

MARINE MAMMALS STRANDED IN THE AZORES DURING 1990-91

JOÃO GONÇALVES, LEONOR GALHARDO & JOÃO BRUM

ARQUIPÉLAGO



GONÇALVES, JOÃO, LEONOR GALHARDO & JOÃO BRUM 1992. Marine mammals stranded in the Azores during 1990-91. *Arquipélago. Life and Earth Sciences* 10: 113-118. Angra do Heroísmo. ISSN 0870-6581.

Seven strandings of marine mammals were recorded in the Azores during 1990-91. The species involved were: *Megaptera novaeangliae* (humpback whale), *Balaenoptera borealis*? (sei whale), *Physeter macrocephalus* (sperm whale), *Globicephala macrorhynchus* (short-finned pilot whale), *Stenella frontalis* (spotted dolphin) and *Stenella coeruleoalba* (striped dolphin). External measurements of the stranded specimens are reported as well as the mercury levels in the muscle tissue of three of them. These are the first strandings recorded from the Azores of *M. novaeangliae*, *B. borealis* and *S. frontalis*.

GONÇALVES, JOÃO, LEONOR GALHARDO & JOÃO BRUM 1992. Arrojamentos de mamíferos marinhos nos Açores em 1990-91. *Arquipélago. Ciências da Natureza* 10: 113-118. Angra do Heroísmo. ISSN 0870-6581.

Durante 1990-91 foram registados nos Açores, sete arrojamentos de mamíferos marinhos. As espécies arrojadas foram: *Megaptera novaeangliae* (baleia de bossas), *Balaenoptera borealis*? (rorqual nortenho), *Physeter macrocephalus* (cachalote), *Globicephala macrorhynchus* (baleia piloto tropical), *Stenella frontalis* (golfinho pintado) e *Stenella coeruleoalba* (golfinho listado). A morfometria externa dos exemplares arrojados, bem como os níveis de mercúrio de três deles são aqui fornecidos. Os arrojamentos de *M. novaeangliae*, *B. borealis* e *S. frontalis* são registados pela primeira vez nos Açores.

João M. Gonçalves, Universidade dos Açores, Departamento de Oceanografia e Pescas, P-9900 Horta, Açores, Portugal. - Leonor Galhardo, Escola Secundária das Laranjeiras, P-9500 Ponta Delgada, Açores, Portugal. - João Brum, Universidade dos Açores, Departamento de Biologia, P-9500 Ponta Delgada, Açores, Portugal.

INTRODUCTION

There have been few studies of the marine mammals of the Azorean waters even though they occur frequently in the region.

Most publications relate to the sperm whales and the hunting activity which finished in 1984 (e.g. FIGUEIREDO 1946, CLARKE 1956, MARTIN & MEL 1983).

Studies of other marine mammals occurring in the Azores were made by CHAVES (1924), FERREIRA (1935) and RICHARD (1936). New studies in the region started in the 1970's (ALLEN & al. 1979; MARTINS & al. 1985; GORDON & al. 1987, 1988, 1989), and were mainly concerned with sperm whales.

A compilation of the cetacean strandings and sightings in the Azores up to 1988 was compiled by REINER (1990). GALHARDO (1990) reported 7

strandings from 1976 to 1989, of which one (*Mesoplodon europaeus*) had not been listed in REINER (1990). The data of two other strandings during 1990 that were presented preliminarily by GALHARDO (1990) (*Megaptera novaeangliae* and *Globicephala macrorhynchus*) are included here.

In all, 20 species of cetaceans have been reported from Azorean waters (sightings, strandings and other methods)(cf. GALHARDO 1990).

METHODS

Data were collected from the stranded animals using the protocol of NORRIS (1961). External parasites were collected when present, and identified according to LEUNG (1967). Mercury levels were determined on fresh samples of the dorsal muscle tissue by a standard method (cold vapour

atomic absorption spectrophotometry - ANON. 1975). When possible, stomach contents were preserved for later identification and skulls were prepared for further cranimetric studies.

