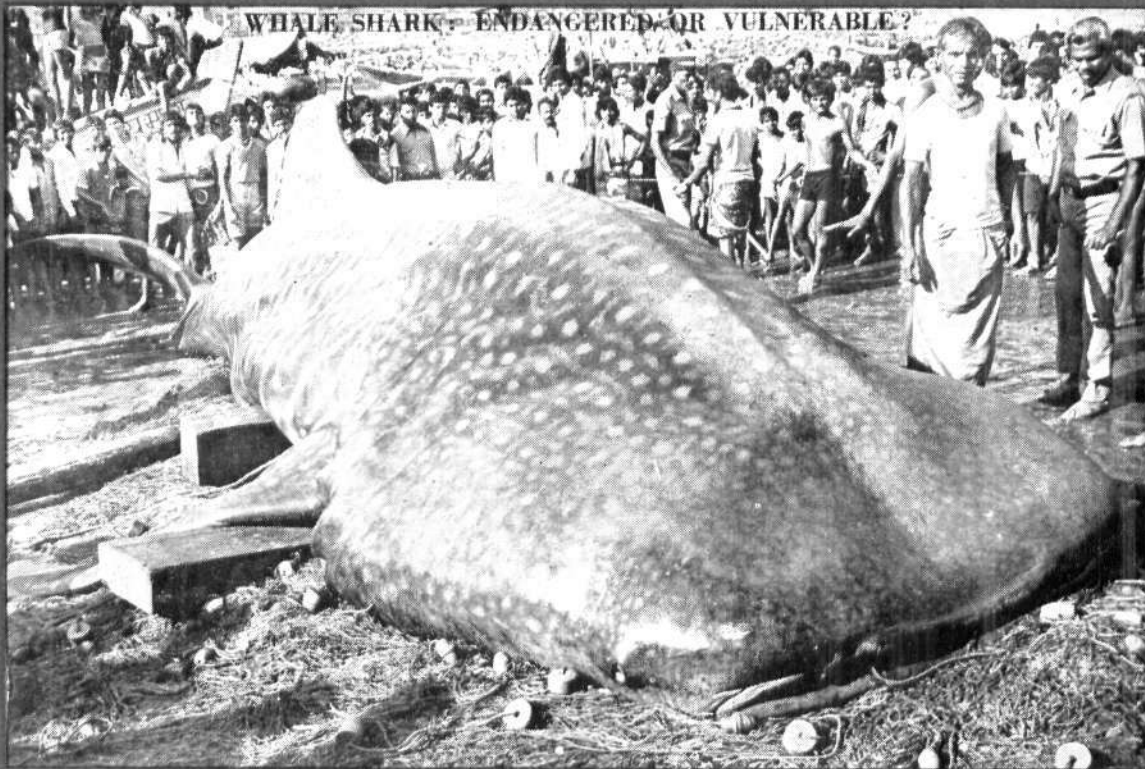




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THE MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the National Marine Living Resources Data Centre (NMLRDC) 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. 66: 1986

ON THE LARGEST WHALE SHARK *RHINCODON TYPUS* SMITH LANDED ALIVE AT CUFFE PARADE, BOMBAY*

The most publicised whale shark, *Rhincodon typus* Smith, which reportedly got entangled in the midwater gill net (*waghra*), operated in 33 m. depth off Khanderi light house (lat. 18° 42' N long. 72° 48' E) about 26 nautical miles south of Bombay, on the west coast of India was landed alive at Cuffe Parade, on 21st November, 1983 (Fig. 3). (Please see photograph on back cover)



Fig. 1. The whale shark completely wrapped in gill net with floats. The shark was brought by three 20 footer mechanised boats seen in the back ground.

On 20-11-1983, at about 1400 hrs a 20 footer mechanised fishing boat named *Maya Prasad* fitted with an engine of 16 H.P. steamed out for gill net fishing from Cuffe Parade under the Captainship of Shri Jagannath Balakrishna Dhanu. The boat reached the fishing ground at about 1700 hrs on the same day. As usual, five fishermen of the boat paid out 36 units of gill net at about 1730 hrs. Earlier, the fishermen had noticed some surface-floating huge fish causing considerable damages to their surface set gill nets. To avoid further damage, the fishermen temporarily switched on to the operation of midwater gill net by attaching few more sinkers to their nets. The crews of *Maya Prasad* gill netter were terribly frightened as their boat started dragging away from its position at about 2330 hrs when the high tide was 4.60 m, 20th instant being a full-moon day. They were at a loss to understand as to what exactly had happened but roughly guessed that some huge fish had got entangled in their net. Realising a grave risk to their life and property in the sea, the boat crews shouted

