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18. CHANKS CAUGHT BY THE RESEARCH VESSEL CADALMIN IV FROM TRAWLING GROUNDS IN GULF OF MANNAR

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ABSTRACT

The Sacred Chank, *Xancus pyrum* was caught in bottom trawl net operated by the Research Vessel CADALMIN IV in different areas in Gulf of Mannar. The areawise, depthwise and monthwise catches of the chanks, the ecological conditions from where they were obtained, size composition of the chanks and length-weight relationship have been studied. Maximum number of chanks were caught from trawling grounds off Tiruchendur coast. The highest numbers were recorded in the period October-March. The chanks ranged from 25 mm to 117 mm in maximum shell diameter and 54 mm to 202 mm in length. In the trawling grounds from where the chanks were netted the bottom was muddy sandy with rocky patches here and there and the other fauna found were polychaetes, crabs, gastropods, bivalves, starfishes, sea urchins, sea lillies, cephalopods etc.

INTRODUCTION

The Sacred Chank, *Xancus pyrum* forms dense beds off Tuticorin coast and supports an important fishery. (Hornell 1914, Mahadevan and Nayar 1973). The chanks are distributed in the area at depths of 11 to 27 m. The bottom where the chank beds are found has been stated to consist of very fine sand and sometimes coarse sand and some of the areas are partly rocky (Hornell 1922, Mahadevan and Nayar 1974). Chank fishing is done along the Tuticorin coast during November-May when the water clarity is good. The disposition of chank beds in the area has been surveyed for the first time by Hornell (1922) and recently by Mahadevan and Nayar (1974).

During the course of exploratory fishing conducted by the Research Vessel CADALMIN IV of the Central Marine Fisheries Research Institute based at Tuticorin, in Gulf of Mannar off Manapad-Valinokkam coast with bottom trawl net in 1982, chanks were netted on several occasions from different fishing grounds. Data were collected on areawise, depthwise and month-wise catches of the chanks; ecological conditions where they occur, the size composition of the chanks and length-weight relationship. The results obtained are presented in this paper.

MATERIAL AND METHODS

Data have been collected on the number, length, maximum shell diameter and weight of chanks caught in the different fishing areas and depth zones in which bottom trawling was conducted in Gulf of Mannar with CADALMIN IV as part of the experimental fishing programme of Central Marine Fisheries Research Institute. The sediment in the different areas was collected with a grab, dried and sieved using standard sieves. The fauna and flora occurring in the sea bottom from where chanks were netted were collected from the trawl catches and identified. Direct underwater observations were carried out by one of the authors (Pon Siraimeetan) off Tiruchendur coast, Tuticorin Harbour area and Thalayirampar using SCUBA equipment. The length-weight relationship of 155 chanks measuring 54 mm to 202 mm in length was studied.

RESULTS

Areawise distribution

Bottom trawling was conducted in ten fishing areas in Gulf of Mannar between Lat. 8° and 9° N and Long 78°E. Of the total of 155 netted chanks, 23.2% (36 chanks) were obtained from area 8-78/3B, off Tiruchendur coast and the next two areas from where

highest number of chanks were got are 8-78 4C, in Punnakayal trench and 8-78/5B, immediately south of Tuticorin, close of Tuticorin Harbour. 11% of the chanks were netted from area 9-78/1C, off Valinokkam coast. The number of chanks fished from other areas surveyed was much less and they accounted for 5.8 to 1.2% (Fig. 1).

