Young Scientist- Tomorrow's Science Begins Today
Vol. 1, Issue – 2015
ISSN: 2581-4737

EFFECT OF BUPROFEZIN ON REPRODUCTIVE PERIOD IN PERICALLIA RICINI FAB (LEPIDOPTERA: ARCTIIDAE)

YOGESH KUMAR MISHRA*, R.S. SINGH*
*Department of Biotechnology, B.N.D Collage, Kanpur, UP, India.

ABSTRACT

Any concentration of the burpofezin applied to adult *Pericallia ricini* Fab prolonged to sexual maturity. As per statistical analysis, the concentration from 0.0001% to 0.50% among which the preoviposition period varied from 3.12 to 3.32 days, affected this period identically (P>0.05) with less prolonging effect as compared to the 1.00 per cent concentration of the buprofezin with the preoviposition period tasted for 3.86 days. Further, the treatment affected orally with any concentration of this insect growth regulator exerted significant influence on the oviposition period (P<0.05). The oviposition period varied from 1.80 to 7.60 days among different concentration of the burpofezin administered orally and it declined with the advancing concentration.

KEYWORDS: Reproduction, Buprofezin, Pericallia ricini.

INTRODUCTION

The wooly bear, *Pericallia ricini* Fabricius **(Lepidoptera: Arctiidae)** is a polyphagous insect feeds on Soyabean, Groundnut, Castor, Cucurbits etc. Pericallia ricini fabricius biology and development on different food plants was described by **Basu (1944).** 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 can not 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. These chemicals particularly penfluron, diflubenzuron, diamino fruly-S-triazine, diofenolan, cyromazine, esaflumuron, novaluron, keyouniao, buprofezin, triflumuron, fenoxycarb, tebufenozide, teflubenzuron, lufenuron and fenoxiculve have been found effective without any obvious effect mating ability and life span of the insect. The possible use of insect growth regulators present in *intriguing* and exciting area for research. In view of already proved

ISSN: 2581-4737

efficacy of insect growth regulators as control measure in good number of insects and the notoriety of *Pericallia ricini* it was through desirable to apply some of these chemicals against this pest hence this investigation.

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. 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 **(Abbott W.S. 1925).**

RESULT AND DISCUSSION

Any concentration of the burpofezin applied to adult prolonged to sexual maturity. As per statistical analysis, the concentration from 0.0001% to 0.50% among which the preoviposition period varied from 3.12 to 3.32 days, affected this period identically ($P>0.05$) with less prolonging effect as compared to the 1.00 per cent concentration of the buprofezin with the preoviposition period tasted for 3.86 days. Further, the treatment affected orally with any concentration of this insect growth regulator exerted significant influence on the oviposition period ($P<0.05$). The oviposition period varied from 1.80 to 7.60 days among different concentration of the burpofezin administered orally and it declined with the advancing concentration. But the statistical analysis revealed that 0.0001% and 0.001% concentrations which induced an oviposition period of 7.25 to 7.60 days, affected this period identically with more prolonging effect as compared the other concentrations (0.01% to 1%) among which this period, varying from 1.80 to 5.87 days and decreasing with the increasing concentration, differed significantly with the concentrations of the buprofezin applied through food ($P<0.05$) (Table-1). The similar result was found Abbott, W.S. 1925, Basu, A.C. (1944), Cupp, E.W. and J. O'neal (1973), Gupta et. al. (1995), Gupta et. al. (1994), Gupta, G.P., et. al. (2005), Hennebarry, T.J. and Kishaba, A.N. (1966), Janakiraman, S. and Gupta, G.P. (2002), 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), Saxena, A, et. al. (2001), Simmonds, M.S.J., et al (1995), Srivastava, N. C. and Srivastava, B. B. L. (1990) and Yasur, J. and Rani, P.U. (2015) also recorded.

Table 1.Effect of Buprofezin on resproductive periods in *Pericallia ricini* Fab (Values are mean + S.E.).

