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Short Communication

Leather Dye Toxicity on Blood Chemistry of Freshwater Teleost, *Cirrhinus mrigala* (Ham.)

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ABSTRACT

The paper describes the changes in biochemical parameters of freshwater teleost, *Cirrhinus mrigala* (Ham.) when exposed to sublethal concentrations of leather dye Bismarck brown with three concentrations (0.6 mg/L, 0.7 mg/L, 0.8 mg/L) at different time intervals (24 hrs, 48 hrs, 96 hrs, 1 week). The serum total glucose showed decreasing trend on exposure to Bismarck brown at different time intervals and at all three concentrations. Under sublethal exposure to Bismarck brown the glucose level decreased in serum. The fall in the glucose content indicates its rapid utilization by the fish as a consequent of dye's toxic effect. The aim of the study is to aware the people to protect the fish fauna from leather dyes and their effect on the biochemical parameters of the fish *Cirrhinus mrigala* (Ham.).

The Indian leather industry comes in the top 10 export sectors of India, valued about two million US dollars. It contributes 10% of the world raw material. The production of leather produces large quantities of wastewaters containing organic matter and leather dyes, which are discharged into nearby or onto the land. The present paper deals with the effect of leather dye Bismarck brown on blood of fish *Cirrhinus mrigala* (Ham.).

The serum glucose was estimated by the method of Rex-Montgommery. When the serum was digested in potassium hydroxide solution, a precipitate of glucose was produced which was estimated by anthrone reagent.

Biochemical parameters of toxicant treated fishes have recently emerged as important tool for the water quality assessment and to know biochemical status of fish in the field of environment toxicology. Freshwater teleost, *Cirrhinus mrigala* were treated with leather dyes Bismarck brown. The value of glucose was 12.2±1.46 mg/dL in control in 0.6 mg/L of the dye (Table 1, Fig. 1), while the value of glucose was 11.06±0.20, 10.12±0.10, 10.10±1.24 and 9.94±1.73 mg/dL after 24hrs, 48hrs, 96hrs and 1 week treatment. The decrease was significant after 24hrs, 48hrs, 96hrs and 1 week of treatment. The value of glucose was 12.8±1.23 mg/dL in control set after 0.7 mg/L while as the value of glucose was 11.00±0.49, 10.12±0.10, 10.10±1.24 and 9.94±1.73 mg/dL after 24hrs, 48hrs, 96hrs and 1 week treatment with a significant decrease after 24hrs, 48hrs, 96hrs and 1 week treatment. After treatment with 0.8 mg/L the value of glucose was 12.0±0.97 mg/dL in control set, whereas its value was 10.89±0.20, 10.00±0.10, 9.99±1.04 and 9.86±0.73 mg/dL after 24hrs, 48hrs, 96hrs and 1 week treatment showing significant decrease after 24hrs, 48hrs, 96hrs and 1 week treatment. The total serum glucose showed decreasing trend on exposure to Bismarck brown at different time intervals at all the three concentrations. Under sublethal exposure to Bismarck brown, the glucose level decreases in serum. The fall in the glucose content indicate its rapid utilization by the fish as a consequence of dye's toxic effect. Sastry & Siddique (1982) observed similar effect due to sublethal concentration of Sevin on *Channa punctatus* and decrement in the glycogen was observed by Sivaramakrishna &

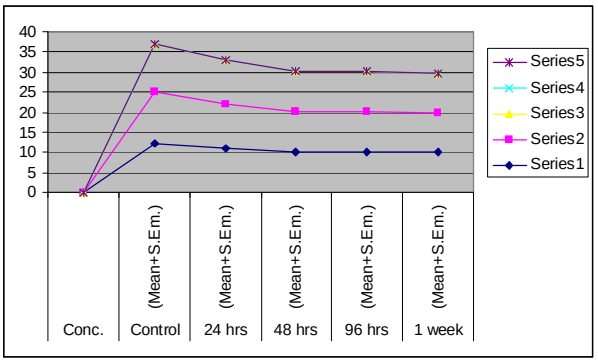

Fig. 1: Glucose content (mg/dL) in *Cirrhinus mrigala* after Bismarck brown treatment.

Radhakrishna (1998) in *Cyprinus carpio*, Sharma (1999) in *Clarias batrachus* exposed to carbaryl, Rani et al. (2001) in *Tilapia mos sambica*, Gupta et al. (2001) in *Heteropneustes fossilis* exposed to washing effluents, Borah (2005) after petroleum oil treatment in *Heteropneustes fossilis*, Tilak et al. (2005) in *Cirrhinus mrigala*, and Karthikeyan et al. (2007) in *Cirrhinus mrigala*. However, the present findings gain conformity by Geetha et al. (1996) on experiment on *Catla catla* after the exposure of methomyl, a carbamate pesticide. Similar results were observed by Afaq & Rana (2008, 2009) in freshwater fish *Cirrhinus mrigala* when treated with leather dyes showing decreasing trend in the total protein.

Table 1: Glucose content (mg/dL) in *Cirrhinus mrigala* (Ham.) after Bismarck brown treatment.

Conc.	Control (Mean±S.Em.)	24 hrs (Mean±S.Em.)	48 hrs (Mean±S.Em.)	96 hrs (Mean±S.Em.)	1 week (Mean±S.Em.)
0.6 mg/L	12.2±1.46	11.06±0.20*	10.12±0.10**	10.10±1.24**	9.94±1.73***
0.7 mg/L	12.8±1.23	11.00±0.49*	10.12±0.10**	10.10±1.24**	9.94±1.73****
0.8 mg/L	12.0±0.97	10.89±0.20**	10.00±0.10***	9.99±1.04***	9.86±0.73***

*Non significant (P>0.05); ** Significant (P<0.05); ***Highly significant (P<0.01); **** Very highly significant (P<0.001)

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