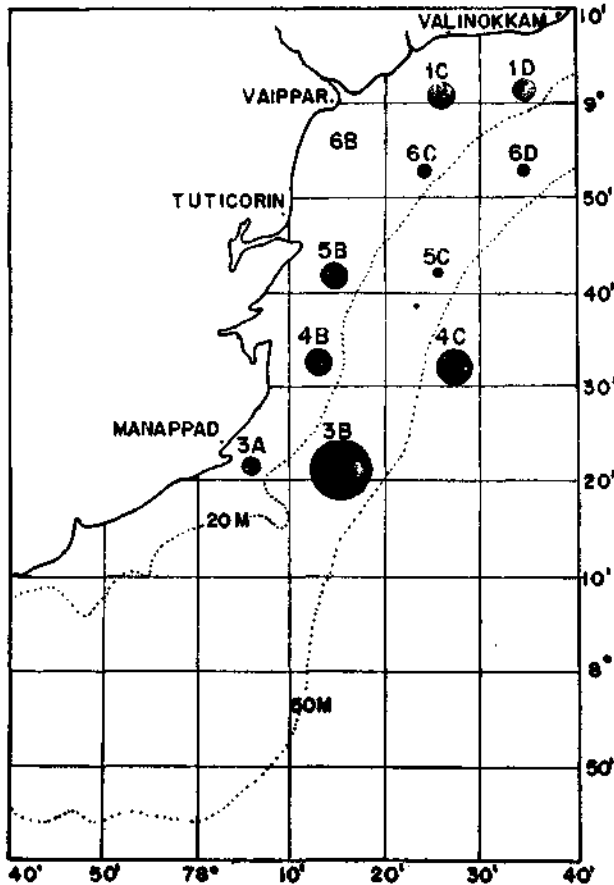


Fig. 1. Relative abundance of chanks caught in trawl net from different areas in Gulf of Mannar

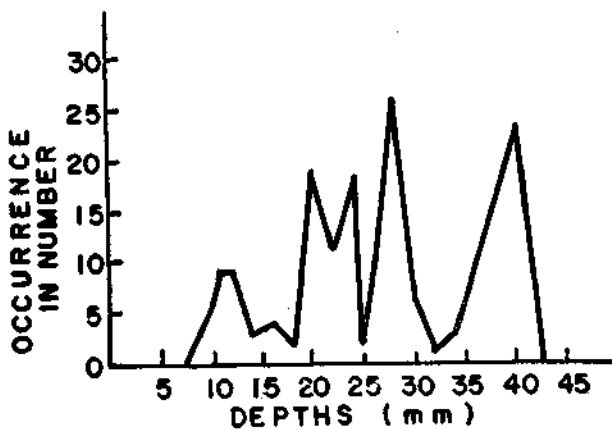


Fig. 2. Occurrence of sacred chank in different depths in Gulf of Mannar

Depthwise distribution

The depths of the fishing grounds surveyed varied from 10 to 40 metres and chanks were recorded upto a depth of 40 metres (Fig. 2). The maximum occurrence of chanks, 16.8% (26 chanks) was from a depth of 28 metres and the next was at 40 metres, 14.8% (19 chanks) and 24 metres 11.6% (18 chanks). The percentage composition at other depths varied from 6.5% to 0.6%.

Monthwise distribution

The highest number of chanks were obtained in January, 1982 (16.8%) and the next best months were March (13.5%), December (13.5%) and February, 1982 (12.2%) (Fig. 3). The catches were less in the other months and accounted for 9.0% (April) to 2.6% (September). The months in which the best catches of chanks were netted by the Research Vessel coincide with the fishing season off the coast.

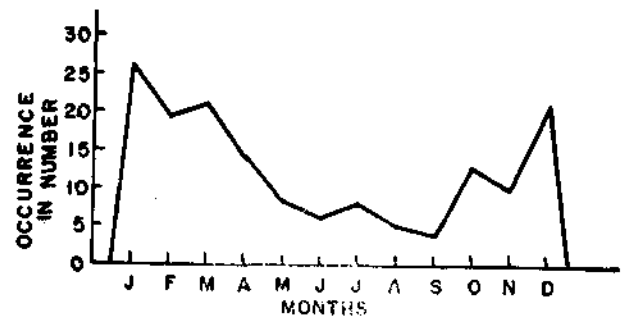


Fig. 3. Occurrence of sacred chank in trawl net in different months in Gulf of Mannar.

Ecological conditions

In the area 8-78/3B where the largest number of chanks were obtained, the dominant component of sediment was fine sand, mud and silt and there was a good amount of shell pieces of bivalves, *Turritella* etc. and small quantities of coarse and medium grain sand. In the areas with the next best catches 8-78/4C and 5B also fine sand and silt formed the bulk of sediment and shell debris and medium sand were a characteristic

feature. In the other areas the sediment was similar to the latter two areas with the shell debris and coarse sand often less.