and light signalled for outside help. Two other nearby mechanised fishing boats namely *Rohini Prasad* (30 H.P.) and *Sainath Prasad* (18 H.P.) immediately rushed to the rescue of the boat in danger. On finding that the net was torn to shreds and it got wound around the body of a whale shark, fifteen crew of the three boats had to battle with the monster for about two and a half hours to overpower and securely tie the shark with strong nylon ropes. (Figs. 7 & 8). The shark after being fully wrapped in 17 gill-net units was completely brought under control and was successfully towed alive to Cuffe Parade beach at about 1000 hrs on 21-11-1983, during high tide, (Figs. 1 & 2). The struggle put up by the shark was so hard that it took about eight hours for three mechanised boats, in unision, to land it at Cuffe Parade. The shark after being alive for about fourteen hours died at about 1330 hrs on 21st instant, when the high tide water receded. The carcase was then completely disentangled from nets and ropes by twentyfive fishermen taking about two hours. (Figs. 9 & 10).

The news of the beaching of a leviathan at Cuffe Parade spread like wild fire throughout the length and

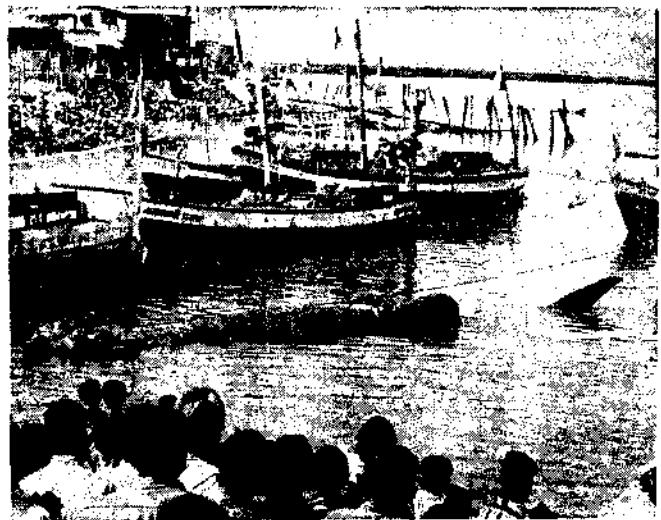


Fig. 2. The whale shark in water at Cuffe Parade after it was towed alive by 20 footer mechanised boats.

breadth of the cosmopolitan city of Bombay through local news papers, radio and television. People from all walks of life thronged at Cuffe Parade to have a glimpse of the giant sea creature and the crowd was so huge and unmanagable that special traffic squad was pressed into emergency service to clear and control the mas-

*Prepared by J. P. Karbhari and C. J. Josekutty, Bombay Research Centre of CMFRI, Bombay.

sive traffic jam. Some orthodox people paid homage to the unbelievably colossal sea creature by showering flowers, rice and vermilion and burning incense sticks. The shark was cordoned off by the local police.



Fig. 3. Dorso-lateral view of the whale shark caught alive in the fishing net near Khanderi Light House, on the Konkan coast of Maharashtra.



Fig. 4. Dorso-lateral view of the whale shark showing the close-up view of longitudinal lateral ridges or body keels.

The staff of Bombay Research Centre of CMFRI immediately arrived at Cuffe Parade and identified the shark as *Rhincodon typus* Smith—the whale shark. The authors strived for two days (21st and 22nd November 1983) to collect all possible data on the morphometry and the anatomy of the fish. The methodology adopted for the collection of morphometric data was as per the guidelines given by Silas and Rajagopalan (1963). The detailed morphometric measurements (in m) of the whale shark are given below:

1. Total length	...	12.18
2. Standard length	...	10.23
3. Head length	...	2.14
4. Girth of body at P1 base	...	5.05
5. Width of mouth from angle to angle	...	1.36

Vertical height of:

6. First dorsal fin	...	1.37
7. Second dorsal fin	...	0.48
8. Anal fin	...	0.34
9. Length of caudal fin from caudal pit along upper margin	...	1.95

