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Chemical Composition of Marine Water fish Varieties

KEYWORDS: pink perch (Nemipterus raponicus), silver belly (Gerres filamentoses) Peroxide value, Rancidity

SOUMYA P.S

Krishy Vigyana Kendra, Kollam, Kerala Agricultural University

ABSTRACT *Fish is recognized as an excellent source of protein, containing all the ten essential amino acids in desirable concentrations for human beings and available at cheaper rate. The present study, on "Chemical composition of marine water fish varieties" was aimed at evaluating the nutrients analysis from two fish varieties namely pink perch (Nemipterus raponicus) and silver belly (Gerres filamentoses) belonging to marine species. The fresh fish varieties were analysed for chemical constituents like moisture, fat, protein, calcium, phosphorus, iron, vitamin A and peroxide value. From this study it is obvious that for comparing the two marine water fish varieties silver belly is found to be high nutritive value. The peroxide value and fat content were high in pink perch which is an indication of developing rancidity of fats.*

INTRODUCTION

In the animal kingdom, fishes are a large group consisting of about 24000 species showing wide morphological and habitat variations. Fish is a natural renewable resource, not only in terms of bio diversity but a source of high quality animal protein food for the people (Ravindra and Pahwar, 2001). Fisheries sector is one of the fastest growing production sectors in the world. In India, fisheries have always been playing a pivotal role in the food and nutritional security of the rural people especially in the maritime and north eastern state of India. In recent years, fish and fish products recorded a substantial quantitative rise in the domestic and export markets (Nair, 2006). Today there is an ever increasing awareness about health foods and fish is finding more acceptances because of its special nutritional qualities. Fish is an easily perishable commodity and deterioration in quality is due to the changes taking place in the various constituents like proteins, lipids etc. Information on the biochemical constituents will help a processing technologist to define the optimum processing and storage conditions, so that the quality is preserved to maximum extent.

EXPERIMENTAL DETAILS

Fishes were obtained from the Thrissur local market. Care was taken to ensure that all fishes used for various analyses were in fresh condition. Muscle from the rear portion of the trunk region of each fish was carefully removed so as to eliminate all bony elements. It was then macerated and processed for various estimations. For each estimation, duplicate samples of muscle were taken which each gave two or more readings.

The moisture content of the fish muscle was estimated by the method of AOAC (1980) and expressed in g $100g^{-1}$. To determine the moisture content, fish muscle was taken in a Petri dish and dried at 60^0C to 70 ^{0}C, in hot air oven. It was cooled in desiccators and weighed. The fat content of fish muscle was estimated by the method of AOAC (1955). Fish muscle was taken in a thimble and plugged with cotton. The material was extracted with petroleum ether for 6 hours without interruption by gentle heating in a soxhlet apparatus. Extraction flask was then cooled and repeated heating was done to remove ether and weight was taken.The protein content was estimated by the method of AOAC (1980). Fish muscle was digested with 6ml con: H_2SO_4 after adding 0.4g of $CUSO_4$ and 3.5g K_2SO_4 in a digestion flask until the colour of the sample was converted to green. Calcium content was estimated by titration method with EDTA as suggested by Page (1982). Phosphorus was estimated colorimetrically after preparing a diacid extract by vandomolybdophoshoric yellow colour method in nitric acid medium as suggested by Jackson (1973). Iron was analyzed colorimetrically using ferric iron, which gives a blood red colour with potassium thiocyanate (Raghuramulu *et al.,* 2003).Vitamin A was estimated by the method suggested by Srivastava and Kumar (2006). Peroxide value was determined to assess to the rate of rancidity during storage. It was estimated by the method suggested by Sadasivam and Manickam (1992). The peroxide content of fresh fish muscle was determined by titration against thiosulphate in presence of potassium iodide using starch as the indicator.

