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## First stranding record of Cuvier's Beaked Whale (*Ziphius cavirostris*) at Karnataka coast, West Coast of India

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### Abstract

The vast Karnataka coast (320 km) is highly productive area in terms of primary/secondary which has in turn escalated the fishery production. This coastal strip is popularly known as the 'Mackerel coast' on fishing atlas because of rich mackerel abundance. Besides this, the coast is also rich in other fishery resources throughout the year. This is the reason, why these marine mammals frequently visit these coasts for foraging and breeding purposes. But they rarely caught either entangling in the net or get hurt themselves by coming in contact with propeller of high speed boats and get stranded themselves on the beach.

**Keywords:** *Ziphius cavirostris*, beaked whale, stranding Karwar, and Karnataka.

### 1. Introduction

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<sup>[1]</sup>. Stranding and sighting records in India shows that Indian sea is habitat for 20 species of cetaceans of which 5 are mysticeti (baleen whale) and rest are odontoceti<sup>[2]</sup>. Our information regarding the cetaceans is restricted mainly due to the stranding and occasional observations on their behavior in the wild. Though there is no fishery for the dolphins and whales along the Indian coasts especially in Karnataka, the smaller cetaceans like dolphins and porpoises are frequently caught as an accidental catch in the gill nets.

The beaked whales are the second-largest family of Cetaceans (after the dolphins). They were one of the first groups to diverge from the ancestral lineage belongs to family Ziphiidae (toothed whales), one of the least-known families of large mammals, comprise 21 species. Their characteristic feature is, elongated beaks without a crease, flippers are small and narrow and fit into pigmented depressions in the body. A single pair of external throat groves may aid in suction feeding. The head is small and tapered and the melon (forehead) is also small, blending into the beak without a crease. The blowhole is semicircular with the ends pointed forward. Most species show sexual dimorphism, as only adult males have functional teeth (tusks) and show excessive and conspicuous body scarring resulting from the usage of these teeth by other males in intraspecific fights<sup>[3]</sup>. These are world's most extreme divers can dive for longer period of 20 to 30 minutes sometime 85 minutes dives have been recorded to great depths of 1,899 meters and more<sup>[4]</sup>. Beaked whales are relatively smaller in size ranging between 3.9 and 6.2 m., spindle-shaped body, with a small, triangular dorsal fin located about two thirds between the beak and the tail<sup>[5]</sup>.

Cuvier beaked whales are most cosmopolitan among the beaked whales with exception of shallow water areas and very high latitude polar regions<sup>[6]</sup>. The *Ziphius cavirostris* is one of the two beaked whales that inhabit in the Indian waters and globally their abundance is likely to well over 1, 00,000<sup>[7]</sup>. Beaked whales can be found anywhere in water more than 200m depth. They seem to prefer waters near the continental slope/edge as well steep underwater geological features like banks and seamounts<sup>[8]</sup>. They are mostly found in small group of 2-7 numbers and are also seen alone<sup>[9]</sup>.

### 2. Materials and Methods

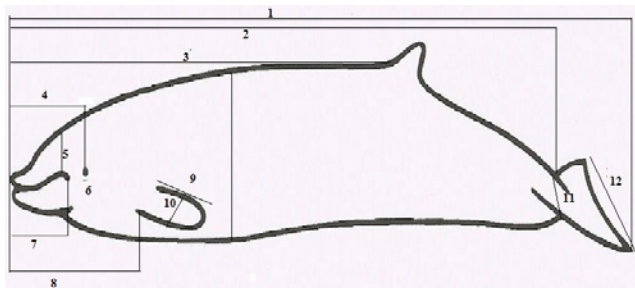
On 15<sup>th</sup> February 2013 at 16.30hr, a Cuvier beaked whale was stranded at Keni beach about 8km from Ankola (14°39'00.03" N, 74°16'32.62"E) (Figure 1) and 33km away from the Karwar Port. The mammal was first sighted by the fisherman of the Keni (Ankola) coast at

noon and was found dead when it came closer to the shore. Morphological studies were carried out and details are given in the Table 2 and Figure 2. Stranding message received late in the evening by forest officials. After reaching the site, Cuvier beaked whale was found dead. Environmental parameters of the area like air & water temperature, pH and relative humidity were recorded in the site. Tidal amplitude data for the study area was procured from the Department of Port, Karwar and are presented in the Table 1. Morphometric study was done as per the methodology given <sup>[1]</sup> and information is given in the Table 2.

Mammal identification was done based on the characteristics provided in the American Cetacean Society. The present stranded mammal was identified as Cuvier's beaked whale belongs to class mammalian, order-cetacea suborder – Odontoceti, family-Ziphiidae, genus-*Ziphius* and species *Z. cavirostris*. Mammal stranding was first of its kind along the Karnataka coast and probably along western coast shoreline. The earlier stranding record was in 1981 in the Lakshadweep coast <sup>[10]</sup> at Minicoy Island, Lakshadweep. Other one was at Parangipettai, Tamil Nadu <sup>[2]</sup>.



