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FOOD AND FEEDING HABITS OF *METAPENAEUS MONOCEROS* FOUND IN THANE CREEK

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ABSTRACT: Food feeding habits of *Metapenaeus monoceros* from Thane creek reveal the fact that they are carnivorous in diet and show preference to polychaetes and crutaceans in the diet. These prawns neither are total detritus feeder nor prefer diatoms though available in large quantity.

Key Words: Food-feeding, Prawn, *M. monoceros*, Creek

INTRODUCTION

The food and feeding habits of different animals explain the distribution, migration and growth of them. Similarly it also helps to establish the trophic links. The study of food and feeding even help in culturing of those animals as feeding habits of an organism are directly related to their habitats.

M. monoceros is a commercially important prawn, commonly found in estuaries, as estuaries are the feeding grounds for the young ones of this prawn. But the references of food feeding habits of this prawn are scanty. Hence the food feeding habits of M. monoceros from Thane creek were studied.

MATERIALS AND METHODS

Two stations placed 6 km. apart, were selected on the Thane creek for the present study. The first station (Stn. I) or Thane station was near Thane Railway Bridge, where the main drainage pipe carrying domestic sewage and industrial effluents opens into the creek. The second station (Stn. II) or Kashali station was near the junction of the creek and Ulhas river, where freshwater inflow is more and large expanse of water was seen through out the year.

The collection of prawn samples was made from commercial nets at both the stations twice a month from May 1981 to April 1982. At stn.II the fishing is terminated from January to April as it becomes uneconomical. The randomly selected samples were brought to the laboratory in icebox. The stomachs were removed and immediately preserved in 5% formalin prepared in seawater.

The feeding intensity was measured by eye estimation method of Pillay (1952). Analysis of different food items was done by the 'point method' (Bapat and Bal, 1950) and their percentage composition was calculated according to the method of Hynes (1950). Later the data was pooled together and is represented monthly.

RESULTS AND DISCUSSION

The prawns have well developed masticatory apparatus hence it was difficult to analyze the food till its species level. Similarly no difference was noticed in the food and feeding habits according to the size or sex.

During the present study the gut contents of *M. monoceros*, at both the stations consisted of crustaceans, polychaetes, fish, mollusks and nematodes remains, plant matter algae, sand, diatoms and mud (Table 1). The crustaceans remains could be identified by the pieces of exoskeleton, broken appendages, compound stalked eyes, while polychaete remains were mostly setae, acicula and muscle debris. Fish remains were mostly cycloid scales while pieces of molluscan shells and plant epidermal tissue with chlorophyll were also noticed in the gut contents.

The main diet of *M. monoceros* at stn.I and stn.II appeared to be polychaetes and crustaceans, while mud forms the third component (Table 1). Other food items were found to be in negligible amount.

At stn.I crustaceans formed the major part of the diet in summer months (March to June) and in post monsoon months (September and October), while in the remaining months polychaetes were the major food. Polychaetes thus show inverse relation with crustaceans but direct relation with mud (Fig 1 & 2). This might be due to the feeding habits of the prawn, as it feeds on the crawling polychaetes in mud, which may also explain the presence of mud in the gut contents. During monsoon period prawn biomass showed positive relation with polychaetes (Athalye *et. al.* 2001) and polychaetes abundance was also noticed in their gut contents showing the preference to polychaetes as food.

At stn. II polychaetes were seen to form the major portion of food contents throughout the fishing season. Similarly, the percentage of mud was much higher reaching 80 % as against 33.33 % at stn.I.

Table 1: Monthly fluctuations in percentage composition of different food items of *Metapenaeus monoceros* from stn.I and stn.II

	Crustaceans		Polychaetes		Mud		Fish		Mollusca		Plant		Algae		Diatoms		Sand		Nematodes	
	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
May	44.44	8.33	34.35	70	12.5	15	0	0	0	0	0.4	0	0	0	3	6.67	3.5	0	1.85	0
June	55.00	40.84	26.67	14.21	5.56	23.16	0	0	0	0	0	0	0	0	2.22	3.16	10	0	0	0
July	30.07	0	53.15	0	14.23	0	0.27	0	0	0	0	0	1.34	0	0.94	0	0	0	0	0
August	19.04	22.81	68.08	43.64	10.65	31.71	0	0	0	0	0	1.49	0.23	0	0	-0.17	1.81	0	0	0
September	43.7	13.84	38	50	16.78	36.36	0.17	0	1.74	0	0	0	0	0.17	0	0	0	0	0	0
October	80.19	16.67	32.66	53.33	14.36	20	0	0	0	0	0.31	0	0.31	0	0.63	0	1.88	10	0	0
November	22.13	0	57.02	20	20	80	0	0	0	0	0	0	0	0	0.85	0	0	0	0	0
December	0	0	66.67	80	33.33	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	24.12	0	60.72	0	5.98	0	0	0	0	0	0.41	0	0.93	0	7.84	0	0	0	0	0
March	46.91	0	40.05	0	9.95	0	0	0	0	0	0	0	0.32	0	2.77	0	0	0	0	0
April	42.14	0	34	0	13	0	0	0	0	0	0.29	0	0	0	2.14	0	0.29	0	8.14	0

Table 2: Monthly fluctuations in percentage of feeding intensity of *Metapenaeus monoceros* from stn.I and stn.II

