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RESEARCH ARTICLE

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Proximate, Amino acid and Fatty acid profile of selected two Marine fish from Parangipettai Coast.

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Abstract
In this present study the protein, carbohydrate, fat, ash and moisture contents of *Sardinella longiceps* and *Plotosus lineatus* having 26.05 Mg/g, 2.35, 79.93, 5.67, 4.76 Mg/g. and cat fish have 32.56 Mg, 1.98, 66.53, 3.46, 4.03 Mg/g. respectively. Total of 20 amino acids which exhibit high levels of phenylalanine followed by lysine and Iso leucine based on the quantum of availability of EAA in the *P. lineatus.* In the present investigation the fatty acid concentration is the major element in both investigated fish. In this result, Palmitic acid, Magaric acid and Stearic acid are the major component in both sample. Consumption of fish and other marine products has always been a major factor in the economy and nutrition of the coastal inhabitants. This information will give the nutritional truth of various elements of the Oil Sardine and Stripped eel catfish leading to fundamental importance for the application of various technological processes.

Keywords: Amino acid, Fatty acid, *Plotosus lineatus,* Proximate and *Sardinella longiceps.*

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INTRODUCTION

In this current scenario the dietary importance of seafood has raised considerably owing to scientifically known beneficial effects of consuming aquatic foods, fats and oil. Marine fish species contributes extremely to the delivery of macro and micro nutrients in our normal food diet (Flowra and Tumpa, 2012). In general, the proximate composition, amino acid level and fatty acid composition of fish are varied from one to another species. It is depending on age, sex, environment and season variations. The biochemical compositions are closely connected to feeding habit, migration and sexual changes in connection with spawning (FAO, 2002; Love, 1988 and Balogun, Talabi, 1985).

Fish are most important source of animal protein and usually consuming at several place of the world due to its having high contents of protein, amino acid and saturated fatty acid. It is more essential for human diet, to raise the utilization of marine fish and its products (Burr, 1989 and Sargent, 1997). Tissue proteins contain 20 different amino acids including essential and non essential of nutritional importance (King et al 1990). A sufficient quantity of dietary protein is required for growth, survival, development, reproduction and maintaining good health throughout life. Amino acids play a vital role both as building blocks of proteins and as intermediates in metabolism. Fish oil is one of the most significant natural sources of polyunsaturated fatty acids. It is scientifically demonstrated to have functional effects on human diet (Saoud et al., 2008; Rafflenbeul, 2001). The fatty acid compositions in fish are influenced by the surroundings and nature of feeding habit (Moreira et al., 2001 and Suzuki et al., 1986). The marine fish contain significant amount of polyunsaturated fatty acids (PUFA) like n-3 PUFA has raised concentration due to it can prevent human cardiovascular disease, anti-inflammatory, anti thrombotic effects, reduction of blood cholesterol level and prevention of cancer (Kris-Etherton et al., 2003; Chen et al., 2007 and Din et al 2008).

Indian Oil Sardine *Sardinella longiceps* is a species of ray finned fish in the genus Sardinella. It can be found in the northern regions of the Indian Ocean. Phytoplankton and zooplankton are the major feed for this species (Whitehead et al., 1988).

The *Plotosus lineatus* is generally known as striped eel catfish belonging to the family of Plotosidae (Thunberg, 1787). It is inshore species, inhabiting a variety of habitats, such as lagoon, sandy substrate and coral reefs (Golani, 1993).

The purpose of the present study has to investigate proximate and fatty acid compositions of the marine catfish and sardine fish. The data obtained will provide the nutritional fact of various parts of the fish which will be fundamental importance for the consumers.

Picture 1: ***Sardinella longiceps.***

Picture 2: ***Plotosus lineatus.***

MATERIALS AND METHODS

Collection of sample:

Fresh samples of catfish *P. lineatus* and sardine fish *S. longiceps* were collected from Parangipettai Coastal area. They were kept in cold iced box and transported to the laboratory. Non edible parts like intestines, gills, liver and gonads were removed from the sample fish and edible portion only took for the analysis. Those species of the fish sample was oven dried in an electric oven at between 70-80 °C until the samples get constant weight and used following procedure for the analysis.

Estimation of Protein:

The Folin-Ciocalten Phenol method of Lowery *et al.* (1959) was used for the determination of the total protein in the tissue.

Estimation of Lipids:

The lipid content was estimated by the procedure given by Folch *et al.,* (1957).

Estimation of Carbohydrates:

The total carbohydrate was estimated by Phenol-Sulphuric acid method described by Dubois *et al*. (1956).

Estimation of amino acid:

The experimental samples where finely ground for estimating the amino acid in the HPLC (Merck Hitachi L-7400) following the method of baker *et al.,* (1994).

