

Sperm Whale *Physeter macrocephalus* stranded at Devbagh beach, Karwar, western coast of India

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Karwar Bay is located in the Arabian Sea on the central western coast of India (14°48'05"N & 74°07'48"E) (Fig. 1), and is known for its rich bio-resources such as crustaceans, mollusks, and fin fishes. This section of the coast is popularly known as the 'mackerel coast'. Rich marine resources like squids, prawns and other invertebrate animals support a very good fishery in this area. In fact, this area is a very good feeding ground for many pelagic fishes as well as marine mammals. It is a breeding and feeding ground for dolphins, porpoises and whales all of which visit this area seasonally.

The cetaceans are a diverse group with fossil evidence dating back more than 50 million years. All living families of toothed whales evolved 5-25 million years ago (Joseph & Velerie 2005). The Sperm Whale belongs to the sub order Odontoceti, family Physeteridae, and is cosmopolitan in distribution. The species name comes from the presence of spermaceti in its head. It has a large head (one-third of its body length), and the S-shaped blowhole is located very close to the front of the head (Whitehead 2002) on the left side. This gives rise to a distinctive bushy, forward-angled blow.

It is a sexually dimorphic cetacean, although both

sexes are the same size at birth (Shirihai & Jarrett 2006). Adult male Sperm Whales grow up to 67ft (20.5m) and weigh up to 57,000kg (Whitehead 2002). As they grow, mature males typically attain sizes 30 to 50 % bigger and three times as massive as females. Females have longer and more prominent genital slit which encompasses the closer spaced genital and anal openings and is flanked by small slits on each side containing nipples.



Materials and Methods: On 17 September 2009, at 1730hr, a female Sperm Whale was stranded at Devbagh beach (14°50'34.97"N & 74°06'47.87"E) about 2km away from the Karwar coast (Fig. 1 & Image 1). Devbagh beach is located about 1.5km northwest of Karwar beach. This beach is covered with casuarina plantations (*Equisetifolia* sp.) and areas of *Ipomea pes-carpe*, a sand dune plant. The beach is connected to the mouth of the Kali Estuary in the south and is a known turtle breeding ground. Due to the onset of darkness, morphometric studies could not be made at the time of initial discovery and hence the morphometric study of the stranded sperm whale was done the next morning (Table 2). The tidal amplitude was 0.51m at 1548 hr on 17 September 2009 and 0.30m on 18 September 2009 at 1430hr. The measurements were taken based on Joseph & Velerie (2005).

Karwar area air, water temperature and humidity were obtained from the Karwar Meteorological Department. Tidal amplitude data for the study area were procured from the Department of Port, Karwar and are presented in Table 1. Prey catch statistics of Karwar area were obtained from the Karnataka State Fisheries Department, Karwar, India and presented in Table 3.

Results: The mammal was first sighted by fisher folk of the Goa coast (Polem beach), about 8km north of Karwar bay and at that time was active and very close to the shore (2km). The next day it was sighted at Karwar

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Image 1. Stranded whale on Devbagh shore

