

Strandings and feeding records of Bryde's whales (*Balaenoptera edeni*) in south-eastern Brazil

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Information on *Balaenoptera edeni* strandings along the Brazilian south-east coast and feeding associations with other marine vertebrates are reported. A total of 19 strandings were observed from 1972 to 2003 along ~1200 km of coast. Strandings were evenly distributed among seasons with no distinguishable peaks. Besides the stranding data, opportunistic observations on Bryde's whales engaged in feeding activities were reported from nine cruises along São Paulo and Rio de Janeiro State coasts (22–24°S). Bryde's whales were observed preying on Brazilian sardines (*Sardinella brasiliensis*) in at least three events, and possibly two others. Associations with other marine vertebrates were observed, and included dolphin fish (*Coryphaena hippurus*), little tunny (*Euthynnus alletteratus*), unidentified sharks, terns (*Sterna hirundinacea*, *Sterna* spp.), brown boobies (*Sula leucogaster*), frigate birds (*Fregata magnificens*), parasitic jaeger (*Stercorarius* cf. *parasiticus*), albatrosses (*Thalassarche* spp.), and bottlenose dolphins (*Tursiops truncatus*). Stranding data and on-board observations support the hypothesis that Bryde's whales are common in coastal waters of south-eastern Brazil.

INTRODUCTION

Bryde's whales (*Balaenoptera edeni* Anderson, 1878) are the least known of the large baleen whales (Kato, 2002). Their occurrence has been reported from all tropical and temperate waters between 40°N and 40°S (Kato, 2002). This species is regularly observed in coastal areas of south-eastern Brazil during the austral summer and autumn wherever effort occurs (Zerbini et al., 1997). Although occasionally reported along the Brazilian coast (e.g. Zerbini et al., 1997), Bryde's whales' behaviour, seasonal occurrence and abundance in coastal waters are poorly known. This study provides new information on *B. edeni* strandings along the Brazilian south-east coast, as well as feeding associations with other marine vertebrates. Additionally, a revision of published and unpublished stranding records of Bryde's whales was conducted for the Brazilian south-east coast. As recent investigations have been considering the taxonomic status of Bryde's whales (see Best, 1977; Wada & Numachi, 1991; Kato, 2002; Wada et al., 2003), and no conclusions were reached on behalf of the western South Atlantic specimens, the authors opted to use the nomination *Balaenoptera edeni*, Anderson, 1878.

RESULTS AND DISCUSSION

Data on Bryde's whale feeding behaviour were collected by the authors during dedicated and opportunistic

platforms of observations between 1993 and 1999 on the coasts of São Paulo and Rio de Janeiro States (22°S–24°S), south-eastern Brazil. Prey and associated vertebrates were photographed and identified later. Stranding records were reported during regular beach surveys, and through the implementation of a network for notification of whale carcasses along ~1200 km of the Brazilian south-east coast.

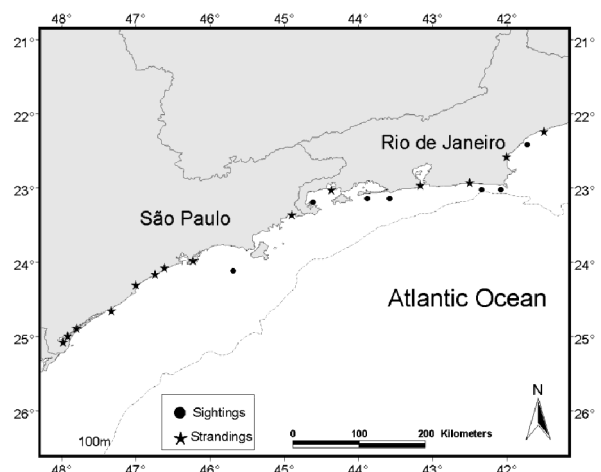


Figure 1. Stranding and sighting locations for Bryde's whales along the south-east coast of Brazil, 1972–2003.

