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A STUDY ON LENGTH-WEIGHT RELATIONSHIP AND FEEDING BIOLOGY OF SHRIMP SCAD *ALEPES DJEDABA* (FORSSKAL, 1775) OFF RATNAGIRI COAST, MAHARASHTRA

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ABSTRACT : ***Alepes djedaba*** **is one of the important carangid species landed as trawl by-catch along the Ratnagiri coast. A total of 577 individuals were studied for the length-weight relationship and it showed isometric growth in *A. djedaba*. Gut content analysis revealed *A. djedaba* to be a carnivore fish feeding mainly on *Acetus* spp., copepods, shrimp larva, isopods, ostracods, amphipods and small sized fishes. Juvenile and moderate size fishes fed on zooplankton dominant food including small sized anchovies, *Acetus* spp., shrimp larva, copepods, amphipods, ostracods, fish scales, fish eggs and broken appendages. The bigger individuals of *A. djedaba* were found to feed exclusively on juveniles of small anchovies.**

Key words : *Alepes djedaba*, length-weight relationship, food and feeding biology, Ratnagiri.

INTRODUCTION

Carangids are one of the largest families of bony fishes in the world and comprise of runners, black pomfrets, queen fishes, trevallies, scads, pilot fishes, Jacks, horse mackerel, darts, leather jacket and pompanos. *Alepes djedaba* commonly known as shrimp scad is one of the important carangid species landed as trawl by-catch along the Ratnagiri coast. Work on the length-weight relationship, food and feeding of carangids such as *Megalaspis cordyla* (Jaiswar and Acharya, 1991; Reuben *et al*, 1992; Sivakami, 1995; Kasim, 1999; Saker *et al*, 2004; Panda *et al*, 2011), *Decapterus russelli* (Murty, 1991; Jawad *et al*, 2010; Panda *et al*, 2011), *Selar cremunophthalmus* (Roos *et al*, 2007), *Caranx carangus* (Hamsa and Kasim, 1989), *Caranx kalla* (Kalita and Jayabalan, 1997) and *Scomberoides lysan* (Thulasitha and Sivashandini, 2012) has been reported earlier. Reports of work on *Alepes djedaba* are few from India with exception of Sivakami (1990) and Raje (1993) from Cochin and Veraval coasts, respectively. From Pakistan coastal waters Shuaib and Ayub (2011) studied some aspects on the biology of the species and Barr *et al* (2014) studied from Arabian Gulf off Saudi Arabia.

The production of carangids in India stood at 296230 tonnes during the year 2017-18 (CMFRI, 2018). Carangids formed 14% of the pelagic fish landings of Maharashtra state. Study of biology is important for the management of the species.

METHODOLOGY

A total of 577 specimens were collected from the commercial landing centre of Mirkarwada in Ratnagiri at weekly intervals during the period from March, 2018 to December, 2018 and brought to laboratory for investigation.

The length-weight relationship was calculated for 290 males, 250 females, 37 indeterminants and 577 pooled sample of *Alepes djedaba*. It was estimated separately for males, females and combined sexes using the formula $W = aL^b$. This equation was expressed logarithmically as $\text{Log } W = \text{Log } a + b \text{ Log } L$ where, W = weight of the fish in gram, L = length of the fish in centimetre, '*a*' is a coefficient related to body form and '*b*' is an exponent indicating growth pattern. Gut contents from 577 specimens were analysed by Numerical method (Biswas, 1993), where the each food item was computed as percentage of total number of stomachs examined. The fish examined were grouped into 10 mm length intervals to determine the selectivity of food if any in different

size groups.

RESULTS AND DISCUSSION

The regression equation for male, female, indeterminant and sexes combined were as follows:

Male: Log (-1.8311) + 2.9057. Log L
(r = 0.9746)

Female: Log (-1.9542) + 3.0035. Log L
(r = 0.9844)

Indeterminant: Log (-2.1250) + 3.1316. Log L
(r = 0.9925)

Combined: Log W = Log (-1.8981) + 2.9583 . Log L
(r = 0.9797)

Plate 1 : *Alepes djedaba* from Ratnagiri.

