

# Comparative study of Effect of meal containing Flax seed on RBC and WBC in fresh water fish *Labeo rohita* in Balagahat region at Ahmedpur

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## ABSTRACT

Rohu a fish of the carp family cyprinidae, found commonly in rivers & freshwater lakes. It is a bottom feeder & prefers to feed on plant matter written Flax seeds which belong to family linaceae, is popular for its protein, fibers quality, and its lipid contents. Present study is an attempt to evaluate the effect of fresh seed meal on Hematological profile of *Labeo rohita*. Hemoglobin content, PCV (Packed Cell volume), MCHC (Mean corpuscular hemoglobin conc.) and WBC. *Labeo rohita* is commonly called as Rohu a fish of the carp family cyprinidae, found commonly in rivers & freshwater lakes. It is a bottom feeder & prefers to feed on plant matter written Flax seeds which belong to family linaceae, is popular for its protein, fibers quality, as well as its lipid contents. Present study is an attempt to evaluate the effect of fresh seed meal on Hematological profile of *Labeo rohita*. Hemoglobin content and WBC. As hematological profile indicates the physiological condition of an individual. The food plays an important role in nutritional value. The hematological profile indicates the physiological condition of an individual. The food plays an important role in nutritional value. The circulatory fluid is blood and it show some changes which is discussed in this paper.

**Key Words:** - Flax seed, RBC and WBC, *Labeo rohita*, Balagahat region.

## INTRODUCTION

The commercial utilization of flaxseed proteins in food products depend on its functional properties before its incorporation in various food Products. The flaxseed contains both soluble and insoluble fibers. About one-third of the fiber in flaxseed is soluble and it may help to lower cholesterol and to regulate levels of blood sugar. The remaining two-thirds of the fiber in the flaxseed is insoluble which aids digestion by increasing bulk and preventing constipation. (Institute of Medicine, 2002). The flaxseed contains both soluble and insoluble fibers. About one-third of the fiber in flaxseed is soluble and it

may help to lower cholesterol and to regulate levels of blood sugar. The remaining two-thirds of the fiber in the flaxseed is insoluble which aids digestion by increasing bulk and preventing constipation. (Institute of Medicine, 2002).

The improvement in a range of functional properties may be achieved either by genetic modification, chemical processing or physical treatment of the proteins (Oomah and Mazza, 1993). The functional properties of different proteins can be employed to figure out the fact that how flour proteins can be Used to supplement, fortify, enrich or replace more expensive protein sources which are used traditionally (Akobundu *et al.*, 1982).

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#### Study Area:

Latur is located at 18°24'N,76°35'E, . It has an average elevation of 631 metres (2070 feet). It is situated 636 meter above mean sea level. The entire district of Latur is situated on the Balagahat plateau, 540 to 638 metres from the mean sea level. Latur district is located between 17°52' North to 18°50' North and 76°18' East to 79°12' East in the Deccan plateau.

Latur District is in the Marathwada region of Maharashtra in India. It is bounded by Nanded District to the East; Omarabad District to the south-west; Beed District to the north-west; Parbhani District to the north. AndhraPradesh and Karnatakastates to the south-east.

Average rainfall in the district is 600 to 800 mm. The temperature ranges from 24°C to 41.6°C, though at the peak they may reach 41°C. From November to January, is the winter season. Temperatures at the peak drop to single digits but usually they hover around 13.9°C to 21.8°C sometimes lowers up to 11°C. January to March are the months with moderate temperatures

Indian fisheries and aquaculture is important sector of food production, providing nutritional security, contributing to the agricultural exports and engaging about fourteen million people in different activities. Constituting about 4.4% of the global fish production, the sector contributes to 1.1% of the GDP and 4.7 of the agricultural GDP. The total fish production of 6.57 million metric tons presently has nearly 55% contribution for the inland sector and nearly the same form culture fisheries (WHO, 2003). One of the major problems faced by rapidly growing aquaculture is the availability of fish feed, since feed cost is the largest operating (>50%) cost of semi-intensive fish farming (Sehagal and Toor, 1991; De Silva, 1992).

