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Blainville's beaked whale, *Mesoplodon densirostris*, in New Caledonia[1]

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Abstract: Blainville's beaked whale, *Mesoplodon densirostris*, was positively identified in the waters around New Caledonia from two strandings, one live sighting, and two rostra collected from the seafloor. This is the only species of Ziphiidae reported so far from the New Caledonian archipelago and adjacent waters.

BLAINVILLE'S BEAKED WHALE, *Mesoplodon densirostris*, is probably the most abundant mesoplodont in the Tropics, occurring in waters that range from tropical to warm temperate throughout the world (Mead 1989, Pitman 2002). As for all beaked whales, most of the current knowledge on the distribution, biology, and ecology of this species comes from strandings. Strandings or sightings of Blainville's beaked whales have been reported from oceanic islands in the tropical Pacific, including the Solomon Islands, New Britain, and French Polynesia (Reeves et al. 1999) and the Cook Islands (N. Hauser, unpubl. data available at http://www.whaleresearch. org/). Strandings of Blainville's beaked whales have also been reported from Queensland (Paterson et al. 1993). To our knowledge, there is only one previous mention of Blainville's beaked whale in New Caledonia, in the form of ''teeth . . . recovered from a reef flat'' (Garrigue and Greaves 2001). No other details were given by those authors on the material or on the circumstances of the finding. Here we present all the information we have collected so far on Ziphiidae in New Caledonia. This comes from two strandings, one live sighting, and the remains (rostra) of two sunk individuals. All the data and material refer to *M. densirostris*.

The first known stranding of a Ziphiidae in New Caledonia occurred in November 1997 at Ile Ouen (22°28'S, 168°48'E), a coastal island located within the southern coral-reef lagoon of New Caledonia's Grande Terre. Locals noticed the two protruding teeth of the animal, which they called ''cornes de poissons'' (''fish horns'') because they were positioned above the head. The two teeth were sold to a curio shop and are currently owned by a private collector in Nouméa. The shape of the teeth (Figure 1) unambiguously pointed to a male *Mesoplodon densirostris* (Ross 1984, Mead 1989, Miyazaki 2002). These are the only remains known from this individual because the carcass was, reportedly, intentionally destroyed by fire.

The second stranding occurred on 7 June 2001 at Saint-Louis on the southwestern coast of New Caledonia's Grande Terre (22°14'S, 166°33'E) and was reported by the local daily newspaper, although no identification to species was given (Anonymous 2001). Only a few pictures and a sample of skin were saved from this stranding. The carcass was buried on the beach but the head was cut off and separately buried at Ateliers Municipaux in Mont-Dore. Unfortunately, the precise location of

burying has since been lost (Anonymous 2002). On the day it was discovered, the animal was already dead and swollen and bore numerous round scars, presumably caused by cookie-cutter sharks, *Isistius* sp. Most of this scarring was fresh and was located on the back of the animal, suggesting that it was adrift offshore, floating upside down, for some time before stranding. Close-up pictures of the anterior part of the body (Figure2) show the exaggerately arched mandible characteristic of an adult *Mesoplodon densirostris* (Leatherwood et al. 1983). No erupted tooth was visible, indicating that the individual was a female or an immature male. The identification of the individual as *M. densirostris* was subsequently confirmed by nucleotide- sequence analysis of a portion of the control region of the mitochondrial DNA (M. L. Dalebout, pers. comm.).

