

FOOD AND FEEDING HABITS OF THE SCIAENID FISH
PENNAHIA MACROPHthalmus (BLEEKER)

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ABSTRACT

Quantitative analysis of the food of the sciaenid fish *Pennahia macrophthalmus*, seasonal variations, food in relation to length of fish, feeding intensity and food selection are discussed. The species is a carnivore, feeding mainly on fishes and prawns.

INTRODUCTION

THE SCIAENID FISH *Pennahia macrophthalmus* (Bleeker) is one of the major constituents of the sciaenid fishes landed by the trawlers along Mandapam Coast. Its food habits were studied by Srinivasa Rao (1967) and Appa Rao (1981) along Waltair Coast; by Suseelan and Nair (1971) from Bombay Coast and Gandhi (1982) from Porto Novo. However, no information is available on its food habits from Mandapam and adjacent areas of the Gulf of Mannar and Palk Bay.

The author thankful to Mr. S. Mahadevan, Regional Centre of Central Marine Fisheries Research Institute, Mandapam Camp and Mr. C. Mukundan, Research Centre of CMFRI, Vizhinjam for critically reading the manuscript and offering their comments.

MATERIAL AND METHODS

Bi-weekly collections were made during 1968 and 1969 from the trawlers operating from Mandapam. Fishes were preserved in 5 per cent formalin after making an incision on the abdomen. 3010 fishes were analysed

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during this period. Though various methods for the analysis of the food of fishes are available, the 'Index preponderance' suggested by Natarajan and Jhingran (1961) was found suitable for the study of food of *P. macrophthalmus*.

It was not always possible to identify the stomach contents upto species or genetic level as the stomach contents were found often in an advanced stage of digestion. The term 'fishes' was used to indicate the fishes that could not be identified due to the advance state of digestion. The presence of mud was also recorded as part of the food though its occurrence may be accidental.

RESULTS

'Fishes' formed the major constituent of the stomach content of the species during the period of observation. *Stolephorus commersoni* occurred in all the months except in January, February, and December in 1968 and February, September and November in 1969. Its peak occurrence was during October in 1968 and June in 1969. *Acetes indicus* was another important food item of the species with its peak occurrence in December and November during the years 1968 and 1969 respectively.

Penaeid prawns formed another important constituent of the food having its peak occurrence in January 1968 and May in 1969. *Lucifer* spp. was another common food item found in the stomach. Fishes like *Sardinella* sp., *Leiognathus* spp., *Apogon* spp. and gobids also formed its food. Other food items were *Sepia* sp., crabs, *Mysis* sp., *Calanus* spp., planarians, echiuroids, *Philene* sp., sabellids, fish larvae and fish eggs (Fig. 1 and 2).

Though there was no marked qualitative variation in the food between the years, there was monthly variation in the food. 'Fishes' were the dominant food item during February, March, May to July and September in 1968 and in January, July and September in 1969. *S. commersoni* formed its major food item in August and October during 1968 and in February, June and August during 1969. It was further observed that the penaeid prawns were found to be the important constituents of the food during January to April in 1968 and March, May and October to December in 1969. *Acetes indicus* was found more in the food content during December in 1968 and March, April and October to December in 1969. *Lucifer* sp. was observed to occur as an important food item during the month of December in both the years.

The order of importance of food was found to be more or less same for the major constituents of the food during 1968 and 1969. The first four places were taken by 'Fishes', *S. commersoni*, penaeid prawns and *Acetes indicus* in both years. The following three places were taken by *Sardinella* spp., *Lucifer* spp., and *Leiognathus* spp. respectively in 1968 and *Bregmoceros* sp., *Leiognathus* spp. and *Lucifer* spp. in 1969.

'Fishes', penaeid prawns and *Acetes indicus* formed the major items of food from the fishes of length 80 to 199 mm. It was observed that the bottom living molluscs like *Philene* sp., were found in the stomach of fishes of length 150 mm and above. However, *Squilla*

