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# Comparison Between Value of Indian Major Carps and Air Breathing Carps in Open Inland Fishery Sector

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**ABSTRACT**

In India, 75% population live in rural area and agriculture fish farming are major occupation of them who live in village. The total fish production of 10.07 million metric tonnes in India presently has nearly 65% contribution from the inland sector and nearly the same from culture fisheries. Actually Fish constitutes major source of protein in the diet. Fish apart from being important in human diet, its fatty acid are currently under intense scientific investigation because of numerous health benefits attributed by them. The objective was comparison between value of Indian Major Carps (IMC) and Air Breathing Carps (ABC) in open inland fishery sector. The amount of protein in fish muscle is usually somewhere between 15-20%, but values lower as 15% or as high as 28% are occasionally met with in some species. IMC are demandable and easily acceptable for consumers, it can fulfil population demand for their nutritional value in everyday life and air breathing fish not easily available and acceptable by all classes of consumer. Among IMC Rohu (*Labeo rohita*) achieve the 1st position as it can fulfil population demand for their nutritional value at a lower cost for the above reasons. Even induced breeding become more popular in IMC where as the anthropogenic activity is tough for air breathing fishes. Their seeds collected from the natural environment, but due to exposure of chemicals in land and water the population become enough less day to day. So, save them from the list of endangered species for their nutritious value as compare to protein and lipid.

**Key words:** Indian Major Carps (IMC), Air breathing fish, protein, lipid, human diet, population demand, scientific investigation, induced breeding, nutritious

## INTRODUCTION

Fish constituents a major source of protein in our diet and its growth depends on number of factors such as food, space, temperature, salinity, season and physical activity[1]. Fish have a low caloric value and low fat but high protein content. Studies on the chemical composition of fish have been carried out on marine fish, but analyses carried out on fresh water fish are rare. Fish can remove from malnutrition of people easily. The live weight of Majority of fish usually consists of about 70-80% of water, 20-30% of protein, 2-12% of lipid[2]. The reason for superior food conversion efficiency of fish is due to assimilation of protein rich diet because of their lower dietary energy requirements. Fish helps to reduce blood pressure by small amount but improve blood clotting regulation. All proteins are chains of chemical units. They are linked together

to make one long molecule. These units, of which there are about 20 types, are called amino acids. Among all proteins some are essential in the human diet for the maintenance of good health. Lysine and methionine are two essential amino acids, present in high concentrations in fish proteins. Fish protein gives a good combination of amino acids which is highly active to people's nutritional requirements. The main body constituents of the fish are including water, lipid, ash, protein. Carbohydrates and non- protein compounds are also important constituents but are present in small amount and are usually ignored during analysis[2,3]. The study objective was comparison between value of Indian major carps and air breathing carps in open inland fishery sector.

## MATERIALS AND METHODS

**Study area:** Fresh fish samples of *Labeo rohita* (rohu), *Anabas testudineus* (koi), *Heteropneustes fossilis* (singhi) were purchased from whole seller fish market (Gate Bazar) at Midnapore Town, Paschim Midnapore.

**Methods of data collection:** We had visited the market and collected the data from the sellers from March to May 2017 about the different types of fish (Table 1). By consulting the buyers also, objectives matched with them that air breathing fishes are how much costlier and demandable also.

**Study design:** The fish samples were immediately packed in autoclaved poly bag and brought into the laboratory. Fishes are washed with distilled water, measured the length and weighted by digital weight machine. They are all approximately 100 g.

**Frequency of analysis-biochemical estimation:** Protein can be estimated from the fish flesh according to the methods of Lowry *et al.*[4] using Folin-Phenol reagent. The 200 mg of muscle tissue was taken from fish muscle and homogenized in 5.0 mL of 0.1(N) NaCl. Then 2.0 mL of 5% PCA was added to the above mixture. Centrifuged the homogenate at 10,000 rpm for 10 min and then supernatant was discarded. Again wash with 2.0 mL of 5% PCA. The 5.0 mL of diethyl ether was added to the pellet and again centrifuged at 10,000 rpm for 10 min and then decant the supernatant. The pellet was dissolved in 2.0 mL of 0.1(N) NaOH. This mixture used for protein determination.

