MARINE FISHERIES INFORMATION SERVICE

No. 53

SEPTEMBER, 1983

Technical and Extension Series

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
COCHIN, INDIA

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

THE MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of Information on marine and brackish water fishery resources and allied data available with the Fishery Data Centre and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

Abbreviation – *Mar. Fish. Infor. Serv. T & E Ser.*, No. 53 : 1983

NEW PENAEID PRAWN RESOURCES SHOWING UP ALONG MAHARASHTRA COAST*

Introduction

Introduction of mechanised trawling operations has been greatly beneficial to the maritime states of India and this has been found to be the case in Maharashtra state as well, since the fishermen has been able to fish beyond the traditional close inshore areas of the coast line and tap the fishery resources not exploited by the indigenous fishing operations. In several areas this has resulted in locating new fishing grounds and exploitation of unexploited resources of prawns and other groups, thereby increasing the production considerably over the years. The prawn fishery of Maharashtra state has been studied by Mohamed (1967, *Proc. Symp. Crustacea Mar. biol. Assoc. India* part IV: 1408–18) and others and they have enumerated the species of prawns contributing to the fishery. In recent times from 1977 onwards consequent to the increased operations of the trawlers especially in slightly deeper areas, some prawns which have not been earlier represented in this fishery are noticed to occur in increasing abundance in the landings at Sassoon Dock so as to contribute to substantial fishery. In view of the increasing demands for prawns, the details of the fishery and biological aspects of these prawns have been studied right from the initial occurrence of the species in the fishery and the results are presented here.

Species composition

The following four species of prawns belonging to the penaeidae were represented (Fig. 1–8).

Metapenaeopsis stridulans (Alcock): This is the 'fiddler shrimp' growing to a maximum total length of about 100 mm and can be easily identified by the presence of the stridulating organ (a row of small ridges) on the postero–lateral part of the carapace.

Parapenaeus longipes Alcock: Popularly known as the "flamingo shrimp", this is a still smaller species reaching a maximum total length of only 95 mm. The species is reported in fishable quantities for the first time and one of the important diagnostic feature is the presence of the longitudinal suture from the anterior to posterior margins of the carapace laterally.

Trachypenaeus curvirostris (Stimpson): This species known in popular English name 'southern rough shrimp' and locally 'Dugdu' grows to a maximum total length of 105 mm. The short and stumpy nature is characteristic of the species which is reported as a fishery in India for the first time.

Solenocera choprai Nataraj: FAO English name for the prawn is 'Ridgeback shrimp.' It reaches a maximum total length of 125 mm and the foliaceous antenna is the diagnostic generic character.

M. stridulans and *P. longipes* together constituted about 75% of the total landings of the four species at Sassoon Dock, the former contributing to 40% and the latter 35%. *S. choprai* formed 15% and *T. curvirostris* 9% on an average. *Atypopenaeus stenodactylus* and the crangonid shrimp *Pontocaris* sp. were found in stray numbers.

