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THE EFFECT OF LEVO AND TRIGARD PESTICIDES ON THE LIFE OF POTATO MOTH INSECT *PHTHORIMAEA OPERCULELLA* (ZELLER)

ВЛИЯНИЕ ПЕСТИЦИДОВ LEVO И TRIGARD НА СМЕРТНОСТЬ КАРТОФЕЛЬНОЙ МОЛИ *PHTHORIMAEA OPERCULELLA* (ZELLER)

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Abstract

The study was conducated in the laboratories of the Department of biogenic control techniques/Technical College/Al-Mussaib for the period from 2015–2016, different concentrations of Levo and Trigard pesticides has been used in the treatment of the larvae of *Phthorimaea operculella* and found that Levo pesticide has slighte ffect in the treatment of first larval instar especially after feeding for one day, the perdition ratios were 13.33, 20.00 and 26.66 at the treatment concentrations of 0.50, 1.00, 1.50 ml/liter, respectively, while the concentration of 3 g/liter of Trigard pesticide has an obvious effect on the perdition of the first larval instar after 1 day of feeding, the perdition ratio reach 30.00 percent while the concentration 1.50 ml/liter of the Levo pesticide and concentration 3 g/liter of the Trigard pesticide have a higher perdition ratios after 3 days of feeding, the perdition ratios were 26.66 and 30.00%, respectively, while the concentration of 3 g/liter. Trigard pesticide has a comparatively great effect when treatment of third larval instar, reaching 36.66 and 40.00% after 1 and 3 days of feeding, respectively, while the Levo pesticide has lower effect at perdition ratios which reach 30.00 and 36.66% at concentration of 1.50 ml/liter after feeding of third larval instar of the insect for 1 and 3 days, respectively.

Аннотация

В работе представлены результаты изучения действия инсектицидов Levo 2.4sL и Trigard на личинок (гусениц) картофельной моли *Phthorimaea operculella*. Levo (коммерческое название) является естественным производным *Sophora flavescens*, широко известного лекарственного растения, используемого в различных фармацевтических препаратах. Нетоксичен для человека и домашних животных. Trigard – ингибитор роста насекомых, используется для борьбы с личинками Diptera и Coleoptera (коммерческие названия Larvadex, Premix). Проникает в листья и вызывает гибель личинок до того, как они нанесут ущерб. Trigard предлагает до двух недель остаточной активности и совместим с существующими программами IPM Исследование проводили в лабораториях кафедры биологического контроля технического колледжа Эль-Мусаиб в период с 2015 г. по 2016 г. Были использованы различные концентрации инсектицидов Levo и Trigard для обработки личинок *Phthorimaea operculella,* собранных на зараженных клубнях картофеля с местных рынков. Установлено, что Levo обладает незначительным действием на личинок первого возраста, особенно после кормления в течение одного дня: показатель смертности составил 13.33, 20.00 и 26.66 % при концентрациях препарата 0.50, 1.00, 1.50 мл/л, соответственно. Trigard при концентрации 3 г/л показал явно выраженное действие на личинок первого возраста. После одного дня кормления гибель достигает 30.00%. Levo при концентрации 1.50 мл/л и Trigard при концентрации 3 г/л после 3 дней кормления вызывают более высокую смертность – 26.66 и 30.00%. В концентрации 3 г/л Trigard имеет сравнительно высокий эффект при обработке личинок третьего возраста, достигающий 36.66 и 40.00% через 1 и 3 дня кормления, в то время как Levo имеет более низкий эффект, вызывая гибель до 30.00 и 36.66% при концентрации в 1.50 мл/л после кормления личинок третьего возраста в течение 1 и 3 дней.

Key words: Levo, Trigard, *Phthorimaea operculella*.
Ключевые слова: Levo, Trigard, *Phthorimaea operculella*.

Introduction

Potato tuber moth *Phthorimaea operculella* is one of the pests that cause obvious economic damage on the Solanaceae family plants [Hamdani, 2005], as the larvae burrow in the leaves, stems, and feed on the tubers, leading to the whole crop destruction in some conditions [Essmat, 1988].

Researchers turned to search for other ways safer for the environment, including plant extracts and pesticides, including Levo pesticide as the usage of botanical pesticides for fighting insect pests is not new as used over a wide range and commercial [Valencia, 2006]. Most botanical pesticides affect tactile way or breathing or contagious in a way which is generally biodegradable vital quickly any advantage easily biodegradation and thus lose their toxicity within hours or days and this reduces their activities on useful organisms and is relatively environmentally safe. Matrine the pure substance is the active ingredient of the pesticide and Levo be white crystals are soluble in water and alcohol base is weak, and with a very steady salt [Fluence, 2006] this substance affects on the central nervous system of insects, which result the inhibition of all life processes. Commercially synthetic the pesticide does not contain any chemical substance synthetic. The pesticide prepared from these plants is not toxic to humans or animals and does not cause pollution of the environment [Holloway, 2006], while the Trigard is pesticide vital extracts of fungi avermitilis Streptomyca that goes back to Actinomyetes group used for combating insects and mite and works by absorption has after touching used in integrated programs management (IPM) and interferes with nerve transmission, causing nerve impulses to stop and then paralysis and finally death [Zubaidi, 1987], this research was conducted to study the effect of pesticides Levo and Trigard in combating the potato tuber moth.

Materials and Methods

Insect Breeding: infected potatoes tubers, which contain the larvae of potato tubers insect moth were collected from the local markets and placed in wooden cage measuring 30×30×30 cm with base of wood and sidesfrom muslincloth to ensure that larvae do get out from cages and placed sawdust at the bottom of the cage in order to larvalthen theadult insect were fed with a sugar solution of 5% and then placed in cages at the laboratory at a temperature of 25±2°C and relative humidity 65±5%.

