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IMPACT OF TOXIC SEDIMENT ON BIOCHEMICAL ASPECT OF GPT AND GOT OF CHANNA PUNCTATUS

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ABSTRACT
In this study we procured toxic sediment from Amlakhadi water channel in Bhuj where paper, dye and textile industries were dumping their toxic wastes. We took Channa punctatus to test the toxicity of the sediment in the lab to find the NOEC for their GPT and GOT.

AIM OF EXPERIMENT
The aim of experiment was to determine the NOEC (No Observation Effect Concentration) of toxic waste for GPT and GOT of fish Channa punctatus.

INTRODUCTION
The serum glutamate oxaloacetic transaminase and serum glutamate pyruvate transaminase function act as a link between carbohydrate and protein metabolism by catalyzing interconversion of strategic compounds like alpha ketoglutarate and alanine to pyruvic acid and glutamic acid, and aspartate and alpha ketoglutaric acid to oxaloacetic acid and glutamic acid respectively (Knox and Greengard,1 985; Watts and Watts, 1974; Martin et al; 1983).

REAGENTS
All the following chemicals and glasswares, used for the study, were of analytical grades.
AST / ALT (GOT / GPT) :
PO_4 Buffer, □□□-Ketoglutarate, GPT substrates, 2,4 DNPH, 0.4 N NaOH.

Sampling

Biochemistry

The fish were anesthetized until they became motionless and lied at the bottom on ice and then rinsed. Liver, kidney, stomach, intestine and pituitary gland tissues were isolated, weighed and placed immediately in 0.2 M Sucrose solution and crushed together. Afterwards tissues were diluted 19 times of its weight and homogenized and then centrifuged. The clear supernatant was stored in freezer for different bio-chemical tests

SEDIMENT
Organic contents in terms of organic carbons and organic matter, as well as nutrient load in terms of nitrogen and phosphates of the composite sediment, are presented in **Table**

SURVIVAL OF TEST ORGANISMS AT TOXIC SEDIMENT
ACUTE TOXICITY
LC_{50} value of Channa punctatus was 25.5 gm/l, while values of LC_0 & LC_{100} were 50.0 & 12 gm/l respectively.

SELECTION OF SUBLETHAL DOSES
The three sublethal doses for Channa punctatus were taken as different fractions of their LC_{50} test values i.e.25.5 gm/l respectively.
The three sublethal doses taken for Channa punctatus were 1.2, 0.8 & 0.5 gm/l.

RESULT AND DISCUSSION

Nutrient, Organic Load and Heavy Metal Concentrations in Composite Sediments from Amlakhadi Channel

Nutrient & Organic Load	
Organic carbon (%)	2.72
Organic matter (%)	4.7
Total Nitrogen (mg/100 gm)	245
Total Phosphorus (mg/100 gm)	49.5
Heavy Metal Concentration (in mg / 100 gm)	
Cadmium	6.0
Chromium	7.18
Copper	58.27
Lead	6.19
Iron	2763.5
Manganese	47.4
Zinc	109.75

ENZYMATIC ANALYSIS

SERUM GLUTAMIC PYRUVATE TRANSAMINASES (ALT OR SGPT)

CHANNA PUNCTATUS

Table 1 shows that data are highly significant. **Fig. 1** indicates that there was steep decrease in the mean value, i.e. from 15.9515 unit on 0 day to 8.6168 unit on 5^{th} day, 7.9257 unit on 10^{th} day, 4.0282 unit on 20^{th} day and 5.6477 unit on 30^{th} day. **Table 2** shows that data of medium concentration are significant. **Fig. 2** shows that the mean value were initially decreased on 5^{th} & 10^{th} day, i.e. 8.0194 and 7.6067 unit over 0 day mean value of 10.2451 unit. Later it recovered to 9.4480 and 9.7991 unit on 20^{th} and 30^{th} day respectively. **Tables 3 & 4** show that data are insignificant. **Figs. 3 & 4** depict that the mean values of different days of 0.5 gm/l are more or less same as those of control.