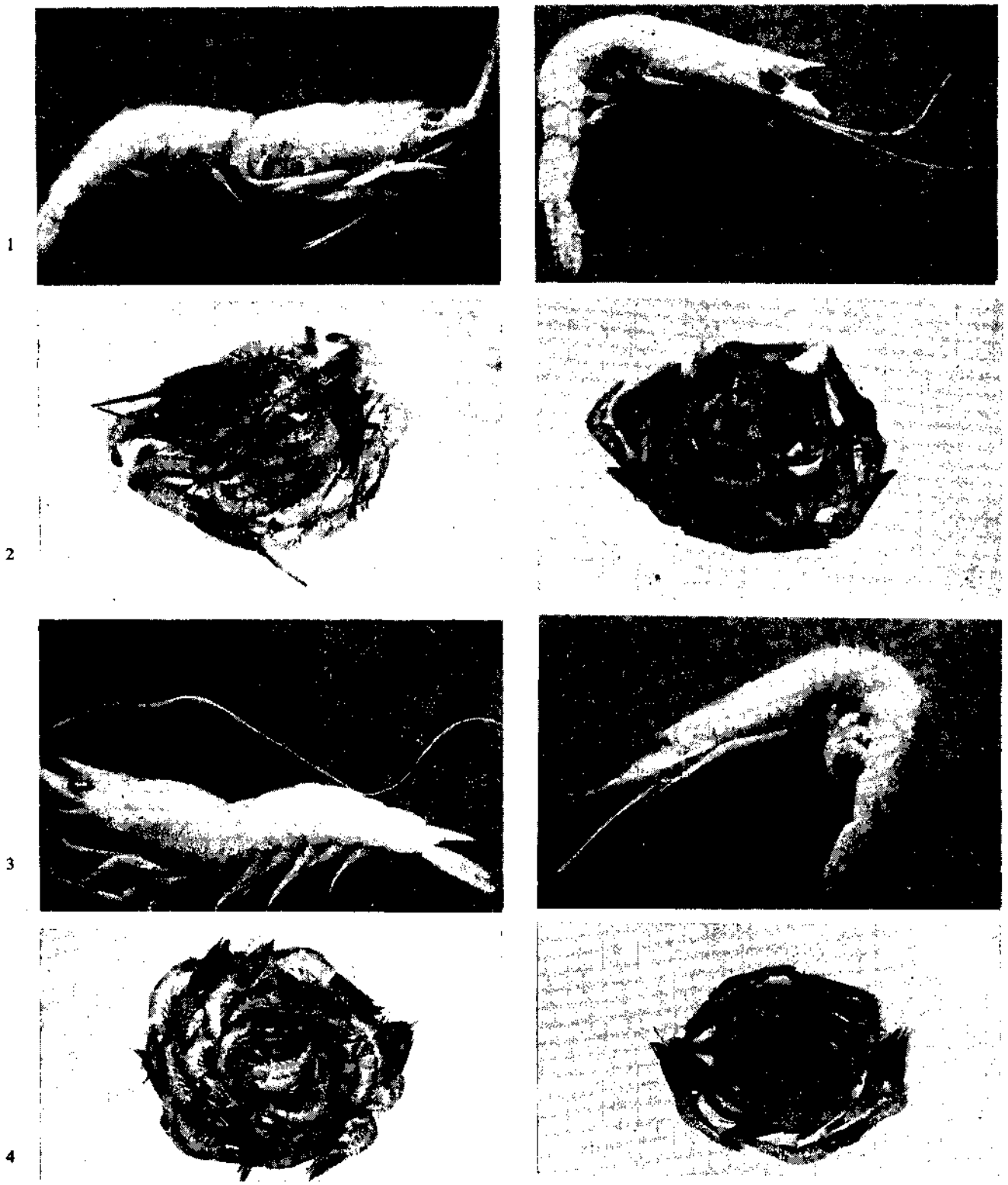
Fishing operations

The fishing was carried out by mostly country crafts operating 18–22 m shrimp trawls off Murud, Srivardhan and Harnai coasts of Maharashtra in a depth zone ranging from 40 to 75 m (Fig. 9). Gokhale (Science Today: 5–8, 1982) reported that fishermen of both Maharashtra and Gujarat fish in areas of this depth range using their small country crafts. Very recently the research vessel R. V. Saraswathi of Central Institute of Fisheries Education caught good numbers of some of the above mentioned species in a depth range of 60 to 70 m off Harnai coast (area 17–72.5 B) in trial fishing operations with a pelagic trawl, confirming the presence of these species in these depth areas.

Production

The combined total production of these four species put together at the centre was estimated at 11,720 tonnes during the years 1977 to 1983 with an average

* Prepared by M. Aravindakshan and J. P. Karbhari



Figs. 1 & 2. *Solenocera choprai* Nataraj; 3 & 4. *Trachypenaeus curvirostris* (Stimpson); 5 & 6. *Metapenaeopsis stridulans* (Alcock); 7 & 8. *Parapenaeus longipes* Alcock.

yearly landing of 1,674 tonnes for each season. The magnitude of the landings of the constituent species during the different years is presented in Fig. 10. Taking the total production of the species, the landing figures were the highest during 1978 and 1979. Thereafter a slight decline was noticed in 1980 and 1981. However, in 1982 and 1983 the catches have gone up, although not reaching the 1978 and 1979 level. The average catch per unit amounted to 70 kg.

Fishing season

The fishery for these species is highly seasonal. The fishery commences from late February or early March and continues up to June, by the end of which month the trawler operations in deeper regions are suspended. The availability of large sized penaeid prawns in the shallower inshore areas in larger quantities and the onset of the monsoon are the factors leading to the suspension of fishing for these prawns.

Biological observations

Biological aspects like size ranges, sex ratio, maturity, food preferences etc. have been studied.

