Abstract

One of the cheapest sources of animal protein and other essential nutrients required in human diets is fish. The study was conducted to determine the proximate composition of three marine fishes of Thanjavur district. The fishes studied were Lutjanus campechanus, Sardina pilchardus and Lates calcarifer. It was found that Lutjanus campechanus, contains highest protein, and lipid concentration while Lates calcarifer holds highest concentration of moisture and lowest value of protein and fat. On the other hand, Sardina pilchardus hold lowest concentration of moisture. The finding has proved with strong evidence that three fishes undertaken for the present study are rich in the most nutrients essential for proper health maintenance of humans.

1. Introduction

Rich food for poor people, fish makes a vital contribution to the survival and health of a significant portion of the world’s population. It provides essential nourishment, like quality proteins, fats, vitamins and minerals. Fish is a major source of food for mankind all over the world from the times

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immemorial providing an important amount of animal protein in the diets of man. The importance of fish as source of high quality, balanced and easily digestible protein, vitamins and fatty acids is well understood phenomenon. Proximate composition of a species helps to assess its nutritional and edible value in terms of energy units compared to other species. Variation of biochemical composition of fish flesh may also occur within same species depending upon the fishing ground, fishing season, age and sex of the individual and reproductive status. The biochemical composition of the fish muscle generally indicates the fish quality and so, proximate composition of a species helps to assess its nutritional and edible value. Fish provides the most of the gross and essential protein, fat, minerals, vitamins and essential amino acids. It is excellent for growth and development of human body and prevents several nutritional deficiency diseases. Carbohydrates are the most economical and inexpensive sources of energy for fish diets. Protein is the most expensive part of fish feed, it is important to determine the protein requirements for each species and size of cultured fish.

Proteins are formed by linkages of individual amino acids. Over 200 amino acids occur in nature, only about 20 amino acids are common. Of these, 10 are essential amino acids that cannot be synthesized by fish. The 10 essential amino acids that must be supplied by the diet are: methionine, arginine, threonine, tryptophan, histidine, isoleucine, lysine, leucine, valine and phenylalanine. Of these, lysine and methionine are often the first limiting amino acids. Lipids are high-energy nutrients that can be utilized to partially spare protein in aquaculture feeds. Lipids supply about twice the energy as proteins and carbohydrates. Lipids typically comprise about 15% of fish diets, supply essential fatty acids (EFA) and serve as transporters for fat-soluble vitamins. Lipids from these marine oils can have beneficial effects on human cardiovascular system.

Several studies reveals the proximate composition of commercially important fishes (Qasim, 1972; Sinha and Pal, 1990; Das and Sahu, 2001; Patra et al., 2010). The present study was undertaken to elucidate the dynamics of biochemical composition of flesh of *Lutjanus campechanus*, *Sardina pilchardus* and *Lates calcarifer* collected from Thanjavur market.

### 2. Materials And Methods

Cultured live fishes are common food in several areas of Thanjavur, so marine decorate commercially available three different fishes such as *Lutjanus campechanus*, *Sardina pilchardus* and *Lates calcarifer* were selected for this study. The sample were collected and moisture was determined by drying the sample at 105° C in an oven (Maynard, 1970). Carbohydrate content was estimated by Anthrone method (Hedge et al., 1962). Protein was estimated by Lowry’s method (Lowry’s et al., 1951) Lipid was estimated by the method of Cox and Pearson method. The results obtained in the present investigation were subject to statistical analysis like mean and standard deviation (SD) and the results were tabulated Table 1 and Fig 1.

### Table 1: The results obtained in the present investigation

<table>
<thead>
<tr>
<th>S. No</th>
<th>Species name</th>
<th>Moisture</th>
<th>Carbohydrate</th>
<th>Protein</th>
<th>Lipid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Lates calcarifer</em></td>
<td>81.6 ± 1.51</td>
<td>30.8 ± 4.763</td>
<td>42.8 ± 7.10</td>
<td>1.122±0.47</td>
</tr>
<tr>
<td>2</td>
<td><em>Lutjanus campechanus</em></td>
<td>76.8 ± 3.56</td>
<td>32.7 ± 5.63</td>
<td>46.3 ± 3.04</td>
<td>1.683±0.74</td>
</tr>
<tr>
<td>3</td>
<td><em>Sardina pilchardus</em></td>
<td>72.2 ± 1.42</td>
<td>36.6 ± 4.25</td>
<td>44 ± 31.26</td>
<td>1.622 ± 0.71</td>
</tr>
</tbody>
</table>
3. Results And Discussion

Various biochemical parameters of *Lates calcarifer*, *Lutjanus campechanus* and *Sardina pilchardus* were analyzed. It was found that among the three species highest moisture content 81.6 ± 1.51 was recorded for the species *Lates calcarifer* and lowest content 72.2 ± 1.42 in *Sardina pilchardus*. The taste of the fish depends on its moisture content. Less moisture content reveals more taste (Ebanasar and Pazhanisamy). Complex nutrients such as carbohydrates, proteins and lipids constitutes the flesh of fishes. Nutritive value and biochemical composition have significant relationship with each other. This coincides the study moisture, protein carbohydrate, and fat, among the three different fishes studied, *Sardina pilchardus* showed less moisture content with high taste. Carbohydrate content was more 36.6 ± 4.25 in *Sardina pilchardus* and lowest content 30.8 ± 4.763 in *Lates calcarifer*. Less carbohydrates in *Lates calcarifer* indicates the food value for children and Diabetic patients. Highest protein content 46.3 ± 3.04 was recorded in *Lutjanus campechanus* and lowest content 42.8 ± 7.10 in *Lates calcarifer*. High protein level of *Lates calcarifer* showed its effective for growing person and adults. Highest lipid content 1.683 ± 0.74 was recorded for the species *Lutjanus campechanus* and lowest content 1.12 ± 0.47 in *Lates calcarifer*. Lipid content was...
comparatively low in all the fishes studied. The meagre lipid quantity does not have effect on consumption.

Chandra Shekhar et al. (2004) reported that moisture content was low when other constituents (Lipid, protein and carbohydrate) were high in *Labeo rohita*. Carbohydrates in fishery products contain no dietary fiber but only glucides, the majority of which consist of glycogen (Okuzumi and Fujii, 2000). Proteins are important biomolecules involved in a wide spectrum of cellular functions. Das (2001) reported that different species showed different lipid level at different condition (Temperature, Freezing time, Location size).

References