RESULTS AND DISCUSSION

In the present study, highest moisture content was observed in pink perch (81.39 per cent). This was in confirmation with the findings of Reddy *et al.* (1990), Sarma *et al.* (1998) and Jayakumari *et al.* (2006) who reported almost similar moisture content of 80 to 82.34 per cent in pink perch.. Silver belly fish had a moisture content of $75.50g100g^{-1}$.The result obtained by Nair and Suseela (2000) is in line with the present findings (74.70 per cent). Among the fish varieties highest fat content of $3.74g100g^{-1}$ was found in pink perch. The fat content of this fish variety was within the range reported by Reddy *et al.*(1990) and Jayakumari *et al.* (2006), but this value was slightly higher than the findings of Sarma *et al.* (1998). Silver belly had the lowest fat content of $1.78g100g^{-1}$. This result obtained is close to the value ($1.6g100g^{-1}$) reported by (Gopalan *et al.*, 1989). Silver belly had a protein content of 18.66g $100g^{-1}$, and this is close to the value reported by Nair and Suseela (2000) and Gopalan *et al.* (1989). They reported a protein content of 18.70 g $100g^{-1}$ and 19.2 g $100g^{-1}$ respectively. Pink perch had the lowest protein content of 16.25g $100g^{-1}$. Reddy *et al.* (1990), Jayakumari *et al.* (2006) and Sarma *et al.* (1998) reported almost similar protein content in the range of 16.18 to 17.08g $100g^{-1}$ in pink

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perch. The marine fish pink perch had the highest calcium content of 943.25mg100g^{-1}. Similar value was reported by Reddy *et al.* (1990). The calcium content of silver belly was 728.40 mg100g^{-1} which was close to (715mg100g^{-1}) as reported by (Gopalan *et al.,* 1989). Highest phosphorus content was observed in marine fish variety silver belly (674.81 mg 100g^{-1}). Gopalan *et al.* (1989) reported slightly higher phosphorus content (741mg 100g^{-1}) in silver belly. Pink perch had the lowest phosphorus content of 248.89 mg 100g^{-1}, and similar values were reported by Reddy *et al.* (1990) in pink perch. Here silver belly had the highest iron content of 2.30 mg 100g^{-1}, which is in line with the findings of Gopalan *et al.,* 1989, who reported an iron content of 2.20 mg 100g^{-1} in silver belly fish and 2.14 mg 100g^{-1} in pink perch. Vitamin A content was found to be high in silver belly 80.43µg 100g^{-1} compared to pink perch 86.06µg 100g^{-1} .Jishy (2004) reported that marine fish like *veluri, netholi* and *flat fish* had a vitamin A content Highest peroxide value was observed in pink perch (0.17meq 100^{-1}g) compared to silver belly (0.13meq 100g^{-1}). Reddy (1990) and Jayakumari *et al.* (2006) reported almost similar peroxide value in the range of 0.11 to 0.13meq 100g^{-1} in pink perch fish.

Fish varieties	Moisture (%)	Fat (g)	Protein (g)	Calcium (mg)	Phosphorus (mg)	Iron (mg)	Vitamin A (µg)	Peroxide value (meq)
Pink perch	81.39^{a}	3.74^{a}	16.25^{d}	943.25^{a}	248.89^{d}	2.14^{b}	86.06^{c}	0.17^{a}
Silver belly	75.50^{d}	1.78^{d}	18.66^{c}	728.40^{b}	674.81^{a}	2.30^{a}	80.43^{d}	0.13^{d}

Table.1. Chemical constituents of fresh fish muscle (per 100 g)
Values having different super script differ significantly at 5% level

DMRT column wise comparison

CONCLUTION

It was concluded from the study that constituents like moisture, fat and calcium were comparatively high in pink perch and protein, phosphorus and iron were found to be more in silver belly compared to pink perch. The highest peroxide value was recorded by pink perch. From this study it is obvious that for comparing the two marine water fish varieties silver belly is ideal for consuming, processing and developing new products.

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