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LONG-LINING, SPECIFICALLY FOR SHARKS, PRACTISED AT THOOTHOOR

Jacob Jerold Joel

Vizhinjam Research Centre of Central Marine Fisheries Research Institute, Vizhinjam-695 521

and

I. P. Ebenezer

Kanyakumari Field Centre of Central Marine Fisheries Research Institute, Kanyakumari-629 702

Introduction

For many years now, the dynamic fishermen of Thoothoor, a fishing village on the western coast of Kanyakumari district of Tamil Nadu, have been venturing into the deep waters exclusively for sharks. As the dried shark fins have become a money spinner in the export market, the activities of these fishermen have also widened considerably. They now operate from many centres along the west coast from Kanyakumari to Gujarat with Thoothoor as their main centre of activity for fishing, procurement of shark fins, drying them and arranging for export.

The main fishing method is long-lining from mechanised boats, which is almost perennial in this village except for a few weeks when the sea is rough due to monsoon winds. The peak shark fishing season in this area is from september to December. During slack season many fishermen migrate to centres in other maritime states mainly of the west coast, where berthing facilities are available. The fishing harbour at Chinnamuttom, a few kilometers north of Kanyakumari, is a boon for them, particularly during inclement weather conditions (front cover photo).

Among various elasmobranchs (sharks, skates and rays) and teleosts (bony fishes), the common species are *Carcharhinus* spp., *Galeocerdo* sp., *Sphyrna* spp., *Aetobatus* sp., *Epinephelus* spp. and *Pristipomoides* sp. All the items other than sharks and skates are considered bycatch only.

The fishery survey data collected for the Fishery Resources Assessment Division of the Central Marine Fisheries Research Institute from 1986 to 1991 and the observations made by the authors during the same period have been utilised here to prepare the account. The cost of material and products referred to in the report pertains to the end of the year 1992 unless specified otherwise. As far as possible alphabetical indexing is followed while listing out names or groups of fishes and hence the same would not denote abundance of any qroup or species.

Fishing method

Boats with a length range of 9-12 m, fitted with engines varying from 30 to 90 HP, are engaged in operating long-lines with hooks commonly of number 000 (pronounced 'three zero') or rarely 00 and 0000. The number of boats varies considerably during different months of the year reaching upto about 200 at peak season. The fishing method is locally called *mattu*, considering the large-sized hooks used exclusively. The long-line is made of segments of 20 m long nylon ropes in a series. At the junction of two such ropes, another 1.5-m long wire made of steel wires, wriggled with one another, is attached from the mid point of which is hung a 0.75-m long wriggled steel wire with the hook. The steel wire linkage in the line is intended to prevent the shark from biting the line in its attempt to escape from hooking. The number of hooks in a line, with one hook for every 20-m piece, is variable but usually around 250. The ropes used as line are treated in a concoction prepared by boiling husks of

tamarind seed in water. It is said to give the ropes ample strength and a colouration that could easily match with the colour of the adjacent water at night. The cost for fabricating a long-line with 250 hooks would be about Rs. 30,000.

A boat with 6-8 fishermen leaves the shore at dawn. Enroute they go ahead with the first part of their work, ie. the bait collection. The flesh of dolphin is the most preferred bait. So, dolphin hunting is carried out using a harpoon. The harpoon connected to a rope with the free end of the rope held by the fisherman, is thrown at the dolphin. The harpooned dolphin is then hauled into the boat. In the absence of dolphin, flesh of fishes like *Lethrinus* spp., *Lutjanus* spp./tuna etc., caught by hooks-and-line is also used. After bait collection the crew reach the fishing ground 40-70 km away from the shore at 100-200 m depth and set the long-line with baited hooks at dusk since night time is most ideal for hooking sharks. The gear is hauled in by next morning and if the catch is satisfactory the fishermen return to the shore; otherwise, they stay back and hunt for bait for the next operation.

