ACID PHOSPHATASE ACTIVITY IN THE BLOOD OF LABEO ROHITA 
INDUCED BY AZODYES

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Acid phosphatase is a lysosomal hydrolytic enzyme which causes hydrolysis of esters and helps in autolysis of cells after death. The present study is an attempt to evaluate the toxic effects of two azodyes Metanil yellow (4 - aniline azo benzene- m- sulphonic acid) and Bismark brown (2,4 -diamino 3’ amino azo benzene) on acid phosphatase activity in the blood of a freshwater fish Labeo rohita. Acid phosphatase activity in the blood was found to be depleted at acute and chronic exposures of both the dyes. The results were statistically highly significant (P< 0.01 ).

MATERIALS AND METHODS

Living specimen of Labeo rohita were collected local fresh water resources and acclimatized in laboratory conditions for a minimum period of seven days before experimentation. Visibly healthy fishes were selected and treated with 0.1% KMnO₄ solution and were divided into five batches. One batch was kept in water and was used as control. The remaining four batches were kept in acute and chronic concentrations of metanil yellow and bismark brown. Water was replaced periodically and black paper was used to prevent any possible photo-oxidation of the dyes. The fishes of all batches were sacrificed at 48 hrs and 96 hrs (acute exposure ) and 15 days and 30 days (chronic exposure). The blood was collected from the cut caudal vein and was allowed to clot at room temperature and then centrifuged at 2000 rpm. The ‘t’ test of Fisher was used to calculate the significance of data.

RESULTS AND DISCUSSION

The present study reveals a significant decrease in the acid phosphatase activity in the blood of Labeo rohita under the stress of metanil yellow and bismark brown. ( Table - 1). The decrease was -82.80%, -107.09%, -102.65% and -117.06% under the stress of metanil yellow and -69.84%, -82.73%, -99.40%, and -106.84% under the stress of bismark brown at T1 and T2 ( acute ) and T3 and T4 ( chronic ) exposures respectively. The Results were statistically highly significant (P< 0.01 ).

Acid phosphatase is a phosphatase, a type of enzyme, used to free attached phosphate groups from the molecules during digestion. It is basically a phosphomonoesterase. It is stored in lysosomes and functions when these fuse with endosomes which are acidified while the function. Therefore it has an acid pH optimum. Suppressed acid phosphatase activity was observed in liver and kidney of C. batrachus and H. fossilis in response to Diphenyl dis-azobinepthionic acid intoxication. Decreased acid phosphatase activity was reported in liver, kidney, gills, intestines and muscles of C. batrachus in response to phenylene brown intoxication. A decrease in acid phosphatase activity was also observed in brain, liver, gills and intestine of C. fasciatus in response to chrysophenine- G and direct deep black. The enzyme activity was found to be depleted in the blood of C. fasciatus under the stress of metanil yellow and bismark brown. The enzyme activity also decreased in the liver, gill and muscle tissues of L. rohita collected from the polluted lakes of Bangalore. Inhibition in acid phosphatase activity was reported in the liver of Nemacheilus donisonii.
after 120 days of continuous exposure of three sublethal concentrations of basalin\textsuperscript{19}. However a raised acid phosphatase level was reported in the blood of \textit{C. batrachus} when exposed to lead nitrate\textsuperscript{11}. A decrease was also seen in liver and muscle tissues of \textit{L. rohita} exposed to arsenic\textsuperscript{12}. Activity of the enzyme in gills, liver and gonads increased above normal in 48 hrs exposure followed by a fall below normal in 160 hrs exposure to steel plant effluents in \textit{C. carpio}\textsuperscript{13}. The activity of enzyme decreased significantly with increasing concentrations of tannery effluents in muscles, liver and intestine of \textit{Cyprinus carpio}, \textit{Oreochromis mossambicus} and \textit{Channa stratus}\textsuperscript{14}. The probable cause of inhibition in acid phosphatase activity may be-

1. Due to the effect of toxicants on protein itself.
2. Competition with the substrate.
3. The reversal of the enzyme activity by effecting the factors like magnesium etc. (the activating ion for this enzyme).

**REFERENCES**


**Table 1. Alteration in the Acpase activity induced by 4’AASA and DAAB in the blood of \textit{L. rohita} values are mean ±S.E. of Nine observations each**

<table>
<thead>
<tr>
<th>Dyes</th>
<th>C</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
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| 4’AASA |        | -30.18 ±0.242
|        |        | -55.17 ±0.242
|        |        | (-82.80%) | (-107.09%) | (-117.06%) |
|        |        | -62.50 ±0.22
|        |        | (-102.65%) | (-111.06%) |
| DAAB   |        | -30.18 ±0.242
|        |        | -51.26 ±0.32
|        |        | (-69.84%) | (-82.73%) | (-99.40%) |
|        |        | -55.15 ±0.28
|        |        | (-82.73%) | (-99.40%) | (-106.84%) |

<table>
<thead>
<tr>
<th>4’AASA</th>
<th>T1 48 hrs</th>
<th>Metanil Yellow</th>
<th>T2 96 hrs</th>
<th>DAAB</th>
<th>Bismark Brown</th>
<th>T3 15 days</th>
<th>T4 30 days</th>
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