

A note on the most northerly record of Gervais' beaked whale from the western North Atlantic Ocean

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ABSTRACT

A juvenile male Gervais' beaked whale (*Mesoplodon europaeus*) was found dead in Barnstable Harbor, Cape Cod Bay, Massachusetts, USA. It apparently died from a septicaemia, possibly induced by a puncture wound of unknown origin. The previous most northerly stranding for this species in the western North Atlantic ocean was from New York State, USA.

KEYWORDS: BEAKED WHALE-GERVAIS'; NORTH ATLANTIC; STRANDINGS; MORPHOMETRICS; DISTRIBUTION; DISEASE

INTRODUCTION

Gervais' beaked whales (*Mesoplodon europaeus*), occur in tropical and warm-temperate waters of the Atlantic Ocean (Mead, 1989) and appear to be most concentrated in the western North Atlantic (Norman and Mead, 2001). This species is the most frequently stranded mesoplodont along the US Atlantic coast (Mead, 1989).

MATERIALS AND METHODS

A single cetacean was reported alive on riprap under a pier at the Sandwich Marina, Massachusetts, at 23:15 on 18 September 1997 and then again in Barnstable Harbor at Harbor Point Road at 15:30 on 19 September, where it was pushed back out by local residents. It was observed swimming erratically on that day. On 21 September 1997, a single Gervais' beaked whale was reported dead at Mill Creek, Barnstable Harbor, Cape Cod Bay at 41°42.7'N, 070°15.7'W, 10 miles ESE of the initial sighting. The animal was found dead in right lateral recumbency (Fig. 1). The sandy mud below the dorsal fin was mounded up around the fin margin suggesting that the animal had been struggling prior to death at that site. Personnel from the Woods Hole Oceanographic Institution (WHOI) and the New England Aquarium (NEA) performed a necropsy on the animal on 22 September in Woods Hole, including measurement of external features and a gross examination of its external and internal organs. All major organs except the brain were sampled for histology, and examined for histopathology at the Armed Forces Institute of Pathology, in Washington DC.

RESULTS

The animal was identified as Gervais' beaked whale morphologically (C. Potter, pers. comm.) and genetically (P. Rosel and B. McLeod, pers. comm.). Measurements of the animal are shown in Table 1. This male had a total straight length of 386cm and weighed 545.5kg. Colouration was dark grey to black over the dorsum, becoming lighter on the sides. The ventral surface was light grey to white. Overall, it appeared to be in relatively good body condition. Numerous superficial holes, scrapes and cuts were distributed over the body. No fishing gear or rope marks were found on the animal. Fig. 2 shows the left lateral view of the head. A ragged puncture wound measuring 8cm long and 1cm deep was observed dorsocaudal to the right eye with surrounding surface gouges (Fig. 3) and with underlying focal haemorrhage in the blubber and underlying muscle (Fig. 4). Patches of skin were also missing, along the direction of linear scratch marks. An erupting tooth whose apex was just visible on the right mandible 9.1cm from the anterior tip of the beak and 16cm from the angle of the jaw. An ulcer was observed on the tongue surface. The lungs were a uniform dark red in colour (Fig. 5). The heart and lungs weighed 18.652kg. Half of the post-cranial blubber weighed 57.933kg. The heart chambers appeared normal. The stomach and bladder were empty. All muscles and joints examined appeared normal.

Apparent parasitic nodules were observed at several sites in the blubber. Histopathologic examination revealed evidence of acute pulmonary congestion accompanied by alveolar and interstitial edema. Such changes are common, non-specific findings in stranded cetaceans. A focus of

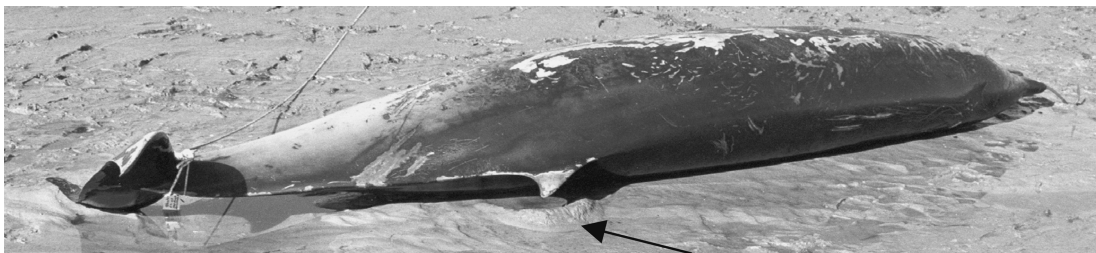


Fig. 1. Gervais' beaked whale stranded at Mill Creek, Barnstable Harbor, MA, USA on 21 September 1997. Note the mud ridges below the dorsal fin suggesting a pre-mortem struggle at this site (arrow).

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Table 1

Morphometrics of stranded Gervais' beaked whale, MH-97-566-Me (= WHOI 97-246) (all measurements in centimetres).

