

OBSERVATIONS ON THE FOOD AND FEEDING HABITS OF THE EEL,  
*MURAENESOX CINEREUS* (FORSKAL) FROM PORTO NOVO

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ABSTRACT

Feeding in *Muraenesox cinereus* was studied from the catches of hooks and line fishing operations from the catamarans. This fish is a carnivore and largely piscivorous, feeding on the pelagic, demersal and bottom living organisms. Cannibalistic tendency is noticed. Pelagic fishes like the mackerel and the clupeids are found mostly preferred.

The false conger eels, *Muraenesox cinereus* (Forsk.) and *M. talabonoides* (Bleeker) and the giant moray eels, *Thrysooides macrura* (Bleeker) are usually fished in fairly good numbers at Porto Novo. *M. cinereus* is by far the major constituent. From the observations of Rao (1969) and Kagwade (1969) *M. talabonoides* forms the main species supporting the eel fishery in Maharashtra and Gujarat. The present paper gives an account of the food and feeding habits of the *M. cinereus* collected from fish landed at Porto Novo during 1972-74.

The material were collected from the landing centre by random sampling during the period from June 1972 to May 1974 from the catches of hooks and line operated from the catamarans. A total of 320 stomachs were studied. The species were gutted at the landing place and the stomachs brought to the laboratory. The feeding intensity was studied by the occurrence of distension of stomachs. Fishes were grouped under various categories viz. full,  $\frac{3}{4}$  full,  $\frac{1}{2}$  full,  $\frac{1}{4}$  full, trace and empty. Volumes and number of frequency of occurrence of each food item were determined. To find out the food preferences if any, the index of preponderance method (Natarajan and Jhingran 1962) was used, i.e.,

$$I_i = \frac{v_i \cdot o_i}{\sum v_i \cdot o_i} \times 100 \text{ where, } I_i \text{ is the index to the food, } v_i \text{ and}$$

$o_i$  the volume and occurrence of the food item i.

*Feeding activity*

Table 1 shows the percentage occurrence of stomach in different degrees of fullness during the period of observation. Empty stomachs were evident

throughout the year, and most prominently during February-May period. Feeding activity was intensive during the second half of the year as shown by the percentage occurrence of gorged and full stomachs in good proportion as against the empty stomachs, while the first half recorded relatively less feeding activity.

TABLE 1. *The percentage occurrence of stomach in different degrees of fullness in M. cinereus during 1972-74.*

	<i>Conditions of Stomach</i>					
	<i>Full</i>	$\frac{1}{2}$ <i>Full</i>	$\frac{1}{3}$ <i>Full</i>	$\frac{1}{4}$ <i>Full</i>	<i>Trace</i>	<i>Empty</i>
June 72	37.93	13.79	15.52	10.34	3.46	18.96
July	34.28	—	8.58	5.71	28.57	22.86
August	40.62	21.87	9.37	6.27	—	21.87
September	82.12	—	21.88	15.62	9.38	25.00
December	62.50	—	—	12.50	6.25	18.75
February 73	15.38	—	23.08	7.69	—	53.84
March	—	—	13.33	33.33	—	53.33
May 74	—	—	36.36	—	—	63.64

The percentage composition of the food of this species is presented in table 2. It is seen that fishes dominated in the diet throughout the year forming the major item. Next to fishes came Molluscs and Crustaceans in the order of abundance.