For species identification, LEATHERWOOD & al. (1976), LEATHERWOOD & REEVES (1983), RIDGWAY & HARRISON (1985), DUGUY & ROBI-NEAU (1987) and EVANS (1987), were used.

Often the strandings were only communicated several days after the event and the animals were often decomposed, which made it impossible to perform complete studies in all cases.

RESULTS

The main data on the strandings are given in Table 1 and Fig. 1. Five specimens were recorded in 1990, and two were recorded in 1991.

The species stranded in the Azores during 1990-91, in chronological order, were:

1 - *Megaptera novaeangliae* (Borowsky, 1781) - humpback whale

This stranding occurred near Mosteiros, S. Miguel Island (Fig. 1), on 21 March 90. The animal was

Table 1
Morphometrics from stranded specimens

Measurements (cm) and counts	<i>Megaptera novaeangliae</i>	<i>Globicephala macrorhynchus</i>	<i>Stenella frontalis</i>	<i>Baluenoptera borealis</i> ?	<i>Physeter macrocephalus</i> 1 2		<i>Stenella coeruleoalba</i>
Date	23/iii/90	03/v/90	21/viii/90	27/viii/90	29/viii/90	21/ii/91	27/iv/91
Latitude N	25° 49.3'	28° 04.8'	28° 40.4'	25° 25.5'	25° 37.9'	27° 56.1'	28° 37.6'
Longitude W	37° 35.9'	38° 24.2'	38° 38.1'	37° 49.4'	37° 48.8'	38° 37.8'	38° 32.5'
Total length	442	485	192	1320	630	1600	151
Tip of upper jaw to anterior insertion of dorsal fin	-	130	83	-	-	-	73
Tip of upper jaw to anterior insertion of flipper	-	63	43	-	-	-	39
Tip of upper jaw to blowhole	-	42	30	-	-	-	29
Length of the base of dorsal fin	-	94	28	73	-	-	20
Dorsal fin height	-	43	21	32	-	-	13
Length of flipper	90	69	25	165	-	-	22
Maximum width of flipper	30	23	11	37	-	-	8
Width of flukes, tip to tip	180	125	47	-	-	-	33
Tooth number of hemi upper jaw		8	32				45
Tooth number of hemi lower jaw		8	35		-	16	48
Number of ventral grooves	22			51/52			
Sex	?	Male	Female	Male	?	Male	Male
Mercury level in muscle tissue (μ g.g ⁻¹ \pm S.E., ww) (n=3)	-	10.9 \pm 0.66	4.0 \pm 0.22	-	-	-	0.7 \pm 0.2

already in an advanced state of decomposition and the skull was not complete. However, identification was made from the shape of the flippers and the 22 ventral grooves which extended to and circumscribed the umbilicus.

This is the first known stranding of this species in the Azores, although it is referred to from the whaling period (CHAVES 1924; FERREIRA 1935) and has been observed between the Azores and mainland Portugal by GORDON & al. (1989). ALLEN & al. (1979) mention sightings by whalers.

According to the biometric information given by RIDGWAY & HARRISON (1985), the total length of the specimen corresponds to that of a newborn calf.

2 - *Globicephala macrorhynchus* Gray, 1846 - short-finned pilot whale

The specimen was stranded near the harbour of

Calheta do Nesquim, Pico Island (Fig. 1), on 03 April 90. It was alive when first observed but died a few hours later. The animal had scar tissue along the lateral sides of the body which was infested by the external amphipod parasite: *Isocyamus delphini* (Guérin-Méneville, 1836). The number of teeth on each hemi jaw (8) and the short length of flippers (which amount to 14% of the total length) permitted the identification of the specimen.

The total mercury level in the dorsal muscle tissue (10.9 ± 0.66 S.E. $\mu\text{g.g}^{-1}$ ww), although a little bit higher (1 unit), is of the same order of magnitude as the values reported by GLÉMOT (1986) to this species in the Caribbean region.

