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## Hematological indices of control water fish *Channa gachua*: a biochemical study

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**Abstract-** Live freshwater fishes *Channa gachua* collected from Taj Baj Khan Pond, Hajipur. These fishes were acclimatized in the Zoology Laboratory of Science College, Patna and their haematological parameters and biochemical parameter were thoroughly studied in the control stage viz RBC and WBC count, haemoglobin content, viz. protein and cholesterol. The haematological parameter of *Channa gachua* showed the values as- RBC ( $4.1 \times 10^6$ ) WBC ( $3.4 \times 10^3$ /cumm) haemoglobin (10.5 g/dl) PVC (32.0 %/dl) MCV (78.0 $\mu$ m) MCH (25.6 pg/dl) and MCHC (32.8 g/dl) etc. The biochemical finding included Glucose (87.5mg/dl) and Cholesterol (149.4mg/dl). The finding of the present study highlights the normal range of haematological and biochemical parameter in freshwater Snakehead *Channa gachua*.

**Key words:** *Channa gachua*, control, hematology, cholesterol.

### INTRODUCTION

Blood parameter in *Channa gachua* is affected by many factors including water quality, temperature, food availability and physical condition of the fish. This physico chemical characteristic directly and indirectly affects the blood components of fishes. The impact blood parameter is also varied according to the sex, size, season and age of the fish. The blood parameter may be considered as indicator of the status of aquatic bodies.

Review of literature have shown a great degree of variation in protein, cholesterol and glucose level depending upon sex, size and age of the fishes. Some researcher reported that the percentage of protein varied from species to species.<sup>1-3</sup> The value of haematological parameter depends on the season and the slow or active movement of fish. It was reported that haematological parameter are affected by microbial infection of fish and

toxins.<sup>4,6</sup> Although many research paper deals with the hematology of freshwater fish. This paper deals with important blood parameter of fish *Channa gachua*.

However, the systematic report of the haematological characteristics of *Channa gachua* is very scanty. Hence, the present research paper gives an insight of haematological profile of control freshwater fish *Channa gachua*.

### MATERIALS & METHODS

Samples were collected from fresh water of Hajipur Bihar, Taj Baz Khan Pokhara, Hajipur and Patna fish market. The fish were brought to the Zoology Laboratory of Patna Science College, Patna.

Blood samples were collected by cardiac puncture using a 21 gauge hypodermic needle. They were collected in vials, one containing the anticoagulant EDTA, for blood cell studies and the other without EDTA to separate the clot and serum to study certain biochemical components.

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Standard hematological procedures for laboratory studies were adopted for experimental analysis. Red and white blood cells (RBC and WBC) were counted using a Spencer's haemocytometer. Whole blood parameters such as haemoglobin content (Hb), packed cell volume (PCV) mean corpuscular volume (MCV) mean corpuscular haemoglobin (MCH) mean, corpuscular haemoglobin concentration (MCHC) were determined by the standard protocol given by Welchsclbam. The standard methods employed for the determination of blood chemistry were referred to serum proteins<sup>7</sup>, glucose<sup>8</sup>, cholesterol<sup>9</sup>. The data obtained were subjected to statistical analysis and explained in Results & Discussion section.

**RESULTS & DISSCUSION**

The haematological parameters of *Channa gachua* are shown Data obtained various haematological parameter the shown as-RBC (4.1x10<sup>6</sup>) WBC (3.4x10<sup>3</sup>/cumm) haemoglobin (10.5 g/dl) PVC (32.0 %/dl) MCV (78.0µm) MCH (25.6 pg/dl) and MCHC (25.6 pg/dl). Besides the value of the content of Protein was (6.6 g/dl), Glucose was (87.5mg/dl) and Cholesterol was (149.4mg/dl.)

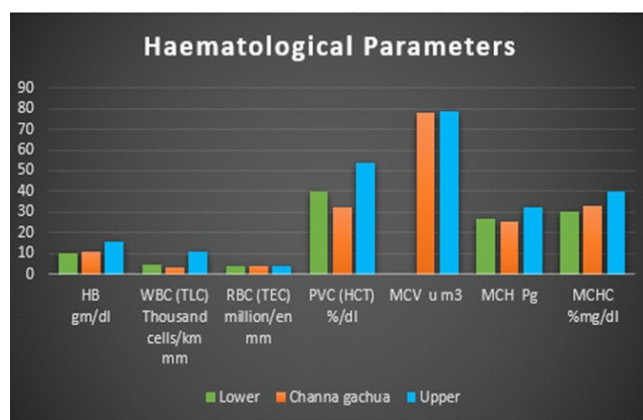
The results of heamato biochemical analysis showed that the maximum recorded protein content among the freshwater in the blood of *Channa gachua* order - Channiformes have been found and Biochemical profile such as protein & cholesterol were found to be lower sides among the order channiforme.

The levels of glucose were found very high Glucose showed higher value than cholesterol and protein. Haematological parameters in a fish are also affected by the physico-chemical conditions and its habitat. Lower values of haematological parameters were observed in sedentary and benthic condition. The female fish had more esnophill cells than male in *Channa gachua*.

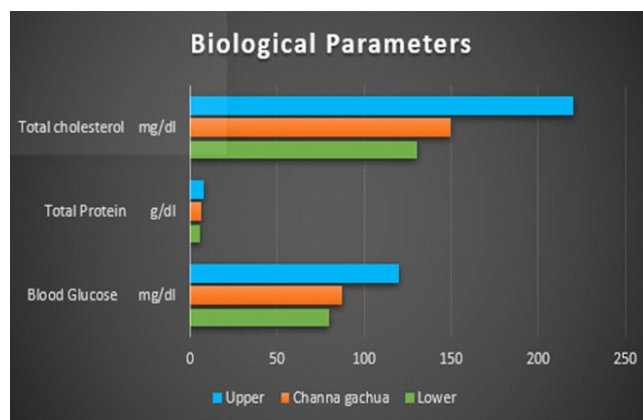
Haematological values like haemoglobin, PVC, MCV, MCH and MCHC in RBC as well as WBC count obtained in the present study are almost in agreement with the parameters observed in the blood of experimental fishes *Channa gachua* earlier workers. The number of total erythrocytes is positively correlated with body length. Seasonal changes in RBC count and haemoglobin content were observed in freshwater fish.