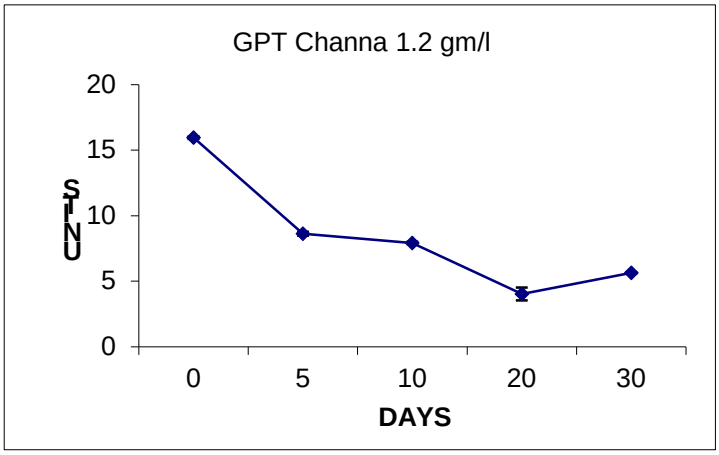
Serum Glutamic Oxaloacetate Transaminases (AST or SGOT)

Channa punctatus

Table 5 shows that data are highly significant. **Fig. 5** shows that there was steep decrease in the mean value i.e. from 6.1582 unit on 0 day to 0.7806 unit on 5^{th} day and 0.1390 unit on 10^{th} day. Then the values were gradually increased on 20^{th} & 30^{th} day, i.e. 1.0294 & 2.4750 unit respectively. **Table 6** shows that data are significant. **Fig.6** shows that the mean value was initially decreased on 5^{th} & 10^{th} day, i.e. 2.6735 and 3.3718 unit from mean value on 0 day, i.e. 6.3376 unit. Later it recovered to 5.8691 and 5.8209 unit on 20^{th} and 30^{th} day respectively. **Tables 7 & 8** show that data are not significant. **Figs. 7 & 8** depict that the mean values of 0.5 gm/l are comparable to mean values of control on different days.

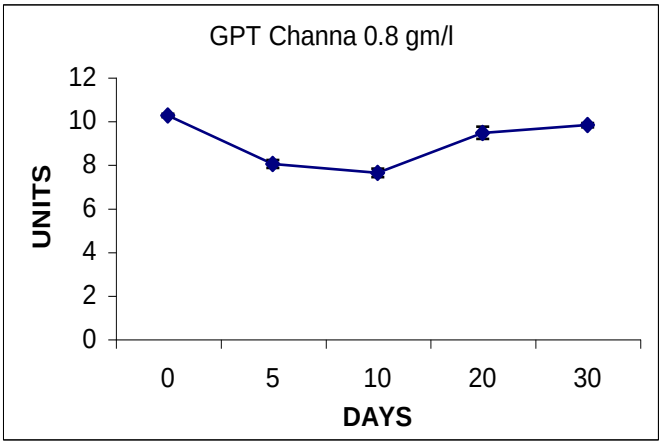
GPT Channa 1.2 gm/l

0	15.9515	0.08623
5	8.6168	0.15012
10	7.9257	0.07965
20	4.0282	0.48568
30	5.6477	0.03949