Mode of treatment	Concentration (%)	Pre- Oviposition period	Oviposition period (days)
Adult Feeding Method (AFM)	0.0001	3.12 0.24	7.60 0.27
	0.001	3.14 0.22	7.25 0.26
	0.01	3.25 0.17	5.87 0.17
	0.10	3.31 0.22	4.11 0.12
	0.50	3.32 0.21	3.06 0.11
	1.00	3.86 0.15	1.80 0.26

REFERENCES

1. Abbott, W.S. 1925, A method of computing the effectiveness, of an insecticide. *Journal of Economic Entomology,* 18: 265- 267.
2. Basu, A.C. (1944). Effect of different food plants on the larval and post larval development of moth, *Prodenia litura* Fab. (Lepidoptera: Noctuidae) J. Bombay Nat. Hist. Soc. 44 (1&2), 275-288.
3. Cupp, E.W. and J. O'neal (1973). Morphogenetic effect of juvenile hormone analogue (ZR-512 and ZR-515) on larvae of *Solenophsis richteri* (Fore) and S. *invicta* (Buren.) Environ. *Entomol.* 2: 191-194.
4. Gupta, Mridula; Gupta, P.K.; Gupta. M. (1995). Interference to larval development of rice moth, *Corcyra cephalonica* by *dflubenzuron*, Ind. J. of Entomology, 57: 43-49.
5. Gupta, Maridula; Singh, R.; Gupta, P.K. (1994). Ovicidal activity of diflubenzuron on *Diacrisia oblifqua* L. Indian J. of Entomology, 56; 4, 429-430.
6. Gupta, G.P., Birah, A. and Rani, S. 2005. Effect of plant lectins on growth and development of American bollworm (*Helicoverpa armigera*). *Indian Journal of Agricultural Sciences.* **75**: 207-212.
7. Hennebarry, T.J. and Kishaba, A.N. (1966). Effects of some chemosterilants on the viability of eggs, fecundity, mortality and mating of the cabbage looper. J. Econ. Ent. 59 (1) : 156-159.
8. Janakiraman, S. and Gupta, G.P. 2002. Effect of modified artificial diet and insecticidal proteins on growth and development of tobacco cutworm (*Spodoptera litura*). *Indian Journal of Agricultural Sciences*, **72**: 719-725.
9. Jeyasankar, A., Venkatachalam Chennaiyan, Tamilarasu Chinnamani, Gnanasekaran Ramar 2014. Feeding and growth inhibition activities of *Tragia involucrate* Linn. (Euphorbiaceae) on *Achaea janata* (Linn.) (Noctuidae: Lepidoptera) and *Pericallia ricini* (Fab.) (Lepidoptera: Arctiidae). *Open Access Library Journal, 1 : e439.* http://dx.doi.org/10.4236/oalib.1100439

10. Mala, S. and Muthalagi, S. 2008. Effect of Neem oil Extractive (ONE) on repellency, mortality, fecundity, development and biochemical analysis of *Pericallia ricini (Lepidoptera: Arctiidae). Journal of Biopesticdes,* 2: 12-15.
11. Mohamed, M. J. and Kareem, A. A. 2010. Effect of leaf extracts of medicinal plants on feeding, larval growth and defecation of woolly-bear caterpillar, *Pericallia ricini* (F.) (Arctiidae: Lepidoptera) on castor beans. *Madras Agricultural Journal,* 97(4/6): 168-171.
12. Radwan, H.S.A.; O.M. Assal,; G.E. Abo-Elghar; M.R. Riskallah and M.T. Ahmed (1986). Some aspects of the action of diflubenzuron and triflumuron on food consumption, growth rate and food utilization by *Spodoptera littoralis* larvae. J. Insect Phys. 32(2) : 103-107.
13. Saxena, A, and Khattri, S.N. and Kumar, P. (2001). Effects of certain insect growth regulator on the growth and development of *Pericallia ricini* Fab. (Lep.: Arctiidae). Flora and Fauna, Jhansi.
14. Simmonds, M.S.J., Blaney, W.M., Ley, S.V., Anderson, J. C., Banteli, R., Denholm, A.A., Green, P.C.W., Grossman, R.B., Gutteridge, C., Jennens, L., Smith, S.C., Toogood, P.L. and Wood, A. 1995. Behavioural and neurophysiological responses of *Spodoptera littoralis* to azadirachtin and a range of synthetic analogues. *Entomologia Experimentalis et Applicata,* 77:69-80.
15. Srivastava, N. C. and Srivastava, B. B. L. 1990, Influence of chitin biosynthesis inhibitor diamino-furyl-s-triazine on larval food consumption and growth of *Pericallia ricini* F. (Lep., Arctiidae). *Journal of Applied Entomology,* 109: 410-413.
16. Yasur, J. and Rani, P.U. 2015. Lepidopteran insect susceptibility to silver nanoparticles and measurement of changes in their growth, development and physiology. *Chemosphere,* 124: 92-102.