**Table 1- The Haematological parameter of control water fish *Channa gachua***

Haematological Parameters	<i>Channa gachua</i>	Normal value in teleost
HB gm/dl	10.5	10-16
WBC (TLC) Thousand cells/km mm	3.4	4.5-11.0
RBC (TEC) million/en mm	4.1	3.9-4.2
PVC (HCT) %/dl	32.0	40-54
MCV u m <sup>3</sup>	78.0	78-94
MCH Pg	25.6	27-32
MCHC %mg/dl	32.8	30-40
Biochemical parameters		
Blood Glucose mg/dl	87.5	80-120
Total Protein g/dl	6.6	6.0-8.0
Total cholesterol mg/dl	149.4	130-220



**Graphical Representation of The Haematological Parameters of control water fish *Channa gachua***



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#### REFERENCES

1. **Khanna S. and Singh J. 1973.** Studies on the blood glucose level in *Channa punctatus* (Bloch.). *Acta Zool.*, **52**: 97-101
2. **Singh M. 1995.** Haematological responses in a freshwater teleost *Channa punctatus* to experimental copper and chromium poisoning. *J. Environ. Biol.* **16(4)**: 339-341
3. **Menon K. R. 1952.** A comparative study of protein concentration of the blood plasma in some representative vertebrates. *J. Univ. Bombay.* **3**.
4. **Yasmin R., Pandey B. N. and Yasmin A. 1993.** Seasonal variation in haematological indices with reference to the effect of water temperature in *Oreochromis mossambicus* (Peters). *J. Freshwat Biol.* **5(2)**: 177-181.
5. **Harikrishnan R., Nisha Rani M., and Balasundaram C. 2003.** Haematological and biochemical parameters in common carp *Cyprinus carpio* following herbal 647 treatment for *Aeromonas hydrophila* infection. *Aquacult.* **221(1-4)**: 41-50.
6. **Nuzhat Parveen and Shadab G. G. H. A. 2011.** Evaluation of micronuclei and haematological profiles as genotoxic assays in *Channa punctatus* exposed to malathion internation. *J. Sci. Nat.* **2(3)**: 625-631.
7. **Schmidt F. H. 1971.** Methodon de Hoan, Und Blutzucker bestimmung II. Bluzucker, Handbook desbiabetes. E.F. Pleiffer (ed.) mellitus J.F. Lehmann's Veriag. *Munich.* **2**: 1-938.
8. **Fleg H. M. 1973.** *Ann. Clin. Biochem.* **10**: 1350-1356.
9. **Fossatip L. P. 1982.** Serum triglycerides determined colorimetrically with an enzyme that produces hydrogen peroxide. *Clini. Chem.* **28**: 2077- 2080
10. **Abdul Naveen P., Venkaeshwaslu and Janaiah C. 2011.** Biochemical alteration induced by triazophos in the blood plasma of fish *Channa punctatus* (Bloch). *Annals Biol. Res.* **2(4)**: 31-37.
11. **Bhagat R. P. and Banerjee V. 1986.** Haematology of an Indian freshwater eel *Amphipnous cuchia* (Hamilton) Erythrocyte count related parameters with special reference to body length sex and seasons. *Compt. Physiol. Ecol.* **2(1)**: 21-27.
12. **Blaxhall P. C., Daisley K. W. 1973.** Routine haematological methods for freshwater fish a review of selected literature. *J.Fish. Biol.* **4**:593-604.
13. **Dharan Sing, Kamlesh Nath, S. P. Thrivedi and Sharma, Y.K. 2008.** Impact of copper on haematological profile of freshwater fish *Channa punctatus*.
14. **Goel K. A. and Sharma S. D. 1987.** Some haematological characteristics of *Clarias batrachus* under metallic stress of arsenic comp. *Physiol. Ecol.* **12**:63-66.
15. **Holmes W. N. and Donaldson E. M. 1969.** The body compartments and the distribution of electrocytes. In *Fish Physiology* [Hear, W.S. and Randall, D.J. (eds.)], New York: Academic Press, **1**:1-89.
16. **Kannathasan A. 2008.** Studies on certain physico-chemical parameters haematological characteristics of the freshwater fishes, *Aristichthys nobilis* (Richardson), *Labeo rohita* (H.) and *Cirrhinus mrigala*. M.Phil thesis Bharathidasam University. 1-75.
17. **Mahipal Singh. 1995.** Haematological responses in freshwater teleost *Channa punctatus* experimental copper and chromium poinsonent. *J. Environ. Biol.* **16**: 339-341.
18. **Mishra N., Pandey P. K. and Datta Munshi S. 1977.** Haematological parameters of an air breathing mud eel *Amphipnous cuchia* (Ham.). *J. Fish Biol*, **10**: 567-573.
19. **Ramesh M. 2001.** Toxicity of copper sulphate on some haematological parameters of freshwater teleost *Cyprinus carpio* (Var). *J. Indian Fish Asso.* **88**: 131-136.
20. **Raizada M. N. and Singh C. P. 1980.** Seasonal variation in the protein composition of blood serum of freshwater fish *Cirrhinus mrigala*. *Ind. J. Zoo.* **8(7)**: 381-385.

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