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PROTEIN ESTIMAION IN SEVEN DIFFERENT SUN DRYED FISH SPECIES IN CUTM CAMPUS, BHUBANESWAR

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Abstract: Sun dry fishes are a traditional product which are dried in various ways by different ethnic groups so their texture, test, smell varied from product to product. Dried fish has very high nutritional value and is a rich source of protein. Protein estimation was done on seven dried fish samples traditionally prepared in Deogarh district of Odisha, India. Samples were collected from various parts of that district namely Kandhal, Balam, Bahadapasi etc. The samples included the fish species like *Labeo rohita*, *Chana punctata*, *Heteropneustes fossilis*, *Cirrhinus reba*, *Mastacembelus armatus*, *Puntius ticto* and *Mystus vittatus*. The protein content of samples was estimated by use of different instruments like centrifugation machine, Oven, Spectrophotometer etc.

Keywords **- Protein, sun-dry fish, Lowry, energy source, traditional.**

INTRODUCTION

Nutrition is an important factor of fish production and consumption. Fish is one of the important food components of our diet and a good source of protein. Sundry fish contain a good quality and quantity of digestible protein. Dry fish are kept for a long period of time that's why it is use during the scarcity of fresh fish.

Dry fish is a medium cost dietary protein source which is a favourite food item among Odisha people and its market demand is very good. Some people don't like to consume some fresh marine fish species but they like to consume dry fish of those species. Dry fish has a storage life of several year which is a key feature of it and a rich source of protein,essential fatty acid,vitamins, many minerals et cetra. It is consumed and preferred all over the world for its nutritional value, taste and aroma.In the developed world,people are concern about risk and health issues.On the other hand,in the developing countries some consumers have higher purchasing capacity also conscious about their own health issues regarding intake of food due to social inequality.

Today people are very much concern about the health, nutritional issues and nutritional values of food items when they are buying food items from market.The demand for dried RTE (ready-to-eat) and RTC(ready-to-cook) is gradually growing because of their convenience. They are very popular in Asia because of their long self-life, quality,easy transportation capacity and stability.Consumer should be able to rehydrate and cook dried fish with in a very short period of time but they should be as nutritious and tasty as fresh and frozen fish (Thorner 1973). The costal water of Odisha appears to be potentially very rich as a fishing ground with a variety of fish species. A large quantity of fish captured during the winter season which comprised of low price, are further use by the fishers for sun drying.

In fresh fish micro-organism grow very quickly until unless we preserve it .Drying of fish is a method of preservation of fish by removing the water content of body because that promote the microbiological , chemical and biochemical deterioration .Sun drying is an ancient practice of food preservation , which is very cheap and effective one , and the resulting product is very easy to transport and store over a long period .A number of studies has been done on marine fishes which are found in the literature . However very few workshas done on dry fishes. This work will be one of its kind to explore the protein content of dry fish.

Fisheries have social,economic,nutritional and food security importance.A rough estimation told that today about forty million people are employed world-wide in fishery activities (FAO;2012).Indian dry fish market export eight percent(8%) of total dry fish and earned INR 7540 million during 2012 -2013 (MPEDA, 2013). In present day the dry fish export potential of India increases to 25% of the total sea food export from 7% (Feb 3, 2016). The nutritional quality of dry fish some time retains high nutritional value as compared to fresh

fish (Faruque, et al. 2012). About two third (78%) of total fish catch in India are consumed in fresh form and remaining one third (6%) are consumed in preserved form. (Govindan 1985)

Protein are complex organic compounds and made up of long chain amino acid where the amino acids are bound together by peptide bonds.It is the building block of bones,muscle, cartilage, skin,blood ectra. It synthesizes enzyme, hormones and body chemicals. Protein perform body functions including modification of molecular reactions , DNA replications ,responding to stimuli , provide structure to cells and organs and transcribing molecules from one location to another .Proteins are different from one another according to their arrangement of amino acids which is detected by the nucleotide sequence of their genes and which usually results in folding of proteins in to specific three dimensional (3D) structure that determines its activity . As chain of amino acid residues is called polypeptide. A protein contains at least one long polypeptide chain. Polypeptides contain less than 20 -30 residues are considered to be proteins which are commonly called peptide in some cases called oligopeptides. A single amino acid residue is bonded together to adjacent amino acid residues.