The only live sighting of a beaked whale so far reported for New Caledonia occurred on 9 August 2003 off the eastern coast of New Caledonia's Grande Terre (21°40'S, 166°50'E) and consisted of a loose pod of five animals swimming near or at the surface of the sea. The sea was calm and the weather was sunny. The pod was first spotted from a helicopter cruising at an altitude of ca. 330 m and subsequently observed from an altitude of ca. 50 m for one more surfacing, when all five individuals sounded simultaneously (L. Farines, pers. comm.). A photograph among the series taken then by the helicopter's crew shows the back and the right profile of an individual of the pod (Figure 3). This whale was identified as a Blainville's beaked whale (and excluded from all other known beaked whales) by its flat forehead and typically arched maxilla topped at its middle by a white bulge (Leatherwood et al. 1983, Cawardine 1995), features that were both described by the helicopter's crew (R. Barthe and L. Farines, pers. comm.) and visible on Figure 3 despite the poor quality of the details on this picture. This individual and at least two other individuals in the pod bore numerous pale scars on the back and flank, attributable to cookie-cutter sharks. Pale blotches were visible at the base of the dorsal fin and at the posterior part of the jaw (Figure 3). The back and flanks were beige or brown and the dorsal side of the caudal fin was dark brown. The whitish belly was clearly delineated from the flank along a concave demarcation line running approximately from the anal region to the flipper. The dorsal fin was moderately tall and falcate. Although this individual was not ''black or charcoal gray on the back, slightly lighter on the abdomen'' as described in Leatherwood et al. (1983) and other identification guides (e.g., Watson 1985, Jefferson et al. 1993, Cawardine 1995), the coloration and pigmentation patterns shown in Figure 3 match those of an individual in a pod of Blainville's beaked whales that was filmed in the Bahamas in 1998 (N. Hauser and H. Peckham, unpubl. data).

Two rostra of mesoplodont whales were collected during dredging of the summit of Seamount 1 (25°13'S, 170°22'E; depth, 900–925 m) on 23 November 1993 during the BATHUS III cruise of RV

Alis (Richer de Forges and Chevillon 1996). These two rostra, of bone of an extreme density, were stained dark, a coloration presumably caused by a film of ferromanganese deposited on their surface. The two rostra have been deposited at Museum National d'Histoire Naturelle, Paris, under registration numbers CG 2003-439 and CG 2003-440. Specimen CG 2003-439 was 540 mm long and weighed 3.7 kg; specimen CG 2003-440 was 404 mm long and weighed 2.2 kg. The eroded state of rostrum CG 2003-440, apparently due to drilling or boring invertebrates, suggests that it had lain on the sea floor for years, although from the information currently available it is not possible to estimate its age. Rostrum CG 2003-439 was almost intact and bore only a few fixed invertebrates, including small bryozoans colonies and small serpulid polychaetes. This suggests that this specimen was very recent, perhaps only a few months or a few years old, when it was collected. Taken together, the following features are diagnostic of the rostrum of *Mesoplodon densirostris*: it is deeper than wide; in lateral view, the dorsal profile is approximately rectilinear, the ventral profile is slightly convex, and a lateral maxillary ridge is present, forming a smooth sigmoid curve; in dorsal and ventral views, a swelling of the median portion is noticeable (Van Beneden and Gervais 1868–1880, Harmer 1924, Raven 1942, Moore 1966, Mead 1989). The rostrum of *M. densirostris* is also remarkable by its extreme density (de Buffrénil and Casinos 1995). All the foregoing characteristics were present in both specimens CG 2003-439 (Figure 4) and CG 2003-440, despite the eroded state of the latter, allowing their identification as *M. densirostris*. In addition to these characteristics, specimen CG 2003-439 was also remarkable by the prominence of its lateral maxillary ridge, the widening of its median and posterior parts, and a relatively strong development of the posterior portion of the mesorostral bone (Figure 4). The latter peculiarities resemble the changes that occur in old male *Ziphius cavirostris* (Fraser 1942, Robineau and Di Natale 1995), although the rostrum of *Z. cavirostris* cannot be confused with that of *M. densirostris*, because the former is wider than deep and narrows steadily from base to tip (e.g., Jefferson et al. 1993). We therefore propose that rostrum CG 2003-439 may be that of an old male *M. densirostris*.