Snout to:

10. First dorsal fin	...	4.08
11. Second dorsal fin	...	6.95
12. Pectoral fin	...	1.79
13. Pelvic fin	...	4.48
14. Anal fin	...	7.45

Interspace between:

15. First and second dorsals	...	2.80
16. Anal and caudal	...	0.98
17. Pectoral and pelvic origins	...	2.68
18. Pelvic and anal origins	...	3.08

Length of:

19. Pectoral fin along outer margin from anterior insertion	...	2.16
20. Pectoral fin from angle of inner margin to tip	...	1.78
21. Pelvic fin along outer margin from anterior insertion	...	0.65
22. First dorsal fin along outer margin from anterior insertion	...	1.55
23. Second dorsal fin along outer margin from anterior insertion	...	0.65
24. Length of clasper from inner base of pelvic fin	...	0.78
25. Length of pelvic fin along its inner edge	...	0.55
26. Interspace between eye and spiracle	...	0.19
27. Interspace between eye and angle of jaw	...	0.25
28. Diameter of eye ball	...	0.03
29. Diameter of orbit	...	0.07
30. Inter-orbital distance	...	1.98
31. Width of the mouth straight across inside from angle to angle of jaws	...	1.18

Description

The body had a hump-backed appearance and the caudal fin measured about two metres. There was a marked concavity at the inter-orbital space

(Fig. 5) which marked the flat wedge shaped form of the head. When seen or photographed in profile, it gave a deceptive fusiform appearance. Eventhough it has been reported that a furrow connecting the nostril to the mouth is absent in the adult, in the present adult whale shark, it was observed that the nasal flaps were well developed and extended in a crescentic fold from the nostril to under the rim of the lip (Fig. 5).

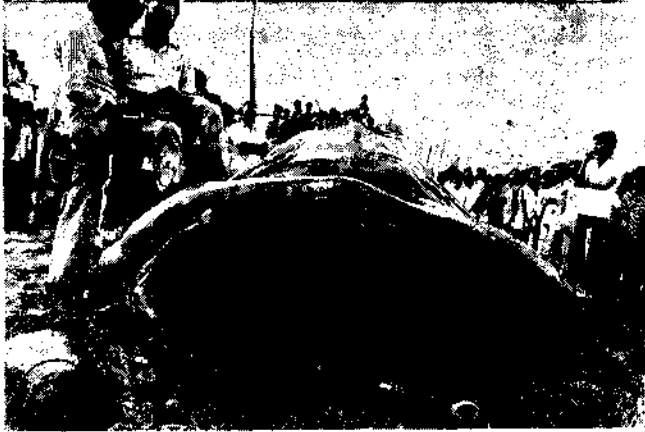


Fig. 5. Frontal view of the whale shark. Note the enormous gape. The width of the capacious mouth is 1.18 m. The Institute staff of Bombay Research Centre of CMFRI is seen in the background recording morphometric data. Also note the marked concavity of the inter-orbital space and the well developed nasal flaps extending into a crescentic fold from the nostril to under the rim of the lip.

Three distinct longitudinal lateral ridges or body keels were present on either side of the body. A dorso-lateral keel commencing above the branchiae extended to below the second dorsal and a median keel commencing anterior to the first dorsal extended to the



Fig. 6. Frontal view of the whale shark showing the close-up view of lateral ruidges or body keels and their origin.

region of the tail. The third, the lowest keel was the strongest and most pronounced. It commenced behind the last gill-silt and reached up to the tail, coalescing there with the keel on its axis (Figs. 4 & 6). The snout was obtuse and depressed and the mouth was terminal and cavernous. The angle of the gape was tad-pole like and terminated in front of the eyes. The colour of the specimen was deep purplish-blue dorsally and the