Fatty acid analysis:

The lipids were extracted according to the method of Bligh and Dyer, (1959) and the total fatty acid composition was determined by Gas Chromatography Chemito, 8610.

RESULT

Proximate composition:

In this present study the protein, carbohydrate, fat, ash and moisture contents of *S. longiceps* and *P. lineatus* having 26.05 Mg, 2.35, 79.93, 5.67 Mg and 4.76 Mg/g. in catfish it has 32.56, 1.98, 66.53, 3.46 Mg. and 4.03 Mg/g. respectively. In this result protein and fat level are increased in *S. londicps.* In *P. lineatus* the carbohydrate, ash and moisture contents are higher than *S. londicps*. Figure one shows the proximate composition list.

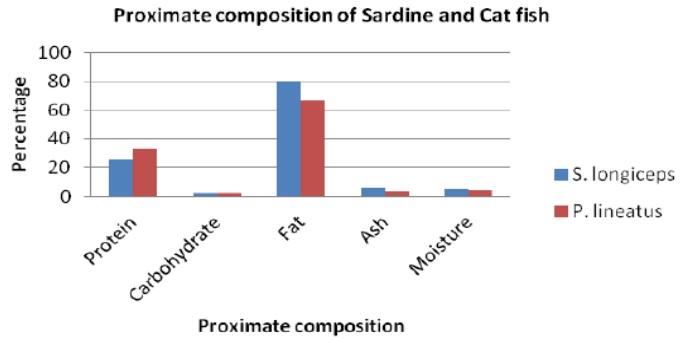

Figure 1: Proximate composition of Sardine and Cat fish.

Estimation of Amino acids:

The present study showed that a total of 20 amino acids which exhibit high levels of phenylalanine followed by leucine and histidine are based on the quantum of availability of EAA in the *S. longiceps* and *P. lineatus*. EAA results are listed on Figure Two. In NEAA Asperagine is predominant element followed by glutamic acid, alanine and tyrosine. Results are listed on Figure Three.

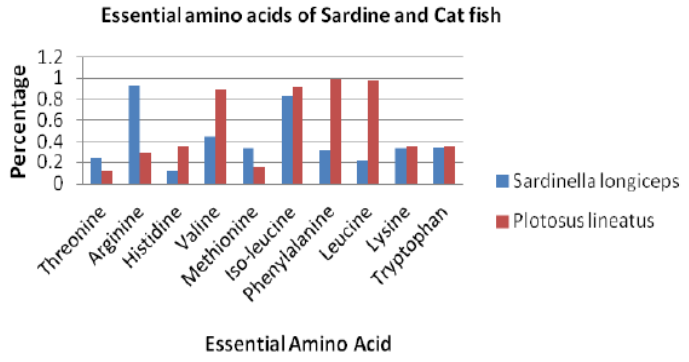

Figure 2: Essential amino acid of Sardine and Cat fish.

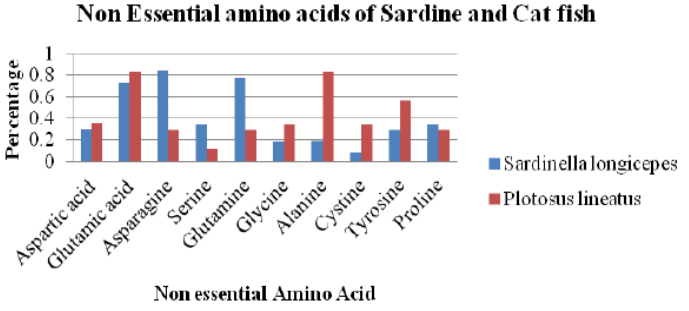

Figure 3: Non essential amino acid of Sardine and Cat fish.

Estimation of Fatty acids:

In the present investigation the fatty acid concentration is the major element in both investigated fish. In this result Palmitic acid, Magaric acid and Stearic acid are the major component in both investigated fish. Results were showed on Figure four.

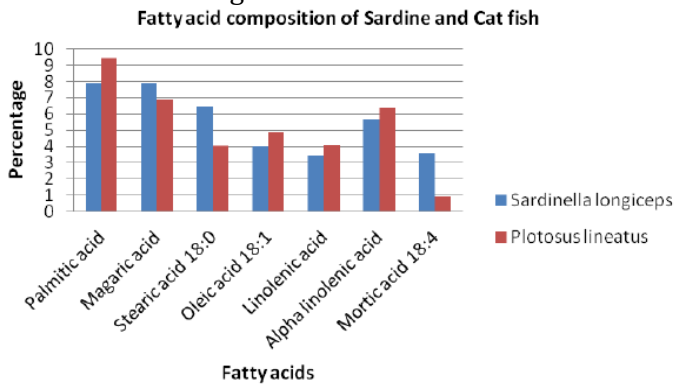

Figure 4: Fatty acid composition of Sardine and Cat fish.

