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HAEMATOLOGICAL PARAMETERS OF CLARIAS BATRACHUS

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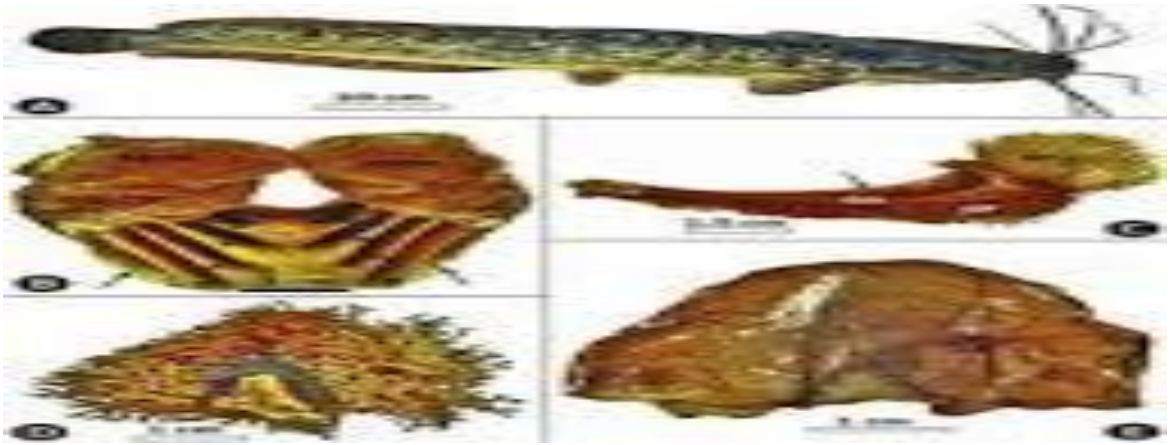
ABSTRACT:

Clarias batrachus has a broad, flat head and an elongate body which tapers toward the tail. It is readily recognizable as a catfish with four pairs of barbels whiskers and fleshy, papillated lips. The teeth are villiform, occurring in patches on the jaw and palate. Its eyes are small. 40" (100cm). However this is rarely achieved in captivity, with 18-24" (45-60cm) being considered a good size. The hematological parameters, hemoglobin (Hb), hematocrit (Hct), red blood cell (RBC), white blood cell (WBC), and hematological indices such as mean cellular volume (MCV), mean cellular hemoglobin (MCH). The CBC report consists of 24 parameters; total WBC, total RBC, HGB, Htc, mean cell volume (MCV), mean cell hemoglobin (MCH), MCH concentration (MCHC), red cell distribution width (RDW)-standard deviation and RDW-coefficient of variation (RDW-CV), PLT, platelet distribution width, mean platelet volume (MPV), The lips are fleshy, the upper more so than the lower. The walking catfish possesses very small eyes, a lengthy dorsal and anal fin that each terminate in a lobe near but free from the caudal fin.

Keywords: Haematological analysis, Erythrocytes, Nebular haemocytometer, Haemoglobin Concentration (MCHC)

INTRODUCTION:

The Southern African sharptooth catfish, Clarias gariepinus is a bimodal-breathing fish. Gills are water-breathing organs and labyrinthine organs, suprabranchial chamber membranes and gill fans are air-breathing ones.



MATERIALS AND METHODS:

Haematological analysis In the experimental protocol, estimation of Haemoglobin (HB) was done with a hemoglobin test kit (Diagnova, Ranbaxy, India) using the cyanmethemoglobin method (Blaxhall and Daisley, 1973; Tanyer, 1985) [8, 58] . "Microhematocrit Technique" was employed for determination of Hct (Blaxhall and Daisley, 1973; Konuk, 1981; Şahan and Cengizler, 2002) [8, 31, 47] . The total red blood cells (tRBCs) were counted using an improved Neubaur haemocytometer (Shah and Altindağ 2004a) [49] . Blood was diluted 1:200 with Hayem's fluid (Mishra et al., 1977) [38] . Erythrocytes were counted in the loaded haemocytometer chamber and total numbers were reported as 106 mm3 (Wintrobe, 1967) [63] . The erythrocyte indices were calculated according to the following formula: Mean Corpuscular Volume (MCV) (µ3/femtolitre) = HCT (%) ÷ RBC (106/ mm3) x 10; Mean Hemoglobin Concentration (MCH) (PG/picogram) = HB (g/100 mL) ÷ RBC (106/ mm3) x 10; Mean Corpuscular Hemoglobin Concentration (MCHC) (%) = HB (g/ 100mL) ÷ HCT (%) x 10 (Kocabatmaz and Ekingen, 1984) . Total count of WBC Total white blood cells (WBC) were counted using an improved Neubaur haemocytometer (Shah and Altindağ 2005; Mgbenka et al., 2003). Blood was diluted 1:20 with Turk's diluting fluid and placed in aemocytometer. 4 large (1 SQ mm) corner squares of the haemocytometer were counted under the microscope (Olympus) at 640 X. The total number of WBC was calculated in mm3 x103 (Wintrobe, 1967). The Physical condition of water is greatly influenced with depth, temperature,

turbidity and light. These constitute the more important physical parameters on which the productivity of a pond depends. Depth of a pond has an important bearing on the physical and chemical qualities of water.

