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NOTE

On some aspects of biology of the mackerel scad *Decapterus russelli* (Ruppell)

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ABSTRACT

The length-weight relationship proved no significant difference between sexes, and the relationship can be described by a single equation: Log W = –5.4870 + 3.2069 Log L. The relative condition factor indicated peak in February for males and April for females. The size at first maturity has been estimated at 189 mm. Maturity studies indicate prolonged spawning season i.e. November-May. This fish is a pelagic carnivore feeding mainly on sergestids (*Acetes* spp.) followed by fish of *Apogon* spp., *Myctophum* spp. and molluscs.

The decapterids, popularly known as mackeral scads appear sometimes in large numbers along the west coast. The cruise 31 of M.F.V. *Saraswati* operated in the area lat. 20° 42' N and long. 70°59' E, off Veraval recorded the highest catch rate of 9,000 kg/hr in the bottom trawl net. The most dominant species in the catch was *D. russelli* (3,000 kg) (Anon, 1985). No work has been done on its biology and other resource characteristics except that by Bapat *et al.* (1982). The present account deals with some aspects of its biology from Veraval.

Random samples of 434 *D. russelli* were collected during January 1985 - April 1986 from trawl net at Veraval. The total length in mm, weight in g, sex, maturation and feeding habit were recorded from fresh sample. The relative importance of various food items was calculated using index of preponderance (Natarajan and Jhingran, 1962).

The length-weight relationship of *D. russelli* was studied based on 269 males of 86 to 232 mm length range and 159 females of 115 to 229 mm length range. Analysis of covariance showed that there was no significant difference between the regression coefficient of males and females. Hence the single logarithmic equation calculated for length-weight relationship for both the sexes was as follows:

Log W = –5.4870 –3.2069 Log L (r=0.92)

This is in conformity with the finding for the related species *Decapterus dayi* (Sreenivasan, 1981).

The relative condition facotr (K_n) was calculated using Le Cren's (1951) formula. The monthly relative condition factor yielded high K_n value in males in February and in females it was during

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April. The relative condition factor in relation to the different length groups reached the peak at 160 mm in males and 180 mm in females.

Only females of *D. russelli* in stage III and above were considered as mature to determine the length at first maturity. 50% of females mature at the length of 189 mm. Hence, this length can be considered as the length at first maturity. In the Philippine waters Tiews *et al.* (1975) found that *D. russelli* matures at the size of 180-200 mm in total length.

The females of *D. russelli* occurred with gonads in maturing, mature and spent condition in most of the months from November to May, indicating prolonged spawning in this species. Delsman (1926), Tiews (1958), Tiews *et al.* (1975) and Sreenivasan (1981) have reported prolonged spawning in *Decapterus* spp.

The 1:0.6 ratio of males to females for the entire period of investigations indicated predominance of males over females. Monthwise sex ratio (Table 1) showed significant difference during November - January and April due to preponderance of males.

The feeding intensity was assessed based on the distention of the stomachs and were classified as gorged, full, 1/2 full, 1/4 full, trace and empty. The empty stomachs occurred in high percentage (49.42%) of the total stomachs examined and vaired from month to month (Fig. 1). Sreenivasan (1974) and Kagwade (1967) noticed a large number of empty stomachs in other carangids namely *Megalaspis cordyla* and *Caranx kalla* respectively.

The index of preponderance (IP) of various food items in stomach of *D. russelli* during the entire period of observation showed that *Acetes* spp. (IP 87.62) formed the major food item, followed by *Apogon* spp. (IP 11.31), digested fish (IP 0.67), molluscs (IP 0.25) and *Myctophum* spp. and copepods (IP 0.01). It is evident that *D. russelli* is a pelagic carnivore like other carangids found in Indian waters feeding

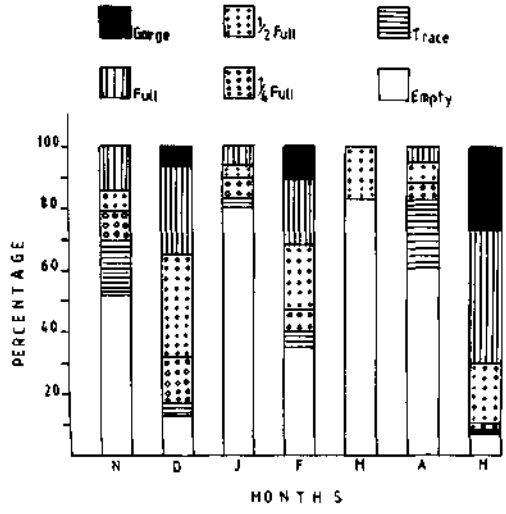

Fig. 1. Monthwise feeding intensity of *D. russelli* in percentages during 1985-'86.

TABLE 1. *Sex ratio in different months in* D. russelli *for the period 1985 to 1986*

Months	No. of specimens examined	Male : female ratio
November	42	1 : 0.5 * *
December	56	1 : 0.5 * *
January	88	1 : 0.4 *
February	41	1 : 0.9 NS
March	6	1 : 0.2 NS
April	144	1 : 0.7 * *
May	51	1 : 0.6 NS
Pooled	428	1 : 0.6 *

* = Significant at 1% level. * * = Significant at 5% level. N S = Not Significant.

substantially on crustaceans, teleosts and molluscs (Datar, 1954; Kagwade, 1967; Sreenivasan, 1974, 1979).

Fecundity estimate was based on 22 females with stage V ovaries ranging in size between 157 and 217 mm in total length and 37.0 and 100.0 g in weight. The average number of ova produced by fish of different length range were : 150-159 mm : 21,547, 170-179 mm : 52,323, 180-189 mm : 53,967, 190-199 mm : 54,906, 200-209 mm : 69,190, and 210-219 mm : 84,228. It is shown that the average fecundity of *D. russelli* ranged from 21,547 to 84,228, with size 150-219 mm of fish. Similar trend in fecundity was observed in *D. dayi* by Sreenivasan (1981).

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