## METHODOLOGY

### Red Blood Corpuscles

**Experimental Units:** Aquarium tank 150L capacities were used as experimental units throughout the experiment for all the trials. The tanks were covered with perforated cover. The tanks were initially washed and filled with Potassium permanganate solutions (4 mg l-1) that were left overnight ten fishes of uniform size were kept in each tank. Ten fishes of uniform size were kept in each tank. The experimental conditions were kept same throughout the study. Blood collected by puncturing the heart of fish on 10th day and 30<sup>th</sup>.

**Experimental organism:** Indian Major Carp, *Labeo rohita* Fingerlings were procured from Fish Seed Production Centre, Latur and from limboti dam area near Ahmedpur.

### Formulations and Preparation of Experimental Diets

Composition such as flaxseed, wheat bran, rice bran, corn flour, oil mix (sunflower oil + cod liver oil), vitamin and mineral mixture (premix plus), BHT (Butylated hydroxyl toluene) and vitamin C were taken for feed formulation (Table 1). Four diets, one control diet and other Diet A (10% flax seed), Diet B (30% flax seed) were prepared respectively.

**Table 1: Experimental Diet in % (Dry Matter)**

| Ingredient   | Control Diet | Diet-A (T1) | Diet-B (T2) | Diet-B (T3) |
|--------------|--------------|-------------|-------------|-------------|
| Company feed | 30           | --          | --          | --          |
| Flax seed    | --           | 10          | 30          | 50          |
| Wheat bran   | 30           | 30          | 25          | 18          |
| Corn Flour   | 15           | 24          | 15          | 12          |
| Rice bran    | 30           | 30          | 25          | 16          |
| Oil mix      | 04           | 04          | 04          | 04          |
| Premix       | 02           | 02          | 02          | 02          |
| Vitamin C    | 0.2          | 0.2         | 0.2         | 0.2         |
| BHT          | 0.2          | 0.2         | 0.2         | 0.2         |

**Table 2: Composition of Experimental Diet in % (Dry Matter)**

| Ingredient   | Control Diet | Diet-A | Diet-B | Diet-C |
|--------------|--------------|--------|--------|--------|
| Company feed | 30           | --     | --     | --     |
| Flax seed    | --           | 10     | 30     | 50     |
| Wheat bran   | 30           | 30     | 25     | 18     |
| Corn Flour   | 15           | 24     | 15     | 12     |
| Rice bran    | 30           | 30     | 25     | 16     |
| Oil mix      | 04           | 04     | 04     | 04     |
| Premix       | 02           | 02     | 02     | 02     |
| Vitamin C    | 0.2          | 0.2    | 0.2    | 0.2    |
| BHT          | 0.2          | 0.2    | 0.2    | 0.2    |

### White Blood Corpuscles

**Experimental Units:** Uniform sized rectangular aquarium tank 150L capacities were used as experimental units throughout the experiment for all the trials. The tanks were covered with perforated cover. The tanks were initially washed and filled with Potassium permanganate solutions (4 mg l<sup>-1</sup>) that were left overnight ten fishes of uniform size were kept in each tank. Ten fishes of uniform size were kept in each tank. The experimental conditions were kept same throughout the study. Blood collected by puncturing the heart of fish on 10th day and 30<sup>th</sup>.

### Formulations and Preparation of Experimental Diets:

Ingredients of interest such as flaxseed, wheat bran, rice bran, corn flour, oil mix (sunflower oil + cod liver oil), vitamin and mineral mixture (premix plus), BHT (Butylated hydroxyl toluene) and vitamin C were taken for feed formulation (Table1). Four diets, one control diet and other Diet A (10% flax seed), Diet B (30% flax seed) were prepared respectively.

**Collection of Blood:** Each fish was anesthetized with clove oil at 50µl of clove oil per liter of water before

taking blood. Blood was withdrawn from caudal vein (Vena caudales) using a medical syringe (23G), which was previously rinsed with 2.7% EDTA solution. Blood collected was then transferred immediately to test tube containing thin layer of EDTA powder (as anticoagulant) and shake well in order to prevent haemolysis of blood. RBC, WBC Hb, PLT, MCV, MCH, and MCHC were measured by using Colter Counter, Hematological 5 part auto analyzer machine.

