

THE SHORT - FINNED PILOT WHALE *Globicephala macrorhynchus*  
GRAY, 1846, THE FIRST RECORD FOR CHILE.

PRIMER REGISTRO PARA CHILE DEL CALDERON DE ALETA CORTA  
*Globicephala macrorhynchus* GRAY, 1846.

CARLOS GUERRA CORREA

Instituto de Investigaciones Oceanológicas - Universidad de Antofagasta - Casilla 1240  
Antofagasta, CHILE

KOEN VAN WAEREBEEK

Laboratorium Morfologie en Systematiek, Museum voor Dierkunde Rijksuniversiteit Gent.  
Ledeganckstraat 35, 9000 Gent - BELGIUM.

GEORGE PORTFLITT KANDORA

GUILLERMO LUNA JORQUERA

Grupo de Conservación de la Vida Silvestre.  
Instituto de Investigaciones Oceanológicas - Universidad de Antofagasta - Casilla 1240  
Antofagasta, CHILE

ABSTRACT

The southern boundary of the distributional range of the short-finned pilot whale, *Globicephala macrorhynchus* Gray, 1846, is extended up to Paposo (25° 03' S), Chile.

Craneal measurements given by KASUYA (1975) are compared with those found by the authors for *G. melaena* and *G. macrorhynchus*.

*G. macrorhynchus* becomes the second Pilot Whale species from the genus *Globicephala* described for Chilean waters.

RESUMEN

Se amplia el límite sur del rango de distribución de la ballena piloto de aleta corta, *Globicephala macrorhynchus*, Gray, 1846, hasta la localidad de Paposo (25° 03' S), Chile.

Se comparan algunas medidas craneales entregadas por KASUYA (1975) con las encontradas por los autores para *G. melaena* y *G. macrorhynchus*.

*G. macrorhynchus* viene a ser la segunda especie del género *Globicephala* descrita para aguas chilenas.

KEY WORDS : *Globicephala macrorhynchus*, *globicephala*, pilot whale.

Pilot whales *Globicephala* Lesson, 1828 occur throughout all tropical to cool temperate waters in the Atlantic, Pacific and Indian Oceans (RICE, 1977). VAN BREE (1971) revising the taxonomy of the genus recognizes only two valid

species : *Globicephala melaena* (Traill, 1809) and *Globicephala macrorhynchus* Gray, 1846. This concept has met general acceptance since (MITCHELL, 1975; RICE, 1977; LEATHERWOOD & REEVES, 1983).

The distribution of *G. melaena* or Long-Finned Pilot Whale in the Atlantic Ocean extends over both hemispheres, excluding tropical waters (FRASER, 1950). The antitropical distribution implies the existence of two completely isolated populations which made DAVIES (1960) accord them subspecific status : *G. m. melaena* in the North Atlantic and *G. m. edwardsi* circumpolar in cool temperate waters of the southern ocean.

*G. macrorhynchus* or Short-Finned Pilot Whale can be found in tropical and warm subtropical waters of the Atlantic Ocean and of the Indo-Pacific Ocean. In the eastern Pacific it is known from the northern coast of Guatemala to Alaska (VAN BREE, 1971). For the western Pacific *G. macrorhynchus* is reported from the Japanese coast by KASUYA (1975). KASUYA (1975) demonstrates also the presence of *G. m. melaena* in Japan until at least the 10 th. century A. D. and

discusses the possibility that a small population of *G. m. melaena* might survive in northern Japanese waters.

*G. macrorhynchus* had not yet been cited for the southeast Pacific until 1985 when six pilot whales were landed in Pucusana, Perú (12° 12' S), victims of an incidental catch, which were examined and identified by VAN WAEREBEEK & REYES (1986) as belonging to this species.

New data suggest that *G. macrorhynchus* might even be the predominant pilot whale species, at least seasonally off the Central Peruvian coast (VAN WAEREBEEK & REYES, unpublished data).

For the Chilean cetofauna only *G. melaena* has been registered (YAÑEZ, 1948; DONOSO - BARROS, 1975; AGUAYO, 1975; TORRES et al. 1979; SIELFELD, 1983). DONOSO - BARROS (1975) indicates that this species is widely

TABLE Cranial measurements of there pilot whales skulls of Northern Chile (in mm).

