mackerel and carangids are the major resources landed at Cochin Fisheries Harbour in the order of abundance. During the period under study, penaeid prawns contributed 17% to the total landings with the lowest landings of 1561 tonnes (8%) in 1985 and record landings of 12,197 tonnes (26%) in 1991. Main contributors to this groups are P. stylifera (48%), M. dobsoni (35%) and P. indicus (5%). The entire prawn catch was by trawlnets even though rare occurrence of the species were found in purseseines, ringseines and other motorized units like boatseines.

Perches contributed on an average 5,440 tonnes during this period. The first landings of perches was recorded in 1974 with a small catch of 42 tonnes. Maximum landings of this group was recorded in 1993 with 15,700 tonnes (27%). Main contributor to this group was Nemipterus spp. About 95% of the perches were landed by trawlnets and the remaining 5% by mechanized hooks & lines even though meagre landings were by gillnets and purseseines.

Oil sardine (Sardinella longiceps) contributed 11% to the total landings. When purseseine operation gained momentum during the early eighties, oil sardine landings reached 11,000 tonnes per annum, contributing 42% of the total landings. The maximum landings of this species was in 1984 with 14,786 tonnes (45%). About 89% of the total oil sardine catch was by purseseines, 7% by ringseines and remaining 4% by trawl nets. There were incidents of oil sardine catch in mechanized gillnets and in some motorized units.

Cephalopods consisted of squids, cuttlefish and Octopus. When species targeted trawling started during the late eighties, this group was prominent at this harbour. From 1988 onwards, the average landings of this group touched 5,400 tonnes and their contributions towards the total landings was 12%. Maximum landings of cephalopods was in 1994 with nearly 11,000 tonnes (18%) and the minimum recorded landings was 8 tonnes in 1976. Almost the entire landings of cephalopods were due to trawlers.

Mackerel (R. kanagarut) constituted 8% of the total landings. The landings was maximum in 1996 (20%) and minimum in 1976 with an insignificant catch of 18 tonnes. Nearly 73% of the total mackerel were landed by purseseines, 21% by mechanized trawlers, 4% by ringseines and the remaining 2% by gillnets.

Carangids contributed 7% to the total landings. Maximum landings was in 1993 with 7,900 tonnes and minimum in 1977 with 14 tonnes only. Carangids include scads, horse mackerels, Coryphaena spp., Alepes spp., Sedar spp., etc. Major portion (79%) of the carangids were landed by mechanized trawlers, 11% by purseseines, 6% by gillnetters, 3% by ringseiners and the remaining 1% by mechanized hooks % lines.


1034 Targeted shark fishery in Kerala

With the decrease in trawl landings throughout the last quarter of 2002, diversification in fishery was noticed at Cochin Fisheries Harbour. Bigger vessels (Drift gill netters, 55 footers) of 110 HP are operating from here, fishing exclusively for sharks. The area of operation is off Maharashtra and Gujarat coast. Shark lines with 500-1000 hooks are operated. The hook number used is 2. Bait fishes used are mostly tuna, depending on the species that they want to catch. The lines are operated at night. During daytime, the nets are operated mostly for smaller fishes.

The total length of sharks landed varied from 135-165 cm. On 25th February 2003, an adult Cararcharius sorrah (135 cm TL) was cut open and a pup of 37 cm TL was recorded in its body. Most of the sharks when cut open were seen to contain one - two pups. The other species landed include Rhizoprionodon acutus, R. oligolinx, Sphyra lewini, Scoliodon laticaudus, Alopis vulvens. Sharks landed are weighed individually and
auctioned. The fins are cut and sold by the merchants separately to the export houses. The flesh is sold to the domestic market, mainly in Kottayam district.

The fins are dry salted and sold at the rate of Rs. 2000 per kilogram dry weight. They are exported to China and Japan for soup preparation, which is a delicacy there. An adult shark that weighs around 65 Kg (wet weight) fetches up to Rs. 6500. On an average, three to four boats land around 100-125 adult sharks and around 25-30 young sharks. In addition to sharks, rays and guitar fishes are also landed. They are caught in the drift gill nets and hooks. The rays landed are mostly huge *Mobula mobula* and *Manta birostris*. Rays landed sold locally.

The boats operate for 20-25 days, with a to and fro running time of eight days. Around 150-200 blocks of crushed ice are loaded before departure. The holding capacity of the vessel is 200 tonnes, with an endurance period of 30 days. Around 3500 litres of diesel are used per trip and the total expenditure for each trip works out to be Rs. 80,000. Though these boats operate off Maharashtra, the fishermen prefer to land here for higher prices. Globally, concern on the exploitation of this resource is increasing. With decrease in the catches from trawlers, fishermen seem to diversify into areas where they can reap instant benefits. But the only question is “whether this fishery will survive the test of time?”

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### 1035

**An account on the smallest whale shark, *Rhincodon typus* (Smith, 1828) landed at Calicut**

Instances of whale shark being caught in shallow waters along the Indian coast and subsequently brought ashore are not uncommon. They were considered to be commercially unimportant until 1980’s. Whale shark landings in India were mainly due to incidental catches and mostly discarded. Along the Saurashtra coast in Gujarat, there is a regular fishery of whale sharks between February-May with the peak in March-April. Although there are many records of whale shark landings from different parts of Indian waters, records of catches of embryo are scanty.

In the present observation a male whale shark embryo with yolk sac was accidentally caught in a gillnet, 5 km away from the shore at a depth of 20 meters and brought to the shore at Vellayil in Calicut on 15.11.2001. The specimen measured 94 cm in length and weighed 3.8 kg. The embryo was bluish grey in colour dorsally and whitish ventrally with characteristic white spots. A narrow furrow connecting the nostril to the mouth was present, the nasal flaps were well developed and extended in a crescentic fold from the nostril to under the rim of the tip. Three distinct longitudinal lateral ridges of body keels were present on either side of the body. A dorsolateral keel commencing above the second dorsal and a median keel commencing anterior to the first dorsal extended to the region of the tail. The lowest keel was the strongest and most pronounced.

The embryo bore the yolk sac which was pale reddish in colour and weighed 300 g. The specimen is preserved in the museum of the Calicut Research Centre of the Central Marine Fisheries Research Institute, Calicut for future reference. The morphometric measurement of the embryo is given in Table-1.

Whale sharks have internal fertilization and deliver young ones. They are known to mature at 8-9 m length when they are 30 years of age. Whale sharks are kept well in captivity in oceanariums and aquariums in Japan. At present it is not known where exactly whale sharks breed in Indian seas. Only pregnant whale sharks have been recorded. This is an indication of their possible breeding grounds in the Indian coastal waters and breeding season is likely to be towards the last quarter of the year. This claim is supported by the landing of two more juveniles of 2.5 and 2.8m respectively on 2-2-2002 and 11-2-2002 at Calicut in the ring seine. Earlier landing of juveniles of whale shark were also during December-March period. Further studies are needed for determining the breeding season and breeding grounds of whale sharks in Indian waters.

| Table-1 Morphometric measurements (cm) of whale shark landed at Calicut |
|-------------------------|-----|
| Total length            | 94  |
| Fork length             | 84  |