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STUDY ON THE LIPID CONTENT OF SELECTED FISHES (M.S.), INDIA

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Research Paper

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ABSTRACT

An estimation of lipid content in selected fishes namely rohu, mrigala, silver pomfret and pomfret was carried out during year 2018-2019. In the present study, authors found the amount of lipid content in rohu was 0.760 mg/, in mrigala 0.448 mg/g, in pomfret 0.753 mg/g and in silver pomfret 0.619 mg/g. On the basis of result obtained, it can be concluded that, rohu and pomfret contain more amount of lipids as compared to mrigala and silver pomfret.

Keywords: Estimation, Lipid, Fish.

INTRODUCTION

Fishes are exclusively aquatic animals with streamlined body. They have gills for respiration and lateral line sense organs (Verma and Prakash, 2020). They have a very rich nutritive value, providing food and establishing the food security to human beings (Verma, 2007; Kumar *et al.*, 2020). They have large amount of proteins and fats (Sujatha *et al.*, 2013; Syed *et al.*, 2020). They claimed that fishes are highly nutrient-dense food, containing high quality of minerals, vitamins and including vitamin A and D, magnesium and phosphorus. Consuming whole fish can prove beneficial as it has a higher protein-fat ratio than meat from goat, lamb, buffalo, and chicken (Steffen, 2006). A significant percentage of the lipid in fish consists of long chain polyunsaturated fatty acids (PUFA) including eicosapentaenoic acid (EPA) and docosahexanoic acid (DHA). In fishes, PUFAs are found in a form that is liquid and flows freely through the bloodstream. It is different from other fats or oils (Morales *et al*., 2015). In humans, dietary intake of polyunsaturated fatty acids (PUFA) has been important for human nutritional, health, and disease prevention (Sujita *et al*., 2019). Omega-3 fatty acids commonly found in seafood have varied health benefits (Prakash and Verma, 2019, 2020). Reduction of myocardial infarction has been suggested by Bucher *et al*. (2002). As living organisms occupy the environment, lipids and their components play an integral role in their biochemical adaptations. Biochemical processes and life development rely heavily on these lipids. There is a range of functions that lipids play in cellular metabolism (Svetlana *et al*., 2013). Due to its widespread existence in the body, cholesterol is perhaps the well-publicized lipid in nature. Significant losses may occur during periods of high cholesterol levels in seasonal differences (Spinelli and Dassow, 1982; Prakash and Verma, 2018). Even though protein is an important source of energy in fishes but stress conditions causes rapid depletion of stored carbohydrate (Verma and Prakash, 2019; Prakash, 2020).

MATERIALS AND METHODS

In the present study Rohu, Mrigal, Pomfret and Silver pomfret were analyzed for their lipid content (Photo plate 2). For the estimation of lipid fishes were collected from local fish market of Pathardi phata, Nashik (M.S.) and brought them to laboratory one at a time. 1 g lateral body

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tissue was taken and homogenized then homogenized sample was filtered through filter paper. The homogenized filtrate was used for further estimation (photo plate 1). Then lipid content of a particular fish was estimated by using standard procedure. Estimation of lipid was done by Vaniline reagent method; a standard method for lipid estimation (Barnes and Blackstock, 1973). 1 g tissue of fish (namely rohu, mrigala, silver pomfret and pomfret) was taken and homogenized in 10 ml of 2:1 chloroform: methanol mixture (Photo plate 1). Homogenized sample was filter through Whatmann filter paper no.1. 1ml filtrate was taken in test tube and dried at room temperature for 1-2 days. After drying 1ml conc. H_2SO_4 was added. Then mixture was boiled for 7-10 min and cooled at room temperature. 0.2 ml of supernatant solution was taken and 5ml of vaniline reagent added to it. At 530 nm the intensity of color was measured.

Photo plate 1: Images for Lipid estimation.