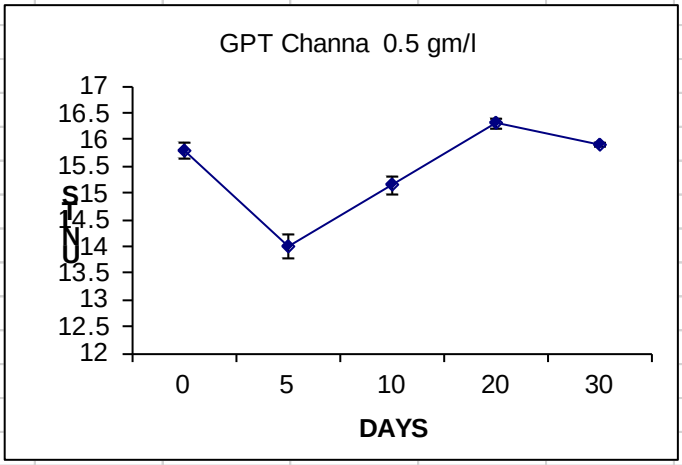
GPT Channa 0.8 gm/l

0	10.2451	0.0814
5	8.0194	0.17602
10	7.6067	0.19459
20	9.448	0.27614
30	9.7991	0.10476

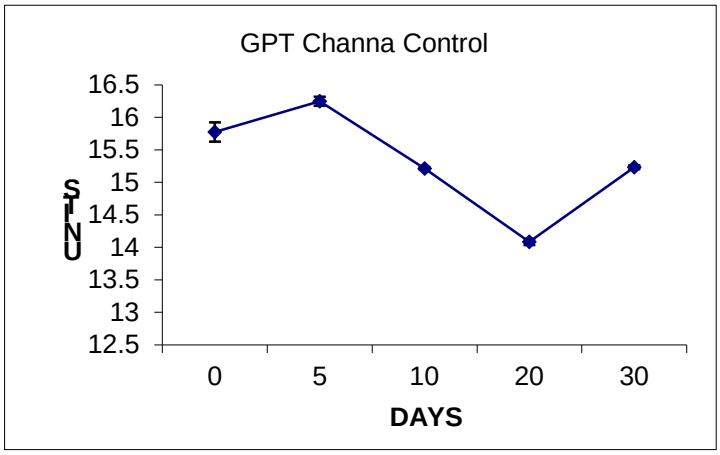


UNIT : nano mole pyruvate formed / min / mg protein at 37ºC.
Mean enzymatic responses of Channa punctatus to toxic sediment.

GPT Channa 0.5 gm/l		
0	15.7722	0.14694
5	13.9786	0.22431
10	15.1484	0.16385
20	16.299	0.08594
30	15.9012	0.05295

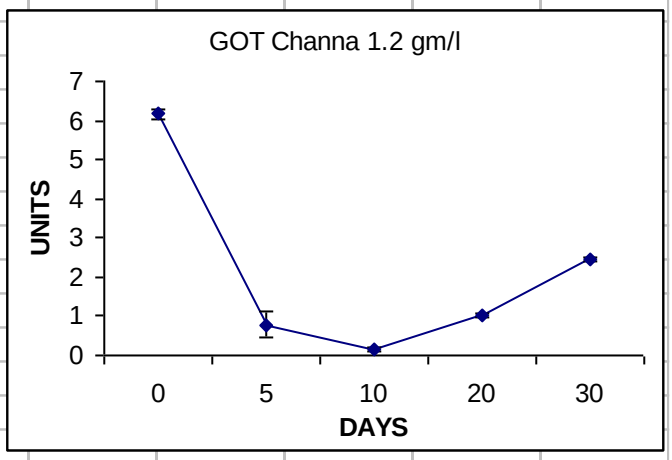


GPT Channa Control		
0	15.7722	0.14694
5	16.2481	0.06926
10	15.2144	0.02251
20	14.0827	0.04571
30	15.2322	0.03044

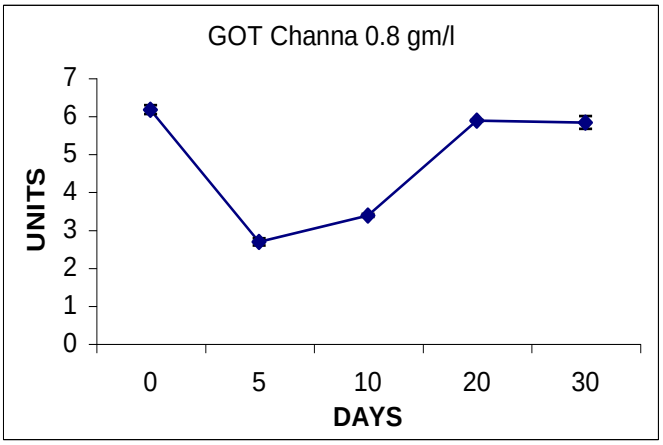


UNIT : nano mole pyruvate formed / min / mg protein at 37ºC.
Mean enzymatic responses of Channa punctatus to toxic sediment.