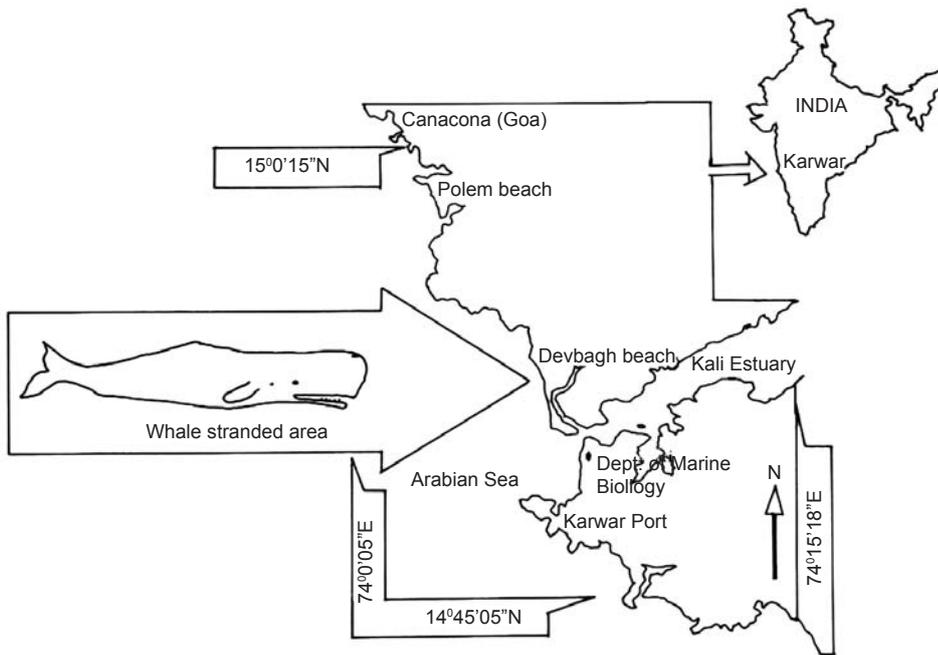


Figure 1. Map showing the location of whale stranding

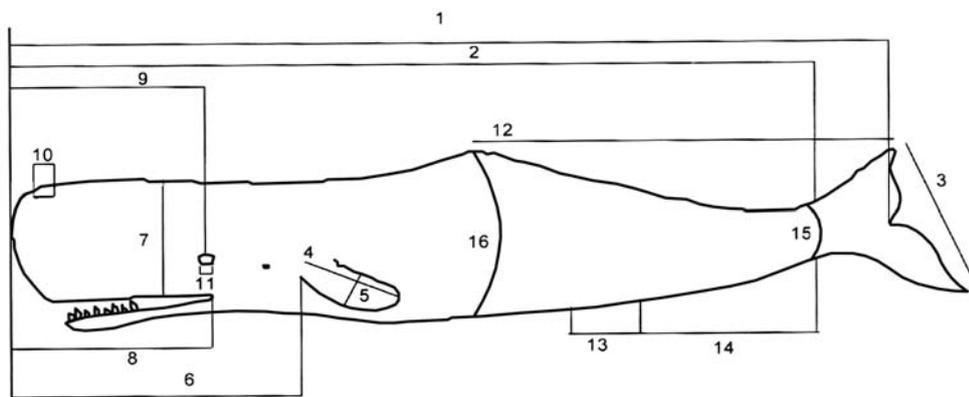


Figure 2. Morphometric parameters of stranded Sperm Whale

1 - Total length; 2 - Standard length; 3 - Fluke width; 4 - Flipper length; 5 - Flipper width; 6 - Snout to anterior insertion of flipper; 7 - Width of the snout; 8 - Snout to angle of mouth; 9 - Snout tip to centre of the eye; 10 - Blow hole length; 11 - Eye diameter; 12 - Dorsal hump to fluke tip; 13 - Length of the genital opening; 14 - Anus to base of the fluke; 15 - Width at the base of tail fluke; 16 - Height of the body



Image 2. Whale dragged on the beach with the help of an earth moving (JCB) machine

bay (Devbagh beach) in the evening, and due to the shallow depth was observed to be struggling to go back to the sea. Rescue attempts were made by fishermen and local people along with scientific personnel of the Department of Marine Biology, Post Graduate Centre of Karnatak University, but they did not succeed before the onset of darkness. The next morning the mammal was found dead, lying very close to the shore. There were no physical injuries apparent on the animal's body. Morphological studies were carried out and details are given in Table 2 and Figure 2.

Discussion & Conclusions: Mortality such as observed here may be due to injury, illness, contaminants, parasites, disease and starvation or anthropogenic



Image 3. Snout portion of the whale showing its blowhole



Image 4. Lower jaw of the whale



Image 5. Tail fluke

Table 1. Supplementary data

	Parameter	Remarks
1.	Weather a. Temperature b. Humidity	Calm
2.	Tide condition	0301-0.26m 0950-1.87m 1548-0.51m 2152-1.75m
3.	Offshore human activity	Fishing activity: small mechanized and traditional fishing
4.	Presence of prey fishes	Squids, cuttle fish, crustaceans, silver pomfrets, oil sardine and miscellaneous
5.	Behaviour a. pre stranding b. stranding	Milling (17 Sep 2009); 1830hr. On shore (18 Sep 2009); 0630hr
6.	Sample collected for study	Morphometric only

