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EFFICACY OF DIOFENOLAN ON REPRODUCTIVE PERIODS IN *PERICALLIA RICINI* FAB. (LEPIDOPTERA: ARCTIIDAE)

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ABSTRACT

The female treated with any concentration of the diofenolan through food and significantly prolonged preoviposition (P<0.05) and in response to treatment with different concentrations of this insecticide applied as above, this period varied from 3.0 to 3.89 days and appeared to prolonged concentration but, as per statistical analysis, the concentrations from 0.0001% to 0.50% affecting this period identifically (P<0.05), caused significantly less prolongation as compared the 1.0 percent concentration (P<0.05).

KEYWORDS: Diofenolan, Pericallia, Reproductive Periods.

INTRODUCTION

The black hairy caterpillar, *Pericallia ricini* Fabricius is a polyphagous insect feeds on Soyabean, Groundnut, Castor, Cucurbits etc. Pericallia ricini fabricius biology and development on different food plants. The bioefficacy of insect growth regulators is generally *manifested* during *ecdysis* as it disturbs the process of chitin deposition, thus effecting growth and development of the insects. It also results in failure to feed, due to displacement of mandibles, maxillae and labrum and blockage of the gut. These insect growth regulators also produce delayed symptoms, in which the adults fail to escape from pupal skin and therefore cannot fly, feed and mate. These insecticides also induce the fertility and fecundity as observed by many entomologists. Several insect growth regulators have been found effective in suppressing the population of *Euproctis icilia, Euproctis fraternal, Musca domestica, Pieris brassieae, Spodoptera litura, Pectinophora gossypiella, Earias insulana, Leptinotarsa decemilinata, Achoea janta Oxya japonica, Tenebrio monitor, Utetheisa pulchella* and many other insects.

MATERIAL & METHOD

In Pupal dip Method pupae were dipped in a particular concentration for 2 minutes. After dipping for the fixed duration the pupae were taken out from that concentration of the insect growth regulator. The solvent and the insecticides adhering to the surface of the pupae were soaked in the blotting paper and such treated pupae were maintained for further studies. This method form henceforth will be referred as PDM in the text. In Residue Film method of treatment 1 to 2 hr old adults were exposed to a thin file of residue of a concentration of particular insect growth regulator.

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For obtaining the thin film of the chemical as residue, about 10 ml of a concentration of a chemical was poured in a petridish (10 cm dia) and the petridish was tilted in different ways to spread the chemical on the whole floor area of the petridish and its raised periphery. Thereafter, the petridish was kept in the air for the evaporation of the solvent. This led to the formation of a thin film of a concentration of insect growth regulator in the petridish as residue. Adults were left in petridishes having thin film of the insect growth regulator for 24 hours. The petridishes were covered by thin muslin cloth to prevent the escape of the adults. Such treated adults were employed in the different experiments as described later on. This method of treatment will be designed as RFM in the text from here onwards. In Adults feeding Method of treatment a concentration of a particular insect growth regulator was mixed in 10 per cent sugar solution which was supplied to adults for feeding. From here onwards this method of treatment will be referred as AFM in the text.

RESULT & DISCUSSION

The female treated with any concentration of the diofenolan through food and significantly prolonged preoviposition (P<0.05) and in response to treatment with different concentrations of this insecticide applied as above, this period varied from 3.0 to 3.89 days and appeared to prolonged concentration but, as per statistical analysis, the concentrations from 0.0001% to 0.50% affecting this period identifically (P<0.05), caused significantly less prolongation as compared the 1.0 percent concentration (P<0.05). Like the preoviposition period, the oviposition period was also affected by every concentration of this insect growth regulator administered to the female orally (P<0.05) and in response to the female's treatment orally with different concentrations of this insecticide, this period, varying from 1.57 to 8.0 days and exhibiting indirect proportionality to the concentrations differed significantly with the concentrations of diofenalan (P<0.05) (Table 1). Similar result also found by Abbott, W.S. 1925, Cupp, E.W. and J. O'neal (1973), Gupta, Mridula *et. al.* (1995), Gupta, Maridula *et. al.* (1994), Gupta, G.P. *et. al.* (2005) Effect of plant lectins on growth and development of American bollworm (*Helicoverpa armigera*), Hennebarry, T.J. and Kishaba, A.N. (1966), Janakiraman, S. and Gupta, G.P. (2002) Effect of modified artificial diet and insecticidal proteins on growth and development of tobacco cutworm (*Spodoptera litura*), Jeyasankar, A. *et. al.* (2014), Mala, S. and Muthalagi, S. (2008), Mohamed, M. J. and Kareem, A. A. (2010), Radwan, H.S.A. *et. al.* (1986), Rozpara E *et. al.* (2016), Saxena, A, *et. al.* (2001) Effects of certain insect growth regulator on the growth and development of *Pericallia ricini* Fab. (Lep.: Arctiidae), Simmonds *et. al.* (1995) and Yasur, J. and Rani, P.U. (2015).

Table 1.Effect of Diofenolan on reproductive periods in *Pericallia ricini* Fab (Values are mean ± S.E.)

Mode of treatment	Concentration (%)	Pre- Oviposition period		Oviposition period (days)	
		Value	S.E.	Value	S.E.
Adult Feeding Method (AFM)	0.0001	3.00	0.15	8.00	0.21
	0.001	3.14	0.21	7.61	0.12
	0.01	3.33	0.22	5.51	0.11
	0.10	3.46	0.17	4.56	0.17
	0.50	3.57	0.22	3.46	0.25
	1.00	3.89	0.16	1.57	0.16

Fig. In Parentheses and Transformed value.

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