**Fig 1:** Map showing the location of stranding of Cuvier's Beaked Whale (*Ziphius cavirostris*) at Keni beach.



**Fig. 2:** Morphometric parameters of stranded Cuvier's Beaked Whale (*Ziphius cavirostris*)

1. Total length 2. Standard length 3. Snout to base of dorsal fin 4. Snout to centre of eye 5. Snout width 6. Eye diameter 7. Snout to angle of mouth 8. Snout to anterior insertion of flipper 9. Flipper length 10. Flipper width 11. Width at base of tail fluke 12. Fluke width

Most published estimates of abundance or density are based on visual line-transect studies. Published density estimates range

from 0.4-44 whales per 1,000 km<sup>2</sup> for small beaked whales and up to 68 whales per 1,000 km<sup>2</sup> for large beaked whales <sup>[11]</sup>.

**Table 1:** Environmental data

	Parameters	Remarks
1.	Weather: a. Temperature	Calm 28.8 °C
2.	Tide condition	0222-1.37 14.16 – 0.45 (low-tide) 0858-1.59 21.52 – 1.88
3.	Offshore anthropogenic activity	Fishing activity: small-medium mechanized and traditional fishing
4.	Presence of prey fishes	Crustaceans, Squids, Cuttlefish, oil sardine and miscellaneous
5.	Behavior: a. pre stranding b. stranding	No information On shore (15 Feb.2013); 16.30hr.
6.	Sample collected for study	Morphometric only

**Table 2:** Specification of stranded Whale

Parameters	Dimensions (in inches)
Total length	198 (16 feet)
Snout tip to 1 <sup>st</sup> dorsal fin	126 (10.5 feet)
Snout tip to 1 <sup>st</sup> flipper	46
Snout tip to blowhole	24
Snout tip to orbit	27
Flipper length	21
Blowhole width	6
Dorsal fin base width	13
Dorsal fin to caudal fluke notch	62
Orbit diameter	3.5
Snout length	15
Girth of body	68
Cephalic breadth	40
Right caudal fluke width (tip to notch)	31
Caudal fluke length	11
Lower jaw length	15
Distance between tip of lower jaw to orbit	13.5
Total weight (approximately)	2 ton

### 3. Results and Discussion

Ankola (Karnataka) coast is rich in cephalopods and other fin fish resources, which are main food of the whales and dolphins. The presently stranded whale too might have come for feeding along with pods. As this area is not a known breeding ground of this species, the appearance of beaked whale in this region is probably due to the foraging, as cephalopods are the main dietary components of this whale. This could be one of the reasons which might have lured the whale to these waters. The catch statistics of prey species in this region support this interpretation.

Mead<sup>[6]</sup> reports that all beaked whales feed primarily on deep-water mesopelagic squid and on some fish may also be taken<sup>[12, 13]</sup>. Most prey are probably caught at depths exceeding 200m via suction, as the dentition is much reduced and the mouth and tongue are highly adapted for this feeding method. Diving durations of 20-45minutes have been reported, after which, groups of animals surface together and stay within one body length of each other<sup>[12]</sup>.

Stomach samples of three beaked whale genera *Hyperoodon*, *Mesoplodon* and *Ziphius* primarily contained cephalopod and fish remains, although some also contained crustaceans. *Mesoplodon* spp. were found to contain the most fish, with some species containing fish remains, while the southern bottlenose whale (*Hyperoodon planifrons*) and Cuvier's beaked whale (*Ziphius cavirostris*) rarely, contained fish.

Whales of the genus *Mesoplodon* generally contained smaller prey, such as cephalopods under 500g in weight, compared with other beaked whales. *Hyperoodon* and *Ziphius* frequently contained much larger cephalopods with many important species having a mean weight of over 1000g. This suggests that *Mesoplodon* occupies a separate dietary niche from *Hyperoodon* and *Ziphius*, which may be an example of niche separation. In contrast, *Hyperoodon* and *Ziphius* appear to occupy very similar dietary niches but have geographically segregated distributions, with *Hyperoodon* occupying cold-temperate to polar waters and *Ziphius* occupying warm-temperate to tropical waters<sup>[13]</sup>. The most preferable feeding habit is on cephalopods the deep sea squids but also take fish and some crustaceans<sup>[9]</sup>.

Another threat to toothed whales worldwide is entanglement in fishing gear. This alone assert an unsustainably high death toll and for 86% of all toothed whale species, entanglement and death in gillnets, traps, weirs, purse seines, longlines and trawls poses a major risk to these marine mammals.