The marine mammal fauna of the New Caledonia region in the southwestern Pacific is still poorly known (Bannister et al. 1996, Reeves et al. 1999, Garrigue and Greaves 2001). Based on the proximity of sightings, strandings, and catches, New Caledonian waters potentially lie within the distributional range of several Ziphiidae species, including *Mesoplodon densirostris*; Layard's beaked whale, *M. layardii*; Cuvier's beaked whale, *Ziphius cavirostris*; Longman's beaked whale, *Indopacetus pacificus*; and perhaps Japanese beaked whale, *M. ginkgodens* (Paterson and Van Dyke 1990, Reeves et al. 1999, Pitman 2002, Rudolph and Smeenk 2002, and references therein). Materials and data on Ziphiidae in

the tropical southwestern Pacific include one skull of *I. pacificus* from Queensland (the holotype of the species [Longman 1926]); strandings of *M. densirostris*, *M. layardii*, and *Z. cavirostris* in Queensland (Paterson and Van Dyke 1990, Paterson et al. 1993); one stranding and several sightings of *M. densirostris* and at least one stranding of *Z. cavirostris* in the Cook Islands (N. Hauser, unpubl. data); a specimen of *M. densirostris* stranded in New Britain (Reeves et al. 1999); and strandings and a few sightings and skulls of *Z. cavirostris* from New Ireland (Hale 1931), New Britain, and the Solomon Islands (Reeves et al. 1999). The data on Ziphiidae collected so far in New Caledonia refer to *M. densirostris* only (Garrigue and Greaves 2001; this report). Considering that the reports of M. densirostris given here concern both stranded or sunk animals and a live sighting, this may reflect higher abundance of this species in the New Caledonian archipelago and adjacent waters than other Ziphiidae.

Photographs of the teeth of the male *Mesoplodon densirostris* stranded in 1997, photographs of the stranded carcass of the female *M. densirostris* in 2001, photographs of the live sighting, and photographs of the two BATHUS III mesoplodont rostra have been filed at the library of the Institut de Recherche pour le Développement in Nouméa and can be obtained through the corresponding author. Some of the unpublished photographs and data on beaked whales referred to in this paper were by Nan Hauser and Hoyt Peckham and are available from the Center for Cetacean Research and Conservation's Web site. We thank Paul Lavoix for letting us examine cetacean teeth from his collection; Réginald Bernut, Yves-Marie Bozec, Merel Dalebout, Pascal Hébert, and Gaston Podlejska for providing information on the 1997 and 2001 strandings; Catherine Ledru for providing a series of photographs of the Saint-Louis stranding; Bertrand Richer de Forges of the Institut de Recherche pour le Développement for preserving the two mesoplodont rostra dredged during cruise BATHUS III and for discussions; and Robert Barthe and Luc Farines of Gendarmerie Nationale for providing excellent information and for letting us examine their photographs.

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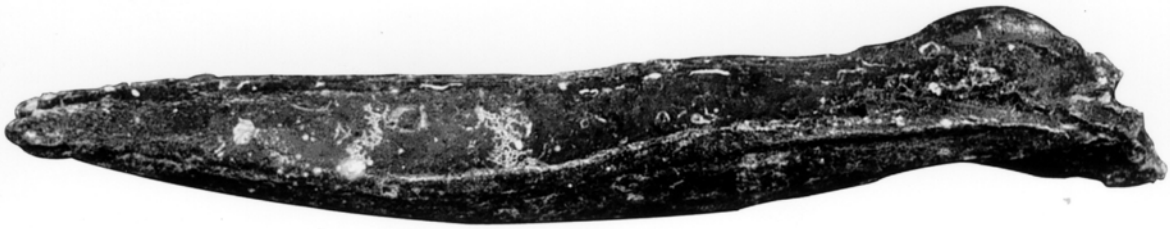
Legends to figures

Figure 1. *Mesoplodon densirostris*. Teeth of specimen stranded at Ile Ouen in the southern lagoon of New Caledonia (November 1997; 22°28’S, 168°48’E).

Figure 2. Blainville’s beaked whale stranded at Saint-Louis (22° 14’S, 166°33’E), southern lagoon of New Caledonia (June 2001). (Photograph courtesy of C. Ledru.)

Figure 3. Blainville's beaked whale sighted off New Caledonia's Grande Terre (09 August 2003; 21°40’S; 166°50’E). (Photograph courtesy of R. Barthe and L. Farines).

Figure 4. *Mesoplodon densirostris*. Rostrum dredged on summit of seamount 1 (23°53’S, 169°46’E, depth = 625-640m) during cruise BATHUS III of R.V. *Alis*. Muséum National d’Histoire Naturelle, Paris, specimen no. CG 2003-339.

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