otolith length (x) were calculated by the method of least squares and expressed as

$$TL = a + b\ (OL)$$

where TL is the total length, OL is the otolith length, a is the intercept and b is the slope.

The relationship for *K. axillaris* could be expressed as

$$TL = -48.1262 + 20.8587\ OL,$$

$r = 0.9706$. $N = 125$ and for *O. ruber* as

$$TL = -26.1173 + 27.0548\ OL,$$

$r = 0.9810$. $N = 141$.

Total length can be estimated from the otolith length. For instance an otolith of 10 mm size gives an estimated total length 160 mm for *K. axillaris* and 244 mm for *O. ruber*, respectively. The equation is species specific and also shows a potential to derive estimates of age from otolith length.

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UTILIZATION AND PROXIMATE COMPOSITION OF A CEPHALOPOD *SEPIELLA INERMIS* (FERUSSAC AND D'ORBIGNY)

ABSTRACT

The marine cephalopod *Sepiella inermis* from Porto Novo waters was investigated for utilization and proximate composition for one year. The protein, carbohydrate and lipid content of the dried edible part was estimated. The percentage of protein 60.85, 35.96%, carbohydrate 0.20, 0.45% and lipid 11.7, 5.55% were observed in males and females respectively.

THE VALUE of cephalopods is increasing in the world market due to their nutritive value and India is earning a good foreign exchange by exporting. While a lot of information is available on protein, carbohydrate and lipid of oysters and clams (Ansell, 1972, 1974 a, b, c, d, 1975 ; Wafer, 1974 ; John, 1980 ; Balasubrahmanyan, 1984 ; Jayabal, 1984), knowledge on these aspects of cephalopods particularly *Sepiella inermis* is scarce. Hence an attempt is made here to estimate the protein, carbohydrate and lipids of *S. inermis* from Porto Novo waters.

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Utilization

Cephalopods are usually consumed in fresh condition by the local people. In some occasions when the catches are very large, they are sun dried and sold in market like other fishes in Porto Novo. Normally the catches are very poor in Porto Novo region. The mantle, the edible part was separated out and the meat

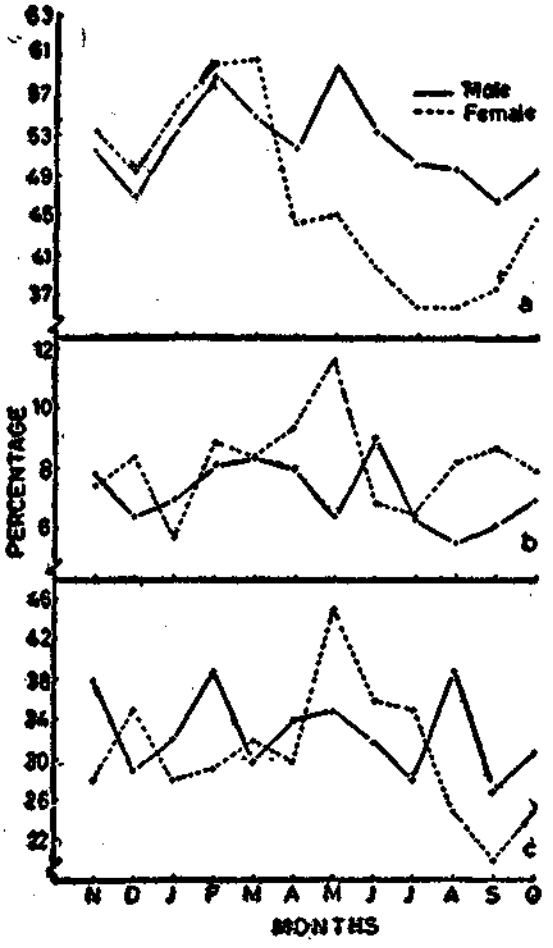

FIG. 1. Monthly variation of : a. protein, b. carbohydrate and c. lipid in *S. inermis*.

is cooked into curries, soup, cutlets and fried with chilly powder. In Porto Novo the mantle costs about Rs. 20/kg. In Pazhyar the cost of the flesh based on the number of pieces per kg is about Rs. 20/ kg (10-15 pieces) and the smaller ones costs about Rs. 10-15/ kg. In Visakhapatnam it is about Rs. 16-20/ kg (Rayudu and Chandramohan, 1983). Smaller ones and the discarded portion of the bigger ones were used as bait for fishes as well as manure. The cuttlebones are collected by the peoples and purchased by the shell merchants in monthly intervals, Rs. 1.50-2.00 per kg in Porto Novo. The cuttlebones are used in the preparation of abrasives and dentrifices (Dees, 1961). It is used for cleaning glasses and the powder of the bone is used as medicine for some ear ailments and Romans used the bone powder as a cosmetic (Trivedi and Sarvaiya, 1976).

Material and methods

The specimens of *S. inermis* was procured from the fish trawlers in fresh condition from the Porto Novo waters at monthly intervals for a period of one year, November to October and brought to the laboratory. They were first thoroughly washed with tap water and subsequently with distilled water. After this, the mantle was cut open, the males and females were separated out and the cuttle-bones were removed from the body. Then the whole mantle was dried in an oven at a constant temperature of 40°C. The dried material was powdered and seived by a bolting silk cloth. The powdered meat was used to determine the proximate composition of the animal.

Protein was estimated by Biuret method as modified by Raymont *et al.* (1964). Carbohydrate was estimated using the phenol-sulphuric acid procedure of Dubois *et al.* (1956). The lipid was estimated by chloroform-methanol extraction procedure of Folch *et al.* (1956) was adopted.

Results and discussion

The monthly variation of protein, carbohydrate and lipid in male and female *S. inermis* was shown in Fig. 1.

Most of the cephalopods are edible because of its nutritive value next to finfishes and shellfishes. The mantle constitute the major part of the animal. Present investigation shows the percentage of protein content varied from 60.85-46.50% and 60.48-35.96%, carbohydrate 0.39-0.27% and 0.45-0.20% and lipid 8.95-5.55% and 11.7-5.68% in males and females respectively. Males show high protein and females show high lipid content. Protein shows a marked variation, carbohydrate and lipid does not show any marked variation, but only small monthly fluctuations were recorded in both sexes. Compared with the results and works of Ansell (1974 c, d, 1975) ; John (1980), Balasubrahmanyan (1984) and Jayabal (1984) on bivalve molluscs, *S. inermis* shows little low percentage of carbohydrate, protein and high in lipid.

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