Currently, the biggest threat to mesoplodonts may be anthropogenic noise sources associated with air gun arrays (seismic exploration) and military mid-frequency sonar (2-10 kHz). Necropsies of mass-stranded beaked whales exposed to these sound sources lead to the hypothesis that mortality may be caused by gas-bubble disease induced by behavioral responses to acoustic exposure<sup>[14]</sup> in continuation, the authors conclude further that current monitoring and mitigation methods for beaked whales are ineffective for detecting and protecting them from adverse sound exposure. However,<sup>[15]</sup> tested passive acoustic detection of beaked whales (*M. densirostris*) using distributed bottom-mounted hydrophones in the Bahamas, a first promising step in that direction. Evidence from stranded individuals of several similar species indicates that they have swallowed discarded plastic items, which may lead to starvation and eventually death<sup>[7]</sup>.

Current research reveals two species of beaked whales are most affected by sonar: Cuvier's beaked whales (*Z. cavirostris*) and Blainville's (*M. densirostris*) beaked whales. These animals have been reported as stranding in correlation with military exercises in Greece, the Bahamas, Madeira, and the Canary Islands and the livers of these animals had the most damage (en.wikipedia.org).



**Plate 1:** Stranded Cuvier's beaked whale



**Plate 2:** whale head position



Plate 3: Whale dorsal fin



Plate 4: Amputated tail fluke

#### 4. Conclusion

It is surmised from the present study that, as this area is rich in cephalopods and other fishes, it is very good feeding ground for mammals as well as for larger fishes. The stranded mammal might have diverted from its pod for want of foraging and got stranded here. Another reason could be its tail fluke damaged completely due to propeller of high speed boat, might have caused an imbalance and carried to the shallow shore. In some cases, mortality could be caused due to the gas-bubble disease induced by behavioral responses to acoustic exposure<sup>[15]</sup>.

#### 5. References

1. Joseph RG, Velerie JL. Marine Mammals Shore-A Field Guide for Strandings. 2<sup>nd</sup> Edition. National Aquarium, Baltimore, 2005, 371.
2. Kumaran PL. Marine mammal research in India- Review and Critic of the methods. Current Science, 1983-2002, 1210-1220.
3. Pitman RL. Mesoplodont whales. In: Encyclopedia of marine mammals 2nd Ed. (Perrin WF, Würsig B, 2009).
4. Lewis Smith. "It's official: New free-diving record is 1,899 meters (6,230 ft)". CDNN, October, 17, 2006.
5. Vivekanandan E, Jeyabaskaran R. Marine Mammal species of India. Central Marine Fisheries Research, India. (Ed. Vivekanandan and Jeyabaskaran, 2012, 228).
6. Mead JG. Beaked whales of the genus *Mesoplodon*. In: Handbook of Marine Mammals (Ridgway SH, Harrison SR eds) River Dolphins and the Larger Toothed Whales. Academic Press, London 1989; 4:349-430.
7. Taylor BL, Baird R, Barlow J, Dawson SM, Ford J, Mead JG *et al.* *Mesoplodon* spec. In: IUCN 2009. IUCN Red List of Threatened Species. Version, 2008-2009, 1.
8. Heyning JE. Cuvier's beaked whale *Ziphius cavirostris* G.Cuvier. In: S.H. Ridgway and R. Harrison (Eds.), Handbook of Marine Mammals, River Dolphins and the Larger Toothed Whales. Academic Press 1823-1989; 4:289-308.
9. Jefferson TA, leatherwood S, Webber MA. FAO species identification Guide Marine Mammals I of the World. UNEP/FAO, Rome, 1993, 320.
10. Pillai CSG, Madan Mohan, Unhikoya KK. On a new record of Cuvier's beaked whale *Ziphius carvirostris* from the Indian waters. Journal of the Marine Biological Association of India. 1981; 23:218-220.
11. Barlow J, Ferguson MC, Perrin WF, Balance L, Gerrodette T, Joyace G *et al.* Abundance and densities of beaked and bottlenose whales (family Ziphiidae). J Cetacean Res Manage. 2006; 7:263-270.
12. Pitman RL. Mesoplodont whales. In: Encyclopedia of marine mammals (Perrin WF, Würsig B, Thewissen JGM, eds.) Academic Press, San Diego, 2002, 738-742.
13. Macleod CD, Santos MB, Pierce GJ. Review of data on diets of beaked whales: Evidence of niche separation and geographic segregation. J Mar Biol Ass UK. 2003; 83:651-665.
14. Cox TM, Ragen TJ, Read AJ, Vos E, Baird RW, Balcomb K *et al.* Understanding the impacts of anthropogenic sound on beaked whales. J Cetacean Res. Manag. 2006; 7:177-187.
15. Moretti D, Morrissey R, DiMarzio N, Ward J. Verified passive acoustic detection of beaked whales (*Mesoplodon densirostris*) using distributed bottom-mounted hydrophones in the tongue of the ocean, Bahamas. J Acoust Soc Am. 2006; 119:3374.