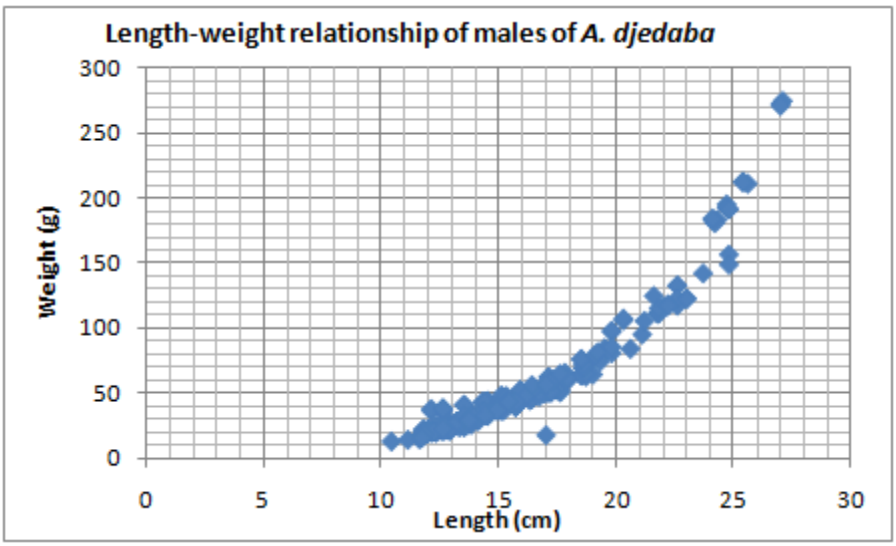
Plate 2 : Map of Ratnagiri.

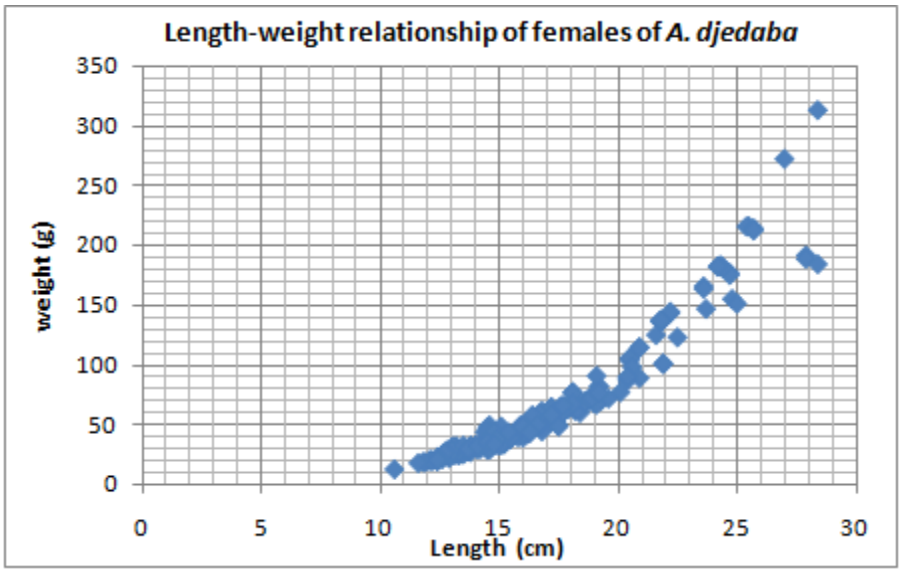
The correlation coefficient obtained for male (r = 0.9746) and female (r = 0.9844) fishes showed that a strong positive correlation exists between the variables length and weight.

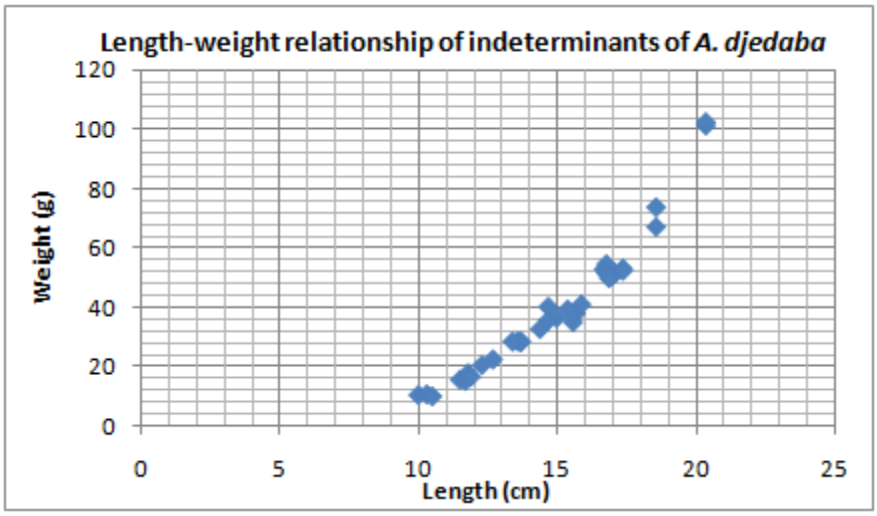
The present study revealed that, the exponential value 'b' for male (2.9057), female (3.0035) and sexes combined (2.9583) were close to the expected value of regression coefficient for isometric growth i.e.; b=3. So it can be said that the species exhibit isometric growth pattern ('b' value close to 3). Student's t test also showed that the 'b' value for both male and female fishes did not significantly deviate from the ideal value of b = 3. Similar results for the species were made by Sivakami (1990) from Cochin waters and Shuaib and Ayub (2011) from Karachi, Pakistan. Isometric growth pattern was also