Table 1. Feeding events and species associated to *Bryde's whale* (*Balaenoptera edeni* Anderson, 1878) along the south-eastern Brazilian coast. Sightings were notified at latitudes ranging from 22°S to 24°S at São Paulo (SP) and Rio de Janeiro (RJ) State coasts.

| Feeding event | | | | Species associated | | |
|---------------|-------------|------------------------|-------------------------------|---|---|-----------|
| N | Date | Locality | Group size (No. of whales) | Fish | Seabirds | Cetaceans |
| 1 | 08 Jan 1993 | Enseada da Cajaíba, RJ | 1 | <i>Sardinella brasiliensis</i> | 1+ <i>Sterna</i> spp. | — |
| 2 | 09 Jan 1993 | Parati, RJ | 3 | <i>S. brasiliensis</i> | 120+ <i>Sula leucogaster</i> | — |
| 3 | 27 Feb 1994 | Alcatrazes Island, SP | 2 | <i>S. brasiliensis</i> , <i>Euthynnus alletteratus</i> , <i>Coryphaena hippurus</i> and unidentified sharks | 250+ <i>Sula leucogaster</i> , 30+ <i>Fregata magnificens</i> | — |
| 4 | 06 Nov 1994 | Marambaia, RJ | 1 | Sardines (clupeid) | 25+ <i>Sterna</i> spp. | — |
| 5 | 21 Nov 1994 | Barra de Guaratiba, RJ | 1 | Sardines (clupeid) | 20+ <i>Sterna</i> spp. | — |
| 6 | 29 Apr 1995 | Arraial do Cabo, RJ | 3 | — | 30+ <i>Sterna</i> spp. and 20+ <i>Sula leucogaster</i> | — |
| 7 | 03 May 1995 | Barra da Tijuca, RJ | 2 | — | <i>Sula leucogaster</i> and <i>Fregata magnificens</i> | — |
| 8 | 22 Nov 1997 | Praia Seca, RJ | 2 | — | 15+ <i>Sula leucogaster</i> | — |
| 9 | 30 Jan 1999 | Macaé, RJ | 3 | — | 15+ <i>Sula leucogaster</i> , 5+ <i>Fregata magnificens</i> , 15+ <i>Tursiops</i> 15+ <i>Sterna hirundinacea</i> , 5+ <i>Stercorarius truncatus</i> cf. <i>parasiticus</i> and 1 <i>Thalassarche</i> spp. | — |

Table 2. Revised (4) and new (15) stranding records of *Bryde's whale* (*Balaenoptera edeni* Anderson, 1878) along the south-eastern coast of Brazil from 1972 to 2003. SP, São Paulo State; RJ, Rio de Janeiro State.

