



IMPACT OF FENVALERATE ON BIOCHEMICAL CONTENTS IN OVARY OF A FRESHWATER SNAIL *BELLYMYA BENGALENSIS*.

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ABSTRACT:

The present investigation deals with to study the effect of sub lethal concentration of pyrethroid pesticide, fenvalerate on biochemical contents in ovary of a freshwater prosobranch snail, *Bellamyia bengalensis*. The biochemical analysis for 1, 7 and 15 days exposed snail was made in the present work. The amount of biochemical components was greatly influenced by fenvalerate in 15 days in pre reproductive period.

Keywords: Fenvalerate, *Bellamyia bengalensis*, Glycogen, Ovary.

INTRODUCTION:

The prosobranch molluscs are much economic importance, as they act as an intermediate hosts for a number of trematode parasites, which causes severe diseases to man and his domestic animals (Chneg and Lee, 1971; Jong-Brink, 1973). The predilection of snails for fungal foods increases the attractiveness of diseased plant and possibility of spreading of the disease by these snails (Jong-Brink, 1973). The structure and function of the reproductive tract of snails and slugs have been studied with increasing interest in recent years. The functions of different reproductive organs have also been investigated (Lavioletta 1954; Arionidae and Quattizini 1967; Plesch *et al.* 1971; Nanaware 1975; Anderson [R. L.](#) (1982), Bhatlawande 1989; Ahirrao and Kulkarni, 2011; Jagtap *et.al.* 2011; Ahirrao and Phand, 2013; Ahirrao and Borale, 2014 and Ahirrao and Phand (2015 and 2017).

In 1989 Bhatlawande studies histochemistry of the reproductive tract of *Laevicaulis alte* and revealed that the glycogen and alkaline phosphates were found throughout the epithelium of reproductive tract. Horne (1973) revealed utilization of carbohydrate and protein in *Bullimus delbatus*. The histochemical work on different metabolites and enzymes in the reproductive tract of different gastropods was reviewed by Nanaware (1974).

The present work was undertaken to investigate its biochemical changes in ovary due to Fenvalerate of the freshwater prosobranch snail, *Bellamyia bengalensis*.

MATERIALS AND METHODS :

The freshwater prosobranch snail, *Bellamyia bengalensis* were collected from Aner Dam near Shirpur, Dist. Dhule, Maharashtra (India)

and maintained in the laboratory condition for acclimation. LC₅₀ values for 24 hr were determined by exposing the snails to pesticides fenvalerate during breeding season. A group of 25 animals were released into 0.0016 ppm fenvalerate concentration in water. After treatment the animals were sacrificed after 1, 7 and 15 days of exposure during pre-reproductive, reproductive and post-reproductive periods. The snails were subjected to pyrethroid, fenvalerate at 9.00 a.m. every time and were sacrificed only during morning hours between 8 to 9 a.m. in order to avoid changes in the concerned parameters due to circadian rhythms (Shankaraiah, 1978).

The tissues were subjected into alcoholic Bouin's fluid for detection of glycogen. For Histochemical detection of glycogen Best's Carmine method (Glick, 1949) was used as described by Pearse (1961). For biochemical estimations dry powder was used and its weight was kept practically constant through the experimental work. Glycogen was estimated by Kemp *et.al.* (1954). Experimental data was analyzed statistically by adopting statistical method (Pillai and Sinha, 1968). Each value given here is the mean and standard deviation of three different preparations and each preparation was assayed three times. A variation was considered significant at 5% level of probability.

RESULT AND DISCUSSION :

The freshwater prosobranch snail, *Bellamyia bengalensis* show the marked histochemical changes after 1, 7 and 15 days of exposure

during pre-reproductive, reproductive and post-reproductive periods. In the ovary the glycogen was appeared in the cuboidal cells of follicles in the form of tiny droplets. Ovary showed positive reaction for glycogen.

The biochemical estimation of glycogen in the ovary after 1 day exposure a considerable depletion in glycogen content was observed during pre and post-reproductive periods while during reproductive period a significant increase was noticed (11.89%, $P < 0.005$). Upon 7 and 15 days of exposure span during all the periods a significant depletion in glycogen amount was observed. The percent decreased in glycogen content during experiment was found to be in the range from 11.95% to 56.06%. The maximum decreased was observed during pre-reproductive period after 15 days of exposure (56.06%, $P < 0.001$).