Pipette out 0.2 mL of above mixture in a test tube. Then made up the volume to 0.5 mL with 0.1(N) NaOH/distilled water. Blank were prepared contains 0.5 mL of distilled water instead of sample mixture. The 5.0 mL of copper reagent was added to each of the test tube including blank. The mixture was properly mixed by cyclomixture and allowed to stand for 10 min. Then 0.5 mL of Folin Phenol reagent was added to each of the test tube and incubated at room temperature for 30 min. Blue colour developed after 30 min was read in Spectrophotometer at 660 nm. Standard curve was prepared earlier using BSA as a protein source and protein content was calculated with the help of this standard curve. The values were expressed as mg/g wet weight of tissue and the concentrations were expressed as percentage. This value can be obtained from the graphical method of Lawry standard curve.

Lipid from the fish muscle was estimated by the method of Folch *et al.*[5] using chloroform methanol (1:1) mixture. Then lipid content was calculated by the following formula. Lipid content in the muscle:

$$(g/kg) = (F-I) \times 100/X \text{ g/g\%}$$

Where:

F = Final weight of watch glass

I = Initial weight of watch glass

x = g muscle sample taken for estimation

## RESULTS AND DISCUSSION

The information of protein and lipid are important for the fish used as food by the consumers. This also facilitates the selection of most appropriate species having higher protein contents and condition for human consumption. The body composition is used as an indicator to assess the nutritional status and condition of fish.

The average value of protein variation was 16.99% which is near to the findings of Pradhan *et al.*[6] and Mahboob *et al.*[7]. The protein content is 18-20%[8]. The finding results of protein are most of the same value with the Table 2. The variation of lipid

Table 1: Length of fishes

| Sr. No. | Name of fish | Length (cm) |
|---|---|---|
| 1. | Rohu | 20.0 |
| 2 | Singhi | 23.8 |
| 3. | Koi | 16.2 |

Table 2: Protein lipid average SD value

| Sr. No. | Fish samples | Protein (g/g%) (Avg) | Lipid (g/g%) (Avg) |
|---|---|---|---|
| 1. | Singhi (stinging cat fish) | 18.60±1.3 | 1.4±0.2 |
| 2. | Koi (climbing perch) | 16.90±0.3 | 4.4±0.8 |
| 3. | Rohu | 15.49±0.4 | 2.9±0.1 |

ranges from 1.5 to 5.2%. In general average value of lipid is 7.35% which is supported by the study of Pradhan *et al.*[6] and Mahboob *et al.*[7].

Air breathing fishes can survive in waste water bodies. In case of aerobic hypoxia it can take oxygen from air by their air breathing organ. No need of supplementary food in shallow water bodies. Cat fish (Magur, Singhi, Koi) plays as an important role in everyday life as a nutritious food for medical treatment. But in case of artificial breeding the breeding rate and survival rate of fry is too low. We are trying for better improvement through artificial breeding.

## CONCLUSION

Indian major carps are highly valuable, demandable and nutritional food for the population. According to cost IMC is better than breathing fishes. For this cause should increase the production of IMC, so that maximum population will be eligible to buy this type of fishes in future. If it's possible can make a new invention for all.

## REFERENCES

1. Weatherly, A.H. and H.S. Gill, 1987. The biology of fish growth. Academic Press, London, UK.
2. Love, R.M., 1970. The chemical biology of fishes. Academic Press 1 London, UK.
3. Cui, Y. and R.J. Wootton, 1988. Bioenergitics of growth of cyprinids, Phoxinus, the effect of the ration and temperature on growth rate and efficiency. J. Fish Biol., 33: 763-773.
4. Lowry, O.H., N.J. Rosen Brough, A. Farr and R.J. Randall, 1951. Protein measurement with the Folin phenol reagent. J. Biol. Chem., 193: 265-275.
5. Folch, J., M. Lees and G.H.A. Sladane-Stanley, 1957.A simple method of the isolation and purification of total lipid from animal tissue. J. Biol. Chem., 226: 497-509.
6. Pradhan, S.C., A.K. Patra and K.C. Mahanty, 2012. Biochemical studies of muscle. Int. J. Curr. Res., 4: 228-234.
7. Mahboob, S., F. Liaquat, S. Liaquat, M. Hassan and M. Rafique, 2004. Proximate composition of wild and farmed *Labeo rohita* (Rohu), Pak. J. Zool., 36: 39-43.
8. Jindal, M., S.K. Garg and N.K. Yadava, 2008. Effect of feeding dietary protein sources on daily excretion in Channa punctatus for sustainable aquaculture. Adv. Aquatic Ecol., 21.