Preparation of pesticides concentration and their sources.

1. Inhibitory insect growth Trigard 75% g/liter is insecticide works on insect growth regulator used to control the larvae of insects Diptera and Coleoptera in the vegetable fields, orchards, fruit and preparing a wettable powder containing 750 g/kg active ingredient Gyromazin which sold under the commercial names such as Larvadex, Premix The pesticide was prepared at the production company ((CRD) Complete Randomize) concentrations (1, 2, 3) g/liter were prepared for the purpose of treatment of larval stage of the insect.

2. Pesticide Levo 2.4sL is an organic insecticide, the active ingredient is Otxometran Oximturn 24% was prepared at Sineria (the producing company)it is an extract of several medicinal plants as an active substance that affecting the nervous system of harmful insects, by affecting on breathing and impaired movement. Levo does not contain any chemicals and is non-toxic to humans and animals and does not leave deposits that affect the environment concentrations of (0.50, 1.0, 1.50) ml/liter were prepared for the purpose of treatment insect larval stages.

The effect of the Levo and Trigard pesticides in the destruction of the first instar larvae of the insect.

At the exit of the adult from the laboratory farm they were placed (2 males +2 female) in glass bottles containing sugar syrup 5% to feed the adult and strips of paper were placed hanging inside the glass bottles for the purpose of laying eggs by the female and then these strips pulled and placed into the dishes with filter paper in their base and left for 24 hours then the strips containing eggs aged 24 hours pulled which first instar larvae were obtained from them and Petri dishes containing 5 grams of fresh-cut vegetable leaves used, and each dish treated with 0.5 ml of water or concentrations of pesticides Levo and Trigard then the food medium left in the air for two hours for drying, ten larvae from the first instar placed in

each dish and these dishes were closed tightly, placed in the incubator with three replicates per treatment, the proportion of perdition of larvae treatment was calculated after 1 and 3 days of feeding.

The effect of pesticides Levo and Trigard in the perdition of the third instar larvae.

The third instar larvae were treated by the same way to ensure that all the treated larvae at one age, ten larvae placed in a petri dish with three replicates, the proportion of perdition of larvae treatment was calculated after 1 and 3 days of feeding.

Statistical analysis.

Experiments were designed in accordance with the full design of randomization C.R.D. The data were analyzed statistically using analysis of variance table (ANOVA) the difference is below a lesser amount of significant (L.S.D) 0.05 to the significant result test, gary.2010)),Genstat is astatistical program used for this purpose. The corrected percentages transformed to the angle values to be entered in the statistical analysis. The perdition ratios corrected according to the following treatment (corrected mortality percentages – CMP, %) [Rawi et al., 2000]:

$$CMP=1-\frac{\text{the death percentages of treatment \%}-\text{mortality percentages in comparison \%}}{100-\text{mortality percentages in comparison \%}}\times 100\%.$$

Research results

Table 1 shows the effect of the Levo pesticide in the proportion of the death of the larvae of the first instar of an insect with a significant difference, the percentage of perdition first day was 13.33, 20.00, and 26.66% at concentrations of 0.50 and 1.00 and 1.50 ml /l and perdition ratios increased after 3 days of feeding, reaching 26.66 at concentration of 1.500 ml /l while the treatment by Trigard pesticide outperformed at concentration of 3 g/l significantly after three days of feeding, reaching 30.00% , the perdition ratios increased with the progressive of larval age and these results agreed with the research by [Panhwar, 2005].

Table 1
Таблица 1

The perdition percentage of the larvae of the first instar of potato tuber insect moth treatment by Levo and Traigard pesticide after 1 and 3 days of feeding
Гибель гусениц первого возраста картофельной моли под действием пестицидов Levo и Traigard после 1 и 3 дней кормления

Pesticide (Treatment)	Concentrations%	The perdition percentage after feeding for	
		1 day	3 day
Levo, ml/L	0.50	13.3	13.3
	1.00	20.0	23.3
	1.50	26.6	26.6
Traigard, g/L	1	20.0	26.6
	2	26.6	26.6
	3	30.0	30.0
Control	distilled water only	3.3	3.3
L.S.D(0.05) For concentrations = 5.6 For phases = 6.3			

Table 2 shows the outperformed of Trigard pesticide significantly when the treatment is 3 g/L after 3 days of feeding for the third insect larval stage to all treatment, the total perdition percentage reached 40.00% this is because of the increased perdition ratios after 3 days of feeding to the accumulation of toxic material in the body of the insect, which

increased its influence and thus the perdition ratio, this was confirmed by [Corbitt, 1989] when treated the cotton leaf worm larvae by pesticide Trigard.

Table 2
Таблица 2

The perdition percentage of the larvae of the third instar of potato tuber insect moth treatment by Levo pesticide and Trigard after 1 and 3 days of feeding
Гибель гусениц третьего возраста картофельной моли под действием пестицидов Levo и Traigard после 1 и 3 дней кормления

Pesticide (Treatment)	Concentrations %	The perdition percentage after feeding for	
		1 day	3 day
Levo, ml/L	0.50	23.3	26.6
	1.00	26.6	26.6
	1.50	30.0	36.6
Traigard, g/L	1	26.6	30.0
	2	30.0	33.3
	3	36.6	40.0
Control	distilled water only	3.3	3.3
L.S.D (0.05)For concentrations = 6.1 For phases = 6.7			

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