Abstract

Four commercially important edible shellfishes such as Penaeus indicus, Scylla serrata, Perna viridis and Loligo duvauceli were collected from Nattika, Kerala and their biochemical composition were analysed on nutritive aspects. Among the four shellfishes, the highest protein and lipid content were reported in Penaeus indicus. Highest carbohydrate and water content were estimated in Perna viridis. Highest ash content was estimated in Scylla serrata. The present investigation was a useful reference for consumers in order to choose shellfishes based on their nutritive value.

I. INTRODUCTION

Shellfishes are exoskeleton bearing aquatic invertebrates which represent an alternative food resource to finfishes. Shellfish should be considered as low lipid, high protein food that can be included in a low fat diet. They are rich in several vitamins and minerals that are needed to human body (Food and Nutrition Board, 2007). It is one of the most nutritionally balanced healthy diet. The analysis of biochemical composition of an organism such as protein, carbohydrate, lipid, mineral and moisture content is often necessary to ensure that they meet the nutritional requirements essential for the growth and health of a living being (Nicy, et al., 2016). Shellfishes form an important source of food especially for the coastal inhabitants. Besides forming a delicious food in domestic market, they form a rich source of foreign exchange also.
II. METHODOLOGY

Four important edible shellfishes such as *P.indicus*, *S.serrata*, *P.viridis* and *L.duvaucelli* were collected from Nattika, Kerala. The study involves the estimation of protein, carbohydrate, lipid, water, and ash content in the muscle by standard procedure. The Folin-ciocalteu method (Lowry method) was adopted for the estimation of total protein in the tissue. Total carbohydrate content was estimated by the procedure using phenol and sulphuric acid followed by colorimetry. The chloroform-methanol extraction procedure is used for extracting lipid from the tissue. The water content of the shell fish was estimated by drying a known weight of tissue in a hot air oven at 100°C for 6 hrs. The difference in weight before and after drying give the amount of water present and the result were expressed in percentage. Ash content was estimated by burning the oven dried sample in a muffle furnace at 550°C.

III. RESULT

The analysis of biochemical composition of selected shellfishes showed that *P.indicus* has high protein content (5.27mg/g). It was followed by *L.duvaucelli* (3.79mg/g), *S.serrata* (3.34mg/g) and lowest was reported in *P.viridis* (2.68mg/g). (Graph-1). Highest carbohydrate content was reported in *P.viridis* (0.189mg/g) and lowest in *L.duvaucelli* (0.071mg/g). 0.086mg/g and 0.083mg/g were observed in *P.indicus* and *S.serrata* respectively. (Graph-2). Highest lipid content was reported in *P.indicus* (4.27%) followed by *P.viridis* (3.8%), *S.serrata* (3.33%) and *L.duvaucelli* (3.2%) (Graph-3). Highest water content was reported in *P.viridis* (83%) and lowest in *P.indicus* (79%) (Graph-4).The water content in *S.serrata* and *L.duvaucelli* were reported as 81% and 80%. Highest ash content was reported in *S.serrata* (2.66%) followed by 2.19% in *P.viridis* and 1.76% in *L.duvaucelli*. The lowest ash content was reported in *P.indicus* (1.35%) (Graph-5).

Graph 1: showing the total protein content in selected shellfishes.
**Comparative Study on the Biochemical Composition of Some Selected Shellfishes on Nutritive Aspects**

**Graph 2:** showing the total carbohydrate content in selected shellfishes

<table>
<thead>
<tr>
<th></th>
<th>p.indicus</th>
<th>S.serrata</th>
<th>P.viridis</th>
<th>L.duvaucelli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate (mg/g)</td>
<td>0.086</td>
<td>0.083</td>
<td>0.189</td>
<td>0.071</td>
</tr>
</tbody>
</table>

**Graph 3:** showing the total lipid content in selected shellfishes

<table>
<thead>
<tr>
<th></th>
<th>p.indicus</th>
<th>S.serrata</th>
<th>P.viridis</th>
<th>L.duvaucelli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lipid (%)</td>
<td>4.27</td>
<td>3.33</td>
<td>3.8</td>
<td>3.2</td>
</tr>
</tbody>
</table>

**Graph 4:** showing the total water content in selected shellfishes

<table>
<thead>
<tr>
<th></th>
<th>p.indicus</th>
<th>S.serrata</th>
<th>P.viridis</th>
<th>L.duvaucelli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water (%)</td>
<td>79</td>
<td>81</td>
<td>83</td>
<td>80</td>
</tr>
</tbody>
</table>
IV. DISCUSSION

Edible shellfishes are valuable in the diet because they contain good quality protein, lipid, minerals, and vitamins which are beneficial to humans. Among the four shellfishes in the study, *Penaeus indicus* contain highest protein (5.27 mg/g) and lipid content (4.27%). The findings here are in agreement with the reports of Nurnadia, et.al. (2011) and Mukundan, et.al. (1981). From a nutritional standpoint, shrimps are high in protein, low in saturated fat, and have neutral flavor (Dayal, et.al., 2013). High protein, low lipid content, and highest ash content which is a measure of mineral content, were estimated in *Scylla serrata* in the present study. In 2000, Baliao observed that mud crab has high market value due to its low fat, high protein, mineral, and vitamin content as well as fine taste. According to Saritha, et.al. (2015), in *Perna viridis* the protein content and lipid content were high in comparison to carbohydrate and ash content. More or less similar results were observed in the present investigation also. So *P. viridis* can be considered as an alternative source of cheap animal protein. Nicy, et.al. (2016) reported that more than 75% of the cephalopod landings along southwest coast of India are generally represented by the squid, *Loligo duvauceli* and cuttlefish, which contain a good amount of protein and low fat. Crustaceans flesh is slightly higher in protein, while molluscs and cephalopods will be lower in protein content. The present study also agree with these results.

V. CONCLUSION

*P. indicus* can be suggested as an ideal nutritious food among the four shellfishes analyzed because of its relatively high value of protein and lipid. By avoiding the use of butter, ghee, and by choosing steam or broil instead of frying, shellfish can be a low fat, low cholesterol, high protein, and heart-healthy choice food. This investigation is a useful reference for consumers in order to choose shellfish based on their nutritive value.

VI. ACKNOWLEDGEMENT

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VII. REFERENCES


TO CITE THIS PAPER