Occurrence of Hector’s beaked whale, *Mesoplodon hectori*, in Southern Brazil

Alexandre N. Zerbini¹,² and Eduardo R. Secchi¹,³

¹Museu Oceanográfico Prof. Eliézer de Carvalho Rios, Fundação Universidade do Rio Grande, Caixa Postal 379, Rio Grande, RS, 96200-970, Brazil
²Washington Cooperative Fish and Wildlife Research Unit, School of Aquatic and Fishery Sciences, Box 355020, University of Washington, Seattle, WA, 98195-5020, USA
³Marine Mammal Research Group, University of Otago, P.O. Box 54, Dunedin, New Zealand

**Abstract**

In February 1994, a Hector’s beaked whale, *Mesoplodon hectori*, was found ashore 80 km north of Rio Grande (32°07′S, 52°05′W), southern Brazil. The skull (CBL = 497 mm) and post-cranial skeleton (C 7, T 11, L 10, Ca 17 = 45) were collected and placed at the Museu Oceanográfico ‘Prof. Eliézer de Carvalho Rios’ collection (MORG 0104). The whale was identified based on skull morphology and measurements, as well as shape and position of the mandibular teeth. The small size (skeletal length = 236 cm), unfilled mesorostral channel, wide open tooth pulp cavity, and unfused vertebral epiphysis indicated that the animal was young. This whale is the first record of the species in Brazil. In addition, it extends northwards the known range of Hector’s beaked whale in the west South Atlantic Ocean by about 800 km and represents the northernmost record of the species.

**Key words:** *Mesoplodon hectori*, stranding, distribution, osteology, Brazil, South Atlantic Ocean.

**Introduction**

The Hector’s beaked whale, *Mesoplodon hectori* (Gray, 1871), is one of the least known ziphiid species. It is found primarily in cold temperate waters of the Southern Hemisphere between 35°S and 55°S (Mead & Baker, 1987; Goodall & Lichter, 1988; Mead, 1989; Jefferson *et al.*, 1993). Individuals found ashore and sighted at sea along the coast of California (USA) were attributed to this species (Mead, 1981). However, recent molecular analyses of these whales suggested that they belong to a different, undescribed species (Dalebout *et al.*, 1999). In the South Atlantic Ocean, Hector’s beaked whale is known from individuals found ashore in Argentina, the Falkland Islands, and South Africa (e.g., Ross, 1970, 1984; Goodall & Lichter, 1988).

**Specimen Description**

In early January 1994, a small ziphiid whale was reported to have stranded 80 km north of Rio Grande (32°07′S, 52°05′W), Rio Grande do Sul State, southern Brazil. Poor weather and beach conditions precluded collection of the specimen until early February. It was found in an advanced stage of decomposition (code 5 according to Geraci & Lounsbury, 1993, p. 181), which prevented sex determination. The skull (Fig. 1) and nearly complete post-cranial skeleton were preserved (MORG 0104). After cleaning and preparation, the specimen was identified as a ziphiid of the genus *Mesoplodon*. The skull was measured (Table 1) following Moore (1963) and Ross (1984) and the whale was identified as a Hector’s beaked whale. The determining diagnostic characters were: the relatively narrow width of the premaxillary crest (Ross, 1970), which in our specimen was almost equal to the width across the premaxillaries at the level of the anterior border of the superior nares, and the triangular shape of the teeth that were positioned near the tip of the lower jaw (Fig. 1). The mesorostral channel and tooth pulp cavity were both open. After removing all organic material, the dried weight of the left and right teeth were 1.06 g and 1.07 g, respectively. The vertebral formula was C 7, T 11, L 10, Ca 17 = 45. There were eight chevrons and all vertebral epiphyses were unfused to the centrum of each vertebrae. The skull and post-cranial skeleton measured 236 cm in a straight line.

**Discussion**

The osteological information indicated that the present specimen was young. Previous calf records
(e.g., Lichter, 1986) suggested that the species was probably 190–202 cm long at birth. Mead (1984, 1989) assumed that one growth layer group (GLG) represents one year in *Mesoplodon*. Goodall & Lichter (1988) estimated 1–1.2 GLGs in the teeth of a 300 cm long young specimen (RNP 860). The whale reported here was intermediate in length between newborn calves and specimen RNP 860, thus it was possibly a yearling.

