

OCURRENCE OF EARLY JUVENILES OF THE RIBBONFISH,
TRICHIURUS LEPTURUS LINN. IN THE KAKINADA AREA
WITH NOTES ON THEIR FOOD

K. A. NARASIMHAM

Central Marine Fisheries Research Institute; Unit, Kakinada-2

The occurrence of 425 juveniles of *Trichiurus lepturus*, measuring 37-120 mm, during March 1966 to October 1970 off Kakinada is reported. Food analysis of 153 juveniles revealed that in the smaller juveniles calanoid copepods predominated while the larger juveniles preferred fish larvae, prawn larvae and a variety of crustaceans. The spawning period appears to be prolonged from January to September with peak activity in February-June in the offshore waters beyond the 30 metre line. It is inferred that the juveniles are pelagic in habitat.

Except for a few casual records, there is no detailed published information from Indian waters either on the occurrence or on the food of the early juveniles of *Trichiurus lepturus*. In the course of a study on the biology and fishery of this species the author collected 425 juveniles of 37-120 mm length during March 1966 to October 1970 off Kakinada (Long. 82° 20' to 82° 30'E; Lat. 16°-40' to 17°-10'N). Their occurrence and food are dealt with in this communication.

Gear-wise, the material comprised 377 juveniles from otter trawls, 44 from boat-seines and 4 from shore-seines. The term 'early juvenile' is used for convenience. Most of the adult diagnostic characters are manifested in the juveniles and identification is further confirmed by Alizarin staining of 11 juveniles (37-95 mm length) which gave the following ranges for the meristic characters studied: vertebrae 166-171 (pre-caudal 38-40, caudal 128-132), dorsal fin III, 130-134, extending up to vertebra number 134-138; anal fin i+I, 101-107, extending up to vertebra number 143-148. Food studies were made on 153 juveniles collected from otter trawls between 07-30 to 14-00 hr by the occurrence and points methods (Pillay, 1952).

The monthly length-frequency distribution of the juveniles are shown in Table 1. They were available for 7 months from March through October excepting June. Some length-groups (41-50 and 51-60 mm) occurred for 4-5 months.

The occurrence of different food items are shown in Fig. 1(A) for all size-groups. The copepods ranked first followed by 'other crustaceans', prawn larvae, fish larvae, *Lucifer* and 'other foods'. Among the copepods, a vast majority belonged to sub-order Calanoida, a few to Cyclopoida and none to Harpacticoida. They were represented by species of *Paracalanus*, *Acrocalanus*, *Eucalanus*, *Centropages*, *Temora*, *Pontella*, *Oithona*, *Euchaeta marina* and *Rhincalanus cornutus* etc. Under 'other crustaceans' were included mysids, amphipods, euphausiids, ostracods, crab larvae, other crustacean larvae and other unrecognisable crustaceans. Mostly the mysis and post-larval stages of penaeids were observed under the category 'prawn larvae'. Among fish larvae, the anchovy group was dominant and *Stolephorous* spp. were common. Under 'other foods' traces of *Coscinodiscus* spp. and lamellibranch larve were included. From Fig. 1. (B, C and D) it is obvious that in the smaller length-group the copepods were most dominant followed by *Lucifer* while in the larger length-group fish larvae, 'other crustaceans' and prawn larvae were the favourite food items. Vijayaraghavan (1951) and Basheeruddin and Nayar (1962)