Catch

Based on data collected for five years from 1986 to 1989 and 1991, average monthly catch details have been worked out, which are presented in Fig. 1. The average monthly catch was 171 t, with the annual average catch of 2,048 t. April, May and August to December were the

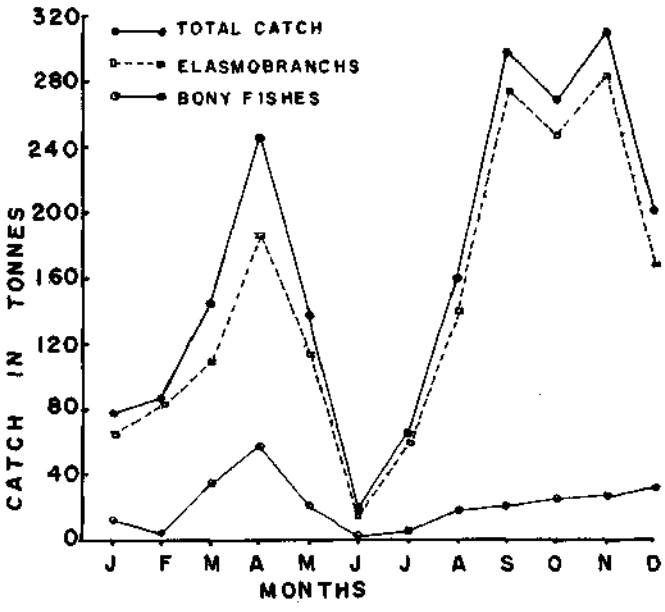

Fig. 1. Average monthly long line landings in tonnes during 1986 to 1989 and 1991.

months of good catch by longliners operated from this centre. The maximum catch per trip recorded was 1,870 kg. The average catch per trip was highest in November with 778 kg and lowest in March with 273 kg. The fishing trips per month ranged from 50 in June to 538 in March, with the annual average of 3,840 trips. On an average, sharks contributed 85.2% to the year's total catch followed by bony fishes (13.5%) and rays and skates (1.3%).

Of the total shark landings, 49.9% was constituted by species of *Carcharhinus* and *Isurus* (commonly *C. dussumieri C. limbatus, C. melanopterus, C. sorrah* and *I. oxyrinchus*, 26.6% by the tiger shark *Galeocerdo cuvier*, 19.9% by hammerheads *Eusphyra* and *Sphyrna* (commonly *E. blochii, S. lewini* and *S. zygaena*), and the rest (3.6%) by species of other sharks (mostly species of *Echinorhinus, Prionace, Rhizoprionodon, Scoliodon* and *Stegostoma* and rarely, *Alopias* and *Centrophorus*). Of these, *Echinorhinus brucus* formed 3.2% of the total shark catch. This species, so far known to be rare (Silas and Selvaraj, *J. mar. biol. Ass. India*, **14** (1) : 395-401, 1972; Somasekharan Nair and Thulasidas, *Mar. Fish. Infor. Serv., T & E Ser.*, **60**, 1984) is commonly landed here and is known by the local name, *aattu vaalai*. The squalids, *Centrophorus granulosus*, recently recorded from Indian Seas (*Mar. Fish. Infor. Serv., T & E Ser.*, **113**, 1991) and *C. uyato* are also landed here occasionally. The rays and skates include species of *Aetobatus, Dasyatis, Himantura, Urogymnus, Rhinobatus* and *Rhynchobatus*.

Of the bony fishes which contributed 13.2% of the total catch, the lutjanid *Pristipomoides typus* and the serranids *Cephalopholis* and *Epinephelus* dominated, followed by tunas and carangids.

Marketing and disposal

The catches are auctioned singly or *en masse* to the merchants (Fig. 2). The required fins are removed and the shark is cut open to remove the liver for oil extraction and the flesh is cut into strips for salting. The bony fishes caught are usually salted onboard to avoid putrification and then auctioned at the shore.

