

Effect of Different Concentrations of Buprofezin on Food Consumption and Digestion in the Treated Larva of *Pericallia Ricini* Fab



S. P. Srivastava, Yogesh Kumar Mishra, Nidhi Srivastava

Abstract: There was a marked increase in reduction of food consumption at each concentration level in test from 0.0001 to 1.0 percent level. Minimum reduction in food consumption was 20.55 percent at 0.0001 per cent level. Food digestion was reduced by 29.71 per cent at 1.00 per cent level. The reduction in food consumption and food digestion was much reduced in comparison with control.

Keyword: Buprofezin, Larva, *Pericallia ricini*, Development.

I. INTRODUCTION

Male and female, *Pericallia ricini* Fab. were collected in second week of July 2010 on various agricultural crops and wild hosts, but it certainly manifests the marked preference for castor in field. 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 mainly manifested due to ecdysis because it disturbs the process of chitin deposition, thus effecting growth and development of the insects. It also results in failure to feed, due to the displacement of mandibles, maxillae and labrum resulting in blockage of the gut. These insect growth regulators also produce the delayed symptoms, where the adults fail to escape the pupal skin therefore they 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 brassicae*, *Spodoptera litura*, *Pectinophora gossypiella*, *Earias insulana*, *Leptinotarsa decemlineata*, *Achoea janta* *Oxya japonica*, *Tenebrio monitor*, *Utetheisa pulchella* and many other insects.

II. MATERIAL & METHOD

In the Residue Film method of treatment, 1 to 2 hours old adults was exposed to a thin file of the residue of a concentration of particular insect growth regulator.

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* Correspondence Author

Dr. S. P. Srivastava, Department of Zoology, P.P.N. P.G. College, Kanpur (U.P.), India. Email: spsrivastava6@gmail.com

Dr. Yogesh Kumar Mishra, Department of Zoology, CMJ University Meghalaya. Email: ygmshra@rediffmail.com

Dr. Nidhi Srivastava*, Department of Chemistry, P.P.N. P.G. College, Kanpur (U.P.), India. Email: nidhi.srivastava2006@gmail.com

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To obtain the thin film of the chemical as a residue, about 10 ml of the concentration of the chemical was poured in to a petridish (10 cm diameter) and the petridish was tilted in different ways to spread the chemical on the surface 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. 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.

III. RESULT & DISCUSSION

Observations were recorded about the affect of buprofezin on consumption of the amount of food, consumed by the treated larvae. Data indicated a significant reduction of food consumption with increase in the percent of treatment. The food intake was adversely affected and was reduced maximum by 41.22 percent at 1.00 percent level of feeding. There was a marked increase in reduction of food consumption at each concentration level in test from 0.0001 to 1.0 per cent level. Minimum reduction in food consumption was 20.55 percent at 0.0001 percent level. Food digestion reduced by 29.71 percent at the level of 1.00 percent. The reduction in food consumption and food digested was much reduced in comparison with control. (Table-1). Similar result also found by Abbott, W.S. 1925, Bhatnagar, A. and Saxena, R.R. (1998), Cupp, E.W. and J. O'neal (1973), Diraviam, J., Uthamasamy, S. (1993), 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*), 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), M.M. H. Khan (2019), 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, Radwan, H.S.A. et. al. (1986), 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 Zhang S, et. al. (2014).

Table 1: Impact of Buprofezin under different concentration on food consumption and digestion in the treated larva of *Pericallia ricini* Fab.

Mode of treatment	Concentration (%)	Reduction in food consumption and digestion	
		Food consumption	Food Digestion
AFM (ADULT FEEDING METHOD)	0.0001	20.55	67.75
	0.001	25.64	53.61
	0.01	31.52	43.14
	0.10	36.61	36.71
	0.50	38.41	33.11
	1.00	41.22	26.54
	Control	19.91	73.45

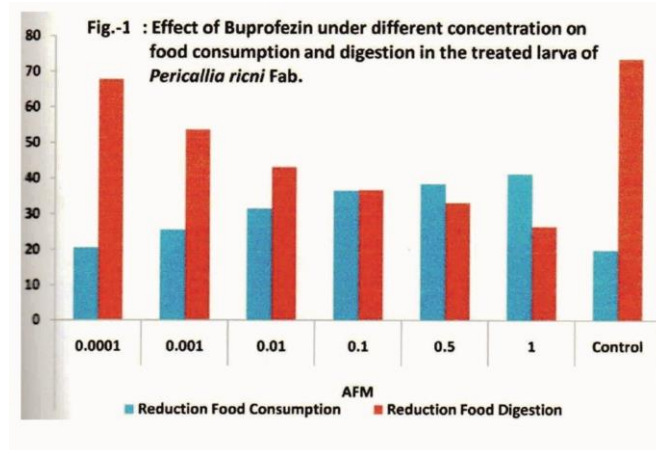


Fig 1. In Parentheses and Transformed value.

IV. CONCLUSION

Impact of Buprofezin was observed in case of larval development of *pericallia ricini* during AFM (Adult Feeding Method). The impact of insect growth regulator is much toxic. In the larval feeding treatment, the insect growth regulator suppressed the rate of food consumption in the treated larva and adult. The mortality and emergence of larvae is shown in the above result and discussion. Observation has significant finding in the development of insect can be checked and caused by buprofezin products is least harmful for men and other animal.

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AUTHOR PROFILE



Dr. Satya Prakash Srivastava is Assistant Professor of the Department of Zoology in P.P.N. College Kanpur, affiliated to C.S.J.M. University, Kanpur. He has obtained his Graduation, Post Graduation and Ph.D. Degree from C.S.J.M. University, Kanpur. He has a long teaching experience of UG and PG classes from last 20 years. He has also been awarded the certificate of excellence reviewer in recognition of an outstanding to the quality of the journal for his honorary service. He has also served as a key note speaker and presented papers in various seminars and conferences. He has published several papers in reputed journals. He has been an Ex. Treasurer of Indian Science Congress, Kanpur.



Dr. Yogesh Kumar Mishra is an Assistant Professor at Department of Zoology, Shiv Darshan Lal Degree College (affiliated to Prof. Rajendra Singh (Rajju Bhaiya) University, Prayagraj). His current research investigates Toxicological effect of various chemical in crop destroying caterpillars. He obtained his Ph.D. from CMJ University, Meghalaya, India. He has worked as a Junior Scientist at Kumaun University, Campus Almorah. He has authored/ co-authored more than dozens peer-reviewed journals articles. He is an active reviewer for some notable ISI/Scopus journals. He has been assisting with the supervision of undergraduate students for their projects, masters and Ph.D. students for their thesis work. He has rich experience in academia and research. He has taught several modules on Zoology.



Dr. Nidhi Srivastava is Associate Professor & Head of the Department of Chemistry in P.P.N. College Kanpur, affiliated to CSJM University, Kanpur. She obtained his graduation, post-graduation and D.Phil degree from University of Allahabad, Allahabad. She qualified JRF (NET)-2001 and MP (SLET)-2000. And also work as SRF(CSIR) for two years She has a teaching experience of UG and PG classes from last 22 years. Her field of research mainly includes isolation of natural products their identification characterization and screening effect. Dr. Nidhi Srivastava has participated and delivered lectures at various seminars, conferences. She has published several papers in reputed journals. She is also a member of many professional societies.