EFFECT OF NICKEL CHLORIDE ON ANTIOXIDANT ENZYMES (SUPEROXIDE DISMUTASE AND CATALASE) IN LIVER OF Duttaphrynus melanostictus

INTRODUCTION
Living organisms constitute a vast diversity of taxonomy, life history, physiology, morphology, behavior, and geographical distribution. Thus different species have different sensitivities to compounds. Sensitivity is the ability of an organism to respond and react to external stimuli. In the field, a multitude of species can be exposed to numerous toxicants. Therefore, to predict the effects of toxicants and to understand changes in species composition within communities, it is desirable to know how sensitive individual species are to specific toxicants (von Der Ohe and Liess, 2004).

In ecosystem, amphibians acts as trophic link between insects and other vertebrates (Sparling et al., 2000). Decrease in the number of amphibian due to several factor indirectly affect the balance of ecosystem.

This study was designed to see the toxic effects of nickel chloride on antioxidant enzyme (superoxide dismutase and catalase) in liver of Duttaphrynus melanostictus at different time intervals (0h, 24h, 48h and 72h).

MATERIALS AND METHODS
Duttaphrynus melanostictus (70 g to 120 g) were collected locally around the North Orissa University Campus. They were acclimatized for two days prior to the experiment.

The stock solution was prepared by dissolving 1 mg of nickel in 1 ml of distilled water. From this stock solution 50 µl (50 µg) of nickel chloride were given orally to 15 numbers of Duttaphrynus. The animals were sacrificed at 0 hour, 24 hours, 48 hours and 72 hours and different parameters were measured.

RESULTS AND DISCUSSIONS

The weight of treated animals were less in comparison to control and gradually decreases with increase of time intervals (Fig. 7).

Table 1: Comparison of protein content (mg/g tissue), Superoxide dismutase activity (SOD) in Unit/mg protein and Catalase (CAT) level in liver nkat/mg protein of D. melanostictus after treatment of nickel chloride at different time interval. The value are expressed in Mean±S.D.

<table>
<thead>
<tr>
<th>Duration after treatment with furadan</th>
<th>Protein content (mg/g tissue)</th>
<th>SOD (Unit/mg protein)</th>
<th>CAT (nkat/mg protein)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C (0h)</td>
<td>36.61±2.07</td>
<td>41.65±52.96</td>
<td>3.94±0.29</td>
</tr>
<tr>
<td>J (24h)</td>
<td>35.43±3.77</td>
<td>85.80±125.67</td>
<td>4.29±0.69</td>
</tr>
<tr>
<td>J (48h)</td>
<td>50.46±2.01</td>
<td>56.47±69.91</td>
<td>4.12±0.69</td>
</tr>
<tr>
<td>J (72h)</td>
<td>13.92±0.97</td>
<td>50.82±37.45</td>
<td>3.63±1.46</td>
</tr>
</tbody>
</table>

Protein content (mg/g tissue) gradually decreased at 0 hour and 24 hour and then it was increased in 48 hours. It was lower in 72 hour in comparison to Duttaphrynus melanostictus exposed to nickel at different time intervals. The protein content was highest at 48 hours (Table 1 and Fig.8).
One way ANOVA was performed in order to analyse the effect of nickel on the protein content at different time intervals in *Duttaphrynus melanostictus*. One way ANOVA revealed that the protein content at different time intervals in *Duttaphrynus melanostictus* is significant [F(3, 19)=189.720, P= .000]. Post Hoc analysis revealed that the protein content at different time intervals when treated with nickel in *Duttaphrynus melanostictus* was significant at 24 hour, 48 hour and 72 hour (P<0.05; LSD)

The SOD level (unit/mg protein) lower in control in comparison to *Duttaphrynus melanostictus* exposed to nickel at different time intervals. The SOD level was highest at 24 hours and then gradually decreased at 48 hours and 72 hours (Table 1 and Fig. 9).

One way ANOVA revealed that the SOD activity (unit/mg protein) in *Duttaphrynus melanostictus* exposed to nickel at different time intervals is significant [F(3, 19)= 1.076, P=.387]. Post Hoc analysis revealed that the SOD activity (Unit/mg protein) at different time intervals when treated with nickel in *Duttaphrynus melanostictus* was significant Only at 24 hour (P < 0.05; LSD). While 48 hour and 72 hour are not significant with respect to control.

The CAT level (nkat/ mg protein) of *Duttaphrynus melanostictus* exposed to nickel was highest at 24 hours and then gradually decreased at 48 hours and 72 hours. It was lower in 0 hour (control) in comparison to 24 hours (Table 1 and Fig. 10).

One way ANOVA revealed that the CAT activity (nkat/mg protein) in *Duttaphrynus melanostictus* exposed to nickel (0.050 µl) at different time intervals is significant [F(3, 19)= .498, P= .689]. Post Hoc analysis revealed that CAT activity (nkat/mg protein) at different time intervals when treated with nickel in *Duttaphrynus melanostictus* was significant at 24 hour and 48 hours (P < 0.05; LSD). While 72 hour are not significant with respect to control.

**REFERENCES**


