

CHANGE IN GLYCOGEN LEVEL IN GONADS OF FRESHWATER BIVALVE MOLLUSCS *LAMELLIDENS CORRIANUS* DUE TO CHRONIC TREATMENT OF THIODAN (ENDOSULFAN 35%EC) SEASONALY

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ABSTRACT

In the present investigation an attempt has been made to study seasonal variations in glycogen content due to chronic treatment of organochlorine pesticide Thiodan (Endosulfan 35% EC) in female gonad in freshwater bivalve molluscs *Lamellidens corrianus* from Chincholi tank near Sangola, district Solapur (Maharashtra). The molluscs were exposed to Thiodan for 15 days during all the three seasons. In the present investigation maximum decrease in glycogen level was observed during summer season.

Key Words: *Lamellidens corrianus*, Organochlorin, Pesticide, Endosulfan, Thiodan

INTRODUCTION

The direct discharge of industrial effluents and runoff comprising versatile chemicals exert their toxic effect on the living beings, depleting the dissolved oxygen altering pH, changing the CO₂ content and finally affecting the life cycle of the animals (Dehadri, 1990). Variations in biochemical composition from the soft organ due to insecticidal stress have no definite pattern. However, the animal's metabolic activities influence the overall consumption of the organic reserves to balance the ill effects of pesticide. It is well established that application of endosulfan pesticide has increased to control the crop pest, due to its low toxicity to higher animals like mammals and relatively moderate persistence in the environment when compare with other pesticides (Rao and Murty, 1980).

Rao *et al.*, (1979) have reported an elaborative account on pollution of aquatic environment with endosulfan residues. It is also stated from different authors that, there will be a transformation of Endosulfan used in agricultural field to the aquatic environment resulted in great threat to the inhabitants including fish specifically and also to the other aquatic organisms broadly (Mel *et al.*, 2005, Shah 2003, and Zohra 2006). Bivalves are considered as suspension feeder and influenced by the organization and fluctuation of the ecosystem (Akarte *et al.*, 1987).

Present study dealt with seasonal variations in the glycogen level in the gonads of fresh water bivalve mollusc *Lamellidens corrianus* due to sub lethal treatment of Thiodan for 15 days seasonally.

MATERIAL AND METHOD

Experiments were conducted by using Thiodan (Endosulfan 35% EC) and Ekalux (Quinolphos 25% EC) for determination of biochemical divergence from the experimental chronic group and control group for three different seasons. For chronic toxicity experiment was carried out for 15 days and five live molluscs from control and 1/10th of LC₅₀ were sacrificed separately. The gonads were pooled out and were properly blotted and kept in hot air oven for 72 hr at 60°C to get constant weight of dried powder and this was used for glycogen estimations by De Zwaan and Zandee (1972) method.

RESULTS

The change in glycogen content during monsoon, winter and summer season in the gonad of freshwater bivalve mollusc *Lamellidens corrianus* is summarized in Table No.1.

The amount of glycogen in gonad during monsoon season in initial control group, it was 13.85±0.2318 mg/100mg dry wt. After chronic treatment at 5th day it was 12.44±0.28 mg/100 mg dry wt., at 10th and 15th day the glycogen content was 10.67 ±0.23 and 8.623±0.02 mg/100mg of dry wt., respectively.

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When compared with glycogen content of control value after 5th, 10th and 15th day of exposure to Thiodan (Endosulfan 35% EC) showed significant decrease in glycogen level. The glycogen content at 5th day decreased significantly to 10.18 % (P<0.01). At 10th the glycogen content was decreased more significantly to 22.96% (P<0.001) and on 15th day of exposure to 1/10th of LC₅₀ concentrations the glycogen content was decreased significantly to 37.74 % (P<0.001).

During winter the amount of glycogen in gonad in initial control group, was 9.200±0.07 mg/100mg dry wt., where as in the chronic treatment at 5th day it was 14.43±0.28 mg/100 mg dry wt., at 10th day the glycogen content was 12.26 ±0.56 mg/100mg dry wt., and after 15th day of exposure to 1/10th of LC₅₀ concentration of (Thiodan (Endosulfan 35% EC) the glycogen content was 10.97±0.60 mg/100mg of dry wt.