| Locality | Position | Date | TL (m) | Sex | Observations |
|----------------------|-----------------|-------------|--------|-----|---|
| Cananéia, SP | 25°00'S 47°55'W | Aug 1972 | 12.5 | M | in Zerbini et al. (1997) |
| Rio de Janeiro, RJ | 22°58'S 43°10'W | 28 Jan 1983 | 7.1 | M | Borobia and Geise (1986) and cited in Zerbini et al. (1997) |
| Angra dos Reis, RJ | 23°02'S 44°22'W | 03 Apr 1989 | 10.6 | M | cited in Zerbini et al. (1997) |
| Ilha Comprida, SP | 25°00'S 47°55'W | Nov 1994 | 14 | ? | photographs only |
| Saquarema, RJ | 22°56'S 42°30'W | 07 Apr 1995 | 12.4 | ? | cited in Zerbini et al. (1997) |
| Ilha do Cardoso, SP | 25°05'S 47°59'W | 03 Sep 1996 | 14 | F | damaged skull at Ilha do Cardoso-SP |
| Ilha Comprida, SP | 24°54'S 47°48'W | 30 Jan 1997 | 11 | ? | photographs only |
| Peruíbe, SP | 24°19'S 47°00'W | 07 Dec 1997 | 15 | ? | present study—buried at Praia do Centro and not recovered |
| Guarujá, SP | 23°59'S 46°14'W | 18 Jun 1998 | 12.4 | M | no biological material collected |
| Quissamã, RJ | 22°15'S 41°30'W | Jun 1998 | ~8 | F | photographs only |
| Rio de Janeiro, RJ | 22°58'S 43°10'W | 22 Aug 1998 | ~10 | ? | few vertebrae recovered |
| Praia Grande, SP | 24°10'S 43°15'W | 22 Sep 1998 | 14 | ? | photographs only |
| Mongaguá, SP | 24°05'S 46°37'W | 09 Apr 1999 | 12 | ? | photographs only |
| Praia Grande, SP | 24°10'S 43°15'W | 21 Aug 1999 | 12.2 | ? | photographs only |
| Ubatuba, SP | 23°22'S 44°54'W | 24 Jul 2000 | 14 | F | buried at Praia do Félix and not recovered |
| Juréia, SP | 24°40'S 47°20'W | Apr 2001 | 15 | M | complete skeleton at Aquário do Guarujá-SP |
| Barra de S. João, RJ | 22°35'S 42°00'W | 11 Dec 2001 | ~9 | ? | skull and incomplete skeleton recovered (GEMM-Lagos 028) |
| Ilha do Cardoso, SP | 25°05'S 47°59'W | Sep 2002 | ~12 | M | complete skeleton at Ilha do Cardoso-SP |
| Maricá, RJ | 22°59'S 43°00'W | 30 Jan 2003 | 12 | F | photographs only |

Feeding events were recorded on nine different occasions, all of them in multispecific associations. Species recorded in each feeding event are listed in Table 1. *Bryde's* whales were observed preying on Brazilian sardines (*Sardinella brasiliensis*) in at least three events. On four occasions, prey items could not be collected or observed directly. During these events, other marine vertebrates were associated with *Bryde's* whales. These included: dolphin fish (*Coryphaena hippurus*), little tunny (*Euthynnus alletteratus*) and unidentified sharks; seabirds: terns (*Sterna hirundinacea*, *Sterna* spp.), brown boobies (*Sula leucogaster*), frigate birds (*Fregata magnificens*), parasitic jaeger (*Stercorarius* cf. *parasiticus*), albatrosses (*Thalassarche* spp.) and cetaceans: bottlenose dolphins (*Tursiops truncatus*). Feeding behaviour occurred in coastal waters at depths that varied between 15 and 122 m.

A total of 19 strandings of *Bryde's* whale is presented (Table 2). Stranding records were evenly distributed among seasons. From the stranded specimens which could be sexed, six were males and four females. Total length of stranded specimens varied from 7.1 to 15 metres. Most individuals (84.2%) were more than 10 m in length. No calves were reported. Reasons for strandings could not be discerned due to decomposition of specimens.

The feeding events reported in this study have all been recorded in south-eastern Brazil during austral summer and autumn, which agrees with data provided by Zerbini et al. (1997). During these seasons, sardines approach the coast to spawn in shallower waters (Saccardo & Rossi-Wongtschowski, 1991), and it is likely that *Bryde's* whales move inshore while following sardine schools (Zerbini et

al., 1997). Bryde's whale predation on schooling fish, like Brazilian sardines, generally agrees with the reported habits of the species from a few areas such as South Africa (Best, 1977; Best & Rickett, 1984) and Gulf of California, Mexico (Tershy et al., 1993).

Bryde's whales are found stranded along the Brazilian coast more often than all the other balaenopterids, except minke whales (*Balaenoptera acutorostrata* and *B. bonaerensis*) (Zerbini et al., 1997). Stranding and sighting data provided in this study support the hypothesis that Bryde's whales are common in coastal waters of south-eastern Brazil. In about 30 years, only juveniles and adults were reported stranded along the south-east coast of Brazil. Dedicated surveys must be conducted in order to identify movements during time and space and the possible existence of reproductive areas, patterns of habitat use, as well as to describe their feeding habits and details on their associations with other marine vertebrates along the Brazilian coast.

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