International Journal of Pharma and Bio Sciences V1(2)2010

TOXICOLOGICAL EFFECTS OF LEATHER DYES ON SERUM CHOLESTEROL OF FRESH WATER TELEOST,CIRRHINUS MRIGALA (HAM.)

S.AFAQ.,K.S.RANA AND M.A.LONE

Dept. of Zoology Govt. Degree College Pulwama Kashmir, (J&K) India

**Corresponding author* afiqamar_12@rediffmail.com

ABSTRACT

The fresh water Teleost, ***Cirrhinus mrigala*** (Ham. were treated with two leather dyes as in tables 1,2 and Fig.A,B) The serum cholesterol shows decreasing trend on exposure to **Bismarck brown** and **Acid leather brown** at different time intervals and at all three concentrations. However, the effect was more in Acid leather brown exposure. After Bismarck brown and acid leather brown exposure, the cholesterol decreased. It may be due to utilization of cholesterol in exposed fish and hindrance in metabolism. The serum cholesterol showed a decrease with an increase in the exposure time is highly significant

The cholesterol was estimated by the method of Zak *et al.* (1954).The cholesterol reacts with ferric ions in the acid solution of ferric chloride and sulphuric acid. This reaction involved the "3 hydroxy-5-ene" part of the cholesterol molecule, which is dehydrated to form cholesta-3, 5, diene and is then oxidized by the sulphuric acid to link two molecules as biocholestra-3, 5 diene. This obtained substance is finally sulphonated by sulphuric acid in the presence of metal ions (Fe^{+3}) and the red colored disulphuric acid having a high molecular extinction coefficient is formed

The fresh water fishes were treated with two leather dyes as in (tables 1&2) the **serum cholesterol** shows **decreasing** trend on exposure to Bismarck brown and Acid leather brown at different time intervals (24 hrs, 48 hrs, 96 hrs and 1 week) and at all three concentrations. However, the effect was more in Acid leather brown exposure. After Bismarck brown and Acid leather brown exposure, the cholesterol decreased. It may be due to utilization of cholesterol in exposed fish and hindrance in metabolism.

KEYWORDS

Leather Dyes, Cholesterol, *Cirrhinus mrigala*, Decreased

INTRODUCTION

Textile waste treatment for industries reuse remains as a complicated problem due to several reasons. they are Higher oxygen demand (BOD), Chemical Oxygen Demand (COD) and Total Dissolved Solids (TDS content of the waste water ,Non biodegradable nature of organic dye stuffs present in the effluent to solve these problems, much technological advancement were made, and here we describe one of the most important advancement namely, the Membrane Bioreactor (MBR) the MBR process was introduced by the late 1960s as soon as commercial scale ultra filtration (UF) and micro filtration (MF) membranes were available. The original process was introduced by Dorr-Olivier Inc.

TOXICOLOGICAL EFFECTS OF LEATHER DYES ON SERUM CHOLESTEROL OF FRESH WATER TELEOST,CIRRHINUS MRIGALA (HAM.)

This process can help environment protection by treating waste water and making it suitable for the verity of application and thus conserve precious drinking. Thus, Membrane Bioreactor is a suitable alternative for textile waste water treatment as it reduces sludge production, requires less footprint, and addresses most of the problems associated with other treatment systems described above.

MATERIALS AND METHODS

The cholesterol was estimated by the method of Zak *et al.* (1954).The cholesterol reacts with ferric ions in the acid solution of ferric chloride and sulphuric acid. This reaction involved the "3 hydroxy-5-ene" part of the cholesterol molecule, which is dehydrated to form cholesta-3,5, diene and is then oxidized by the sulphuric acid to link two molecules as biocholestra-3, 5 diene. This obtained substance is finally sulphonated by sulphuric acid in the presence of metal ions (Fe^{+3}) and the red colored disulphuric acid having a high molecular extinction coefficient is formed. The homogenate was kept for 10 minutes and then centrifuged for 10 minutes. 1.0 ml supernatant was taken and volume was increased upto 8.0 ml with glacial acetic acid. 2.0 ml of color reagent was added to this solution and the contents of the test tube were cooled in ice water and placed in dark for 15-20 minutes for color development.

CALCULATION

$$\text{Serum cholesterol (mg/gm)} = \frac{\text{Reading of test}}{\text{Weight of serum}} \text{X } 200$$

Table 1.
Cholesterol (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.)
0.6mg/L	0.66±0.07	0.50±0.08**	0.49±0.10***	0.48±0.07***	0.42±0.09****
0.7mg/L	0.64±0.05	0.50±0.02**	0.48±0.08***	0.46±0.08****	0.40±0.51****
0.8mg/L	0.70±0.09	0.55±0.10**	0.50±0.11****	0.46±0.07****	0.39±0.03****

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

TOXICOLOGICAL EFFECTS OF LEATHER DYES ON SERUM CHOLESTEROL OF FRESH WATER TELEOST,CIRRHINUS MRIGALA (HAM.)

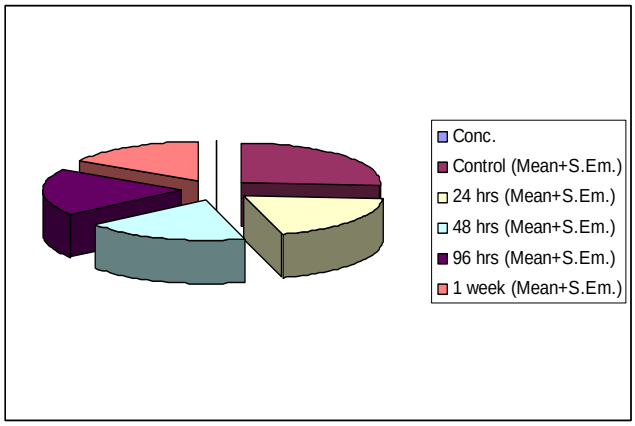

Fig.A

Table 2.

