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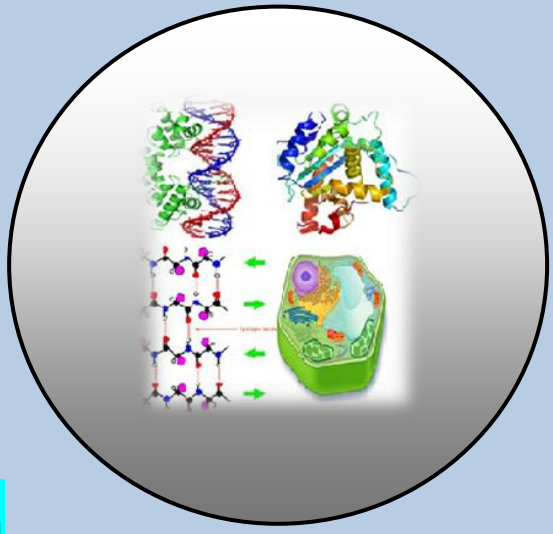

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RESEARCH PAPER

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Intoxication due to Muriate of Potash on Liver GOT and GPT Levels of *Heteropneustes fossilis* (Cat Fish)

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ABSTRACT

Transmination is a reversible process of great importance. It is most sensitive diagnostic index as alterations in transaminases are o differential diagnosis of liver diseases. It was observed that changes in GOT and GPT levels of fresh water teleost H. fossilis when exposed to 6 concentrations of fertilizers muriate of potash for 24 to 144 hours.
Keywords: Muriate, Potash, Liver, GOT & GPT, Heteropneustes fossilis.

INTRODUCTION

Tratisamination is reversible reaction of great importance in body metabolism, since all aminoacids take part in formation of different αketo and aminoacids (Guirard and Snell 1964). It occurs generally in all tissues, more specifically in liver, testes, kidney, brain, heart and blood (West et al., 1974) Intermediary metabolism of proteins, carbohydrates and lipids is altered to meet the demands of the organisms in different situation of life. Alterations in transminases are of limited value in differential diagnosis of jaundice due to overlapped values in different liver diseases, while in acute infective hepatitis, it is most sensitive diagnostic index. Aminotransferases (GOT and GTP) levels of blood and tissues, of fishes, under different situations of life have been studied by several workers (Bell, G.R. (1968, Furia et al., 1973, Wilson, 1973). In this paper we have given the changes in GOT & GPT levels of fresh water, teleost *Heteropneustes fossilis*, exposed to six concentrations of fertilizer muriate of potash for 24 to 144 hours.

MATERIALS AND METHODS

Live and healthy fishes collected from river Gomti at Lucknow were transported to the Laboratory in plastic container in natural water. These were then treated with $KMnO_4$ (2mg/1) to remove infections like fungi, ectoparasites, etc. The fishes were then allowed to rest for 48 hours to bring them to their normal mental and physiological conditions after stress and strain of catch and transport, The fishes were also watched for 72 hours for any mortality during these tests against diseases etc. and the groups with good mortality rates were rejected. Static Bioassay Test were followed for these studios (Doudoroff et al., 1951 and APHA (1976). These fishes were exposed to six different concentrations of fertilizer (6.50444.50g/1s) found lethal in 24 to 144 hours After the required interval of exposure, the fishes wore taken out of the aquaria, blotted dry with the help of clean Turkish towel. After dissecting the fish liver, tissue was taken in 0.7% normal saline solution. The tissue was weighed and homogenized, in 0.7% normal saline at 2-4°C in a glass homogenizer. The homogenates were used for the estimation of GPI and GRT and the method of Reitman and Frankel as given by Wootton was followed (Reitman and Frankel, 1957, Wootton I. D. P. 1964).

RESULTS

The results obtained on GOT and GPT activity of liver of the fish H. fossilis exposed for 24 to 144 hours to six concentrations are given in Table 1. The peak GOT level on the liver was observed after 120 hours at 5.30 g/l, while peak GPT level was observed after 96 hours at 5.55 g/l. The toxicity of this fertilizer was quite evident at its highest concentration. Of 6.50 9/1 it caused maximum inhibition of liver GOT and GPT activities in 24 hours.

