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RESEARCH PAPER

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Tissue Aminotransferase intoxication due to fertilizer Diammonium phosphate on Teleost *Heteropneustes fossilis*

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ABSTRACT

The peak Glutamic Oxaloacetate Transminase (GOT) levels were seen after 120 hours in liver and 144 hours in kidneys at 1.15 gl concentration, while in muscles after 120 hours at 1.50 g/l concentration.
Keywords: Glutamic Oxaloacetate Transminase (GOT), Liver and Heteropneustes fossilis.

INTRODUCTION

Transamination is a process of combined diamination and amination, according to which the aminogroup of one amincacid may be reversibly transferred to the ketoacids of another amino-acid, thus affecting aminoacid—ketnacid conversion. Transaminases have been found practically in all the animal tissues, especially in heart, liver, brain, kidneys, testes lungs skeletal muscles and serum. These have been studied under different physical and physiological conditions of life in different animals and humans, (Agress, 1959; Jallien and Kalofoutis, 1973; Wes, a .1., 1974). In view of diagnostic importance of transarninases, the studies were undertaken to observe alterations of GOT levels of the three tissues liver, kidneys and muscles of H. fossilis exposed to six concentrations of fertilizers diammonium phosphate for 24 to 144 hours and results are given here.

MATERIALS AND METHODS

Live and healthy fishes collected from river, Gomti at Lucknow, were transported to the Laboratory is plastic container in natural water. These wore then treated with KMn^{0}_{4} (2 n g,)) 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 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 rotes were rejected. Static Bioa-ssay. Test (Doudor,,ff oil,, 1951; Sliindbrd Methods, 1976) were followed for these studies These fishes were exposed to six different concentrations of fertilizer (3 00 to 1.(5 WI) found lethal in 24 to 144 hours. After the required interval of exposure, the fishes were taken out of the aquaria, blotted dry with the help of clean Turkish towel after dissecting the fish's liver, kidney and muscle tissues were taken in 0.7% normal saline solution. The tissues were weighed and homogenized, in 0.7% normal saline at 2-4^{0}c in a glass homogenizer. The homogenates were used for the estimation of GOT and the method of Reitman and Frankel (1957) as given by Wootot (1964) were followed.

Table 1. Showings effects of Diammonium phosphate on GOT levels of three tissues of fish *Heteropneustes fossilis.*

Exp. Time Hours	GOT µ moles pyruvate formed/100mg fresh weight/hour mean ± S.D. (No. Obs. 16 in each case)					
Fertilizer conc. g/l.	1.15	1.50	1.85	2.15	2.70	3.00
	1. Liver Control = 47.26 ± 4.23					
24	40.69±2.82	39.36±3.54	41.22±3.97	38.46±4.18	35.12±3.45	34.29±2.68
48	42.49±3.54	43.22±3.43	42.86±3.26	40.62±3.70	36.89±3.64	
72	57.29±4.16	49.99±4.38	52.89±4.10	55.09±3.15		
96	57.19±3.40	55.00±4.15	57.43±3.58			
120	61.42±3.29	59.52±4.14				
144	60.22±3.88					
	2. Kidney Control= 36.89 ± 3.59					
24	30.02±3.13	29.79±2.57	28.62±2.41	29.09±2.40	27.89±2.52	27.49±2.57
48	31.69±3.17	32.42±3.52	30.52±3.15	33.36±3.71	29.15±2.57	
72	39.29±3.70	41.29±3.75	40.32±3.73	41.79±4.11		
96	49.22±3.56	48.22±3.40	51.79±3.85			
120	53.56±3.46	54.29±3.16				
144	54.69±3.17					
	3. Muscle Control= 27.69 ± 3.42					
24	23.81±2.53	23.62±3.24	23.82±3.85	22.75±2.98	22.42±3.16	21.09±3.35
48	26.12±2.84	26.49±3.25	25.12±3.40	24.88±3.24	23.02±3.67	
72	29.79±2.88	30.56±3.12	32.29±3.61	31.06±3.24		
96	34.42±3.89	37.17±3.50	33.79±3.75			
120	39.46±3.21	41.69±3.28				
144	40.96±3.33					

*Indicates significant value (P<0.05)

RESULTS

The results obtained on GOT activity of three tissues, of the fish *H. fossilis*, exposed for 24 to 144 hours, to six concentrations are given in Table I. The toxicity of fertilizer resulted in Peak inhibitions of enzyme activity, at the higher concentration found lethal in 24 to 48 hours. The enzyme levels were however, inhibited at lower concentrations and shorter intervals of exposure.

DISCUSSION

Elevated transminase activities of liver and kidneys, and morphological changes in these tissues have been reported due to the toxicity of several hepato and nephrotoxicants such carbon tetra chloride, thioacetamide, organochlorine and organophosphate insecticides, ethylene glycol etc. (Cornish, 1971: DeBruin, 1970; Donaldson, 1930). Oral phosphate supplements and potassium dihydrogen phosphate caused, calcification of soft tissues, changes in bones, glomerular sclerosis and nephropathy in dogs and rats (Haut et al., 1980; Schneider at al., 1980 ab). It has been observed that nephritis due to chemical agents, results in elevation of blood urea nitrogen, In extreme cases death from uremia (Boyd, 1964) and elevation of creatinine and urea in blood of dogs and cats (Bloom, 1954). The present study is supported by the observation of earlier workers, as the toxicity of fertilizer may have resulted in damage to liver, kidney and muscles of the fish, whose GOT levels were highly altered.

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