Hb - Haemoglobin

MCH - Mean corpuscular haemoglobin

MCHC - Mean corpuscular haemoglobin concentration

MCV - Mean corpuscular volume

PLT - Platelets

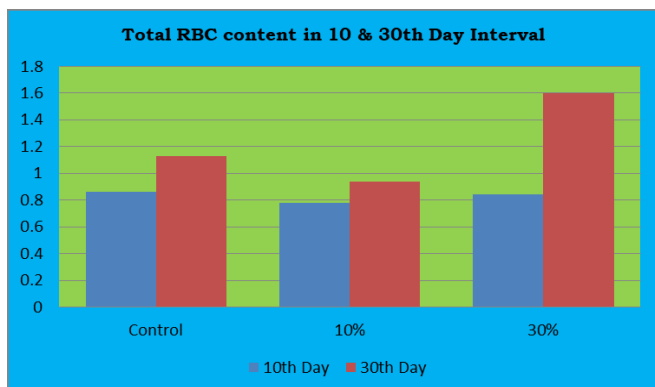
RBC - Red Blood Cell

WBC - White blood corpuscle

## RESULT AND DISCUSSION

**Red Blood Corpuscles:** Experiments it was observed that the RBC, Haemoglobin content, PLT, MCV, MCH, MCHC values were more with T2 diet (50% flax seed) while RBC, WBC count and Haemoglobin content values were less with T1 (10% flax seed) and T2 (50% flax

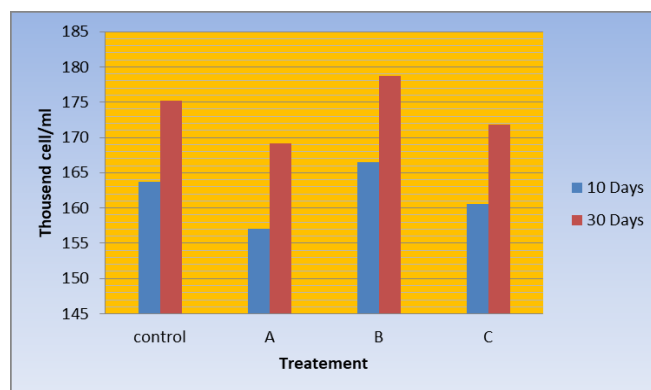
seed) diet. In the present study the fingerlings of the *Labeo rohita* were fed with 10% and 50% flax seed meal out of which 50% flax seed meal showed the best performance. To get an insight into nature of changes that are taking place in the blood parameters in an organism as a result of high-low protein diets (main inclusion flax seeds), encounter, and hematological studies were carried out in the fish *Labeo rohita*. The amount of RBC, WBC, Haemoglobin, PLT, MCV, MCH and MCHC were found to be increased from the control. The values were more significant with 50% (T2) flax seed diet in comparison to control and (T1), 10% and 50% respectively. Hence it was found that the low cost feed ingredients showed encouraging result. Similar findings for *Labeo rohita* were also reported by (Abid and Ahmad 2009, and Hussain *et al.*, 2011), as they concluded that alternative cheaper protein sources can be efficiently used in making cost effective aqua feeds.



The feeding concept thus presents new options for farmers in particular for the culture of the more expensive carnivorous fish which tend to require a higher protein input. Such a feeding schedule will significantly reduce the total feed costs (Kumar *et al.*, 2013)

**White Blood Corpuscles:** After all experiments it was observed that the RBC, Haemoglobin content, PLT, MCV, MCH, MCHC values were more with B diet (50% flax seed) while RBC, WBC count and Haemoglobin content values were less with A (10% flax seed) and B (50% flax seed) diet. In the present study the fingerlings of the *Labeo rohita* were fed with 10% and 50% flax seed meal out of which 50% flax seed meal showed the best performance. To get an insight into nature of changes that are taking place in the blood parameters in an organism as a result of high-low protein diets (main inclusion flax seeds), encounter, hematological studies were carried out in the fish *Labeo rohita*. The amount of RBC, WBC, Haemoglobin, PLT, MCV, MCH and MCHC

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