Table 2. Morphometric measurements of the stranded Whale

	Particulars	Measurements
1.	Total length	32.91' (395")
2.	Standard length	27.66' (332")
3.	Fluke width Tail fluke (Caudal) Tip to Fork L: R:	8.45' 4.20' (50.5"); W:3.16' (38") 4.33' (52.0"); W: 3.0' (36")
4.	Flipper length	3.37' (40.5") Base: 1.33'(16")
5.	Flipper width	Width: 1.41'(17")
6.	Snout to anterior insertion of flipper	9.25' (111")
7.	Width of the snout	5.41' (65")
8.	Snout to angle of the mouth	3.66' (44")
9.	Snout tip to centre of the eye	6.66' (80")
10.	Blowhole length	1' (12")
11.	Eye diameter	0.41' (5")
12.	Dorsal hump to fluke tip	14.41' (172.92")
13.	Length of the genital opening	2.25' (27")
14.	Anus to base of the fluke	11.41' (137")
15.	Width at the base of the tail fluke	4.16' (50")
16.	Height of the body	5.1' (60.01")
17.	Width of the buccal cavity base (lower jaw)	1.0' (12")
18.	Girth at the lower jaw	2.25' (27")
19.	Width at the base of the tail fluke	4.16' (50")
20.	Width of the tail fluke	8.45' (101.5")

External measurements recommended for small cetaceans in the Indian context after Perrin (1975).

Table 3. Catch statistics of molluscs and crustaceans of Karwar coast (Values in metric tonnes)

Period 2009	Molluscs		Prawns			
	Squid	Cuttle fish	a	b	c	d
Jan	74.0	1.0	26.70	23.0	43.0	11.0
Feb	59.0	0	19.02	60.0	89.0	31.0
Mar	51.0	2.0	37.01	25.0	71.5	13.0
Apr	23.0	0	12.50	43.0	50.3	13.0
May	81.0	0	24.50	74.0	52.0	24.2
Jun	22.0	0	135.0	19.0	99.0	9.0
Jul	0	0	4.0	3.20	0.0	0
Aug	16.0	0	103.0	427.5	144.0	44.0
Sep	48.0	4.0	46.7	50.0	43.0	19.0
Oct	104.7	0	40.1	25.5	60.0	25.0

Source: Karnataka State Department of Fisheries, Karwar.

a - *Penaeus indicus*; b - *Metapenaeus dobsoni*; c - *Parapenaeopsis stylifera*; d - *Metapenaeus affinis*

**Image 6. Genital and anal openings****Image 7. Stranded whale buried in the pit to preserve its skeleton**

causes. The observed stranding correlates with an unusually low tidal amplitude (leading to shallower than normal waters) which may have been a factor in the stranding. This is initially supported by the lack of external body injury. As this area is not a known breeding ground of this species, the appearance of this sperm whale in this region is probably due to foraging, as squids are the main dietary components of this whale. This might have attracted the whale to these rich waters. The catch statistics of prey species in this region support this interpretation. It was also observed that the previous day and on that day, there was a high catch of squids, prawns, silver pomfrets and small fishes in the particular area, as reported by indigenous fishers. A comparatively high catch of squid, the main diet of the Sperm Whale, was noted in and around Karwar waters during August and September of 2009. In the month of August, the squid catch was 16.0 metric tonnes whereas during September it was 48.0 metric tonnes.

The stranded animal was identified as a female Sperm Whale *Physeter macrocephalus* (Images 2-6). Later, the whale was buried in the beach (Image 7) to preserve its skeleton for further studies. *Physeter macrocephalus* is a Vulnerable mammal (IUCN 2008) and the U.S. has listed it as an endangered species.

According to Joseph & Velerie (2005), saving a live-stranded animal is not always possible, but here an attempt was made, which although it failed, provided valuable insight for rescue operations in future.

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