Nº	MEASUREMENTS	AMM - 16	AMM - 15	AMM - 18
	Condylobasal length	675	680	530
2	Length rostrum from base	345	320	240
3	Width rostrum at base	265	310	219
4	Width rostrum at 1/4 length	240	305	200
5	Width rostrum at 1/2 length	197	285	186
6	Width premaxillae at 1/2 length	176	282	168
	Width rostrum at 3/4 length	148	223	126
8	Preorbital width	432	497	350
9	Postorbital width	467	518	385
10	Skull width at zygomatic	465		380
11	Skull width at parietals	330	---	284
	Max. width premaxillae prox.	171	215	151
	Max. width premaxillae distally	176	285	
	Width external nares	100	126	96
	Orbital length	109	104	99
	Length antorbital process	75	76	42
	Height crest	33	49	14
18	Width internal nares	134	149	
19	Length upper toothrow	184	165	155
20	No alveoli upper left	(11)	(8)	(8)
	No alveoli upper righth	(11)	(8)	(8)

distributed on the Chilean coast from Coquimbo ( $29^{\circ} 50' S$ ) to Punta Arenas ( $53^{\circ} 08' S$ ). AGUAYO (1975) however mention its presence from Arica ( $18^{\circ} 28' S$ ) to as far south as  $60^{\circ} S$ .

Since 1980 numerous excursions have been made along the coast of the II Region, e.g. from Río Loa ( $21^{\circ} 25' S$ ) to  $26^{\circ} 10' S$ . Several trips formed part of the "Proyecto Larus" (financial support : DIEXAT – Universidad de Antofagasta), while others were organized by the "Grupo de Conservación de la Vida Silvestre" with the objective of studying marine mammals in the II Region.

In March 1984 two pilot whale calvaria were collected from the beach Pta. Paso Malo ( $21^{\circ} 58' S$ ). The calvaria were entered into the collection of the Instituto de Investigaciones Oceanológicas of the Universidad de Antofagasta under numbers AMM – 015 and AMM – 016.

In July 1986 another calvarium was recovered from a beach in Paposo ( $25^{\circ} 03' S$ ) and registered under number AMM – 018.

Cranial measurements of all three calvaria are listed in Table I. Figure 1 shows the very distinctive cranial morphology between specimens AMM – 015 and AMM – 016. The most striking

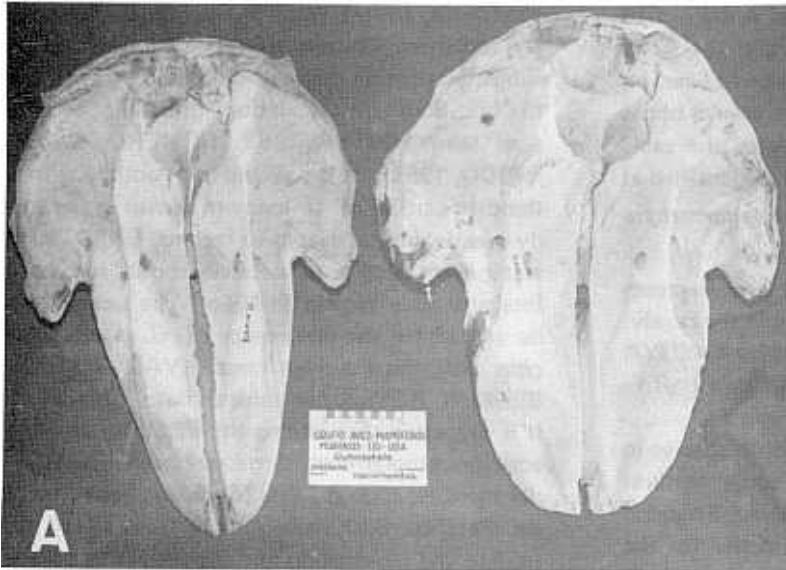
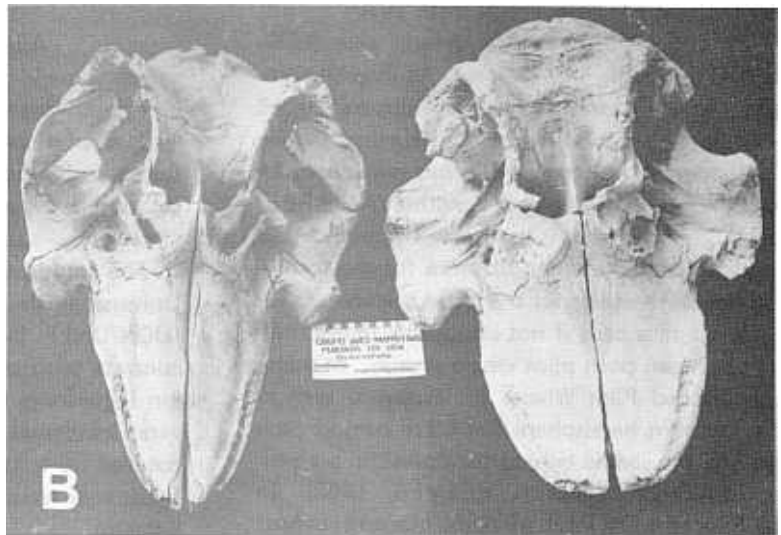