Most proteins are folded in to unique three-dimensional structure. The shape of protein which are generally in folded form is known as its native conformation. Although some proteins can fold without any help through the chemical properties of their amino acid, other require the aid of molecular chaperons to fold in to their native states. Biochemists divide it in to four distinct aspects of protein structure (Murray et al. 2006).

(i)Primary structureis the amino acid sequence.This protein is also known as poly amide.

(ii)Secondary structure is regularly repeating local structure stabilized by hydrogen bonds. It is of three types-alpha helix, beta helix and turns.

(iii)Tertiary structures are the overall shape of a single protein molecule; the spatial relationship of secondary structure to one another. Tertiary structures are generally stabilized by molecular interactions,most commonly the formation of a hydrophobic core but also through salt bridges, hydrogen bonds, disulphide bond and even post translation. The tertiary structures control the basic functions of protein.

(iv) Quaternary structures are the structure formed by poly peptide chains, usually called protein sub units in this context, which function as a single protein complex.

MATERIALS AND METHODOLOGY

Sample collection

Dried fish species were collected from traditional dry fish markets of Deogarh district of Odisha, India. Seven number of dried fish species were namely Barkot, Bahadapasi, Jhumpra etc. collected from local market. Sampling sites are listed in Table-1. The collected dried fish samples were grinded to take out the powder extract in different bags and use for further protein estimation.

Table 1. Samples with sampling site.

Samples	Collection site
Labeo rohita	Bahadapasi
Heteroneptus fossilis	Barkot
Puntious ticto	Jhumpa
Mystus vittatus	Barkot
Mastacembelus armatus	Barkot
Chana panctata	Barkot
Cirrhinus reba	Barkot

Protein Analysis

Protein content was determined by Lowry's method with slight modification in conn. of chemicals and samples used.

RESULTS AND DISCUSSION

In present study of protein estimation on sun dried fishes that including the preparation of perfect concentration of chemicals standard solutions with all the precautions, reference and guidance during the study time. The whole procedures were conducted properly to find out the actual result of the specimen. These were summerized in the tables below.

The optical density (OD) of all the sundried fish powder were summerized, mean and standard deviation of all these optical density datas were summerized in Table no-1 of statistical analysis part.

The study was carried out to find the result about the protein content of different sundried fish and estimate which fish has highest protein content and which fish has lowest protein content.

The total protein concentration found to be in *L. rohita* was (0.95±0.35), *H. fossilis* was (0.97±0.40), C.reba was (1.14±0.50), *P. ticto* was (1.24±0.48), *M. vivitatus* was (1.06±0.50), *M. armatus* was (0.96±0.25), *C. punctata* was (1.39±0.25), standard solution was (1.48±0.35). The protein content was found to be highest in *C. punctata* with (1.39±0.25) and lowest in *L. rohita* with (0.95±0.35). So the nutritional value of sun dried *C. punctata* is very high as it has high protein content as compared to the other taken fish samples.

High protein food can help to reach at fitness goals. Protein is much required for healthy body.Serum proteins are divided into two groups, alumin and globulin. Protein acts as a transporter of hormones,vitamins, minerals, lipid and other materials. In addition to proteins help to balance the osmotic pressure of blood tissue.

Table-2 Protein content (Mean±SD) in different species of dry fishes with standard comparison.