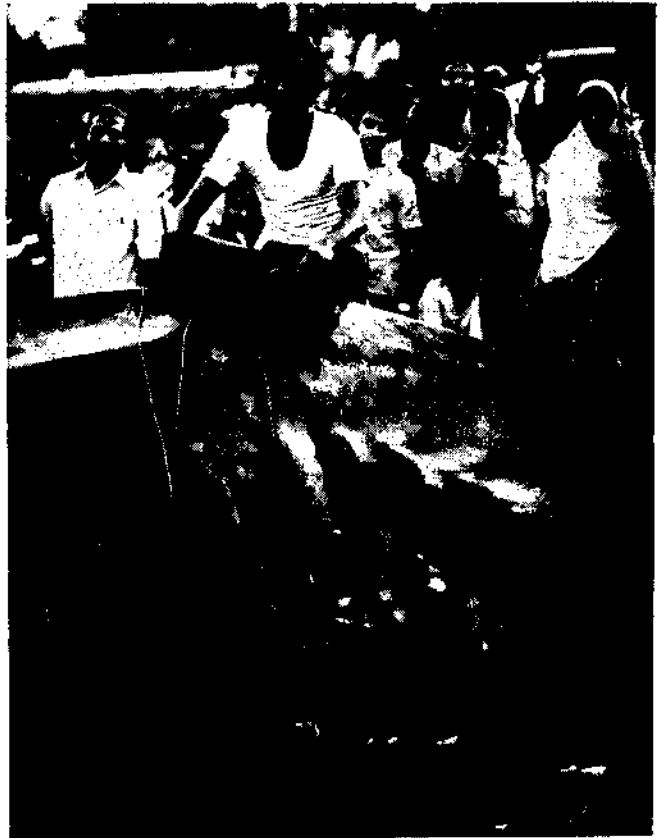


Fig. 7. Showing the ingenuity of the fishermen in securedly tying the whale shark with strong nylon rope near the gill slit region.

under surface was reddish-white. The same flush of red was visible under the head and on the margins of the fins.

The dorsal surface and the head were covered with a profusion of white spots which were arranged in a regular series of 23 vertical rows. In each alternate row the spots were fainter and tended to coalesce into linear markings, so that as a whole, the markings presented a pattern of rows of large, well spaced spots, alternating with linear bands. The anterior dorsal fin was spotted and faintly marked with transverse lines produced by coalescing of spots. Second dorsal was without spots, pectorals profusely and caudals sparsely spotted (Fig. 10). On the head, spots were more pronounced and formed a kind of mosaic (Fig. 9).



Fig. 8. The whale shark tied with nylon rope near the caudal pit.

Myriad of small rasp-like teeth were arranged in vertical rows on the toothband in each jaw. In appearance and feeling, the teeth in the bands were all pointing backward. One specimen of sucker fish *Remora remora* found firmly clinging to the upper palate, well inside the buccal cavity of the whale shark was collected and preserved by the authors. The tongue was large and flat. The specimen was an adult male and a pair of well developed copulatory organs called claspers extended backwards as far as the hind edge of the ventral as described by Prater (1941).

Disposal of the whale shark

The fishermen were confused after landing such a huge shark and were planning to dispose off the carcass by towing it back into the sea. On receipt of the proper and timely guidance from the authors, the entire animal was sold out for Rs. 4000/- to a local fish merchant (M/s Afzal Fisheries) who arranged to cut up for curing on 22-11-1983. Eight persons working for 10 hours (from 0800 to 1800 hrs.) could complete this stupendous task of fish disposal. The flesh was

cut up into 475 big pieces each weighing about 20 kg. Thus the total weight of the glistening white soft flesh along with the cartilageous vertebrae and skin was approximately estimated at 9,500 kg. The flesh was cured by using 2,400 kg of salt, costing Rs. 750/-. The cured flesh was sold out for Rs. 6,250/- to M/s A. Sankara Appa of Secunderabad (Andhra Pradesh). During salt curing the brine formed was approximately equal in volume to that of the flesh cured, which was quite an unusual phenomenon.

The liver of the fish was shared equitably between the fishermen and the fish merchant. The fish merchant sold his share of liver (510 kg) to a shark liver oil extracting plant (Haffkine Biopharmaceutical Corporation Ltd., Sasoon Dock, Bombay) who had extracted 255 litres of liver oil. Data for oil analysis furnished by the above plant revealed that the oil was deficient in Vitamin A, potency being 6000 I/U per gm and Free Fatty Acid (FFA) being 1.6. The fishermen had received 508 kg of liver as their share and they had extracted oil in a crude form by heating. The fishermen use the oil against some skin diseases and as a preservative for their fishing crafts. The total weight of the liver was estimated at 1,018 kg.

