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On the distribution of *Globicephala melaena* (Traill, 1804) (Cetacea, Delphinidae) in the south-west Atlantic

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The genus *Globicephala* is considered as cosmopolitan (see, for exemple, TOMILIN 1967). Nevertheless, exact data on the distribution of the two species of the genus (*Globicephala melaena* and *Globicephala macrorhynchus*) are very scarce. The main cause is that the systematics of the genus has only been established recently (VAN BREE 1971).

According to the literature, information from the south-west Atlantic coasts is rather scarce. CABRERA (1940, 1961) accepts that *Globicephala melas* (sic) occurs from Mar del Plata as far as a latitude of about 70 °S (for all the localities see fig. 1). PINERO and CASTELLO (1975) comment that most of the Argentinian records are not based on determined specimens, because the preserved osteological material is very poor. After GOODALL (1978) the situation would be different for Tierra de Fuego where she has been able to collect many long-finned pilot whale skeletons.

Thanks to the kind permission of the respective curators, I had the opportunity of studying the Cetacean collections of four museums of the zone, these of Rio de Janeiro, São Paulo, Buenos Aires and La Plata. Osteological material of *Globicephala melaena* is kept in two of these museums. In the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" there are two skulls, both of them from the coasts of Buenos Aires (localities, Buenos Aires and Miramar). In the "Museu de Zoologia" of São Paulo there is a skull. In the table measurements of the three skulls are shown.

The São Paulo specimen is the most interesting one. It was collected in Cananéia, São Paulo state, in 1920 by LÜDERWALDT, according to the attached data. The animal had been identified as *Globicephala macrorhyncha* (sic). However, if one takes into account the characters that VAN BREE (1971) gives for determining the two species of the genus, this skull belongs to a long-finned pilot whale. First of all there were 10 alveoli on each side of the lower jaw. They were not visible in the upper jaw. Normally, the presence of more than nine teeth in each tooth row is a typical character of *Globicephala melaena*, always

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Fig. 2. Dorsal view of the skull of the Cananéia specimen

according to VAN BREE. Nevertheless, this character alone does not seem sufficient for determination. I have seen a specimen of shortfinned pilot whale with ten teeth (CASINOS and BOU 1980). The other specific character however was very clear: the rostrum was rather long, with the lateral borders of the maxillae not covered by the premaxillae (fig. 2).

After PIÑERO and CASTELLO (1975) the most northerly record of long-finned pilot whale in the south-west Atlantic would be Santa María cape (Rocha district, Uruguay). So, as very often happens with cetacean distribution, we wonder if the Cananéia specimen is an isolated one or it exemplifies the normal distribution of the species in this zone. The record would move the known limit about 9° to the north, very close to the theoretical limit if we accept the antitropical distribution of *Globicephala melaena* in the Atlantic postulated by DAVIES (1963). There is only a little more than a degree between Cananéia and the Tropic of Capricorn.

Let us examine the distribution of the long-

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finned pilot whale off the African coasts. A recent paper (VAN BREE et al. 1978) has shown the presence of both species of pilot whale in South Africa, although it seems that *Globicephala melaena* is predominant. The real northern limit of this species in the zone does not appear cleary. For the north-west African coast, we have DUGUY's data (1976). He observed long-finned pilot whales at $21^{\circ} 24' \text{ N}/17^{\circ} 42' \text{ W}$, that means about 2° below the Tropic of Cancer. Perhaps we can establish a comparison with the situation in the southwest Atlantic. In both zones cold currents exist that reach as far as subtropical/tropical waters. In Africa there is the Canaries current; in South America the Malvinas current. MITCHELL (1975) has already shown the presence of *Globicephala melaena* in the cold

