

# Effect of Dithane M-45 on Cholesterol Content in Fresh Water Snail, *Pila Globosa*



## Zoology

KEYWORDS :

**Asheesh Gaur**

Asst. Professor, Dept. Of Zoology, I.F.T.M University, Moradabad

**R.C.Gupta**

Associate Professor & Head, Dept. Of Zoology, Hindu College, Moradabad

**Shalini Gupta**

Asst. Professor, Govt. Girls Degree College, Behat, Saharanpur

### ABSTRACT

The present study has been taken up to observe the toxic effect on a fresh water snail, *Pila globosa* induce by Dithane M-45. The present study showed prominent changes in cholesterol level of hepatopancreas and renal organ of fresh water snail, *Pila globosa* following acute and chronic exposure of Dithane M-45. The elevation was highly pronounced ( $P < 0.05$ ) at acute and chronic exposure in hepatopancreas while slightly elevation was observed in renal organ at acute chronic exposure of Dithane M-45.

### INTRODUCTION

The present day although use of pesticides and fertilizers has increased to a great extent to increase agriculture production, but they are causing serious problem of water pollution as they reach the ponds, lakes, rivers and other water bodies along with run-off water. Thus these surface water bodies get a significant concentration of agriculture chemicals, changing the quality of water and affect aquatic fauna and flora. The present study was aimed to investigate the toxic effects of corbamate pesticide. Dithane M-45 (Manacozeb 75% wp) on freshwater snail *Pila globosa*. In the present study an attempt has been made to find out cholesterol changes in hepatopancreas and renal organ of fresh water snail, *Pila globosa* after the administration Dithane M-45.

### MATERIAL AND METHODS

Testing snail, *Pila globosa* were collected from ponds around Dist. Moradabad, U.P. After cleaning the shell of snail from mud, snails were washed with 0.1% solution of potassium permanganate to eliminate any pathogens if present on their body. Now the snails were stocked in aerated aquaria for 24 hours without food before use for experiment. After washing with 0.1% solution of potassium permanganate, the snails were divided into three batches. The snails of first batch were exposed with 100mg/ litre for acute (1, 2 and 4 days), the snails of second batch were exposed with 60 mg/litre for chronic (15, 30 and 60 days) and the snails of third batch were kept in ordinary tap water under the ideal conditions.

The Hepatopancreas and renal organ were separated and their homogenates were prepared in Chloroform to a known volume. The estimation of cholesterol content has been done according to the method of Zlatkis et al. (1954).

### OBSERVATION AND RESULT

The present study showed prominent changes in cholesterol level of hepatopancreas and renal organ of fresh water snail, *Pila globosa* following acute and chronic exposure of Dithane M-45 (Table 1-3). The alteration in cholesterol level of hepatopancreas was found +8.780%, +15.716% and +24.648% under acute exposure and +38.875%, +56.903% and +75.661% under chronic exposure of Dithane M-45. Similarly increase in cholesterol level of renal organ was found +4.833%, +10.979% and +14.649% under acute exposure and +18.904%, +28.682% and +34.327% under chronic exposure of Dithane M-45. The elevation was highly pronounced ( $P < 0.05$ ) at acute and chronic exposure in hepatopancreas while slightly elevation was observed in renal organ at acute chronic exposure of Dithane M-45.

**Table 1 Alteration in Cholesterol contents of hepatopan-**

**creas and renal organ of *Pila globosa* at acute exposure of Dithane M- 45**

S.No	Tissue	T <sub>1</sub>		T <sub>2</sub>		T <sub>3</sub>	
		Control	Experimental	Control	Experimental	Control	Experimental
1.	Hepatopancreas	20.284 ±0.428	22.065 ±0.470	20.265 ±0.425	23.450 ±0.467	20.249 ± 0.429	25.240 ±0.484
2.	Renal organ	18.620 ±0.389	19.520 ±0.415	18.598 ±0.385	20.640 ±0.410	18.615 ±0.375	21.342 ±0.413

T<sub>1</sub> = 1 day \*Values given in the table are the mean of 9 observations each, T<sub>2</sub> = 2 days \* Values are mean + SE of 9 observations each, T<sub>3</sub> = 4 days \* Values are significant at  $P < 0.05$ .

