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The Influence of Textile Mill Effluent on Haematological Changes of *Labeo rohita*

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Abstract: In the present study an attempt was made to investigate the toxicity of textile mill effluent on economically important fish, *Labeo rohita*. Bioassays were carried out. Changes were observed after 30days of exposure, (sublethal concentration). Red blood cells, (RBC) count and Hb content decreased when compared to the control. The number of white blood cells (WBC) increased in textile effluent treated fishes. The results are statistically significant Ph 0.05 level.

Keywords: *Labeo rohita*, textile mill effluent, RBC, WBC and Heamoglobin

I-INTRODUCTION

Pollution of the fresh water resources by waste water of domestic and industrial origin is posing serious threat to mankind. In recent past most of the water bodies are being contaminated by different types of industrial effluent, Of which the textile mill effluent is more important which cause major harm to the life of aquatic organisms especially fishes. The fresh water fishes constitute an important link in the food chain as top consumers in aquatic ecosystem and as the prey to the predators in terrestrial ecosystem. Moreover most of the fresh water fishes also form protein rich food for human beings but unfortunately majority of xenobiotic substances enter into the body of fishes as the water bodies are mostly contaminated by industrial effluent.The survey of literature [1],[2],[3],[4],[5],[6]. reveals that the fish has been used as the test animal to elucidate the toxic effects of various kinds of toxicants. Haematological parameters have been regarded as the physiological indicators of stress during various kinds of pollution [7],[8],[9] have given the importance of this study of blood in fishes. Hence an attempt has been made in the present study to evaluate the effect of textile mill effluent of certain haematological parameters of the common fresh water edible fish, *Labio rohita.*

II-MATERIALS AND METHODS

Bioassays were carried out by using textile mill effluent collected from one of the local mill and locally collected fishes of known weight and size were used in the present study. By adopting the method [10] the LC_{50} 96 hr value of the effluent to the fishes was found. Then a group of ten fishes wsere reared in different sublethal concentrations along with appropriate control for 30 days. The total RBC s and WBC s were counted using Haemocytometer and Neubauer counting chamber. The haemoglobin contents was determined using Haemoglobinometer by Sahli's acid haematin method.

III-RESULTS AND DISCUSSION

Blood is the only readily available tissue in all animals and haemotological studies constitute certain health indices. In the present investigation (Table-1) textile effluent seems, to have passed the drastic fall in the erythrocytic count which may be attributed to the destructive action of the effluent on red cells. [11] have also reported similar results. The anemic effect of *L.rohito* after exposure to textile mill effluent in the present study could be due to

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inhibition of erythrocyte production increase in the rate of erythrocyte destruction due to haemodilution [12], [13]. Lower haemoglobin level might decrease the ability of the fish to enhance its activity in order to meet occasionsl demands like seeking food and escape [14]. Differences have profound effect on survival potential in natural fish populations [15]. The haemoglobin value of many species of fish has been determined and is known to be a useful index of health fluence further experiment on bone marrow is quite significant to can form the nature of anaemia since erythroblasts in the bone marrow reveal abnormality and delaying maturation of nucleus and effecting haemoglobin anaemic conditions [16].

In the present investigation, exposure to effluent produced a dose dependent increase in WBC's which could be owing to stimulated lymphopoiesis and to an enhanced release of lymphocytes from lymphomycloid tissues [17]. Such a lymphocyte response could be the result of direct stimulation of the immunological defence due to the presence of toxic substances in the effluent or may be associated with effluent induced tissue damages. This falls in line with findings of [18].

Values of total count of RBC's in the control and effluent treated *L. rohita*.

(Each value is mean ± SD of 5 observations)

Concentration of Textile mill effluent(%)	**No. of RBC's (in million)/ml of blood**	**No. of WBC's (in thousand)/ml of blood**	**Haemoglobin (%)**
Control	1.77 ± 0.014	6.45 ± 1.01	78.00 ± 3.03
.01	1.60 ± 0.018 * -9.60 r = +0.62	9.87 ± 0.75 * +53.02 r = +0.45	67.20 ± 2.78 * -10.40 r = +0.53
0.2	1.54 ± 0.018 * -12.99 r = +0.45	10.47 ± 0.86 * +62.50 r = +0.55	50.80 ± 2.74 * -32.26 r = +0.06
0.3	1.45 ± 0.017 * -18.07 r = +0.90	11.56 ± 0.45 * +79.22 r = +0.51	43.15 ± 1.75 * -44.67 r = +0.63
0.4	1.38 ± 0.025 * -22.03 r = +0.63	12.70 ± 0.50 * +98.43 r = +0.52	31.60 ± 1.62 * -57.86 r = +0.30
0.5	1.23 ± 0.019 * -30.50 r = +0.21	13.78 ± 1.25 * +113.64 r = +0.57	25.10 ± 0.90 * -67.82 r = +0.70

+ indicates increase over control * indicates significant (t value)

- indicates decrease over control

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IV-CONCLUSION

The present study reveals that due to the influence of toxic mill effluent the amount of RBC and Hb have been decreased in blood of fish Bat the amount of WBC has been increased as an immunological defense to survive against the toxic substance in the effluent.

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