Table

Measurements of the three skulls

Measurements		M.A.C. Buenos Aires	N.B.R. Miramar 25–136	M.Z.S.P. Cananéia 4192		%	
1 Total skul	l length*	557 mm	683 mm	653 mm	100	100	100
2 Rostrum l	ength	311 mm	385 mm	318 mm	55.8	56.3	48.7
3 Rostrum	3 Rostrum basal width		280 mm	284 mm	43.0	40.9	43.5
4 Rostrum	4 Rostrum width 60 mm						
anterior to	o base	225 mm	261 mm	265 mm	40.3	38.2	40.6
5 Rostrum	width at middle	179 mm	239 mm	214 mm	32.1	34.0	32.7
6 Rostrum	6 Rostrum width at ³ / ₄ of						
the length		137 mm	159 mm	175 mm	24.5	23.2	26.8
7 Maximum	premaxillae width	157 mm	184 mm	188 mm	28.1	26.9	28.8
8 Preorbital	Preorbital width		463 mm	450 mm	71.8	67.8	69.0
9 Postorbita	l width	429 mm	512 mm	495 mm	77.0	75.0	75.8
10 Zygomati	width	413 mm	_	498 mm	74.1	-	76.2
11 Width of	braincase across						
squamosa	s	281 mm	318 mm	315 mm	50.4	46.5	48.2
12 Length ter	mporal fossa	108 mm	144 mm	150 mm	19.3	21.0	23.0
13 Heigth ter	nporal fossa	93 mm	100 mm	127 mm	16.7	14.6	19.4
14 Tip rostru	m to the nares	408 mm	478 mm	460 mm	73.2	70.0	70.4
15 Tip rostru	5 Tip rostrum to the						
ptervgoid	bone	336 mm	417 mm	382 mm	60.3	61.0	58.5
16 Length of	upper toothrow						
(right)	(right)		183 mm	_	-	26.8	-
17 Length of	Length of upper toothrow						
(left)	(left)		171 mm	_	-	25.0	-
18 Number o	of alveoli of the						
upper jaw	(right)	_	11	_	_	-	_
19 Number of	of alveoli of the						
upper jaw	(left)	_	9	_	-	_	-
20 Lower jay	v length (left side)	476 mm	558 mm	524 mm	85.4	81.6	80.2
21 Coronoid	height	126 mm	159 mm	162 mm	22.6	23.2	24.8
22 Length of	the lower jaw						
symphysis	····· ··· /···	58 mm	66 mm	69 mm	10.4	9.6	10.5
23 Length of	the lower						
toothrow	(right)	158 mm	160 mm	154 mm	28.3	23.4	23.5
24 Length of	the lower						
toothrow	(left)	150 mm	160 mm	158 mm	26.9	23.4	24.2
25 Number of	of alveoli of the						
lower iaw	(right)	11	10	10	-	_	-
26 Number o	of alveoli of the						
lower iaw	(left)	10	10	10	_	_	_
) -	· · ·						

* From the tip of the rostrum to the basioccipital Abbrev.: M.A.C.N.B.R., Museo Argentino de Ciencias Naturales "Bernardino Rivadavia";

M.Z.S.P., Museu de Zoologia de São Paulo.

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currents of the Southern Hemisphere. Therefore, it could be useful to say some words on the Malvinas current in order to analyse the possible distribution of the long-finned pilot whale in the area.

BOLTOVSKOY (1959) gives a synthetic survey of the Malvinas current. It seems that this current is formed by a mass of cold water off the coasts, limited easterly by the Brazil current. The most interesting characteristic for our problem is the northern limit. BOLTOVSKOY used foraminifera as biological indicators. He found foraminifera typical of the Malvinas current as far north as 22°11'S. Nevertheless, it seems that the cold water reaches up to this latitude flowing only on the bottom, since in some place more to the south, off the Brazilian coasts, the waters of the Malvinas current sink and do not rise to the surface. Of course, this current, like any other oceanic one, is not constant in its characteristics and limits. We can assume that changes at the northern limit can influence the distribution of species, like *Globicephala melaena*, which cannot normally be expected to reach such low latitudes.

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