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Studies on analysis of hormonal effects in regulating the blood volume in a freshwater teleostean fish *Mystus bleekeri* (Day, 1877)

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Abstract- The effect of hydrocortisone acetate and L-thyroxine on blood volume and haematocrit values in *Mystus bleekeri* of almost same age group (23 - 35 grams) was studied at 28°C. The blood volume was determined by dye dilution technique using Evans blue. Different doses (total viable dose 1 and 3 mg/ml/100 g of hydrocortisone acetate and 0.5 and 1 mg/ml/100 g of L-thyroxine) of hormones were injected intraperitoneally in a period of 10 days (daily) in different sets of animals. Saline injected control animals had a total blood volume of 0.378 ± 0.051 ml, relative (per 100 g body weight) blood volume of 1.643 ± 0.221 ml and haematocrit value of $45.0 \pm 1.22\%$. Hydrocortisone dose of 1 mg/100 had TBV of 0.278 ± 0.028 ml, RBV of 1.108 ± 0.113 ml and Ht value of $44.0 \pm 0.96\%$. Hydrocortisone dose of 3.0 mg/ml/100g had TBV of 0.222 ± 0.021 ml, RBV of 0.965 ± 0.090 ml and Ht value of $33.0 \pm 0.84\%$. L-thyroxine treated animals (0.5 mg/ 100 g) had TBV of 0.417 ± 0.02 ml, RBV of 1.737 ± 0.125 ml and Ht value of $25.0 \pm 0.75\%$. L-thyroxine dose of 10W/100 had TBV or 0.253 ± 0.026 ml, RBV of 1.100 ± 0.117 ml and Ht value of $28.0 \pm 0.71\%$. From t-test of the data the value of "P" shows that in case of hydrocortisone injected animals the total and relative blood volume as well as haematocrit values become less in both the doses but it is more significant ($P < 0.001$, 0.05 and 0.001) in higher dose. In case of L-thyroxin injected animals the results were somewhat different in different doses. In smaller dose total and relative blood volumes were increased (N.S.) but the haematocrit value was decreased, whereas in higher dose blood volumes and the value of haematocrit were significantly decreased ($P < 0.005$, 0.005 and 0.001). From the experiment it is inferred that both the hormones reduce blood volume and the haematocrit values in this air breathing fish (*Mystus bleekeri*).

Key words: Water quality index, river systems, Jharkhand state

INTRODUCTION

The blood volume estimations are of much importance in ascertaining the physiological conditions associated with loss or gain of fluid by the body. Several environmental, physiological and pathological conditions such as acute exposure to cold, high temperatures, age, muscular exercise, emotional excitement, pregnancy, hemorrhage, burns, dehydration, pernicious anaemia, obesity, myxoedema,

polycythaemia vera, cirrhosis of the liver, leukemia, splenomegaly and congestive heart failure are responsible for changes in the blood volume of human being.¹ The neural lobe (neurohypophysis) of pituitary¹, thyroid², parathyroid and adrenal¹ have either direct or indirect effect on the maintenance of ionic balance which ultimately influences total body water content and blood volume.

Thorson (1958, 1959, 1961)³⁻⁵ measured the body fluid compartments of various fishes and discussed its ecological implications in aquatic vertebrates. Prosser and

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