In the trawling grounds from where the chanks were netted several live molluscs like the bivalves *Tellina coarctata*, *Mactra mera* and live gastropods *Babylonia spirata*, *Mirex virgineus*, *Hemifusus cochlid/urris* *Oliva nebulosa*, *Calliostoma tranquebarica*, *Clanculus microdon*, *Conus amadis*, egg capsules of sacred chank, egg ribbons of *Tonna dolium* and *Natica tigrina*. egg clusters of *Murex trapa* holothurans, sand dollars, sea urchins, crinoids, sponges, sea anemones sea fans, corals, stomatopods, the crabs *Portunus pugio*, *Charybdis* sp, *Ocypoda* sp and hermit crabs were recorded. The species of algae *Gracilaria foliifera*, *Halimena* sp and *Sargassum* sp and *Lithothamnion* and the sea grass *Cymodocea* were represented in the fishing ground. In addition, empty shells of several bivalves *Area complanata*, *A. fusca*, *Cardita bicolor*, *Pecten plica*, *Pinctada fucata*, *Tellina* sp *Pteria* and the gastropods *Oliva gibbosa* and *Turritella acutangula* were distributed over the bottom. On one chank collected during January, a pearl oyster *Pinctada fucata* and a sea anemone *Anemonia* sp were found attached.

A variety of fishes like rays, skates, sharks, *Lutianus*, *Lactarius lactarius*, *Sillago sihama*, *Chirocentrus* sp *Leiognathus* spp, Carangids, *Siganus* sp, *Saurida tumbil*, *Pseudorhombus*, *Lates calcarifer*, *Pseudosciaena diacanthus*, *Rachycentron* sp *Cynoglossus*, *Pellona Thriassocyles*, *Anchoviella commerson*, *Scomberomorus*, *Therapon jarbua*, *Nemipterus*, *Plotosus*, *Platycephalus* spp *Tetrodon* sp, gobids, the prawns *Penaeus semisulcatus*, *P. indicus*, *Parapenaeopsis uncta* and *P. maxillipado*, the lobsters *Panulirus homarus*, *P. ornatus*, *P. versicolor* and *Thenus orientalis*, the squid *Loligo duvaucelii*, the cuttlefish *Sepia elliptica* and *Sepiella inermis* and octopods etc. were caught in the trawl net catches.

Direct underwater ecological observations

Underwater ecological observations made with SCUBA equipment revealed that the bottom at the three grounds where studies were conducted was sandy muddy with rocky

patches here and there. The chanks were seen moving slowly at the bottom with the foot very much expanded. They took a zigzag course in their movement pausing occasionally over the bottom, brown or grey coloured muddy sandy sediment. The chanks also burrowed into the sediment,

Size composition

The size groups were 100-119 mm (35.5%) and 120-139 mm (31.0%). The size groups 140-159 mm and 80-99 mm accounted for 12.3% and 11% respectively (Fig. 7). The other size groups accounted for 4.5% (Fig. 4)

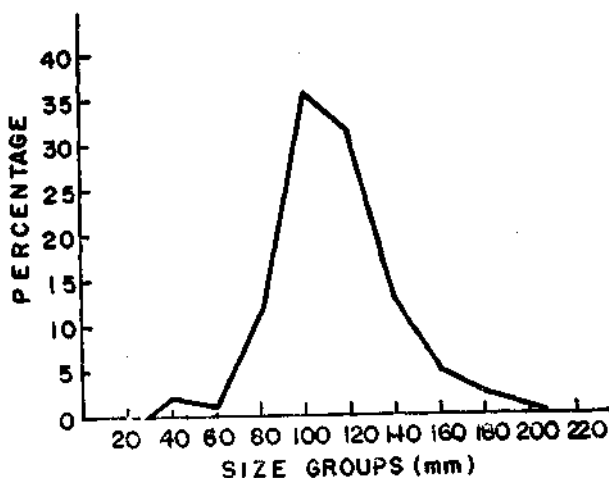


Fig. 4 Length frequency distribution of sacred chank netted in trawl net in Gulf of Mannar.