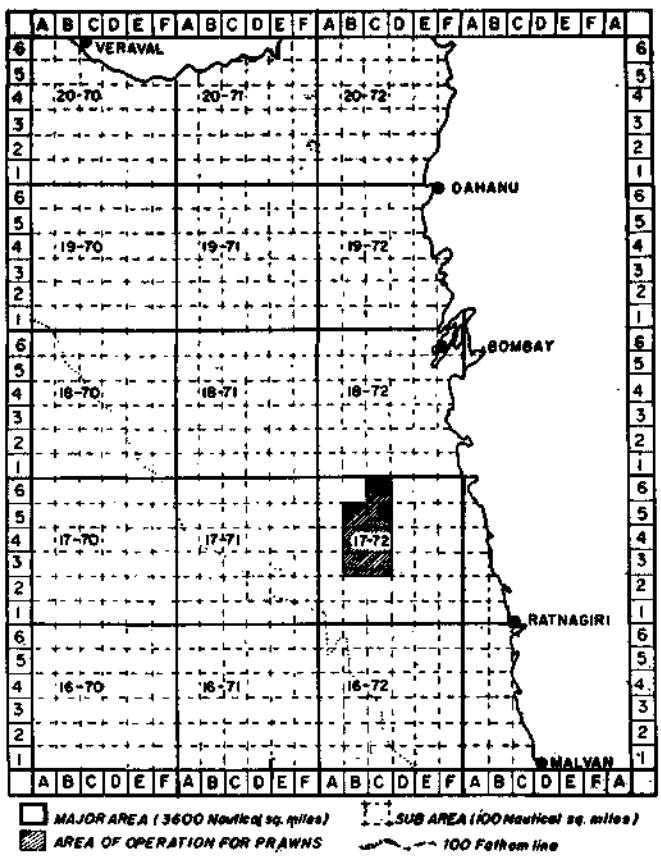


Fig. 9. Map showing the fishing area

M. stridulans was found to have a size range in the fishery between 55–85 mm. The sex ratio was 2:1 with females in domination. Analysis of the stomach contents of 1,125 specimens revealed appendages of decapod crustaceans, remains of gastropod molluscs followed by foraminifera, sand grains and debris. The

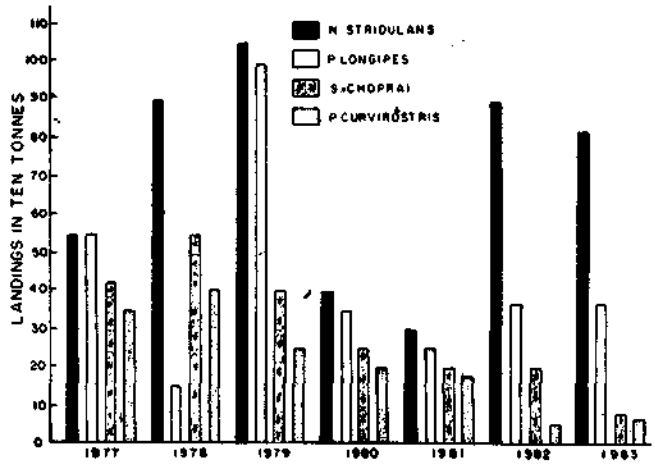


Fig. 10. Specieswise prawn landings during 1977-1983

major food items of crustacean remains formed 70%. The presence of sand grains and debris indicated a bottom feeding habit. Polychaete remains were not observed in the stomachs of the species. Percentage of mature females was observed to be maximum of 70% in March, indicating March–April as probable spawning months.

P. longipes ranged from 55–95 mm in length in the landings. In this species also females were always dominant (sex ratio 2:1) and larger in size. Stomach contents of 1,227 specimens showed that crustacean remains formed the major item of food, forming about 60% with molluscan remains and foraminifera constituting 18%. Sand grains and debris constituted remaining 22%. High percentage of mature females (80%) was observed in months of April and May, indicating spawning during these months.

S. choprai. The size range of the species noticed in the fishery was from 55–125 mm. Males were always smaller in size and less in numbers. Males exceeding 100 mm were not noticed and the sex ratio was 3:1 in general with females in domination. Study of stomach contents of 421 specimens showed a carnivorous diet with crustacean remains dominating (60%) mainly in the form of appendages of decapods.

Gastropod remains and foraminifera followed by sand grains and debris formed the remaining 40%.

Mature females occurred in larger numbers in March and April. During 1980 mature females were observed in August and September as well. The number of eggs in a fully mature female of 107 mm total length was estimated at 1,30,850. The high fecundity of the species points out to the possibility of existence of more exploitable stock in the case of this species.

T. curvirostris ranged from 60–105 mm in size in the fishery. The general sex ratio was 3:1 with females in domination. Males rarely exceeded 70 mm. Stomach analysis of 906 specimens showed items of food similar to the other three species, with crustacean appendages forming the major portion (70%). The percentage of mature females was observed to be 80 in April and May.

General remarks

Among the four species of these prawns it was noticed during the study that *M. stridulans* and *T. curvirostris* were hardy and lesss susceptible to decay than the other two species, *P. longipes* and *S. choprai* which developed blackening of appendages and gill region due to bacterial action much quicker. This would naturally affect the quality of the processed product and create problems for the processor. In order to keep the quality of the prawns proper preservation of the catches on board the vessels and small boats by carrying sufficient ice would be very essential.

The catches are being auctioned at the landing centre, the price varying from Rs. 10 to 15 per kg depending on the size and freshness of the prawns. At an average price of Rs. 12 per kg, prawns of these varieties at an estimated cost averaging 2 crores of rupees are being landed every season at this particular centre. As the price varies with the freshness of the prawns landed and the prawns being of the variety which develops blackenings quickly, no effort should be spared to see that the prawns are landed under proper preservation so that the fishermen could get the maximum price for his catch.

The authors are deeply grateful to Dr. E. G. Silas, Director, CMFRI for the interest and encouragement. They also express their sincere gratitude to Dr. M. J. George, Senior Scientist for scrutinising the manuscript and suggesting modifications. Thanks are also due to our colleague Shri S. K. Chakraborty.