Measurement	cm	% of total length
Snout to centre of blowhole	48	12.4
Snout to eye	46	11.9
Snout to angle of mouth	24	6.2
Snout to anterior insertion of flipper	82	21.2
Snout to centre of genital slit	261	67.6
Snout to anus	283	73.3
Snout to anterior end of dorsal fin	230	59.6
Snout to dorsal fin tip	256	66.3
Snout to midline caudal edge of fluke (no notch)	386	100.0
Flipper length	39	9.0
Flipper width	9	2.3
Fluke width	80	20.7
Fin height	17	4.4
Axillary girth	186	
Maximum girth (170cm from snout)	208	
Anal girth	128	

Blubber thickness (excluding skin)	Dorsal	Lateral	Ventral
Axilla	2.7	2.2	2.0
Maximum girth	3.0	2.2	2.0
Anal	6.6	1.5	2.5

granulomatous and eosinophilic inflammation that surrounded a small cavity was present in the blubber and was probably caused by a parasite. The glossal ulcer was associated with edema and hemorrhage; a subjacent blood vessel was occluded by a cluster of Gram-negative bacilli. No inflammatory cells were present. This lesion provided evidence of a peracute Gram-negative bacterial septicaemia, which was the likely cause of death. The puncture wound between the eye and the blowhole may have been the site of origin of the bacterial infection. Kidney, liver, adrenal, thymus, muscle, lymph node, four heart chambers, trachea, tongue, optic nerve, three stomach chambers, esophagus, skin and pericardium all appeared normal, as far as the degree of autolysis would allow assessment. Seminiferous tubules in the testis showed no oriented or polarised spermatogonia or indication of active spermatogenesis.



Fig. 2. Left lateral view of the head of the animal shown in Fig. 1.



Fig. 3. Puncture wound (short arrow) and surface scrapes dorsocaudal to the right eye (long arrow).

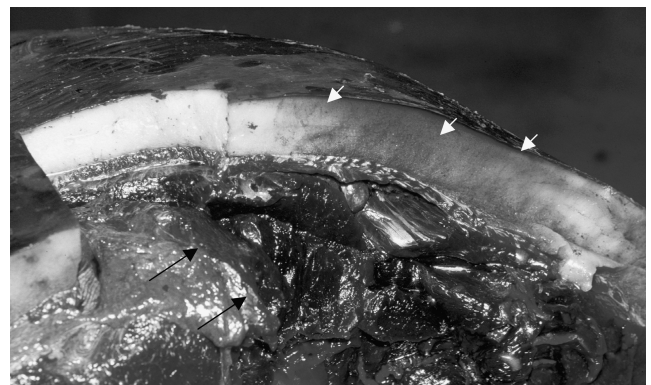


Fig. 4. Focal haemorrhage in blubber (short arrows) and muscle (long arrows) underlying the puncture wound shown in Fig. 3.

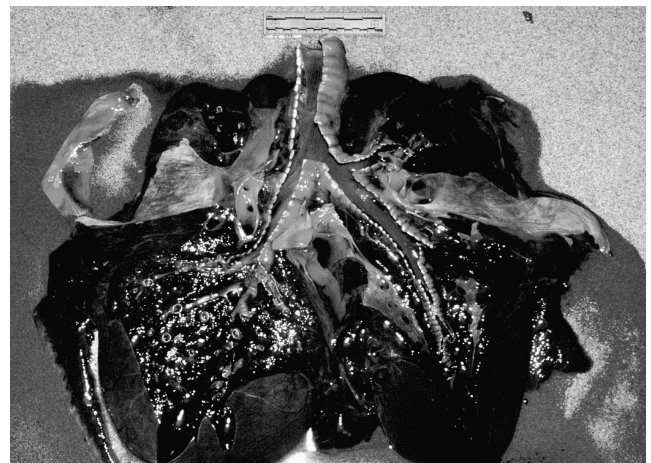


Fig. 5. Lungs and airways showing the dark red colour of the cut lung surface.

DISCUSSION

According to Mead (1989), four species of mesoplodonts are found off the east coast of the USA: Sowerby's beaked whale (*Mesoplodon bidens*); Blainville's beaked whale (*Mesoplodon densirostris*); Gervais' beaked whale and True's beaked whale (*Mesoplodon mirus*). Of these, Gervais' and Blainville's beaked whales appear to favour the more southerly warm temperate waters in the North Atlantic, sympatric in a large portion of their range (MacLeod, 2000). The stranded animal appeared to be a

juvenile on the basis of its total length (Mead, 1984) and testicular immaturity. The stranding of this specimen provides the most northerly record of Gervais' beaked whale from the western North Atlantic. Previously the most northerly record was from New York State (Raven, 1937). It is interesting to note that Gervais' beaked whales are the predominant mesoplodont found beached on the US east coast, whereas Sowerby's beaked whales are the most common mesoplodont taken as bycatch in east coast fisheries (Waring *et al.*, 2002). The furthest south the species has been reported is Sao Vicente (23°58'S; 46°24'W), Sao Paulo state, Brazil (de Oliveira Santos *et al.*, 2004).

The small holes observed were probably scavenger induced, but the scrape marks appear to have been inflicted prior to death, as the substrate upon which the animal apparently died was smooth sandy mud. The suspicion that the initial stranding occurred on marina riprap is pertinent here. Some but not all scrapes appeared to be tooth rake marks. The depth of the wound caudo-dorsal to the eye and the extent of the underlying bruising would suggest that it would be unlikely for the wound to have been self-inflicted on the beach. This wound could have been inflicted by a swordfish or by a harpoon used for tuna or swordfish. The lesion in the tongue was believed to provide strong evidence for a peracute Gram-negative bacterial septicaemia, which was probably the cause of death. The pulmonary congestion and oedema were assumed to be terminal changes. It is not unreasonable to suppose that the septicaemia was initiated by the puncture wound observed between the eye and the blowhole.

Histopathology samples from 26 organs, and the entire head, heart, lung, stomach and reproductive tract (except for the testes) along with 70 photographs of the stranding and necropsy were archived at WHOI, Wood's Hole, MA (MH-97-566-Me, 97-246). The postcranial skeleton was deposited at the Smithsonian Institution, Washington DC (USNM 572520). The skull will be deposited at the Smithsonian once examination is complete in Woods Hole.

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