**Table2. Alteration in Cholesterol contents of hepatopancreas and renal organ of *Pila globosa* at chronic exposure of Dithane M- 45**

S.No	Tissue	T <sub>1</sub>		T <sub>2</sub>		T <sub>3</sub>	
		Control	Experimental	Control	Experimental	Control	Experimental
1.	Hepatopancreas	20.275 ±0.426	28.157 ±0.487	20.280 ±0.419	31.820 ±0.478	20.268 ±0.424	35.603 ±0.495
2.	Renal organ	18.625 ±0.382	22.146 ±0.386	18.604 ±0.386	23.940 ± 0.415	18.644 ±0.381	25.044 ±0.402

T<sub>4</sub> = 15 days \*Values given in the table are the mean of 9 observations each, T<sub>5</sub> = 30 days \* Values are mean + SE of 9 observations each, T<sub>6</sub> = 60 days \* Values are significant at  $P < 0.05$ .

**Table3. Percentage alteration in Cholesterol contents of hepatopancreas and renal organ of *Pila globosa* at acute and chronic exposure of Dithane M- 45**

S.No	Tissues	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
1.	Hepatopancreas	+8.780	+15.716	+22.648	+38.875	+56.903	+75.661
2.	Renal organ	+4.833	+10.979	+14.649	+18.904	+28.682	+34.327

T<sub>1</sub>=1day, T<sub>2</sub> = 2 days, T<sub>3</sub> = 4 days, T<sub>4</sub>= 15 days, T<sub>5</sub> = 30 days, T<sub>6</sub> = 60 days (+) Increase (-) Decrease

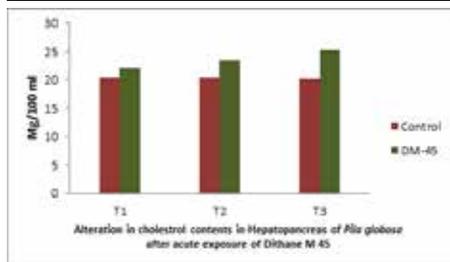


Figure: 1

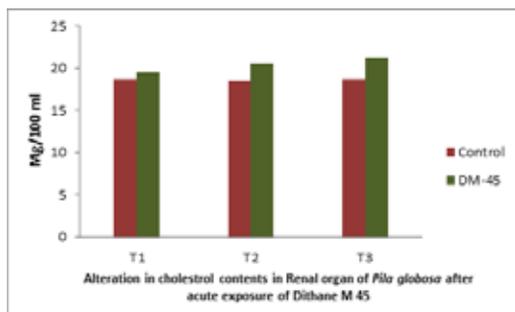


Figure: 2

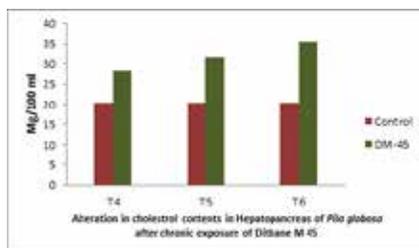


Figure: 3

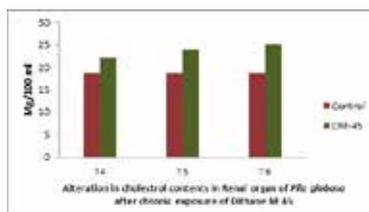


Figure: 4

**DISCUSSION**

Importance of cholesterol to animal bea is well known and it is synthesized by mean of simple precursors like acetate and water. It can also be synthesized from carbohydrate, protein and fatty acid metabolism in liver, intestine, adrenocortex and skin. Aorta is actively busy in the synthesis of cholesterol. Present study reveals significant increase in cholesterol content in hepatopancreas and renal organ of a fresh water snail, *Pila globosa* under the stress of Dithane M-45. Increase in cholesterol content may be due to the utilization of lipid content under the stressed conditions.

