ACID PHOSPHATASE ACTIVITY IN THE BLOOD OF *COLISA FASSCIATUS* INDUCED BY AZODYES

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The present study is an attempt to evaluate the toxic effects of two azodyes viz. 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 *Colisa fasciatus*. The activity of the enzyme was found to be depleted significantly (P < 0.01). The depletion was more prominent following the chronic exposure of both the dyes.

Acid phosphatase is a lysosomal hydrolytic enzyme which causes hydrolysis of esters and helps in autolysis of cells after death. Tewari and Sood¹ reported that acid phosphatase is associated with nucleic acid synthesis and hence its reduction adversely affected the permeability process and nucleic acid synthesis under toxicant stress.

MATERIALS AND METHODS

Living specimens of *Colisa fasciatus* were collected from 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 concentration of Metanil yellow (4-aniline azobenzene-m-sulfonic Acid) and Bismark brown (2, 4 diamino 3' amino azo-benzene). Water was replaced periodically and black paper was used to prevent any possible photo-oxidation of the dyes. The fishes of all the 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 Fisher² 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 *Colisa fasciatus* under the stress of Metanil yellow and Bismark brown (Table 1). Goel and Garg reported diminished serum acid phosphatase activity in *Channa punctatus* in response to tri amino azobenzene and increased serum acid phosphatase activity in response to Bismark brown intoxication. On the other hand Goel et al. reported suppressed acid phosphatase activity in liver and kidney of *Clarias batrachus* and *Heteropneustes fossilis* in response to Diphenyl dis-azo-binephionic acid intoxication. Further decreased acid phosphatase activity has been reported in the liver, kidney, gills, intestine and muscles of *Clarias batrachus* in response to phenylene brown intoxication, Similarly decreased acid phosphatase activity in gills of *Clarias batrachus* in response to Phenylene brown intoxication is also reported. Sharma and Gupta have reported decreased acid phosphatase activity in brain, liver, gills and intestine of *Colisa fasciatus* in response to Chrysopenhine-G and Direct deep black. The probable cause of inhibition in acid phosphatase activity may be—

i) Due to the effect of toxicants on protein itself or ii) Competition with the substrate or iii) The reversal of enzyme activity by affecting the factors like magnesium etc. (the activating ion for this enzyme).

The present findings are in accordance to those of the earlier workers who reported decreased Acid phosphatase activity under the stress of dyes in contrast to Goel et al. who have reported increased enzymatic activity.

Table 1—Alteration in the activity of Acid Phosphatase induced by 4’AASA and DAAB in the blood of *C. fasciatus*. Values are Mean ± S.E of nine observations each.

<table>
<thead>
<tr>
<th>DYES</th>
<th>C</th>
<th>ACUTE EXPOSURE</th>
<th>CHRONIC EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>4’AASA</td>
<td>40.14</td>
<td>42.51</td>
<td>50.14</td>
</tr>
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<td></td>
<td>±0.332</td>
<td>±0.054</td>
<td>±0.335</td>
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<tr>
<td>DAAB</td>
<td>40.14</td>
<td>57.53</td>
<td>52.53</td>
</tr>
<tr>
<td></td>
<td>±0.332</td>
<td>±0.339</td>
<td>±0.358</td>
</tr>
</tbody>
</table>

4’AASA—Metanil Yellow, DAAB—Bismark brown, C—Control, T1—48 hrs, T2—96 hrs, T3—15 days, T4—30 days.
REFERENCES