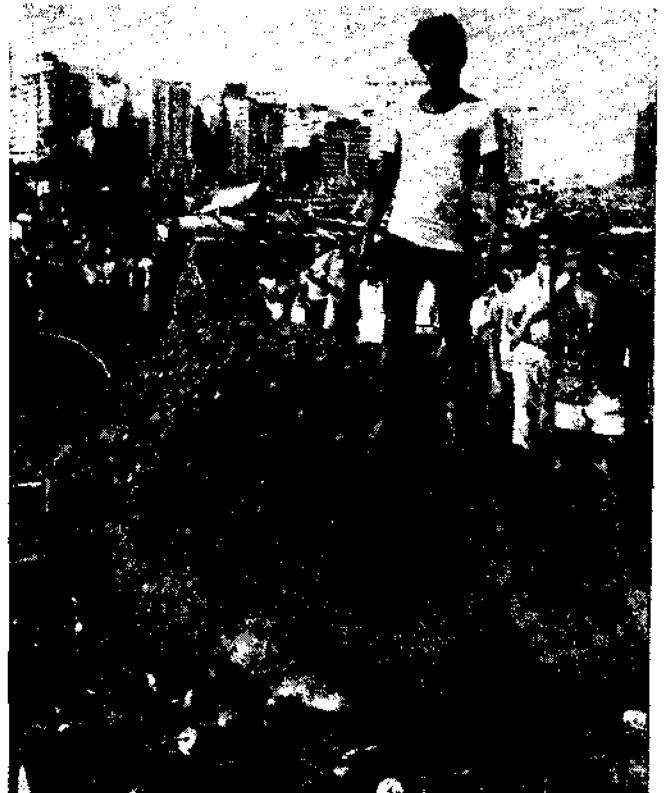


Fig. 9. Frontal view of the whale shark. Note the mosaic pattern of spots on the head. The gill net with floats are lying by the side of the shark. The captor Shri J. B. Dhanu is seen atop the whale shark.

The total weight of the viscera along with its gut contents, fins, gill arches with gill and gill-rackers was estimated at about 500 kg. The total weight of the whale shark was, thus, approximately estimated at 11,018 kg.



Fig. 10. The fishermen helping the CMFRI staff in taking various body measurements of the shark. Note the sparsely spotted caudal fin. A great crowd of people assembled round the shark is also seen.

Anatomical characteristics of the fish

The fish was cut up from dorsal side as it was originally lying in the same position with the ventral portion touching the sandy beach. Further, the weight of the fish was posing a problem to turn it even slightly. One peculiarity noted was that any incision made in the body of this fish rapidly closed up and left no trace of the cut probably due to the resilience of the skin and the deep underlying layers of fat, as was observed by Gogote and reported by Prater (1941) in his description on a 20 feet long whale shark caught near Jayagad, Ratnagiri (Maharashtra) on October 3rd, 1936.

The thickness of the skin along dorsum and abdominal wall was 148 mm and 98 mm respectively. The flesh was soft and whitish in colour as was observed by Chacko and Mathew (1954).

The gill rackers were closely set in a row on the inner extremity of the gill-arches and they projected towards the inner gill-cleft leading into the gullet. The closely set pectinate gill-rackers appeared to be covered by highly vascular tissues as large quantity of blood was seen oozing out when they were cut and removed as a waste. When the viscera of the shark was exposed and the stomach open, large quantity of water gushed out which probably the shark had apparently taken during its long struggle in the net. The analysis of the stomach contents in the field itself revealed that it included varied items such as large quantities of seaweeds and algae, partly digested remains of fish, crustaceans, molluscs etc. It was interesting to note that one suckerfish, *Remora remora*, measuring 208 mm in total length was found in the stomach of the whale shark, probably ingested accidentally.

The unique event of the capture and landing of 12.18 m long and live whale shark locally called *massa* by the traditional fishermen of Cuffe Parade, Bombay, has been widely publicised. The largest specimen obtained so far, on the Indian coasts measured 12.10 m (Kakikini *et al.*, 1959). Though the whale shark is known to attain a length of 18.3 m based on a specimen captured on the east coast of the Gulf of Siam (Smith, 1925) as given by Prater (1941), the Guinness Book of Animal - Facts and Feats (1976) has recorded a whale shark of 11.58 m killed by Captain Charles Thompson and some local fishermen just below Knight's Key, South Florida, U.S.A. in May, 1912 as the largest. From the above published records, it certainly appears that the present specimen of whale shark of 12.18 m at Bombay (India) is an unusually large one.

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