The hepatorenal increase of cholesterol is also suggestive of an increased diversion of acetyl CO-A to acetoacetate for cholesterol synthesis. The increase of cholesterol preceded by the increased diversion of acetyl CO-A to acetoacetate is expanded, as it has been found to be associated with the inhibition of tri-carboxylic acid cycle. The accumulation of cholesterol, associated with retarded oxidative breakdown of sugar, under stress conditions also reported by<sup>1</sup> .<sup>1</sup> reported with a decrease of he-

patic cholesterol under the toxic stress condition. <sup>7</sup> reported increased cholesterol in *Heteropneustes fossilis* in response to Congo red intoxication.<sup>6</sup>reported elevation in the cholesterol content in liver and serum of teleost, *Tilapia mossambicus* in response to Methyl parathion intoxication.<sup>5</sup>reported elevation in cholesterol content in the tissues of pelecypod, *Lamellidens marginalis*.<sup>3</sup>reported an increase in cholesterol content in liver, kidney and serum of *Heteropneustes fossilis* under the stress of zinc and metanil yellow. Sharma and Maya (1987) reported elevated cholesterol in liver and kidney of *Clarias batrachus* under the stress of Arsenic. Ghosh (1988) reported decrease cholesterol level in the blood of *Channa punctatus*, when chronically exposed to Chromium. Sharma and Gupta (1988) reported decrease cholesterol in brain, liver, gills and intestine of *Colisa fasciatus* under the stress of Chorysophenine- G and Derect Deep Black. Gill et al. (1991) reported the elevation in cholesterol level in the liver of *Barbus conchonium* after feeding endosulfan to the fish. Shivaramakrishna and Radhakrishna (1998) observed decrease in cholesterol level in *Cyprinus carpio* after mercury intoxication. Rani et al. (2001) observed decrease in cholesterol level in *Cyprinus carpio* after mercury intoxication. This is mainly due to altered lipid metabolism and energy demand. Highly significant increase in cholesterol level in both test tissues reflects the presence of a marked hypercholestromia. Excess of hepatic lipid in both test tissues signal the presence of hyperlypaemia.<sup>2</sup> observed high liver cholesterol level may be due to hepatic disfunctioning.

Our findings are in accordance with those of Sharma and Maya (1987), <sup>1</sup>, <sup>7</sup>, Gill et al. (1991) and <sup>2</sup> who reported elevation in cholesterol in the different tissues but differs from those of Rao and Rao (1988), Ghosh (1988) Sharma and Gupta (1988) and others who reported depletion in cholesterol content.

**REFERENCES**

1. Bano, Y. (1982): Effect of Aldrin on serum and liver constituents of a freshwater fish, *Clarias batrachus*. *Proc. Ind. Acad. Sci.(Anim.Sci.)*,91(1), 27-32.
2. Desai, H.S. (2002): Toxicological effect on some biological parameters of fresh water fish *Channa punctatus* under the stress of Nickel. *J. Environ. Biol.*; 23 (3) 275-277.
3. Gupta, K. (1986): Haematological, physiological studies on a few tissues of *Heteropneustes fossilis* under the stress of zinc(metal) and metanil yellow (dye). *Ph.D. Thesis, University Meerut*.
4. Kabeer, A.L.,Begum,R.,Sivaish, S.and Rao, K.V.R(1978): *Proc. Ind. Acad. Sci.*,87 :377.
5. Prasad, K.S., Rao, K.S.P, Madhu Ch. And Rao, K.V.R.(1981): Effect of methyl parathion on total lipids and lipid derivatives in the tissue of a pelecypod, *Lamellidens marginalis* (Lamark). *Proc. Nat. Acad. Sci. India*, 51(B) 4.
6. Rao, K.S.P. and Rao, K.V.R (1981): *Proc. Indian Natl. Sci. Acad.*, 1347 (1),53.
7. Sharma, M.L., K.A. Goel, A.K. Awasthi and S.K. Tayagi (1982): Haematological and biochemical characteristics of *Heteropneustes fossilis* under the stress of congo red. *Diphenyl disazobinaphthionic acid*. *Toxicol.Lett.*, 14, 237-241.