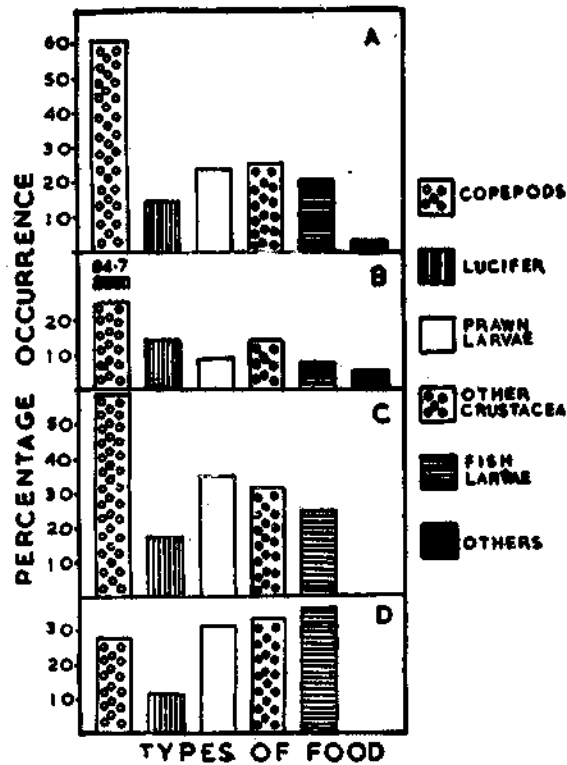


Fig. 1. Showing the occurrence of different food items for all size groups (A), 37-60 mm group (B), 61-90 mm group (C) and 91-120 mm group (D).

TABLE 1. Occurrence of small-sized juveniles of *T. lepturus*

Date	Mar. 66	Apr. 66	Jul. 66	Oct. 66	Mar. 67	Apr. 67	May 67	Sep. 67	Mar. 68	Apr. 68	Sep. 69	Mar. 70	Aug. 70	Total
Length mm														
31-40	1	—	18	—	—	—	—	—	—	—	—	—	—	19
41-50	2	—	61	1	—	1	3	—	—	—	—	—	—	68
51-60	3	—	52	—	—	1	21	—	1	3	—	—	—	81
61-70	6	—	12	—	—	—	8	2	1	10	—	—	—	39
71-80	3	—	5	—	7	—	11	1	—	6	—	—	—	33
81-90	3	—	6	—	2	—	13	4	1	14	—	—	—	43
91-100	4	—	6	—	—	1	27	—	3	19	—	—	—	60
101-110	2	1	3	—	—	—	3	1	5	15	—	1	—	31
111-120	5	3	—	3	—	2	2	—	9	21	3	2	1	51
Total No.	29	4	163	4	9	5	88	8	20	88	3	3	1	425
Min. size mm	37	110	37	41	71	50	45	68	51	54	112	105	114	
Max. size mm	118	117	108	119	83	120	120	103	120	120	120	120	—	

observed similar food elements in the juveniles of comparable length studied by them. Quantitative food analysis showed similar trend. No seasonal variation in the feeding intensity was observed. The incidence of empty stomachs was 9.8% and the average feeding intensity per stomach was moderate with the gut contents more than half full.

Eggs, larvae or juveniles of *T. lepturus* were absent in the plankton collections made on a number of occasions in the fishing grounds by a 3/4 metre plankton net made of fine organdy cloth. Regular examination of the gonads of the fish for more than 5 years from the same fishing grounds did not reveal any stage VI (running) fish, except for a single female of 81.6 cm collected on 15-2-67. These observations show that the present fishing grounds, with a depth range of 5-30 metres, are not the spawning grounds of *T. lepturus*. But the regular occurrence of juveniles over a period of time strongly suggests that *T. lepturus* spawns off Kakinada and the actual spawning grounds appear to be in the offshore waters beyond the 30 metre line. This is in conformity with the findings of earlier authors (Nair 1952; Prabhu 1955; Sekharan, 1955 and Dawson, 1967) who stated that this fish spawns in the offshore waters.

Earlier works recorded juveniles of *T. lepturus* below 120 mm during March-December (Vijayaraghavan, 1951; Nair, 1952; Prabhu, 1955 and Basheeruddin and Nayar, 1962). Prabhu (1955) stated that the post-larvae of this fish grow to 70-90 mm length within one and half months. On the assumption that the growth rate of the early juveniles is similar during different years, it would appear from Table 1 that the spawning period is prolonged, from January to September. Further, as more juveniles were collected by the previous authors and also the present author in March-July, it is reasonable to believe the intensive spawning is confined to the February-June period. Even though Prabhu (1955) believed that this fish spawns only in June, unpublished studies on maturity of this fish by the present author lend support to the view that the spawning period is prolonged. Although the juveniles were mostly caught by bottom trawls, the planktonic nature of the their gut contents indicates that they are pelagic in habit and were caught in the nets at hauling time. However, diurnal vertical movements, if any, have not been studied.

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