Fig. 1. Dorsal (A) and ventral (B) aspect of calvaria AMM-16, *Globicephala melaleuca edwardi*, at left and AMM-15, *Globicephala macrorhynchus* at right from northern Chile



difference in dorsal aspect is the much larger expansion of the praemaxillae in the distal half of the rostrum in AMM – 015 compared to the nearly gradually decreasing width of the praemaxillae from proximal to distal in AMM – 016. In addition the expansion of the praemaxillae in AMM – 015 completely covers the maxillae distally. To the contrary in AMM – 016 the anterolateral borders of the praemaxillae leave the maxillae exposed over the whole length. These characteristics together with the differences encountered in the number of alveoli (Table I) conform with those presented by VAN BREE (1971) to distinguish between *G. macrorhynchus* and *G. melaena*. As such calvaria AMM – 015 and AMM – 016 would correspond to the former and the latter species respectively. The smaller-sized calvarium AMM – 018 though several of its cranial bones are not yet ankylosed demonstrates the same characteristics as AMM – 015 and is identified as a juvenile specimen of *Globicephala macrorhynchus*.

When comparing several cranial measurements (Table II) expressed as percentages of the condylobasal length with those presented by KASUYA (1975) it is possible to confirm in a quantitative way what is shown graphically in Figure 1.

To help the identification of both species in the field we are offering here some features which have proved to be distinctive. Stranded specimens should be checked primarily for the number and size of their teeth and the relative length of the flippers. *G. melaena* normally has 9 – 12 teeth in each toothrow whereas *G. macrorhynchus* has only 7 – 9 teeth (VAN BREE, 1971) but of considerably greater size (SERGEANT, 1958). As indicates its English common name *G. melaena* has long flippers, i.e. 18 – 27 % of the total length of the animal, while the flippers of *G. macrorhynchus* reach only 14 – 19 % of the total body length (VAN BREE, 1971). A commonly used rule of thumb says one-fifth of body length or more for the former and one sixth or less for the latter species.

At sea it is hard if not impossible to discriminate between both pilot whale species. In many Long-Finned Pilot Whales (*G. melaena*) seen in the southern hemisphere the blaze behind each eye and the saddle behind the dorsal fin are white (LEATHERWOOD & REEVES, 1983). In the Short-Finned Pilot Whale (*G. macrorhynchus*)

the blaze behind the eye is often muted (LEATHERWOOD & REEVES, 1983) or absent (VAN WAEREBEEK & REYES, unpublished data). In general the ventral, anchor-shaped, marking is less vivid and extensive in *G. macrorhynchus* than in *G. melaena*. SERGEANT (1962) did not mention any difference in the shape and position of the dorsal fin.

As pointed out by KASUYA (1975) the occurrence of Short-Finned Pilot Whales (*G. macrorhynchus*) as correlated with fisheries showed seasonal fluctuations in Japanese waters. This author inferred that these fluctuations are explained by seasonal changes in the oceanographic conditions, mainly water temperature. Peruvian and northern Chilean waters are known to be subjected to wide thermal fluctuations due to the El Niño Southern Oscillation (ENSO) phenomenon (see WOOSTER, 1983; ROMERO & GARRIDO, 1985). It is possible to hypothesize that the distribution of *G. macrorhynchus* in the study area would be related to regional ENSO warm water event which not necessarily should reach the intensity of a typical El Niño. The same could be argued for the occurrence of *G. macrorhynchus* off the Peruvian coast (VAN WAEREBEEK & REYES, unpublished data). Therefore it is suggested that among the ENSO monitoring activities programmed by national and international agencies, such as CPPS (Comisión Permanente del Pacífico Sur), special attention should be paid to the registration and identification of landed and stranded pilot whales in order to test this hypothesis.

#### ACKNOWLEDGMENTS

The authors wish to thank Mr. Jaime Alvarado, advisor of Public Relations of the "Grupo de Conservación de la Vida Silvestre", for his participation in the surveys to collect osteological specimens.

The study-trip of Koen Van Waerebeek to the Universidad de Antofagasta was financed by the IUCN/UNEP Burmeister's Porpoise Project, in contract with project leader Prof. Dr. D.E. Gaskin (University of Guelph, Ontario, Canada). Several incidental costs of K.V. Waerebeek were covered by a 1985 grant of the "Leopold III – fonds voor Natuuronderzoek en Natuurbehoud", Belgium.