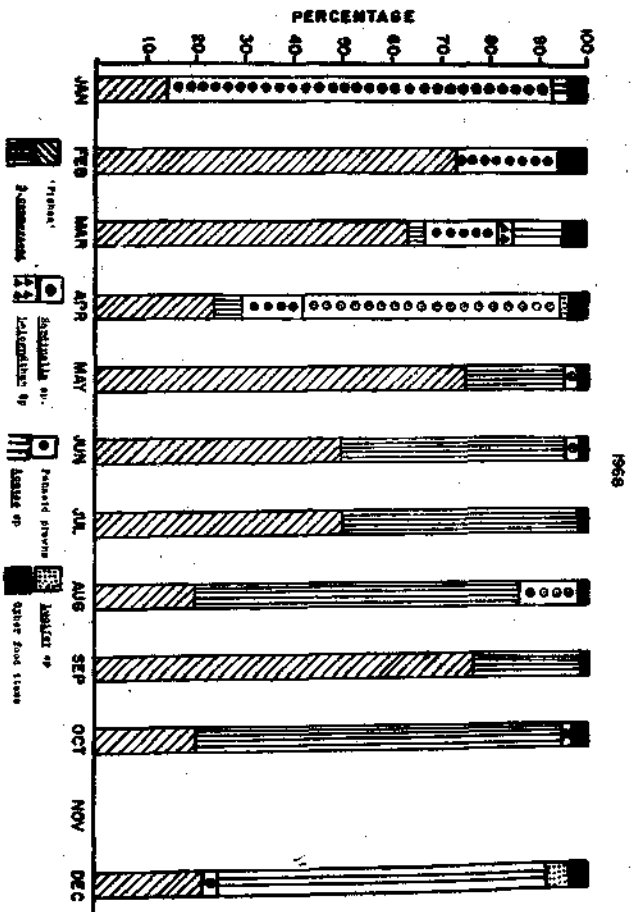
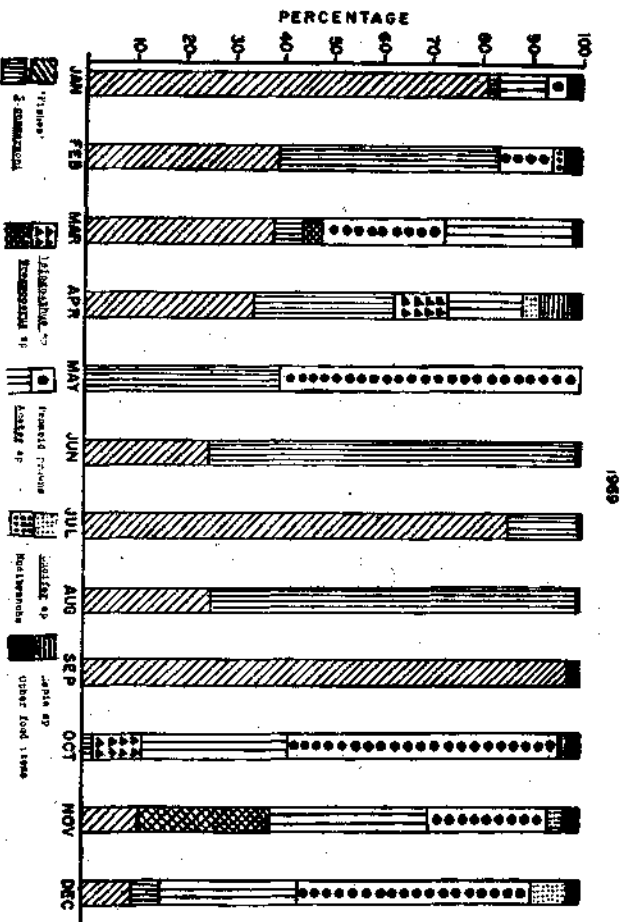
sp., the echiuroid *Thalassema* sp., nudibranchs and polychaetes were found in the stomach of the fishes of length above 130 mm, 100 mm, 140 mm and 110 mm respectively. It was further observed that the benthic forms were found more in the length groups above 160 mm though *S. commersoni* were found in all length groups. The presence of mud in the stomach of the fishes above 90 mm indicated that fishes did not restrict their feeding activities to one of the stratum of the water column alone.

Feeding intensity of the fishes may be indicated by the occurrence of number of 'Gorged' stomachs. It was observed that the feeding intensity was at its peak during the months of October and December. However stomachs in 'full' condition were observed more during July and May though throughout the year they continued to occur. The '½ full' stomachs were recorded during all the months except November to January. '¼ full' stomachs were also observed during all months. The peak occurrence of 'trace' food in the stomach was during May and October though they were found in all months. The 'empty' stomachs dominated during January to March and June to September.

To study the food selection, a record of other fishes caught along with *P. macrophthalmus* was maintained. It was observed that *Leiognathus* spp. did not form an important food item though it occurred along with *P. macrophthalmus* forming 90-95 per cent of the landings. *Stolephorus commersoni*, the dominant constituent of its food was found to constitute a negligible part of the commercial catch. The laterally compressed body form and the presence of strong dorsal and anal spines of the leiognathids might have prevented *P. macrophthalmus* from feeding on them.

DISCUSSION

Srinivasa Rao (1967) and Appa Rao (1981) observed that fishes, followed by prawns,

FIG. 1. Food of *Penaeus macrophthalinus* during 1968.FIG. 2. Food of *Penaeus macrophthalinus* during 1969.

formed the major constituent of the food of *P. macrophthalmus* along the Waltair Coast. Suseelan and Nair (1971) found that 'teleost fishes' and *Acetes indicus* constituted the diet of the species along the Bombay Coast. The present observation of the occurrence of fishes, prawns and *Acetes indicus* as its major food item agrees with the observation of other workers.

Nair (1981) observed that prawns *Acetes indicus*, amphipods and mysids formed the food of juveniles of the sciaenid fish *Johnieops sina*, while fishes, prawns, amphipods, *Squilla* spp. and polychaetes constituted the food of adults. In *P. macrophthalmus*, fishes constituted the major food item in the length groups above 90 mm. The benthic organisms like

echuroid worms, nudibranchs and polychaetes were found in the fishes of length above 100 mm. However fishes formed more than 80% of the food suggesting its piscivorous nature.

Food selection is a common trait in the feeding habits of fishes (Ivlev, 1961). It was observed that though leognathids occurred along with *P. macrophthalmus* in large numbers in the trawl catches, it formed only about 3% of the stomach content of the fish while other linear bodied fishes like *S. commersoni*, *Sardinella* sp. and *Apogon* sp. constituted about 75% of its stomach content though they were not found to occur in large numbers in the commercial catch. The linear body form with weak dorsal and anal spines might have bearing on the food selection.

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