Usually the first dorsal, pectorals and the lower lobe of the caudal fin are highly esteemed in the foreign market. In the case of skates, the two dorsals and the whole caudal fin are preferred. Fins of certain varieties of skates are

considered as superior quality fetching more value than the fins of sharks. The fins which do not roll while being sundried are regarded as very good, and the merchants who are able to identify sharks with such fins are cautious about it while taking sharks in auction.

Fig. 2. Serranids and sharks for auction at the landing centre.

The fins of certain sharks like *Alopias*, *Centrophorus* and *Echinorhinus* are not of any value at all. But either the flesh or liver oil, or in some cases both, are made use of.

Yield of dried fins per shark may be roughly around 2.5 kg, though it may vary from 0.5 kg to 4 kg depending on the size of the fins. The price of fins may vary from Rs. 1,800 to Rs. 2,200 per kg for average quality and upto Rs. 3,500 per kg for the superior quality. Large patches of fins being sundried are a common sight at Thoothoor (back cover photo) during peak period of their landings.

The salted shark flesh is then diverted mainly to markets in Kerala and sold at the rate of Rs. 20 per kg.

The yield and value of liver oil differ considerably from species to species and depending on the quality the price may range from Rs. 150 to Rs. 225 per 15 kg. The liver oil that does not suit to pharmaceutical standards is used for smearing on country craft to repel marine foulers.

Extent of fishing operation

About 250 boats from this village are engaged in long-line shark fishing in different areas of India. Resident fishermen of Thoothoor operate during December to April off Kanyakumari, Tuticorin and Manapad (southeastern part of Tamil Nadu) and land their catches either at Thoothoor or at Chinnamuttom. For fishing off Thoothoor, May to November is considered to be the best season. Fishermen of this village also operate from Vizhinjam and Neendakara in Kerala and from Chinnamuttom and transport the catches in trucks to Thoothoor. The shark merchants of this place employ agents at many places, particularly at Cochin, to gather shark catches from different places for fins and then to pool the stock for export.

Other major areas covered by Thoothoor fishermen are Pallikkal (Kerala), Malpe and Karwar (Karnataka), Goa, Ratnagiri (Maharastra) and Veraval (Gujarat). They fish mainly during September to April in these centres and dispose of the catches there itself.

Biological observation

During the course of the present study a 262-cm long (total length) specimen of the bramble shark, *Echinorhinus brucus*, (Fig. 3) was found to contain a record number of 52 embryos (Fig. 4) against the maximum number of 24 embryos reported by Campagno (*FAO Fish. Synop.* (**125**) Vol. 4, Pt. 1:26, 1984).

Fig. 3. A 262 cm long female of bramble shark, *Echinorhinus brucus*.

Fig. 4. The record number of 52 embryos found in the female bramble shark shown in Fig. 3.

Remarks

A society called "Meen Pidikkum Thozhilalar Sangam", functioning at Thoothoor for the welfare of the fishermen of this village, maintains records of the income of long-liners owned by its members. According to the actual trip-wise gross income of these boats during May 1988 to September 1989, the daily average yield per trip ranged from Rs. 860 to Rs. 16,810. Between these two extremes, the average income per trip ranged from Rs. 1434 to Rs. 6,344. While calculating the income for a fisherman per trip, it becomes clear that each one gets only a paltry sum for his hard work. When a modest income of Rs. 5,000 per trip is considered on an average, an amount of Rs. 2,000 is deducted first towards operational cost. The net profit of Rs. 3,000 is then shared by boat owner (40%), the gear owner who is usually the boat owner himself (20%) and the crew members (40%). When 40% of net profit is shared among eight crew members each one gets only Rs. 150, which is the return for hard work spread over two days and a night. No doubt at times they may get more, but when the share falls still lower, their plight is only imaginable.

Fishermen of Kanyakumari district are skilled, hard working and adventurous and their characteristic seaworthiness has been, of late, recorded by Sivadas (*Mar. Fish. Infor. Serv., T & E Ser.*, **113**, 1991). Under many odds, what obviously keeps them on the move, enterprisingly, is their dynamism coupled with positive thinking for a better future through better catches.