When compared with glycogen content in gonad of control value after 5th day of exposure to Thiodan (Endosulfan 35% EC) significant increases in glycogen level was observed up to 24.96% (P<0.001). At 10th day of exposure to 1/10th of LC₅₀ concentrations of Thiodan (Endosulfan 35% EC) the glycogen content was increased significantly as compare to the 5th day of exposure which was 36.34(P<0.001) but as compare to 5th day of exposure it was decreased significantly. While at 15th day of exposure, there was significant increase in glycogen level was observed comparing to 5th day and it was 42.95 % (P<0.001).

The amount of glycogen in gonad during summer season in initial control group, it was 18.59±0.320 mg/100mg dry wt., where as in chronic treatment at 5th, 10th and 15th day it was 12.13±0.45, 10.40 ±0.32 and 8.043±0.15 mg/100mg dry wt., respectively.

When compared with glycogen content of control after 5th, 10th and 15th day of exposure to Thiodan (Endosulfan 35% EC) there was significant decrease in glycogen level and it was 33.57 % (P<0.001), 43.04% (P<0.001). and 55.95% (P<0.001), respectively.

Table No. 1 Effect of Thiodan (Endosulfan 35 % EC) on the glycogen content in gonad of bivalve mollusc, *Lamellidens corrianus* after chronic exposure during different season (mg / 100 mg dry tissue).

Season	Control	5 th day	10 th day	15 th day
Monsoon	13.85	12.44**	10.67***	8.623***
	±0.3580	±0.2848	±0.2364	±0.2011
		(10.18)	(22.96)	(37.74)
Winter	9.200	14.43***	12.26***	10.97***
	±0.070	±0.2857	±0.5689	±0.6028
		(24.96)	(36.34)	(42.95)
Summer	18.59	12.13***	10.40***	8.043***
	±0.328	±0.4508	±0.3213	±0.1504
		(33.57)	(43.04)	(55.95)

Each value is the mean of three ± S.D. values are significant at *=P<0.05, ** =P<0.01, ***= P<0.001, • = non significant. Bracket value indicate percent increase or decrease when compare with control.

DISCUSSION

In present investigation glycogen content showed variations due to chronic treatment of Thiodan (Endosulfan 35% EC) for 5, 10 and 15 days to gonads. The severity of the Thiodan was more pronounced and there was more decrease in glycogen content from gonad during summer season due to chronic treatment. Abdul Naveed et al., (2005) studied the toxicity of Libocin from the fish, *Channa punctatus* observed decreased glycogen and pyretic level. Lomte and Sabhia Alam (1984) while studying the effects of Malathion on the glycogen content of snail, *Bellameya bengalensis* noticed decreased trends. Depletion of glycogen was also reported in *Channa punctatus* when exposed to Malathion, similar

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report were available to show the depletion in fishes, snail and fresh water mussel (Koundinya and Ramamurthy 1979; Nakano and Tomlison, 1967). Kamble and Muley (2000), while studying the acute toxicity of Endosulfan on the fish, *Sarotherodon mossambicus* observed decrease in glycogen contents from different body parts and further stated that, this depletion was due to the rapid break down for energy requirement. Rathod et al., (2009) while studying the toxicity of dimithoate on glycogen content from muscle, gill, liver and kidney of fish *Arias dussumieria* observed overall decrease from lethal group. Gaikwad (1988), while studying the effect of Endosulfan on carbohydrate metabolism in fish *Tilapia mossambica* stated that pesticide cause strain on fish which might have demanded high energy which resulted in the depletion of glycogen.

In present investigation similar results have been observed. The result obtained in the present investigation due to chronic treatment of Thiodan in gonad in fresh water molluscs *Lamellidens corrianus* during three seasons showed overall decrease in glycogen level. It has been also observed that severity of depletion in glycogen content was more pronounced during summer season.

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