Cholesterol (mg/dl) in Cirrhinus mrigala (Ham.) after Acid leather 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.)
8mg/L	0.66±0.07	0.52±0.09**	0.50±0.09***	0.49±0.07***	0.46±0.03****
9mg/L	0.64±0.05	0.51±0.01**	0.49±0.07***	0.48±0.11****	0.42±0.10****
10mg/L	0.70±0.09	0.57±0.14**	0.53±0.10***	0.49±0.06****	0.42±0.07****

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

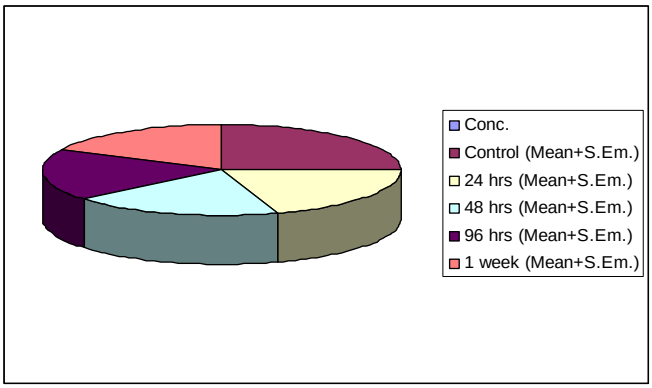

Fig.B

TOXICOLOGICAL EFFECTS OF LEATHER DYES ON SERUM CHOLESTEROL OF FRESH WATER TELEOST,CIRRHINUS MRIGALA (HAM.)

RESULT AND DISCUSSIONS

The fresh water fishes were treated with two leather dyes as in (table 1&2) the **serum cholesterol** shows decreasing trend on exposure to bismarck brown and acid leather brown at different time intervals (24 hrs, 48 hrs, 96 hrs and 1 week) and at all three concentrations. However, the effect was more in acid leather brown exposure. After Bismarck brown and acid leather brown exposure, the cholesterol decreased. It may be due to utilization of cholesterol in exposed fish and hindrance in metabolism. Similar views regarding decrease cholesterol activity have been given by Ghosh (1988) who observed the reduction of cholesterol in blood of *Channa punctatus* over the influence of Chromium. In the present study after exposure of Bismarck brown and acid leather brown, serum cholesterol showed a decrease with an increase in the exposure time is highly significant, Sivaramakrishna and Radhakrishna (1998) in *Cyprinus carpio*, Rani *et al*. (2001) in *Tilapia mossambuca*, Kahre *et al*. (2000) in *Clarias batrachus* exposed to malathion, Radha *et al*. (2005) in *Cyprinus carpio*, Shankar and Kulkarni (2007) in *Notopterus notopterus* and Karthikeyan *et al*. (2007) in *Cirrhinus mrigala*

.

CONCLUSION

The serum cholesterol shows decreasing trend on exposure to Bismarck brown and acid leather brown at different time intervals and at all three concentrations. However, the effect was more in acid leather brown exposure. After Bismarck brown and acid leather brown exposure, the cholesterol decreased. It may be due to utilization of cholesterol in exposed fish and hindrance in metabolism. The serum cholesterol showed a decrease with an increase in the exposure time is highly significant

REFERENCES

1. Ghosh T.K. (1988)- Chronic toxic influence of chromium on biochemical constituents of blood of *Channa punctatus*. Ad. Bios. **7**(11): 153-157.
2. Karthikeyan, S., Palaniappan, P.R. and Sabhanayakam, S. (2007)- Influnce of pH and water hardness upon nickel accumulation in edible fish *Cirrhinus mrigala* (Ham.). J. Environ. Biol., **28**(2): 489-492
3. Khare, A., Singh, S. and Shrivastave, K. (2000) - Maiathion induced biochemical changes in the kidney of freshwater fish-*Clarias batrachus* (Linn.). J. Ecoloxicol. Environ. Monit., **10**(1):11-14.
4. Radha, G., Logaswamy, S. and Logankumar, K. (2005)- Sub-lethal toxicity of dimethoate on protein, glucose and cholesterol contents in the fish *Cyprinus carpio*. Nature Environment and Pollution Technology, **4**(2): 307-310.
5. Rani, A.S., Sudharsan, R., Reddy, T.N., Reddy, P.U.M. and Raju, T.N. (2001)- Effect of arsenite on certain aspects of protein metabolism in fresh water teleost, *Tilapia mossambica* (Peters). J. Env. Biol., **22**(2): 101-104.
6. Shankar, D.S. and Kulkarni, R.S. (2007)- Tissue cholesterol and serum cortisol level during different reproductive phases of the female freshwater fish *Notopterus notopterus*. J. Environ. Biol., **28**(1): 137-139.
7. Sivaramakrishna, B. and Radhakrishnaiah, K. (1998)-Impact of sublethal concentration of mercury on nitrogen metabolism of the fresh water fish-*Cyprinus carpio* (Linn.). J. Environ. Biol., **19**(2): 111-117.