The short-finned pilot whale has been observed regularly in the waters around the Azores by GORDON & al. (1987, 1988, 1989). REINER (1985, 1990) reports a previous stranding in the Azores (Corvo island).

According to the biometric information given

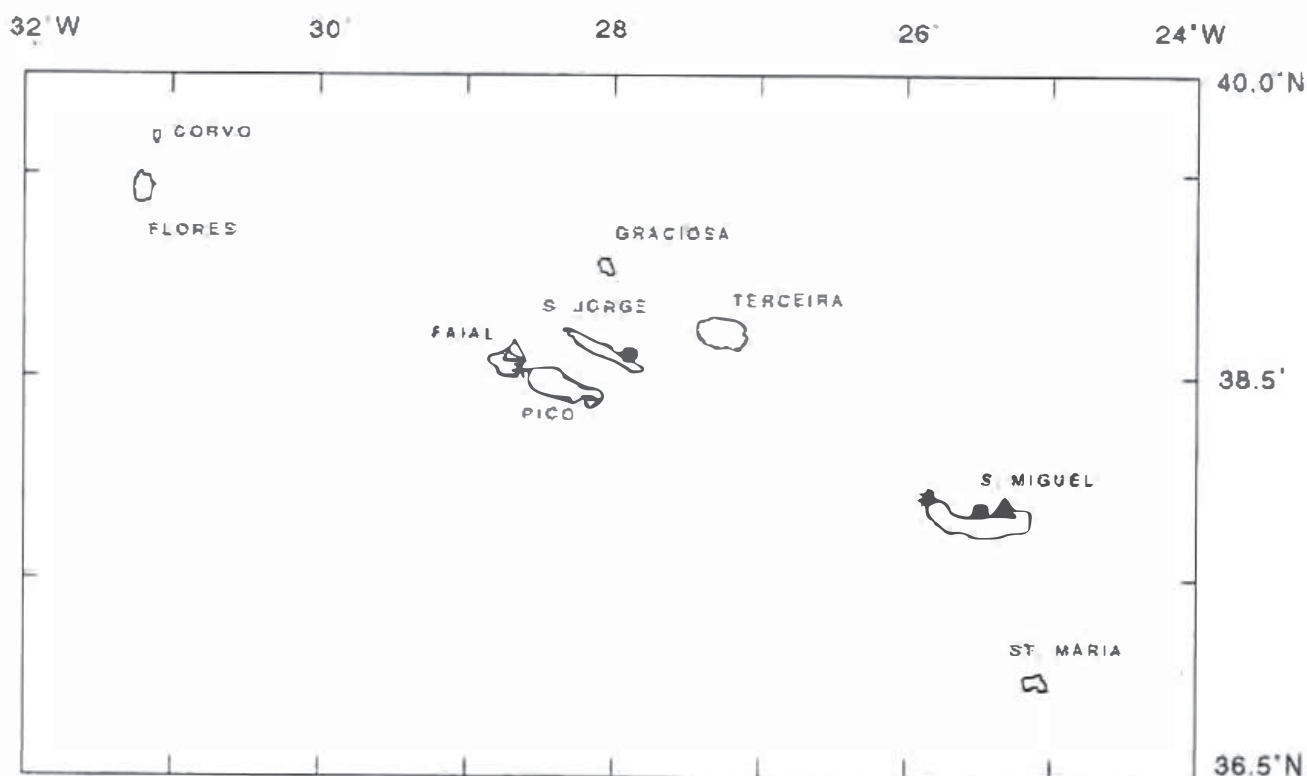


Fig. 1 - Map showing sites of stranded cetaceans in Azores from 1990-91. * - *Megaptera novaeangliae*; ▲ - *Balaenoptera borealis*; ● - *Physeter macrocephalus*; ○ - *Globicephala macrorhynchus*; △ - *Stenella frontalis*; * - *Stenella coeruleoalba*.

by EVANS (1987), the total length of the male observed corresponds to an adult animal.