GOT Channa 1.2 gm/l		
0	6.1582	0.13476
5	0.7806	0.34625
10	0.139	0.04599
20	1.0294	0.05921
30	2.475	0.05266

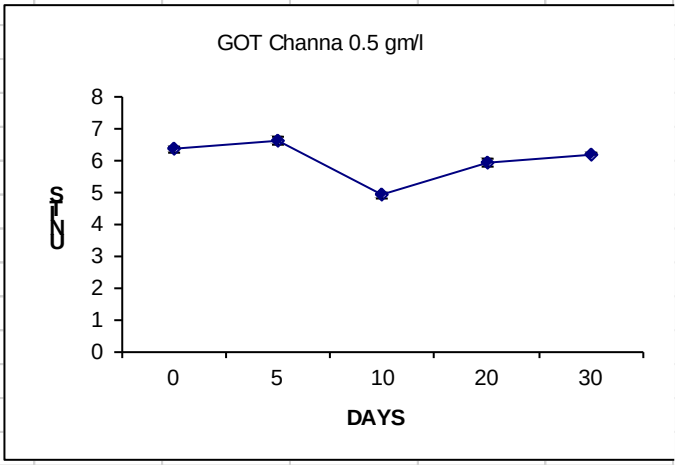


GOT Channa 0.8 gm/l		
0	6.1582	0.11777
5	2.6735	0.0964
10	3.3718	0.0393
20	5.8691	0.01635
30	5.8209	0.16924

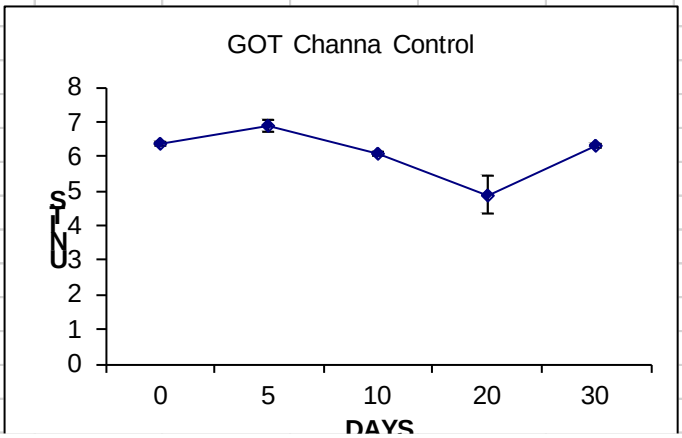


UNIT : nano mole oxyloacetate formed / min / mg protein at 37ºC.
Mean enzymatic responses of Channa punctatus to toxic sediment.

GOT Channa 0.5 gm/l		
0	6.3376	0.08623
5	6.6105	0.12757
10	4.9117	0.08771
20	5.9292	0.14305
30	6.1953	0.04208



GOT Channa Control		
0	6.3495	0.0548
5	6.8659	0.16143
10	6.0767	0.05157
20	4.876	0.53756
30	6.3046	0.04602



UNIT : nano mole oxyloacetate formed / min / mg protein at 37ºC.
Mean enzymatic responses of Channa punctatus to toxic sediment.

CONCLUSION

In the present study SGPT and SGOT show sharp decrease in highest concentration . Both SGPT and SGOT show initial decrease and then recovering to normal in medium concentration. For lowest concentration SGPT and SGOT values were compared to the mean value of control during 30 day experiment.

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