TABLE II. Comparison of some selected cranial measurements of three *Globicephala* skulls from Chile with cranial morphometric data of both *Globicephala* species as listed by KASUYA (1975) \*.

MEASUREMENTS	(1) SAMPLE SIZE	(2) RANGE	(3) MEAN	
	AMM - 16	G. melaena * Chile	AMM - 15	AMM - 18 G. macrorhynchus * N. Pacific
Condyllo - basal length (mm)	675	10 (1) 580 - 712 (2) 633.1 (3)	680	530 24 (1) 540 - 748 (3) 621.6 (3)
2 Rostrum length (%)	51.1	10 49.8 - 54.4 51.7	47.0	45.2 24 47.2 - 51.0 49.2
3 Rostrum basal width (%)	39.3	10 37.3 - 40.1 38.8	45.6	41.3 24 35.6 - 48.6 41.3
4 Rostrum width at middle (%)	29.2	10 27.4 - 31.9 29.2	41.9	35.1 24 28.3 - 49.0 34.1
5 Premaxillae width at same	26.1	10 22.1 - 28.5 24.9	41.5	31.7 24 26.7 - 47.2 32.3
6 Orbital width (%)	62.7	10 61.1 - 65.7 62.9	76.4	66.4 24 62.2 - 78.5 68.7
7 Number of upper teeth alveoli	(11)	14 9 - 11 9.9	(8)	(8) 48 6 - 9 7.8

## REFERENCES

- AGUAYO, A. 1975. Progress report on small cetacean research in Chile. *J. Fish. Res. Board Can.* **32** (7) : 1123 – 1143.
- DAVIES, J.L. 1960. The southern form of the Pilot Whale. *J. Mammal.*, **41** (1) : 29 – 34.
- DONOSO - BARROS, R. 1975. Contribución al conocimiento de los cetáceos vivientes y fósiles del territorio de Chile. *Gayana (Zool.)*, (36) : 127 p.
- FRASER, F.C. 1950. Two skulls of *Globicephala macrorhynchus* (Gray) from Dakar. *Atlantide Rep.*, 1 : 49 – 60.
- KASUYA, T. 1975. Past occurrence of *Globicephala melaena* in the western North Pacific. *Sci. Rep. Whales Res. Inst. Tokyo*, **27** : 95 – 110.
- LEATHERWOOD, S. and R.R. REEVES. 1983. *Whales and Dolphins* San Francisco, U.S.A., The Sierra Club, 301 p. (Paintings by Larry Foster).
- MITCHELL, E. 1975. Review of biology and fisheries for smaller Cetaceans. Report of the meeting on smaller Cetaceans, Montreal. April 1 – 11, 1974. *J. Fish. Res. Board Can.*, **32** (7) : 889 – 983.
- RICE, D.W. 1977. A list of the Marine Mammals of the World. *NOAA Tech. Rep.*, (711) : 15 B.
- ROMERO, H. y A.M. GARRIDO. 1985. Influencias genéticas del fenómeno El Niño sobre los patrones climáticos de Chile. *Invest. Pesq. Chile*, (32) : 19 – 35.
- SERGEANT, D.E. 1958. Age determination of Odontocete whales from dentinal growth layers. *Norwegian Whaling Gazette*, 1959, (6) : 273 – 288.
- SERGEANT, D.E. 1962. On the external characters of the blackfish or pilot whales (Genus *Globicephala*). *J. Mammal.*, **43** (3) : 395 – 413.
- SIELFELD, W. 1983. *Mamíferos marinos de Chile*. Ediciones de la Universidad de Chile, Santiago 199 p. ils.
- TORRES, D., J. YAÑEZ y P. CATTAN. 1979. *Mamíferos marinos de Chile : Antecedentes y situación actual*. *Biol. Pesq. Chile*, (11) : 49 – 81.
- VAN BREE, P. J. 1971. On *Globicephala sieboldii* Gray, 1846, and other species of pilot whales. (Notes on Cetacea, Delphinoidea III). *Beaufortia*, **19** (249) : 79 – 87.
- VAN WAEREBEEK, K. and J.C. REYES. 1986. The first records of the Short-Finned Pilot Whale *Globicephala macrorhynchus* for Peruvian waters. Abstract, 14th Symposium of the European Association for Aquatic Mammals, Barcelona, 16 – 19 March 1986.
- WOOSTER, W.S. 1983. An index of anomalous SST in the Eastern Equatorial Pacific, 1970 – 1982. *Tropical Ocean Atmosphere Newsletter*, (16) : 4 – 5.
- YAÑEZ, P. 1948. Vertebrados marinos chilenos I : Mamíferos marinos. *Rev. Biol. Mar., Valparaíso*, **1** (2) : 103 – 123.