3 - *Stenella frontalis* (G. Cuvier, 1829) - spotted dolphin

This dolphin stranded at Porto da Eira, Cedros, Faial Island (Fig. 1) on 21 August 90.

Although GLÉMOT (1986) do not present mercury data to this species, the total mercury level in the dorsal muscle tissue (4.0 ± 0.22 S.E. $\mu\text{g.g}^{-1}$ ww) of this specimen is within the range of values given by this author for other species of *Stenella*.

PERRIN & al. (1987) regarded *S. frontalis* and *S. plagiodon* as synonyms, and considered the species endemic to the Atlantic.

Although spotted dolphins were the most common dolphins observed around the Azores in the summer months by GORDON & al. (1987, 1988, 1989), as far as we know, strandings have not been reported previously. PERRIN & al. (1987) reported a specimen of this dolphin from the Azores but do not mention if it was a stranding. The first confirmed reference was made by MARTIN (1986), who described an interesting feeding behaviour association between dolphins and Cory's shearwater (*Calonectris diomedea* and *Puffinus gravis*).

The body measurements of the stranded spotted dolphin correspond to an adult female (according to PERRIN & al. 1987).

4 - *Balaenoptera borealis* ? Lesson, 1828 - sei whale

This specimen was found dead near Porto Forno, S. Miguel Island (Fig. 1) on 27 August 90, already in an advanced state of decomposition.

The presence of 51-52 ventral grooves (RIDGWAY & HARRISON 1985) which extended to the navel (EVANS 1987) and the presence of black baleen plates with yellow fringes, suggest that this specimen is *B. borealis*. However, other important specific features in the systematic of Balaenopterids (number of longitudinal ridges between the blowhole and the upper jaw and the colour of the lips) have not been verified, and some incertitude in the identification still remain.

B. borealis was observed for the first time in

the Azores in 1989 (GORDON & al. 1990), and this is the first known stranding in this region.

According to the biometrics given by EVANS (1987) and LEATHERWOOD & REEVES (1983), the present animal was an adult.

5 - *Physeter macrocephalus* Linnaeus, 1758 - sperm whale

The two stranded sperm whales from 1990-91, were already in an advanced state of decay, when found. Only the total lengths were measured. The first of those strandings occurred near Fenais da Luz, S. Miguel Island, on 29 August 90. The second occurred in Lagoa de Sto. Cristo, S. Jorge Island (Fig. 1) on 13 March 1991.

According to the biometric information of EVANS (1987) and LEATHERWOOD & REEVES (1983), the total length of the first animal corresponds to a young individual, the second to an adult male.

6 - *Stenella coeruleoalba* (Meyen, 1833) - striped dolphin

The specimen was found on Conceição beach, Horta, Faial island (Fig. 1) on 27 April 1991.

Otoliths (*lapillae* and *sagittae*) from *Trachurus picturatus* - oceanic horse mackerel, were found in the stomach of the animal.

The total mercury level in the dorsal muscle tissue (0.7 ± 0.02 S.E. $\mu\text{g.g}^{-1}$ ww), is a little bit lower (-0.3) than the range of values (1.0 to 81.2 p.p.m) given by GLÉMOT (1986) in the Mediterranean, Atlantic and Pacific ocean).

S. coeruleoalba is common in the Archipelago, and previous records of this species have been reported by REINER (1990). The species have been commonly observed in the waters of the Azores by GORDON & al. (1987, 1988, 1989).

According to measurements given by DUGUY & ROBINEAU (1987) and LEATHERWOOD & REEVES (1983) the specimen observed was a young immature male.

DISCUSSION

Sightings of *Megaptera novaeangliae*, *Balaenoptera borealis* and *Stenella frontalis* have already

been made in Azorean waters (see GORDON & a. 1987, 1988, 1989; REINER 1990; GALHARDO 1990), but no strandings have been reported previously.