Despite the increasing interest in cetacean science and the resulting increase in reports of stranded animals, records of ziphiid whales along the Brazilian coast are poorly documented. Six *Mesoplodon* species are expected to occur in Brazil (e.g., Pinedo *et al*., 1992), but four have been positively recorded to date: *M. densirostris* (Castello & Pinedo, 1980; Secchi & Zarzur, 1999), *M. grayi* (Soto & Vega, 1994, Pinedo *et al*., in press), *M. layardii* (Pinedo, pers. comm.) and *M. hectori* (present record).

Like most previous Hector’s beaked whale strandings (see summary in Table 8, Goodall & Lichter, 1988), the present record occurred in summer. Ross (1984) proposed that this seasonality of
Table 1. Cranial and mandible measurements of the *Mesoplodon hectori* specimen (MORG 0104) stranded in Southern Brazil.

<table>
<thead>
<tr>
<th>Cranial measurement</th>
<th>mm</th>
<th>%CBL</th>
<th>%ZGW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Condylobasal length (CBL)</td>
<td>497.0</td>
<td>100.0</td>
<td>210.6</td>
</tr>
<tr>
<td>2. Length of rostrum</td>
<td>273.0</td>
<td>54.9</td>
<td>115.7</td>
</tr>
<tr>
<td>Tip of rostrum to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. posterior margin of pterygoid near midline</td>
<td>365.0</td>
<td>73.4</td>
<td>154.7</td>
</tr>
<tr>
<td>4. most posterior extension of wing of pterygoid</td>
<td>387.0</td>
<td>77.9</td>
<td>164.0</td>
</tr>
<tr>
<td>5. most anterior extension of pterygoid</td>
<td>229.0</td>
<td>46.1</td>
<td>97.0</td>
</tr>
<tr>
<td>6. most posterior extension of maxillaries between pterygoids on the palate</td>
<td>282.0</td>
<td>56.7</td>
<td>119.5</td>
</tr>
<tr>
<td>7. most posterior extension of maxillary plate</td>
<td>453.0</td>
<td>91.1</td>
<td>191.9</td>
</tr>
<tr>
<td>8. anterior margin of superior nare</td>
<td>328.0</td>
<td>66.0</td>
<td>139.0</td>
</tr>
<tr>
<td>9. most anterior point on premaxillary crest</td>
<td>367.0</td>
<td>73.8</td>
<td>155.5</td>
</tr>
<tr>
<td>10. most posterior extension of temporal fossa</td>
<td>450.0</td>
<td>90.5</td>
<td>190.7</td>
</tr>
<tr>
<td>11. most posterior extension of lateral tip of premaxillary crest</td>
<td>384.0</td>
<td>77.3</td>
<td>162.7</td>
</tr>
<tr>
<td>12. most posterior extension of pterygoid sinus</td>
<td>25.0</td>
<td>5.0</td>
<td>10.6</td>
</tr>
<tr>
<td>Length of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. temporal fossa</td>
<td>62.2</td>
<td>12.5</td>
<td>26.4</td>
</tr>
<tr>
<td>14. orbit</td>
<td>85.3</td>
<td>17.2</td>
<td>36.1</td>
</tr>
<tr>
<td>15. right nasal on vertex of skull</td>
<td>58.0</td>
<td>11.7</td>
<td>24.6</td>
</tr>
<tr>
<td>16. nasal suture</td>
<td>45.6</td>
<td>9.2</td>
<td>19.3</td>
</tr>
<tr>
<td>Breadth of skull across</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. postorbital process of frontals</td>
<td>240.0</td>
<td>48.3</td>
<td>101.7</td>
</tr>
<tr>
<td>18. zygomatic process of squamosal (ZGW)</td>
<td>236.0</td>
<td>47.5</td>
<td>100.0</td>
</tr>
<tr>
<td>19. center of orbits</td>
<td>213.0</td>
<td>42.9</td>
<td>90.3</td>
</tr>
<tr>
<td>20. Least breadth of skull across posterior margins of temporal fossa</td>
<td>202.0</td>
<td>40.6</td>
<td>85.6</td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. span of occipital condyles</td>
<td>87.9</td>
<td>17.7</td>
<td>37.2</td>
</tr>
<tr>
<td>22. width of an occipital condyle</td>
<td>34.3</td>