Table 1 : Length-weight relationship.

Male	Log (-1.8311) + 2.9057. Log L	r = 0.9746
Female	Log (-1.9542) + 3.0035. Log L	r = 0.9844
Indeterminant	Log (-2.1250) + 3.1316. Log L	r = 0.9925
Total	Log (-1.8981) + 2.9583. Log L	r = 0.9797







reported for other carangids like *Megalaspis cordyla* from north west coasts (Jaiswar and Acharya, 1991) and from Mumbai waters (Panda *et al*, 2011); *Caranx kalla* from Mangalore coast (Kalita and Jayabalan, 1997).

Gut content analysis revealed *A. djedaba* to be a carnivore fish throughout its lifetime. The food constituted of on *Acetus* spp., copepods, shrimp larva, nauplii, isopods, ostracods, amphipods, cephalopod juvenile, small sized

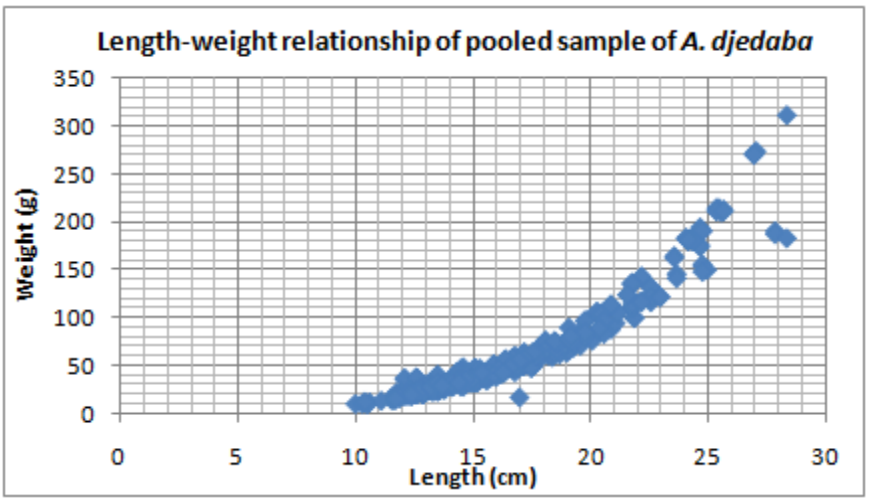


Plate 3 : *Acetus* spp.

Plate 4 : Small sized anchovy.