The number of strandings observed during 1990 is higher than in any other year (5). However, in 1991 only two strandings were recorded.

With the exception of the short-pilot whale and the spotted dolphin, the other species stranded in Azores during 1990-91 have also been recorded from strandings in mainland Portugal (cf. SEQUEIRA 1988; SEQUEIRA & al. 1992).

Probably many more marine mammals are stranded in the Azores but are not reported. For the tuna fishermen, dead floating whales are valuable because they find schools of tuna associated with them. For this reason, they may not communicate their occurrence.

The total mercury levels in the fresh dorsal muscle tissue of the three specimens analysed are within the range of values given by GLÉMOT (1986) for the same species in other regions.

ACKNOWLEDGEMENTS

We should like to thank Eng. Luís Monteiro for performing the mercury analysis and for informations and suggestions related to the subject.

Thanks are due to Sr. Paiva, from the police of Mosteiros (S. Miguel) and to Sr. Serafín from Calheta do Nesquin (Pico), who told us the first two strandings. Norberto Serpa (DOP/UA Staff) helped with data collection in the field.

Dr Marina Sequeira, Dr Francisco Reiner, Dr Ricardo Santos, Dr Malcom Clarke and Dr Jonathan Gordon reviewed critically the first versions of this note. Dr H.R. Martins has kindly identified the otoliths, corrected the English and also given important improvements to the final version.

REFERENCES

- ALLEN, A., Q. BISHOP & J. GORDON 1979. *The Report of Cambridge Azores Expedition*. University of Cambridge. 46 pp.
- ANON. 1975. *Atomic Absorption Methods, Mercury in Canned Fish*. Pye Unicam Ltd., Ref. AA/5. June 1975/951. 4 pp.
- CHAVES, A. 1924. Cetáceos que aparecem no mar dos Açores. - *A Pesca Marítima*, 2 (15): 41-44.
- CLARKE, R. 1956. Sperm Whales of the Azores. *Discovery Report*, Vol. 28. Cambridge. 298 pp.
- DUGUIY, R. & D. ROBINEAU 1987. *Guía de los Mamíferos Marinos de Europa*. Ediciones Omega, Barcelona. 198 pp.
- EVANS, P. 1987. *The Natural History of Whales & Dolphins*. Christopher Helm, Publ. Kent. 343 pp.
- FERREIRA, E. 1934. Gigantes dos mares dos Açores. - *Açoreana* (Boletim da Sociedade Afonso Chaves), 2: 74-86.
- FIGUEIREDO, J. 1946. *Introdução ao Estudo da Indústria Baleeira Insular*. Lisboa. 222 pp.
- GALHARDO, M.L. 1990. *Cetáceos que Ocorrem nos Açores (Biologia, Ecologia e Taxonomia) e Estudos Sobre a História da Baleação nos Açores*. Relatório de Estágio da Licenciatura em Biologia e Geologia do Departamento de Biologia da Universidade dos Açores. 330 pp.
- GLÉMOT, J.-M. 1986. *Le Mercure Chez les Cétacés: Intoxication et Détoxication par le Sélénium*. Thèse pour le Doctorat en Pharmacie. Université de Poitiers. 97 pp.
- GORDON, J., T. ARNBOM, J. BRUM, C. COXSON, R. CUNHA, D. GILLESPIE, T. GORDON, K. HUGHES, T. KIRBY, K. STOREY & V. WALSH 1987. *The first cruise of "Song of the Whale" and cetacean research carried out in the Azores by the International Fund for Animal Welfare*. Cambridge. 11 pp.
- GORDON, J., T. ARNBOM, D. GILLESPIE, T. GORDON, R. LEAPER, A.C. LESCRAUWERT, P. LOVELL & L. STEINER 1988. *Preliminary report on cetacean research being conducted in the waters around the Azores by the International Fund for Animal Welfare*. Cambridge. 95 pp.
- GORDON, J., A. GODDARD, G. LEAPER, R. LEAPER, L. STEINER & C. WHITMORE 1989. *Report of the International Fund for Animal Welfare's cetacean research program in the Azores*. Cambridge. 59 pp.
- GORDON, J., L. STEINER & J. GONÇALVES 1990. Sei whale (*Balaenoptera borealis*) encountered in the Azores: a new record for the Region. - *Arquipélago, Life and Earth Sciences* 8: 97-100.
- LEATHERWOOD, S., D. CALDWELL & H. WINN 1976. Whales, Dolphins and Porpoises of the Western North Atlantic. A Guide to Their Identification. - *NOAA Technical Report NMFS CIRC - 396*. 176 pp.
- LEATHERWOOD, S. & R. REEVES 1983. *The Sierra Club Handbook of Whales and Dolphins*. The Sierra Club Handbook (Ed.). San Francisco. 302 pp.
- LEUNG, Y.-M. 1967. An illustrated key to the species of whale-lice (Amphipoda, Cyamidae), ectoparasites of Cetacea, with a guide to the literature. - *Crustaceana*, 11: 279-291.
- MARTIN, A.R. 1986. Feeding association between dolphins and shearwaters around the Azores Islands. - *Canadian Journal of Zoology*, 64: 1372-1374.
- MARTIN, A.R. & A. MELO 1983. The Azorean sperm