<td>6.9</td>
<td>14.5</td>
</tr>
<tr>
<td>23. length of an occipital condyle</td>
<td>55.9</td>
<td>11.2</td>
<td>23.7</td>
</tr>
<tr>
<td>24. breadth of foramen magnum</td>
<td>41.5</td>
<td>8.4</td>
<td>17.6</td>
</tr>
<tr>
<td>25. Breadth of skull across excocipitals</td>
<td>211.0</td>
<td>42.5</td>
<td>89.4</td>
</tr>
<tr>
<td>26. Breadth of nasals at vertex</td>
<td>34.3</td>
<td>6.9</td>
<td>14.5</td>
</tr>
<tr>
<td>27. Least distance between premaxillary crests</td>
<td>23.6</td>
<td>4.7</td>
<td>10.0</td>
</tr>
<tr>
<td>28. Greatest extension of right premaxillary posterior of right nasal on vertex</td>
<td>8.8</td>
<td>1.8</td>
<td>3.7</td>
</tr>
<tr>
<td>29. Greatest span of premaxillary crests</td>
<td>110.0</td>
<td>22.1</td>
<td>46.4</td>
</tr>
<tr>
<td>30. Least width of premaxillae where they narrow opposite to superior nare</td>
<td>102.0</td>
<td>20.5</td>
<td>43.2</td>
</tr>
<tr>
<td>31. Greatest width of premaxilla anterior to place of measurement no. 30</td>
<td>102.0</td>
<td>20.5</td>
<td>43.2</td>
</tr>
<tr>
<td>Width of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. premaxillae at midlength of rostrum</td>
<td>25.6</td>
<td>5.2</td>
<td>10.8</td>
</tr>
<tr>
<td>33. rostrum in apices of antorbital notches</td>
<td>123.0</td>
<td>24.8</td>
<td>52.2</td>
</tr>
<tr>
<td>34. rostrum in apices of proeminential notches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. width of rostrum at midlength of rostrum</td>
<td>40.9</td>
<td>8.2</td>
<td>17.3</td>
</tr>
<tr>
<td>36. depth of rostrum at midlength of rostrum</td>
<td>33.9</td>
<td>6.8</td>
<td>14.4</td>
</tr>
<tr>
<td>37. transverse width of superior nare</td>
<td>43.8</td>
<td>8.8</td>
<td>18.6</td>
</tr>
<tr>
<td>38. inside width of interior nare, at apices of pterygoids, on the pterygoids</td>
<td>61.1</td>
<td>12.3</td>
<td>25.9</td>
</tr>
<tr>
<td>39. height of skull</td>
<td>227.0</td>
<td>45.7</td>
<td>96.2</td>
</tr>
<tr>
<td>40. width of temporal fossa approximately at right angles to greatest length</td>
<td>39.0</td>
<td>7.8</td>
<td>16.5</td>
</tr>
<tr>
<td>41. Least distance between (main or anterior) maxillary foramina</td>
<td>71.6</td>
<td>14.4</td>
<td>30.3</td>
</tr>
<tr>
<td>42. Least distance between premaxillary foramina</td>
<td>28.9</td>
<td>5.8</td>
<td>12.2</td>
</tr>
<tr>
<td>43. Distance from post. margin of left maxillary foramen to most ant. extension of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxillary proomincence</td>
<td>34.3</td>
<td>6.9</td>
<td>14.5</td>
</tr>
<tr>
<td>44. Greatest length of vomer visible at surface of palate</td>
<td>116.0</td>
<td>23.3</td>
<td>49.0</td>
</tr>
<tr>
<td>45. Amount added to beak because of breakage</td>
<td>25.0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>46. Length of left tympanic bull</td>
<td>47.7</td>
<td>9.6</td>
<td>20.2</td>
</tr>
<tr>
<td>47. Length of right tympanic bull</td>
<td>50.9</td>
<td>10.2</td>
<td>21.6</td>
</tr>
</tbody>
</table>

Table 1 continued overleaf
Strandings might be related to offshore-onshore movements or to seasonal migration from cold temperate/sub-Antarctic waters. Similar seasonal patterns also have been observed for other Southern Hemisphere Mesoplodon species distributed in circumpolar temperate waters, such as the strap-toothed whale, *M. layardi*, and the Gray’s beaked whale, *M. grayi* (e.g., Ross 1984; Sekiguchi et al., 1996).