TABLE 2. *Percentage volume of different food items of M. cinereus.*

<i>Food items</i>	<i>June 72</i>	<i>July</i>	<i>Aug.</i>	<i>Sep.</i>	<i>Dec.</i>	<i>Feb 73</i>	<i>Mar.</i>	<i>May 74</i>
<i>No. of fish</i>	29	36	30	32	18	48	8	21
<i>Mackerel</i>	45.45	54.85	30.34	55.21	—	—	—	71.24
<i>Clupeids</i>	22.62	24.84	15.17	35.01	50.40	35.55	17.14	—
<i>Caranx</i>	7.75	7.06	17.72	—	20.16	20.00	14.28	—
<i>Apogonids</i>	0.26	1.99	1.86	3.51	10.08	11.11	—	4.64
<i>Fl. fish</i>	0.52	1.66	1.26	—	—	—	20.00	9.02
<i>Flyingfish</i>	6.20	—	—	—	—	—	—	17.09
<i>Young eel</i>	1.29	2.09	2.02	1.25	7.26	2.22	—	2.58
<i>Catfish</i>	6.20	—	—	—	—	—	—	—
<i>Squids</i>	8.26	1.25	20.23	—	—	—	—	—
<i>Gastropods</i>	0.15	—	—	—	—	4.44	—	—
<i>Prawns</i>	—	4.18	1.26	—	4.03	6.67	14.28	3.87
<i>Semidigested fish</i>	1.29	2.08	10.12	5.02	8.06	20.00	34.28	—

*Fish*

Among the fishes, mackerel was predominant and this and the flying fish occur only in their respective seasons in this coast, such as March-September for the mackerel and May-June for the flying fish. While mackerel was predominantly eaten in these months, flying fish were less preferred, even though they form the bulk of the fishery. Clupeids, *Caranx* spp. and Apogonids were eaten throughout the year with minor fluctuations in February, September and December. Flat fishes were found in the stomach to a considerable extent in March (20%), while juvenile eels and prawns were identified in the stomachs all the year round with a slightly higher proportion in December for eels and in March for prawns. Cat fishes were noticed in the diet only in June. Fishes in general constituted 92.93% of the contents in the stomach.

*Molluscs*

Molluscs were eaten in less proportion than fishes (5.95% by volume). These were represented by squids as also gastropods like *Nassa dorsata*.

*Crustacea*

Crustacean food was composed of penaeid prawns and crabs. Among the prawns, *Penaeus indicus* and *Solenocera indica* were the commonest. Crustacea formed only a minor item (1.12%) of the total food of this fish.

*Index of preponderance*

The result of analysis is presented in table 3 with ranking in parenthesis. Accordingly mackerels and clupeids held the first and the second place respectively, while caranx the third and the gastropods the last.

TABLE 3. *Index of preponderance to food items of M. cinereus*

Food items	% occurrence	% volume		
Mackerel	20.87	43.31	903.88	55.82(1)
Clupeide	20.00	24.32	486.40	30.04(2)
<i>Caranx</i>	7.82	8.64	67.56	4.17(3)
<i>Apogon</i>	6.96	2.40	16.70	1.03(7)
Flat-fish	4.35	1.89	8.22	0.51(8)
Flying fish	0.87	3.42	2.97	0.18(10)
Young eels	12.17	1.85	22.51	1.39(6)
Cat fishes	0.87	2.05	1.78	0.11(11)
Squids	10.43	5.73	59.76	3.69(4)
Gastropods	1.61	0.22	0.57	0.04(12)
Prawns	4.35	1.12	4.87	0.31(9)
Semi-digested fish	8.70	5.05	43.93	2.71(5)
	100.00	100.00	1619.15	100.00

Suseelan and Nair (1969) observed the carnivorous and predacious nature of *M. talabonoides* in Bombay waters, feeding actively on fishes, crustaceans and molluscs. They encountered in the stomach the occurrence of juvenile sharks in small proportion.

*M. cinereus* is also a carnivorous fish and largely piscivorous and the other items like crustaceans and molluscs constitute only 7.67% of the total feed. At times cannibalistic tendency is noticed in this fish as in the case of *M. talabonoides* (Suseelan and Nair 1969). Juvenile eels accounts for 1.85% by volume of the total food. A close perusal of the occurrence of various food components reveals the predatory nature of this fish as it is found feeding on the pelagic, demersal and bottom living organisms.

Kagwade (1969) and Suseelan and Nair (1969) correlated low feeding in *M. talabonoides* with spawning activity. The present observations have established the occurrence of empty stomachs in large numbers during the months of February, March and May. Females were noticed to be in running condition in these months, especially in February and March.

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