DISCUSSION:

The blood is considered as a mirror in which, majority of the vital processes of an organism taking place, are reflected. The blood of teleost efficiently reflects the essence of the metabolic processes in fishes (Hawkins, 1971) [22] . Besides, toxicological research and environmental monitoring studies have consistently included fish blood as a possible indicator of patho-physiological changes in fishes. Therefore, it is incorporated as essential component of the fisheries management in India (Gupta and Gupta, 1981; Sancho et al., 2000; Barcellos et al., 2003) [21, 48, 6] .The present study was aimed to establish a correlation among two morphologically identical closely allied species of catfishes i.e. Clarias batrachus (Linnaeus, 1758) [24] and C. gariepinus (Burchell, 1822) of family-Clariidae and order-Siluriformes, if any, with special reference to haematological parameters. The present study also deals about variations among blood parameters in these two closely related species. Functional status of the oxygen carrying capacity of the bloodstream in fishes can be assessed by a number of hematological indices such as haematocrit (HCT), hemoglobin (HB), Red blood cells (RBCs), MCH, MCHC, MCV, etc

RESULTS:

The established reference intervals were: white blood cells 3.5– 11.3× 109/L; red blood cells 4.0– 6.1× 1012/L; hemoglobin 11.2– 17.5g/dL; hematocrit 35.4– 52.0%; MCV 77.9– 93.8fl; MCH 24.7– 32.0pg; MCHC 306– 349g/L; RDW-CV 12.1– 13.8% and platelet 131– 391× 109/L. Cyanide-free reagent for hemoglobin analysis Parameters: 25 reportable: WBC, LYM (#,%), MON (#,%), NEU (#,%), BAS(#,%), EOS The immune cell populations present in fish are not very different from those found in mammals. Immune cells in teleosts include natural killer cells, non-specific cytotoxic cells, macrophages, granular leucocytes, thrombocytes, monocytes, dendritic cells, lymphocytes, mast cells, and eosinophilic granule cells.

CONCLUSION:

Fish blood is sensitive to pollution-induced stress, and changes to the haematological parameters, such as haemoglobin content, haematocrit and the

number of erythrocytes, can be used to monitor stress caused by pollutants such as heavy metals (Romani et al., 2003; Barcellos et al., 2004). he following hematological parameters were measured: White Blood Cell (WBC), Red Blood Cell (RBC), hemoglobin (Hb), hematocrit (Hct), Mean Cell Volume (MCV), Mean Cell Hemoglobin (MCH), mean Cell Hemoglobin Concentration (MCHC), Red Cell Distribution Width (RDW), platelet count (Plt), and Mean Platelet Volume (MPV) The conventional method to study the growth in fishes is to measure the length and weight of the body of an individual or a group of individuals at a definite interval of time either in nature or in captivity. Growth parameters assessed at birth help predict subsequent growth and development and risk of disease.

REFERENCES:

1. International Journal of Fisheries and Aquatic Studies 2021; 9(1): 135-141
2. Adedeji OB, Adejbile AFI. Comparative haematological parameters of the Bagrid catfish (Chrysichthys nigrodigitatus) and the African catfish (Clarias gariepinus) from Asejire Dam in southwestern Nigeria. Journal of Applied Sciences and Research 2011;7(7):1042-1046.
3. Adeyemo OK, Okwilagwe OO et al. Comparative assessment of sodium EDTA and heparin as anticoagulants for the evaluation of haematological parameters in cultured and feral African cathfish (Clarias gariepinus). Brazilian Journal of Aquatic Science and Technology 2009;13(1):19-24.
4. Adhikari S, Sarkar B et al. Effects of cypermethrin and carbofuran on certain hematological parameters and prediction of their recovery in a freshwater teleost, Labeo rohita (Ham). Ecotoxicol. Environ. Saf 2004;58:220-226.
5. APHA. Standard Methods for the Examination of Water and Wastewater. APHA, AWWA, WPCF, Washington 2005. 5. Atkinson E, Judd FW. Comparative hematology of Lepomis microlophus and Cichlasoma cyanoguttatum. Copeia 1978;2:230-237. 6. Barcellos LJG, Kreutz LC