	G		F		3/4 F		1/2 F		1/4 F		E	
Stations	I	II	I	II	I	II	I	II	I	II	I	II
Month												
May	13.33	0	40	27.03	2.67	0	12	27.03	3	0	24	45.94
Jun	0	0	13.33	14.29	6.67	0	13.33	14.29	20	8.57	46.67	60
Jul	4.05	2.86	40.54	0	0	0	3.11	0	2.7	0	44.59	0
Aug	3.23	0	62.9	35.44	1.61	0	3.23	3.8	6.45	3.8	22.58	56.96
Sept	1.75	0	38.6	13.33	3.51	0	10.53	6.67	7.02	6.67	38.6	73.33
Oct	1.11	0	12.22	0	0	0	1.11	21.43	14.44	0	71.11	78.57
Nov	2.78	0	27.78	9.09	0	0	2.78	0	0	0	66.67	90.91
Dec	0	0	0	16.67	0	0	100	0	0	0	0	83.33
Jan	0	0	0	0	0	0	0	0	0	0	0	0
Feb	8.57	0	42.86	0	5.71	0	11.43	0	22.86	0	8.57	0
Mar	8.77	0	14.91	0	2.63	0	19.3	0	14.91	0	39.47	0
Apr	12.5	0	33.93	0	1.79	0	14.29	0	17.86	0	19.64	0

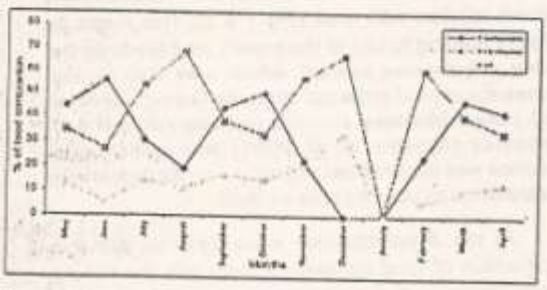

Fig. 1 : Comparison of food components at station 1

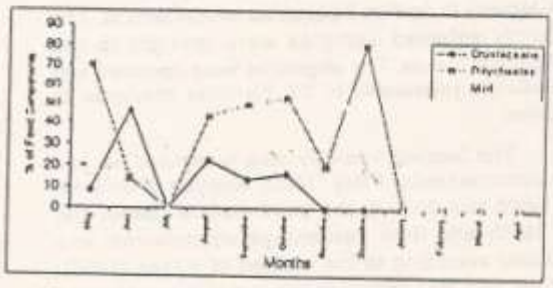

Fig. 2: Comparison of Food Components at Station II

Mollusks, fish remains and nematodes were found to be totally absent from the diet of this prawn from station II.

At both the stations when the feeding intensity was maximum, polychaetes formed the major part of the diet. Polychaetes are also reported in the gut content of *Mugil cephalus* from the same study stations (Tandel,1984, 1986).

Prawns are considered to be omnivorous in diet (Hunts, 1925; Chopra,1939; Gopalkrishnan,1953; Subrahmanyam,1963; Gunter,1964 and Rao,1967). Subrahmanyam (1963) observed that bottom fauna formed predominant part of the diet of *M. affinis*. Pillay (1954) commented that *M. monoceros* fed mainly on detritus, besides copepods, filamentous algae and diatoms, while Mehendale (1959) observed it to feed on detritus along with algae, crustaceans, foraminiferans, polychaetes and miscellaneous items like eggs, fish scales, nematodes. Kathuria (1967) also found *M. monoceros* to be detritus feeder while *M. brevicornis* preferred crustaceans to algae and detritus.

In the study of Godavari estuary Subrahmanyam (1973) commented that *M. monoceros* fed mainly on plant matter, organic detritus, small crustaceans and foraminiferan shells. Athalye *et. al.* (2001) reported phytoplankton, plant matter, annelids, arthropods and mud as food content of *M. monoceros* from Thane creek. George (1974) observed size wise difference in the diet of the prawn, small sized prawn fed mainly on small crustaceans, mud and detritus while in large sized group detritus was found to be in very large proportion.

Though most of the scientists suggest *M. monoceros* to be detritus feeder it is not true for the present study, because though detritus forms 80% of the diet in November at stn.II, 90.90% of the animals had empty stomachs in that month.

Very low percentage of diatoms in the diet is also intriguing, as diatoms formed the major component of the food in *Mugil cephalus* and *Boleopthalmus dussumierei* from the same area during certain months (Tandel,1984) indicating abundance of phytoplankton. Quadros (2001) observed, among crustaceans *Illyoplex gangetica* and *Scylla serrata* found in the area under study, fed predominantly on phytoplankton mainly diatoms. This shows that diatoms are not preferred by *M. monoceros* from this area as food.

Similarly nematodes form 90% of the food contents of *Mystus gulio* (Tandel,1984,1986) from the same locality in certain months, but almost complete absence of them in the diet of *M. monoceros* indicate non preference of the prawn to nematodes.

Overall the feeding intensity of *M. monoceros* at both the stations appeared to be low (Table 2) but comparatively it was better at stn.I where gorged and full stomachs were seen for the entire study period. Similarly the percentage of empty stomachs was lower at stn. I than stn.II where it reached to the level of 90.90 %in November.

Mehendale (1959) commented that feeding activity in *M. monoceros* from Mahim backwaters in general seemed low from October to December and high from June to August. During the present study feeding activity was low in October and November whereas it was high from February to May and in August-September at stn. I. While at stn. II mostly it was lower throughout the fishing season and the lowest in November and December. Gorged stomachs were noted at least to little extent at stn. I but at stn.II they were noticed only once.

Thus it can be concluded that *M. monoceros* in the area under study is largely carnivorous in diet showing the preference for polychaetes and crustaceans as food. Similarly their feeding intensity in the study area was also low.

Athalye *et. al.* (2001) during their investigation in 1991-1993 could get some M. monoceros in the catch but now the fishing is totally stopped at stn.II, Quadros (2001) during his investigations from 1999-2001 could not get this prawn in the commercial catches from Thane creek.

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