SAMPLE NAME	MEAN	±SD
C. reba	**1.14**	**0.50**
H. fossilis	**0.97**	**0.40**
L. rohita	**0.95**	**0.35**
Standard solution	**1.14**	**0.35**
C. punctata	**1.39**	**0.25**
M. armatus	**0.96**	**0.25**
M. vivitatus	**1.06**	**0.50**
P. ticto	**1.24**	**0.48**

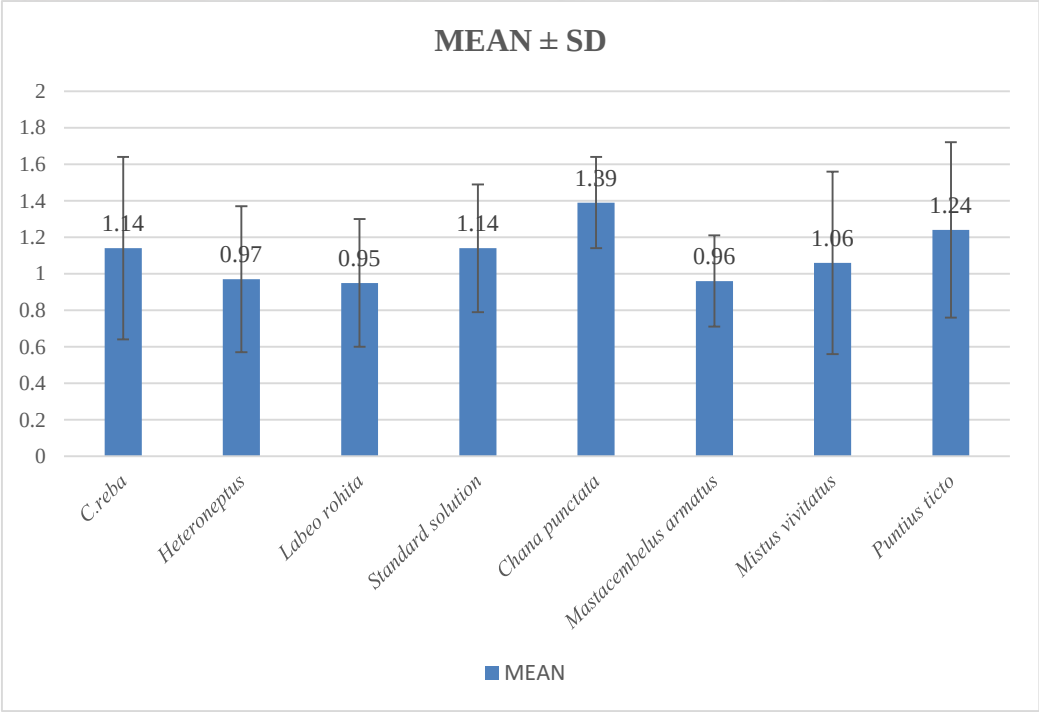

Figure 2. Graphical representation of mean value of fish samples

SUMMARY AND CONCLUSION

Fishing is the process of rising the fish productivity in whole world.It is commonly kept for the production of fish which are the best source of protein and helpful for human health. The study of sundry fish is involved in production and marketing of sundry fish products because it has an economic importance. Fishing mostly includes breeding, nutrition, management, disease control and marketing. Dry fishing mostly includes drying, management, disease control and marketing.

Dry fish also has high nutritional value so eating of dry fish is important for health, body growth and development of body because it is rich in 80-85% of protein, antioxidant, omega-3, low cholesterol and 300 calories of energy. Dry fish contains little salt or cholesterol while being high essential vitamins and minerals. It also has low saturated fat, which is known for aggravate heart and blood-pressure problems. As awareness of obesity, diabetes and heart disease continues to increase, the demand for dried fish will increase as well, benefiting retailers.

Protein is a key source of antibodies and enzymes for all living beings, and makes up an essential part of muscles, hair, bones, cartilage, skin, blood and other bodily components. The protein estimation analysis held on to know about the significance of dry fish in health care. Because protein is very much important for a healthy life.

For the biochemical analysis of protein content, the different species of dry fish were selected. Then powder of dry fish was prepared and taken it for protein estimation. To get the result, biochemical analysis of protein content was done, which was done by centrifugation of collected powder for 20 minutes. From the obtained supernatant, the biochemical parameter that is protein was estimated using required chemicals and spectrophotometer. Then the statistical analysis of concluded datas were done by using excel sheet.

And finally from all it is concluded that, protein content is highest in *Chana punctata* with 1.39±0.25 protein and lowest in *Labeo rohita* with 0.95±0.35 protein.

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