In the invertebrates the glycogen is the most suitable reserve carbohydrate. Stellen and Stellen, (1956) observed the nutritive percentage of glycogen in reproductive as well as in the whole body in *Siphanaria japonica*. The glycogen was being more during pre-reproductive period in *Bellamyia bengalensis*, the stored glycogen might be utilized for the formation of reproductive components and due to this the decrease in concentration during post reproductive period. The stored glycogen was the ultimate source of energy during reproductive period. Similar results were obtained by Kulkarni and Shinde (1992); Ahirrao and Kulkarni (2011); Ahirrao and Phand (2013); Ahirrao and Borale (2014) and Ahirrao and Phand (2015 and 2017).

The results show that the glycogen is very sensitive marker of pyrethroid toxicity, in the sense that within one day of exposure considerable decrease in glycogen was noticed. Quite surprisingly during reproductive period an initial increase and then gradual decrease in level of glycogen was observed in ovary. This initial increase may be due to stress condition to obtain more glucose from food stuff and further decrease in the content is being longer exposure to toxicant. The decrease in glycogen content suggests its utilization to meet energy demands caused by toxic conditions.

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Period	Control	1 Day	7 Day	15 Day
Pre-Reproductive	11.38 ± 1.30	10.02 ± 1.39 - 11.95 *	9.36 ± 1.02 - 17.75 *	5.00 ± 1.11 - 56.06 ***
Reproductive	16.48 ± 1.28	18.44 ± 1.36 - 11.89 *	13.90 ± 1.34 - 15.65 *	10.36 ± 1.63 - 37.13 ***
Post-Reproductive	19.88 ± 1.24	17.26 ± 1.36 - 13.17 *	16.11 ± 1.32 - 18.96 **	11.00 ± 1.21 - 44.66 ***

Table : Effect of Fenvalerate on Glycogen contents of Ovary in a freshwater snail, *Bellamya bengalensis* in mg %.

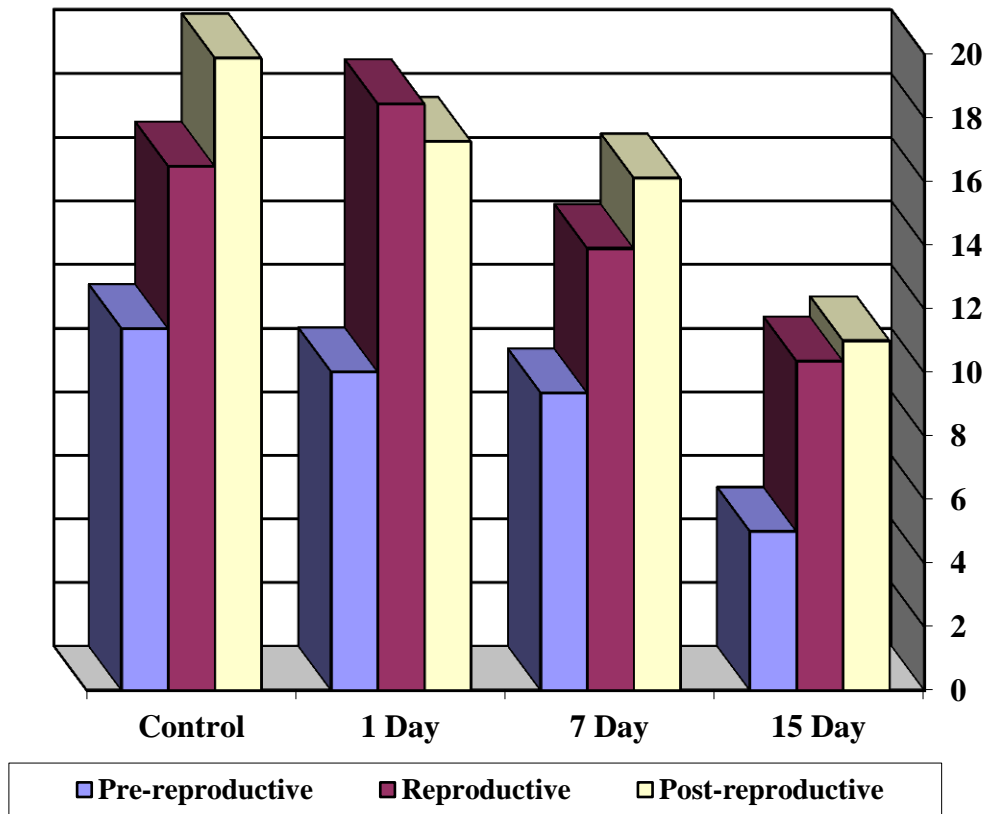


Fig. : Effect of Fenvalerate on Glycogen contents of Ovary in a freshwater snail, *Bellamya bengalensis* in mg %.