- whale fishery: a relic industry in decline. - *Report of the International Whaling Commission*, 33: 283-286.
- MARTINS, H.R., M.R. CLARKE, F. REINER & R.S. SANTOS 1985. A pigmy sperm whale, *Kogia breviceps* (Blainville, 1838) (Cetacea: Odontoceti) stranded on Faial Island, Azores, with notes on Cephalopod beaks in stomach. - *Arquipélago. Série Ciências da Natureza*, 6: 63-70.
- NORRIS, K. 1961. Standardized methods for measuring and recording data on the smaller cetaceans. - *Journal of Mammalogy*, 42 (4): 471-476.
- PERRIN, W.F., E.D. MITCHELL, J.G. MEAD, D.K. CALDWELL, M.C. CALDWELL, P.J. VAN BREE & W.H. DAWBIN 1987. Revision of the spotted dolphins, *Stenella* spp. - *Marine Mammal Science*, 3 (2): 99-170.
- REINER, F. 1985. *Mammifères de l'Atlantique Portugais et la Phoque Moine de Madère*. Thèse d'Université, Université d'Aix-Marseille III, 244 pp.
- REINER, F. 1990. Records of Marine Mammals of the Azores Islands. - *Garcia da Orta, Série de Zoologia*, 15 (2): 21-36.
- RICHARD, J. 1936. Documents sur les Cétacés et Pinipèdes Provenant des Campagnes du Prince Albert 1er. de Monaco. - *Résultats des Campagnes Scientifiques Accomplies sur son Yacht par Albert 1er Prince Souverain de Monaco*, Fascicule XCIV. Imprimerie de Monaco, 72 pp.
- RIDGWAY, S. & R. HARRISON 1985. *Handbook of Marine Mammals*. The Sirenians and Baleen Whales. Vol. 3. Academic Press, London, 361 pp.
- SEQUEIRA, M. 1988. *Mamíferos Marinhos da Costa Portuguesa. Padrões de distribuição e ocorrência das principais espécies*. Relatório de Estágio da Licenciatura em Recursos Faunísticos e Ambiente da Faculdade de Ciências da Universidade de Lisboa, 187 p.
- SEQUEIRA, M., A. INÁCIO & F. REINER 1992. Arrojamentos de mamíferos marinhos na costa portuguesa entre 1978 e 1988. - *Estudos de Biologia e Conservação da Natureza*, 7, 48 pp. SNPRCN - Núcleo de Mamíferos Marinhos, Lisboa.

Accepted 3 July 1992