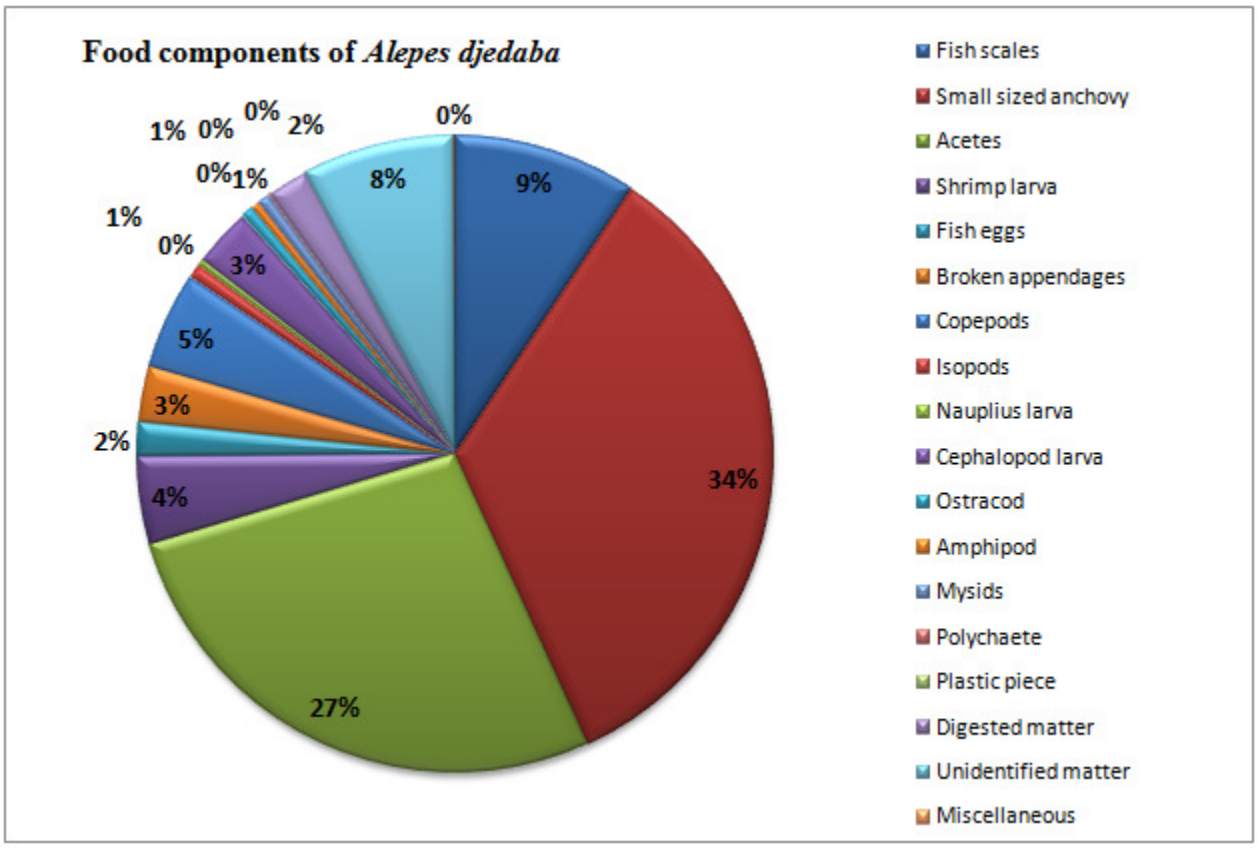
Plate 5 : Cephalopod tentacle.

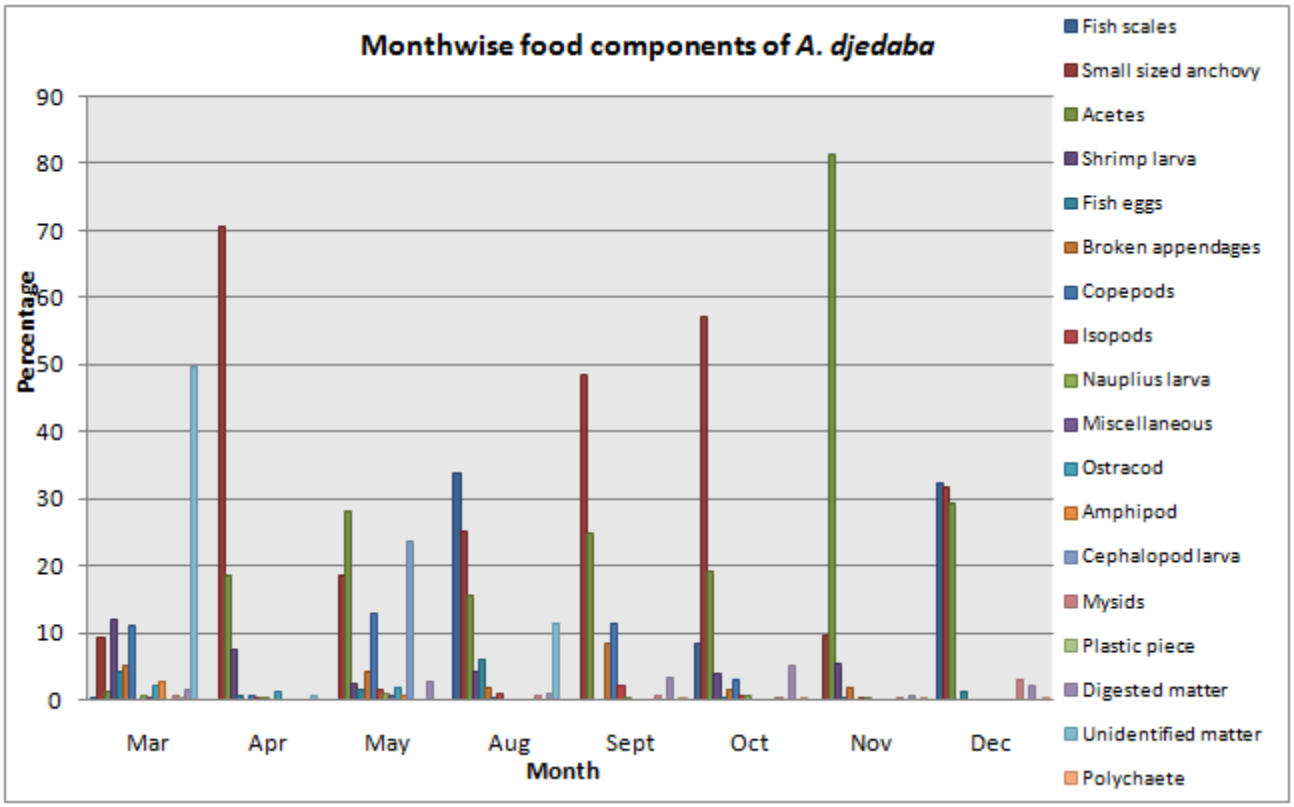
Plate 6 : Cephalopod juvenile.