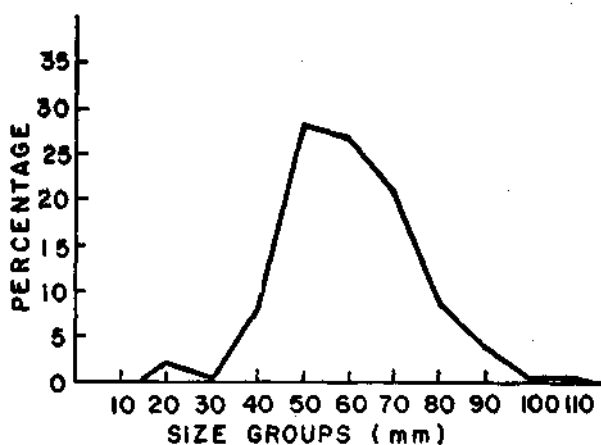


Fig. 5 Maximum shell diameter frequency of sacred chank obtained in trawl net in Gulf of Mannar.

Chanks with maximum shell diameter 50-59 mm formed 27.7% followed by 60-69 mm and 70-79 mm size groups which amounted to 27.1% and 21.3% respectively. The two shell diameter groups 80-89 mm and 40-49 mm accounted for 8.4% and 7.7% respectively and the other size groups represented less than 1% to 4% Fig. 5

Length-weight relationship

The length-weight relationship of *Xancus pyrum* based on 155 specimens of the length range 54-202 mm was calculated as.

$W = 0.000093284.L^{3.11369}$ ($r = 0.76189$)
 where W is weight of chank, L, length of chank and r correlation coefficient.

To test whether the exponent value i. e. 3.11369 differs significantly from 3, t test was applied and it was found that the calculated t value was 1.59 at 153 degrees of freedom indicating that there is no significant departure from 3 (Fig. 6).

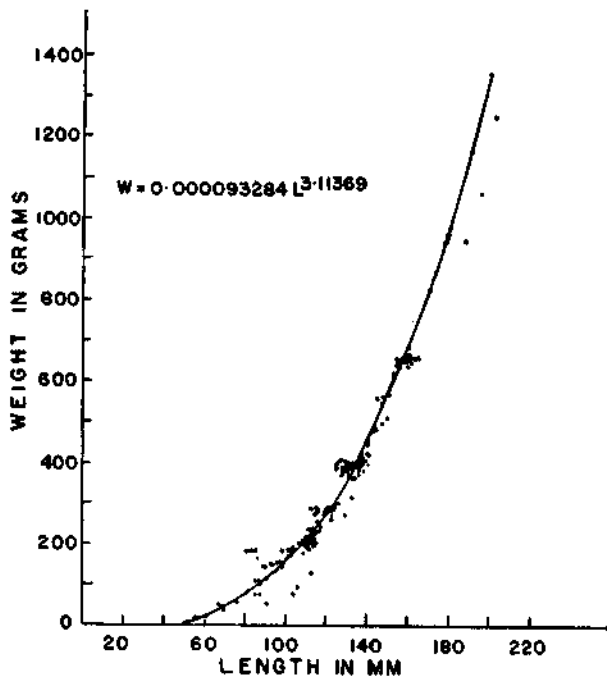


Fig. 6. Lengthweight relationship of sacred chank netted in trawl net in Gulf of Manner.

DISCUSSION

It is noteworthy that the highest number of chanks were netted in bottom trawl off Tiruchendur coast which is one of the richest grounds

from where chanks are collected by skin diving. This area has a depth of 24-28 m which is the maximum depth upto which skin divers go due

