STUDIES ON EFFECT OF PESTICIDE (NUVAN) ON HAEMATOLOGICAL PARAMETERS OF *Catla catla*

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ABSTRACT

The haematological parameter study of fish is a vital source to know the health status of the fish. Pesticides are poisonous, biological toxicants. In this study, *Catla catla* was exposed to three types of concentrations (Low-0.5ppm, Medium-3ppm, High-6ppm). Haematological parameters like (RBC, WBC, Hb, PCV, MCV, MCH, MCHC) were carried out and observed. In the present study it was observed that on the effect of nuvan on *Catla catla*, RBC, WBC, HB, PCV, MCH, MCHC were decreased and only MCV were increased, according to increase in pesticide concentration.

KEY WORDS: *Catla catla*, Pesticide, Nuvan, Haematological parameter.

INTRODUCTION

Fish are rich source of protein and lipid, low fat food that provides a range of health benefits. About 90% of all fresh water fisheries occur in developing countries (FAO, 2007).They provides food and a livelihood for millions of the poor people and also help in economics status, tourism and recreation. It is estimated that freshwater fishes make up more than 6% of the world's annual animal protein supplies for human (Bakthavathsalam *et al.,* 2002). Fishing provides a casting vestige of utilising the resources of a global commons, which are often part of maintaining traditional and cultural customs (Clausen and York, 2008). Day to day, fish culturing becomes a good source of income it is having economic values. Foundation of the work on haematology of fish was laid down in the early 20th century when Krough studied the respiratory function of blood in fishes.

First work on haematology of Indian fish was perhaps published by Dhar (1948). This was a preliminary work on the morphology of corpuscles, erythrocyte and leucocyte count and clotting time of an air breathing fish (*Ophiocephalus punctatus).* Banerjee (1957, 1966) studied the morphology and fragility of erythrocytes in *Heteropneustes fossilis.* Sakthivel (1988) worked on effects of varying dietary protein level on blood parameters. Kandeepan (2014) studied the haematological parameters of *Catla catla.* Patra *et.al.,* (2014) have worked on seasonal variations in certain haematological factors in *Catla catla.*

MATERIALS AND METHODS

Packed cell volume (PCV) RBC and WBC were determined by using aneubauer's haemocytometer. Haemoglobin concentration was measured by Sahli's haemocytometer. PCV value was determined using centrifuge tube. MCV, MCH and MCHC value was calculated according to the standard formula.

$$MCV = \frac{PCV \times 10}{RBC}$$

$$MCH = \frac{Hb \times 10}{RBC}$$

$$MCHC = \frac{MCH \times 10}{MCV}$$

RESULTS AND DISCUSSION

The present study resulted that on the effect of nuvan on *Catla catla*, RBC had very minute change, WBC, HB, PCV, MCH, MCHC were decreased and only MCV were increased, according to increase in pesticide concentration with in comparison to control condition.

