف المميت لمبيد الجاستروتكس 0,75% يليه الفيرتيمك 0,91% والمولوتوف 1,49% ثم النيومايل بقيمة قدرها 2,16%. هذا وقد أمكن ترتيب كفاءة هذه المبيدات المختبرة تنازلياً وفقاً للنسب المئوية للموت التي أحدثها التركيز الأعلى

بعد ثلاثة أيام من المعاملة كما يلي المولوتوف ٩٧,٥% أكبر من الجاستروتكس ٩٢,٥% أكبر من الفيرتيمك ٧٥% أكبر من النيومايل ٤٠% تحت الظروف المعملية.

أما من حيث التجارب الحقلية التي أجريت في زراعات الموالح بمركز كفر سعد محافظة دمياط ، أوضحت أن الجاستروتكس سبب خفضا في تعداد قوقع النخيل ٩٢,٩% يليه المولوتوف ٩١,٩% عند إستخدام معدل ٤ كيلو، ٧,٥ للفدان علي التوالي.

بالإضافة الي ذلك أوضحت الدراسة أن النيومايل كان أكثر كفاءة محدثا نسبة ٩٠,٤% خفضا في تعداد قوقع النخيل في حين سبب الفيرتيمك خفضا في التعداد مقداره ٧٧,٤%.