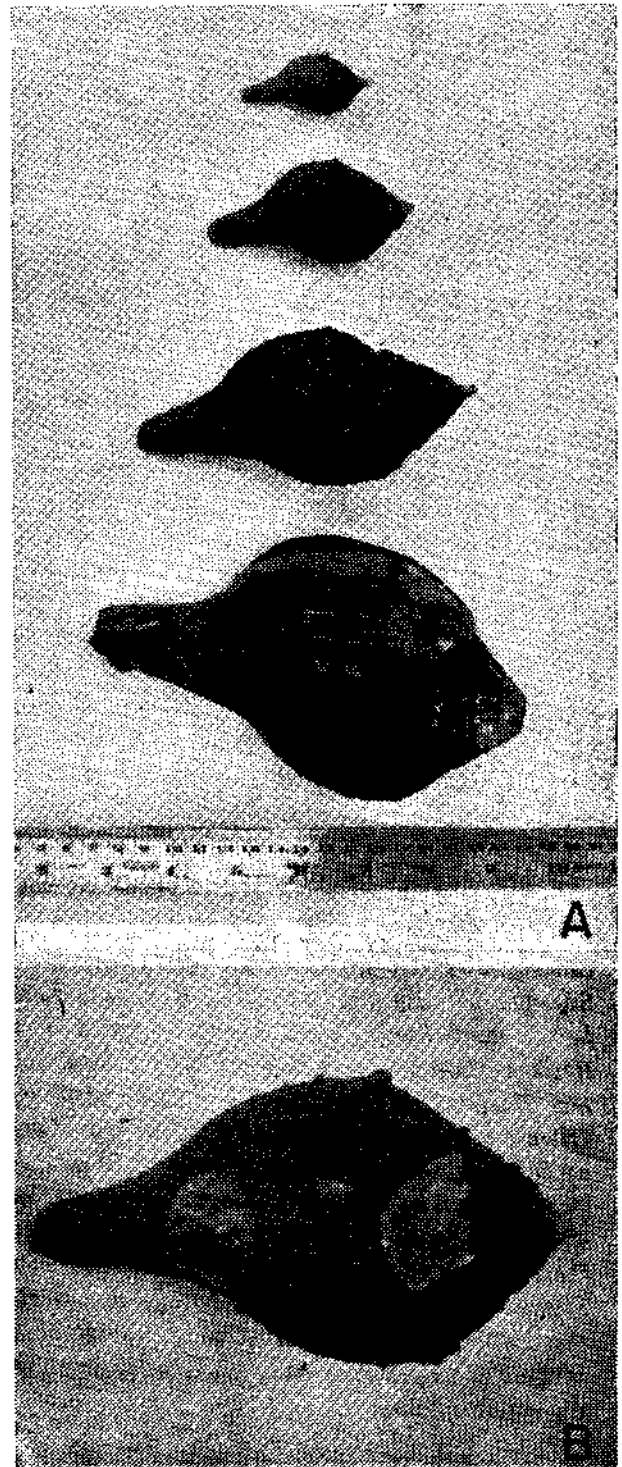


Fig. 7A. A Sacred chank, *Xancus pyrum* of different sizes caught by R. V. CADALMIN IV in Gulf of Manner. B. *Xancus pyrum* with pearl oyster *Pinctada* and sea anemone *Anemonia* sp.

to practical limitations. A good number of chanks, 17.4% of the total chanks obtained by trawling has been netted from the Punnakayal trench 8-78/4C, an area with depth 20-25 m where diving for chanks is not done due to the presence of a channel running at the bottom under the influence of a water current from the Punnakayal Estuary into the sea. The bottom in this area is uneven and there is a rich fauna and flora of diverse species. Hitherto chanks were known from waters of depth upto 27-28 m (Mahadevan and Nayar 1974). The present study has revealed for the first time that the sacred chanks occur at a much higher depth of 40 m, in the fishing area off Manapad and southwest of Valinokkam.

The areas where chanks have been netted in the present work are muddy with fine sand and mud as regular feature. The sediment of the bottom of the areas trawled is similar to that reported by Horneli (1922) and Mahadevan Nayar (1974).

There is a growing demand for shells of the sacred chank in India from the bangle industry as well as for use in workshop and the present production is not sufficient. In this context there is an urgent need for making a resources, survey of the chanks in Gulf of Mannar using SCUBA equipment and assessment of the abundance of the chanks in its entire distributional area.

In commercial trawling carried out in Gulf of Mannar throughout the year off Manapad-Valinokkam coast young chanks 20-25 mm in shell diameter are often netted and suffer destruction. The egg capsules of chanks are also frequently caught in trawl nets in January-

March. This should be prevented by legislation prohibiting the capture of such very small size chanks and egg capsules which will be very helpful in conservation of the species.

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