Table 1. Effect of Muriate of Potash on Liver GOT and GPT levels of Heteropneustes fossilis

Exp. Time Hours	GOT µ moles pyruvate/100mg f.w.t/hour mean ± S.D. No. Obs. 16, Fertilizer conc. g/l					
	4.50	5.30	5.55	5.80	1.01	1.10
	Control Value = 49.72 ± .25					
24	33.42±3.43	34.39±2.42	35.72±2.89	33.29±4.36	31.72±3.89	30.69±3.61
48	38.26±3.21	40.19±3.24	39.42±3.32	41.12±3.44	34.26±3.19	
72	48.35±3.85	46.56±3.97	47.39±3.83	49.19±4.13		
96	54.37±3.96	53.84±4.17	54.92±3.79			
120	58.92±4.60	60.62±4.95				
144	58.02±4.53					
	GPT µ moles pyruvate/100mg f.w.t/hour mean ± S.D. No. Obs. 16 in each cases Control Value 44.01±4.30					
24	44.82±4.37	43.15±3.88	42.14±4.46	35.19±3.94	35.77±3.94	29.40±2.80
48	99.26±4.04	46.68±4.57	48.06±3.94	28.79±2.85	34.35±5.33	
72	44.54±3.98	45.70±4.80	45.94±4.55	30.06±2.71		
96	45.55±4.33	56.39±5.68	51.81±4.18			
120	50.13±4.16	53.88±3.29				
144	55.30±6.31					

± SEM

DISCUSSION

Endosulfan and Sodium arsenite induced toxic changes on liver function of fresh water cat fish H. fossilis (Bloch) has already reported by Singh and Singh 2007 and balasubramaniam and Kumar, 2013. Alternations in transminase activities have been proved as a sensitive indicator for hepatocellular damage (Wroblewski and La Due 1966). Intravenous injection of potassium chloride 0.13 / kg in mice increased the concentration of prostaglandins of brain and kidney and finally death occurred (Mitsuhashi, 1979). While its oral administrations to calves resulted in excess salivation, muscular tremors, excitability and increased packed cell volume and finally death (Neathery et al., 1979). Potassium sulphate, potassium chloride and dipotassium hydrogen sulphate, inhibited the activity and this effect varied according to the anion boned to K^+ (Onsun, 1979) increased concentration of NaKAT pase in the collecting tubules of kidney (Douce and Katz, 1980, Rodriguez et al., 1980). Our observations are in conformity with observations of earlier workers. The dose and time intervals of exposure give clear cut idea of the degree of toxicity caused.

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REFERENCES

Guirard, B.M., and Snell, E.E. (1964). In comprehensive Biochemistry, (Eds: M, Florkin and E.H. Stotz), Vol 15 Elsv. Pub. Co. New York.

West, E.S., Todd, W.R., Mason, H.S. and Bruggen, J.T.V (1974). Test Book of Biochemistry, 4th Edition Amerid. Pub. Co. Pvt Ltd. New, Delhi.

Bell, G.R. (1968). Distribution of transminases in the tissues of Pacific Salmon Orcorhynchus with emphasis on the properties and diagnostic use of glutamate oxaloaccetate transminase, J. Fish Res. Bd. Cand. 25: 1247-1268.

Furia M., lamantia, G. and Scardi, Y. (1973). Bull Soc. Itl, Biol. Sper. 49: 1433-1437

Wilson, R.P. (1973). Comp Biochem Physiol. 46: 617-624.

Doudoroff, P. Anderson, B.G., Burdik, G.E., Galtosff, P.S. hart, W.B. Patrick, R. Strong, E.R., Surber, E.W. and Van Horn, W.M. (1951). Sew, Ind Wast. 23: 1380-1397.

APHA (1976). Standard methods for the estimation of water and waste, 14th Ed. Amer, Publ. Health Asoc, New York.

Reitman, S. and Frankel, S. (1957). In practical Clinical Biochemistry (Ed. H. Varley), 4th Edn. Arnold Heinemann Pub. Ind. Pvt Ltd. New, Delhi.

Wootton I. D. P. (1964). "Microanalysis in Medical Biochemistry" 3rd Edn J and A Churchill Ltd,, London.

Wroblewski, E and La Due, J. S. (1966). Proc. Soc. Exptl. Bio. Med, 91:569-571.

Mitsuhashi, H. (1979). Nippon Hoizaku. Zasshi. 33: 252-258.

Neathery, M. W. Pugh, D. G Miller, W J. Whit Lock, R H., Gentry, R. P. and Min, J. (1979) J. Dairy Sci, 62 : 1758-1765.

Onsun, K. (1979). Edirne Tip. Fak. Derg., 33e42.

Douce, A. and Katz. A. I. (1980). Am. J. Physiol., 238 380-386.

Rodriguez, H. J., Hogan, H, C, Hellman, R. N. and Klahr, S. (1980). Am, J Physiol 234 315-323.

Pratap B. Singh and Vandana Singh (2007). Endosulfan induced changes in phospholipids in the freshwater female catfish, *Heteropneustes fossilis* (Bloch), Journal of Environmental Biology, 28(3) 605-610.

Balasubramanian, J. and A. Kumar (2013). Effect of sodium arsenite on liver function related enzymes of cat fish *Heteropneustes fossilis* and its chelation by zeolite, Ecotoxicol. Environ. Contam., v. 8, n. 2, 2013, 53-58.

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