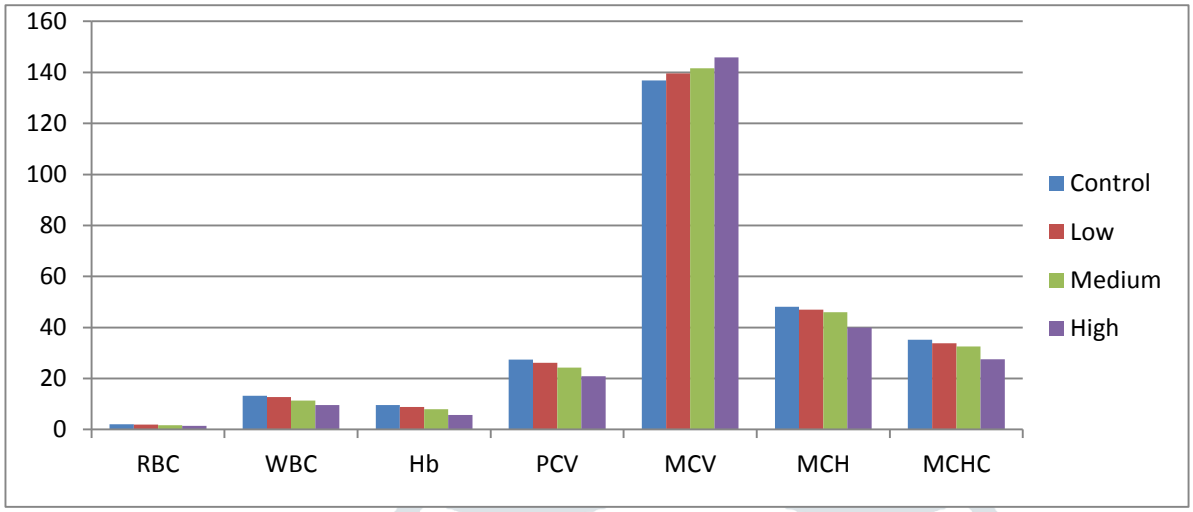

Figure-1 Comparison of haematological parameter effects on nuvan pesticides of *Catla catla*

Table-1 Comparison of haematological parameter (mean±SD) of different doses of nuvan pesticides on *Catla catla*

Haematological Parameters	Control	Low (0.5 ppm)	Medium (3 ppm)	High (6 ppm)
RBC ($X10^6/mm^3$)	2±0.18	1.87±0.17	1.71±0.15	1.43±0.12
WBC ($X10^3/mm^3$)	13.22±1.24	12.66±1.19	11.33±1.2	9.63±0.90
Hb (g/dl)	9.62±0.96	8.82±0.89	7.9±0.73	5.73±0.29
PCV (%)	27.4±2.53	26.1±2.34	24.3±2.19	20.9±1.81
MCV (fl)	136.83±6.03	139.6±6.72	141.61±6.61	145.82±5.79
MCH (pg)	48.07±2.65	46.99±2.55	46.01±1.84	39.95±2.35
MCHC (%)	35.14±1.58	33.84±1.89	32.53±1.55	27.53±1.78

CONCLUSIONS

In conclusion, the present study showed that the haematological parameters like RBC, WBC, Hb, PCV, MCV, MCH and MCHC were decreased or increased in normal, Low concentration, Medium concentration and High Concentration. It is concluded that only MCV was increased in different haematological parameter.

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REFERENCES

1. Bakthavathsalam, R., Anuradha, G. and Lakshmi Prabha, S.R. (2002). Effect of different feeds on the growth rate of Indian major carp, *Catla catla* kept under laboratory conditions. Environ. Ecol., 20(4): 852-857.
2. Banerjee, V. (1957) Morphology and coagulation time of the blood cells on Heteropneustes fossilis (Bloch), Curr. Sci., 26: 58.
3. Banerjee, V. (1966) A note on the haematological studies of Anabas testudineus (Bloch), Sci. & Cult., 32: 326.
4. Clausen, R. and York, R.(2008) Global biodiversity decline of marine and freshwater fish: a cross-national analysis of economic, demographic, and ecological influences. Social Science Research, 37(4):1310-1320.
5. Dhar, R. P. (1948) A note on the haematological studies on Ophicephalus punctatus (Bloch), Proc. Zool. Soc., Bengal, 1: 67-70.
6. FAO, (2007) The state of Food and Agriculture. FAO Agriculture series no. 38.

7. Kandeepan, C. (2014) Heamatological and Biochemical Parameters on Few Fresh Water South Indian Teleosts. Int. J. Curr. Microbiol. App. Sci, 3(9): 1015-1022.
8. Patra, B.B., Panda, R.P. and Patra, A.K. (2014) Seasonal Variations in Certain Hematological Factors of *Catla catla* (Hamilton 1822). IOSR Journal of Applied Physics (IOSR-JAP), 6(4): 01-07.
9. Sakthivel, M. (1988) Effects of varying dietary protein level on the blood parameters of Cyprinus csrpio. Proc. Indian Acad. Sci. (Anim. Sei.), 97: 363-366.