

Biochemical Composition of Yellow Stripe Scad, *Selaroides leptolepis* as a Function of Maturity Stage and Length

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The biochemical composition of *Selaroides leptolepis* was studied in different maturity stages as well as in different length groups. The juveniles contained more protein (76.92%) than males (73.92%) and females (69.24%). With the advancement of maturity, a decrease in moisture as well as protein was noticed whereas a positive relationship was noticed with fats. Spent animals showed distinct variations. Protein and fat followed an inverse relationship.

A knowledge of biochemical composition of fish muscle is of great help in evaluating its nutritive value. The data on moisture, protein, fat and ash contents are also useful in estimating yields of products such as fish protein concentrate, fish meal and fish oil.

Though there are lot of works on the biochemical composition of many teleostean fishes (Basu & De, 1938; Chari, 1948; Sekharan, 1950; Solanki *et al.*, 1976; Nanda, 1981), detailed studies on the biochemical composition of carangid fishes are scarce. In this study the biochemical composition of *Selaroides leptolepis* caught along Tuticorin coast was studied in relation to its maturity stages and length groups.

Materials and Methods

Specimens of *Selaroides leptolepis* were collected from trawler catches off Tuticorin coast. To study variations in biochemical composition at different maturity stages juveniles, immature, maturing, matured and spent specimens of both sexes of *S.*

utilized. To study variations in different length groups, 10 mm length intervals was chosen. The minimum length group studied was 81-90 mm total length and the maximum was 161 mm and above. For each maturity stage and for each length group, twenty samples were used for the estimation of biochemical composition.

The muscle tissue near the dorsal fin above the lateral line was used for the study. The percentage of moisture was estimated based on difference in weight of muscle tissue dried to constant weight in an oven at 60°C. Protein, fat and ash were estimated in the dried tissue. Protein was analysed by Microkjeldahl method (Oser, 1971). For extraction of fat, chloroform: methanol (3:1) was used (Folch *et al.*, 1956). Ash was determined as per AOAC (1975). Except for moisture other components are expressed on a dry weight basis.

Results and Discussion

The mean value of proximate compositional analyses of juveniles, males and

73.6% protein, 10.5% fat and 4.3% ash. Females had lower moisture than males and juveniles but the difference between males and juveniles was not appreciable. The juveniles had the maximum protein followed by males and females and the differences here were quite appreciable. Females, however, contained the maximum fat, juveniles the least. Although juveniles had higher ash content than either males or females, the difference between these groups was negligible.

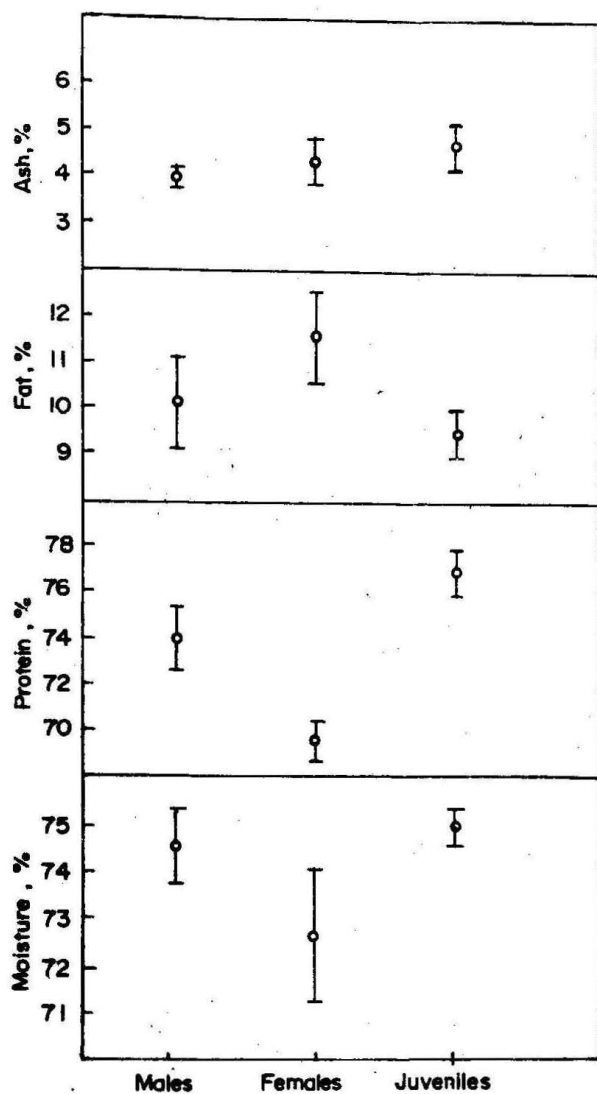


Fig. 1. Proximate composition of males, females and juveniles of *Selaroides leptolepis*