fishes. *Acetus* spp. and small sized anchovy were the most preferred food item and also occurred in gut throughout the study period. Cephalopod juveniles were found in gut during period of May. Size-wise food preference was observed. The juvenile and moderate size fishes (100-210 mm) fed on zooplankton dominant food including *Acetus* spp., shrimp larva, copepods, amphipods, ostracods, fish scales, fish eggs, broken appendages and small sized anchovies. The bigger individuals (210-280 mm) of *A. djedaba* were found to feed exclusively on juveniles of small anchovies. The study thus revealed that diet of *A. djedaba* consists mainly of crustaceans and fishes. Similar result was reported by Venkataramani *et al* (1983-84) for this species from Porto-Novo, Tamil Nadu coast. In other carangids such observation was done in *C. kalla* (Kagwade, 1967), *M. cordyla* (Sreenivasan, 1974) and *D. dayi* (Sreenivasan, 1979).

CONCLUSION

There is no significant difference in the b values of





males, females, indeterminant and pooled groups of *Alepes djedaba* during March 2018 to December 2018 and it is found to have an isometric growth pattern. It is a carnivore fish feeding mainly on *Acetus* spp., copepods, shrimp larva, isopods, ostracods, amphipods and small sized fishes. Juvenile and moderate size fishes fed on zooplankton dominant food including *Acetus* spp., shrimp larva, copepods, amphipods, ostracods, fish scales, fish

Table 2 : Food items observed from March 2018 to December 2018

Food Items	Mar	Apr	May	Aug	Sept	Oct	Nov	Dec
Fish scales	0.3	0	0	33.89	0	8.31	0	32.22
Small sized anchovy	9.33	70.65	18.58	25.1	48.45	57.19	9.53	31.67
Acetes	1.12	18.48	28.17	15.48	24.93	19.17	81.44	29.44
Shrimp larva	11.97	7.61	2.48	4.18	0	3.99	5.32	0
Fish eggs	4.06	0.54	1.55	5.86	0	0.32	0.3	1.11
Broken appendages	4.97	0	4.33	1.67	8.4	1.44	1.91	0
Copepods	10.95	0.54	13	0.42	11.48	2.88	0	0
Isopods	0	0.27	1.55	0.84	2.24	0.64	0.2	0
Nauplius larva	0.61	0.27	0.93	0	0.28	0.64	0.3	0
Cephalopod larva	0	0	23.53	0	0	0	0	0
Ostracod	2.03	1.09	1.86	0	0	0	0	0
Amphipod	2.74	0	0.62	0	0	0	0	0
Mysids	0.61	0	0	0.42	0.56	0.16	0.2	3.06
Polychaete	0	0	0	0	0.28	0.16	0.1	0.28
Plastic piece	0.1	0	0	0	0	0	0	0
Digested matter	1.52	0	2.79	0.84	3.36	5.11	0.7	2.22
Unidentified matter	49.59	0.54	0	11.3	0	0	0	0
Miscellaneous	0.1	0	0.62	0	0	0	0	0

eggs, broken appendages and small sized anchovies. The bigger individuals of *A. djedaba* were found to feed exclusively on juveniles of small anchovies.

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