DISCUSSION

Proximate composition:

In this current investigation the protein contents varied from 26.05 Mg/g to 32.56 Mg/g. in the tissues of Sardine fish *S. longicepes* and Cat fish *P. lineatus*. Parallel works are exposed from numerous fish species. Jitender kumar et al. (2012) were recorded the protein concentration at several fish species like Catla, Rohu, Magur and Pangas species has detected as 10.11 %, 9.53, 14.87 and 13.60 % respectively. Eswar et al. (2014) were checked the protein content on puffer fish of *Lagocephalus lunaris* and *Lagocephalus inermis*. In these species protein contained 9.22 %, 8.92 % in that order. Kumaran et al. (2012) were examined the protein level is 17.56 at some point of the Mullet fish *Mugil cephalus*. These variations could be the food and feeding pattern of the assorted fish species.

The present works revealed terribly elevated level of lipid content varied from 66.53 to 79.93 in investigated fish sample. Some related works were recorded on another fish. Holma et al. (2013) were recorded the lipid contents on fresh fish species having 9.99 %, on traditionally smoked fish species having 10.00 %, on fried fish species have 9.67 % and on salted red fish have 20.2 %. Kumaran et al., (2012) were observed the lipid level on *M. cephalus* contain 2.42 %. Manat Chaijan et al., (2010) were investigated the fat concentration on dorsal, ventral and lateral line of *Pangasianodon gigas* has 0.54 Mg/g. 4.21Mg/g. 8.60 Mg/g. respectively. These much unpredictability has occurred attributable to the food and feeding habitat of fish on different regions.

The moisture level of the sardine and cat fish were varied from 4.03 to 4.76 Mg/g. Similar studies were

conducted on some other fish species. The moisture contents on head 5.89% and bone region 4.22 % on *Oreochromis mossambicus* (Vignesh and Srinivasan, 2012). Manikandarajan et al. (2014) were recorded 5.17 gm of moisture content on cat fish *Arius maculatus*. Manat Chaijan et al., (2010) were recorded the moisture concentration on *P. gigas* at dorsal region 78.88 Mg. ventral region 81.67 Mg/g. and lateral line 75.51 Mg/g. This superior moisture level in organisms is considered benefit due to its involvement in the stabilization of the organisms during movements.

Estimation of amino acids:

The biological importance of protein is visibly reflected upon it essential amino acid content on the investigated species. The present study the twenty essential and non essential amino acids were recorded. Results showed in Figure one and two. Similar works are recorded like Vignesh and Srinivasan, (2012) were recorded twenty essential amino acids in *O. mossambicus* fish species, in this twenty essential amino acid 1.97 % of phenyl alanine, 1.83 % of aminoalkanoic acid, 1.41 % of glycine and 1.31 % of asparagines were recorded higher concentration on head and bone part of tilapia fish species. Kumaran et al., (2012) were studied the essential and non essential composition on *M. cephalus*. In this species ten essential amino acid and eight non-essential amino acids were detected. In this 8 amino acid, glutamic acid and aspartic acid are found as a predominant components in *M. cephalus*.

Estimation of Fatty acids:

The natural importances of lipids are visibly reflected in an investigated selected fish sample. In this current study entirely seven fatty acids were found on selected fish species. The fatty acid concentrations of *S. longiceps* and *P. lineatus* have varied from 0.93 to 9.44 Mg/g. A lot of work has been carried out by some other researchers on different fish sample. Osman et al., (2001) were studied the fatty acid level on 10 different fish species the fatty acid level was varied from 1.46 to 5.77 % Eswar et al., (2014) were observed the fatty acid composition on puffer fish. This author has mentioned PUFA like n-3 has 31.17 %, 31.19 and n-6 7.26 %, 7.29 % at puffer fish *L. lunaris* and *L. inermis* respectively. Memon et al., (2010) determined that Indus River fish are an honest supply of ω3 fatty acids, particularly Vignesh and Srinivasan, (2012) were recorded the fatty acid composition on *O. mossambicus* having higher level of alpha linolenic acid (C18:4) (2.43 Mg /100 g) in head region and the stearic acid (C18:0) (0.78Mg /100 g) in bone region has the major components. This variation could also be connected to the size of the fish investigated for the separate studies or seasonal conditions at the period of the study conducted.

CONCLUSION

Consumption of fish and other marine products has always been a major factor in the economy and nutrition of the coastal inhabitants. India with its immense coastal line has tremendous potential in terms of marine food capital. Fish are a potential source of proteins, essential amino acids and good fatty acids. This information will give the nutritional truth of various elements of the Oil Sardine and Stripped eel catfish leading to fundamental importance for the application of various technological processes.

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