Hector’s beaked whale is one of the rarest species in the genus *Mesoplodon*. Published records described less than 30 specimens found ashore (e.g., Mead & Baker, 1987; Goodall & Lichter, 1988; Mead, 1989). In the western South Atlantic, *M. Hectori* is known only from strandings in the Falkland Islands (Fraser, 1950) and in the Provinces of Tierra del Fuego and Buenos Aires, Argentina (Goodall, 1978; Lichter, 1986; Goodall & Lichter, 1988). The present specimen is the first occurrence of the Hector’s beaked whale in Brazil. This record extends northwards the known range of the species in the western South Atlantic by nearly 7 latitudinal degrees (about 800 km) and represents the northernmost record of Hector’s beaked whale.

**Table 1. Continued.**

<table>
<thead>
<tr>
<th>Mandible measurements (right side)</th>
<th>mm</th>
<th>%CBL</th>
<th>%ZGW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Length</td>
<td>402.0</td>
<td>80.9</td>
<td>170.3</td>
</tr>
<tr>
<td>2. Greatest length of symphysis</td>
<td>107.0</td>
<td>21.5</td>
<td>45.3</td>
</tr>
<tr>
<td>3. Height at coronoid process</td>
<td>88.5</td>
<td>17.8</td>
<td>37.5</td>
</tr>
<tr>
<td>4. Outside height at midlength of alveolus</td>
<td>20.0</td>
<td>4.0</td>
<td>8.5</td>
</tr>
<tr>
<td>5. Inside height at midlength of alveolus</td>
<td>19.2</td>
<td>3.9</td>
<td>8.1</td>
</tr>
<tr>
<td>6. Length from most posterior extension of symphysis to most posterior extension of condyle</td>
<td>300.0</td>
<td>60.4</td>
<td>127.1</td>
</tr>
<tr>
<td>7. Length from posterior margin of alveolus to condyle</td>
<td>372.0</td>
<td>74.8</td>
<td>157.6</td>
</tr>
<tr>
<td>8. Length of alveolus</td>
<td>18.0</td>
<td>3.6</td>
<td>7.6</td>
</tr>
<tr>
<td>9. Width of alveolus</td>
<td>3.8</td>
<td>0.8</td>
<td>1.6</td>
</tr>
<tr>
<td>10. Tip of mandible to alveolus</td>
<td>10.5</td>
<td>2.1</td>
<td>4.4</td>
</tr>
<tr>
<td>11. Greatest length of tooth</td>
<td>24.9</td>
<td>5.0</td>
<td>10.6</td>
</tr>
<tr>
<td>12. Greatest antero-posterior width of tooth at approximately right angles to long axis of tooth</td>
<td>20.5</td>
<td>4.1</td>
<td>8.7</td>
</tr>
<tr>
<td>13. Greatest breadth of tooth</td>
<td>4.4</td>
<td>0.9</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**Acknowledgments**

Amanda Bradford, Merel Dalebout, Natalie Goodall, James Mead, Cristina Pinedo, Mário de Pinna, Salvatore Siciliano, Jeanette Thomas, and Glenn VanBlaricom critically reviewed the manuscript and provided useful comments and suggestions. Bibliographic support from J. Mead and Graham Ross were greatly appreciated. Museu Oceanográfico ‘Prof. Eliézer de Carvalho Rios’ and Universidade do Rio Grande provided logistical support. Adriana C. Fonseca and Manuela Bassoi assisted in collecting and preparing the specimen reported here. A. Zerbini and E. Secchi are supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), processes 200285/98-0 and 200889/98-2, respectively.

**Literature Cited**


Mead, J. G. (1981) First record of *Mesoplodon hectori* (Ziphiidae) from the Northern Hemisphere and a
Occurrence of Hector’s beaked whale, Mesoplodon hectori, in Southern Brazil