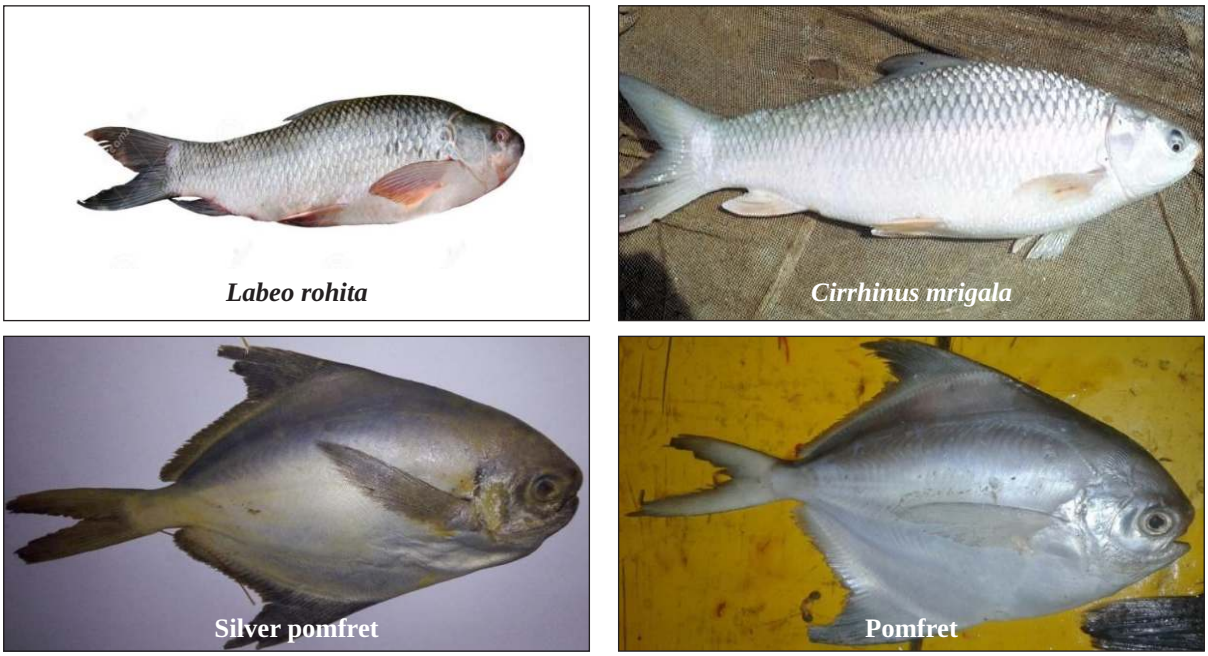


Photo plate 2. Photographs of the fishes under study.

RESULTS AND DISCUSSION

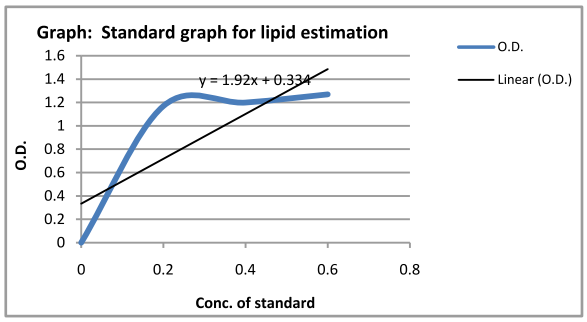
In the present study, lipid estimation was done from rohu, mrigala, pomfret, silver pomfret fishes. In rohu 0.760 mg/g lipid was estimated, in mrigala 0.448 mg/g, in pomfret 0.753 mg/g and in silver pomfret 0.619 mg/g as shown in table no. 2. Binukumari and Vasanthi (2013) conducted their researches on *Labeo rohita* and estimated protein, lipid and carbohydrate under normal and experimental condition from different body tissues. They showed that the protein present in muscles of rohu was 2.89±0.052 mg/g. Sivakami *et al.* (1994) reported that there was a marked decrease in

protein, lipid and carbohydrate content in fresh water fish *Mystus vittatus* exposed to chromium. Saranya *et al.* (2014) reported the low value of lipid during January (2.772 mg/g) and high value in month of February and March in the fish Mrigala.

Fatty acids and lipids play a significant role in structuring of the membranes and directly impact several membrane-mediated processes, including nutrient absorption and transport. Species and habits of fish also affect the amount and type of lipids present in fish. Because of the strong association between high levels of cholesterol in the blood and diseases affecting the cardiovascular system, cholesterol is undoubtedly the most widely discussed lipid in nature. An important component of all cells, it contributes to permeability. It assists in the formation of bile acid and bile salts, 7-dehydrocholestrol and vitamin D3, corticosteroid hormone, androgens, estrogens and progesterone. The lipid acts as an antagonist to phospholipids and is essential for the granulation of cell divisions (Sujatha *et al.*, 2013).

Table 1: Concentration of standard lipid and their O.D.

Concentration of Std. lipid (cholesterol)	O.D.
0	0
0.2	1.17
0.4	1.2
0.6	1.27



Calculations: Lipid estimation

Y= mx + C

Where, Y= unknown O.D.

M = slope

x = concentration of known protein

C = intercept.

General formula used for Carbohydrate, Protein and lipid estimation is

$$x = \frac{(Y- C)}{M}$$

Table 2: Lipid estimation of some fishes represented in terms of mg/g.

Fishes studied	Lipid(mg/g)
Silver pomfret	0.619
Pomfret	0.753
Rohu	0.76
Mrigala	0.448

Rohu has highest source of lipid content, followed by pomfret and lowest in Mrigal. Silver pomfret contains low amount of lipid than rohu and pomfret and high amount of lipid content than *Cirrhinus mrigala.*

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