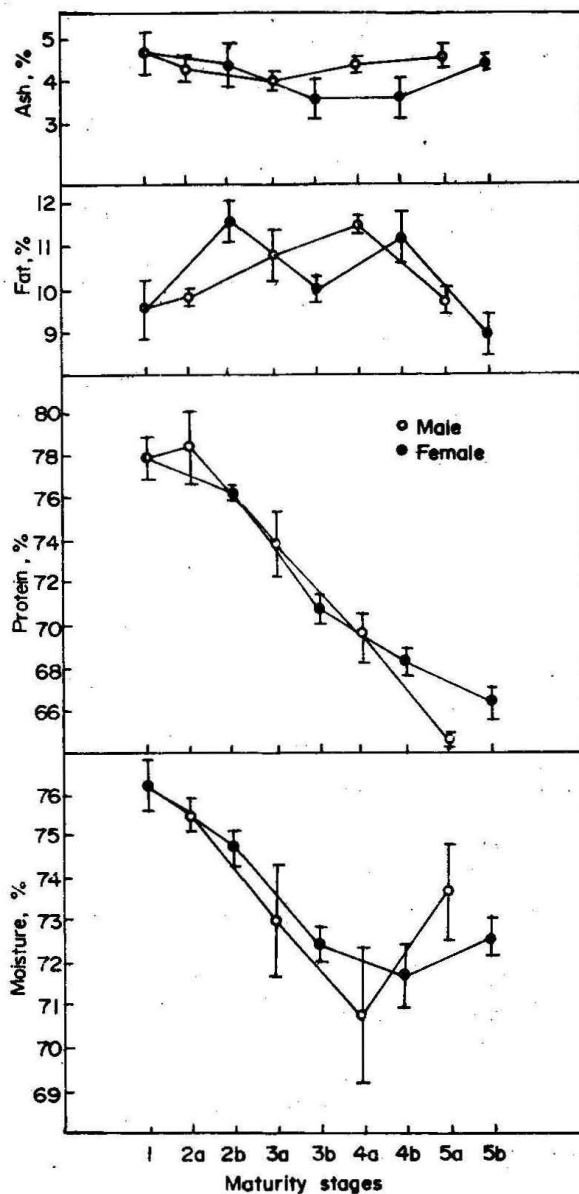


Fig. 2. Proximate composition of *Selaroides leptolepis* at different maturity stages: juveniles (1); immature male (2a) and female (2b); maturing male (3a) and female (3b); matured male (4a) and female (4b); spent male (5a) and female (5b)

Variation in the main components of the fish at various stages of maturity for both sexes can be seen in Fig. 2. Moisture which was highest in juveniles decreased as both sexes approached maturity with males having slightly lower moisture than

females. The moisture content was minimal in the matured fishes but increased in the spent stages. Decrease in moisture content with maturity has been previously recorded in the hill stream fish, *Garra mullya* by Somavanshi (1983) but opposite trends have been observed in Cod (Dambergs, 1964) and *Cyprinus carpio* (Masurekar, & Pai, 1979). Protein content which was highest in juveniles of both sexes declined steadily with maturity and the decline continued into the spent stage as well. Similar observations have been made in *Cyprinus carpio* (Masurekar & Pai, 1979) and in mature *Ilisha melastoma* (Selvaraj, 1984).

Maturation of gonads and spawning season exert direct influence on the amount of fat present (George & Patel, 1956). In this study as well, fat content increased from juveniles to mature stage in males, but in females, immature specimens had the highest fat content which decreased to levels present in juveniles in maturing fish. This decline was reversed as females approached maturity, but declined once again in spent stage. The build up of fat enroute to maturity and its decline in spent stage is a common phenomenon in fishes. Higher

amount of fat in maturing, matured and spent males may be due to accumulation of fat in muscles (Pasupathy, 1981). Inverse relationship between fat and moisture seen in this study has been observed with other teleostean fishes (Brackkan, 1956; Mannan *et al.*, 1961; Masurekar & Pai, 1979; Somavanshi, 1983). The inverse relationship is due to the replacement of the fat with moisture and protein (Brackkan, 1956, Mannan *et al.*, 1961).

When differences in components were examined as a function of length of fish (Table 1), moisture and protein were seen to decline with increase in length. Such decrease with length was recorded in protein content of *Ilisha melastoma* (Selvaraj, 1984), but moisture was, however, seen to increase in this fish with length, which could be due to its migratory habit. In contrast, in *S. leptolepis* fat was less in lower length groups and increased with length. In the length group of 81 to 90 mm having the highest protein content, fat was at its lowest.

The length at minimum maturity at 50% level recorded for *S. leptolepis* from Tuticorin waters is 110-120 mm

Table 1. Mean and standard deviation of the biochemical components in different length groups on *Selaroides leptolepis*

Length group, mm	Moisture, %	Protein, %	Fat, %	Ash, %
81-90	74.88±0.39	78.20±0.39	9.77±0.45	4.79±0.62
91-100	74.94±0.70	77.88±1.82	10.75±0.71	4.18±0.44
101-110	73.39±0.85	74.87±0.45	10.62±0.31	4.17±0.08
111-120	73.63±1.07	69.9±1.19	10.52±0.72	4.17±0.22
121-130	73.19±1.77	68.43±1.84	11.15±1.01	4.11±0.33
131-140	73.19±1.20	68.59±1.30	11.99±0.69	3.92±0.53
141-150	72.69±1.52	67.91±1.58	12.05±0.56	3.73±0.65
151-160	72.72±0.87	67.85±0.43	12.24±0.62	3.53±0.25
161 and above	72.70±1.70	67.45±1.46	13.15±0.78	3.51±0.56

(Venkataramani, V.K. & Venkataramanujam, K., unpublished). Protein and fat contents in this length group found in the present study were 69.91 and 10.52%, respectively. Ash content did not show any appreciable variation at various maturity stages or in length groups

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