

EVIDENCES ABOUT SITE FIDELITY OF THE STRAITS OF GIBRALTAR FOR SPERM WHALES (*PHYSETER MACROCEPHALUS*)

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INTRODUCTION. Presence of sperm whales (*Physeter macrocephalus*) in the area of the Strait of Gibraltar has been reported long ago (Cabrera, 1925; Bayed and Beaubrun, 1987, Notarbartolo di Sciara and Demma 1994, Cañadas *et al.*, 2000). However, because very little is still known about the abundance, distribution, social structure and migration patterns of this species in the region, data for this species were collected from April to October in 1999 and 2000 from whale-watching trips with experienced observers onboard. In 2001 CIRCE started an interdisciplinary research project combining genetic and bio-acoustic approaches to precise. This program focus on the foraging ecology and the breeding status and stock identity of sperm whales encountered in the Strait of Gibraltar on a year round basis. In this work, previous results of photo-identification analysis of the present season 2001 are shown.

METHODS. From April to October of the seasons 1999 and 2000, 582 whale-watching trips were carried out in the region of the Straits of Gibraltar, totalling 1181 hours spent at the sea, and 7,444 nmi sailed, covering the most of the Straits area, but not the Moroccan waters. No trip was done when wind force was stronger than 15-16 knots. Three different boats between 9 and 12 m length were used in these trips, always with 1 or 2 experienced observers on them, with a height of eye of 2.8-3.2 m. For all the cetacean sightings taking place during these whale-watching trips, diverse parameters were recorded: weather conditions, position, associated species, group structure and behaviour patterns. Here, only the data collected at the moment of contact onboard the whale-watching boats with the sperm whales have been considered for the analyses. In the encounters with sperm whales, the approximate size of the animals was calculated, as well as other data such as social structure, breathing and diving patterns. Besides this, in 26 of the sightings of sperm whales, a total of 50 pictures of the flukes were taken for photo-identification studies. Photo-identification work was conducted using a 24 x 36 mm reflex camera, a 300 mm photo-lens and 100 ASA-colour-slide-films. In addition, sloughed skin samples were opportunistically collected for genetic analyses.

On the other hand, from February to April 2001, CIRCE started to work with another methodology based on research trips. A total of 9 of these trips were already carried out in the same study area, using a motorboat 11 m length with a height of eye of 2.9 m. Eleven sightings of sperm whales were recorded. Some of the previous results of the analysis of the 19 pictures used for photo-identification are shown below.

RESULTS. In 36 of the whale-watching trips (6.18 % of the total), each one of them with an average duration of 2 hours and 25 minutes, 54 sightings recordings of sperm whales (4.76 % of the total) were obtained, totalling 60 individuals.

Table 1 and Fig. 1 show the distribution of these sightings in seasons 1999 and 2000, according to time spent at the sea. Fig. 2 shows the recordings of sightings of sperm whales in the study area.

On the other hand, in the precise encounters of the sperm whales with the whale-watching boats, social structure was registered. Fig. 3 shows that in 86.5% of the cases were lonely individuals, in 11.5% were groups of two individuals, and finally in 1.9% of the sightings, were groups of three individuals.

Finally, the analysis of the 50 pictures obtained in seasons 1999 and 2000 used for photo-identification shows that 5 individuals were captured during the season of 1999 and 4 captured in 2000. Three of the individuals captured in 2000 were also captured in 1999.

First results of the analysis, showed in Table 2 of the identified individuals in the 9 first research trips carried out by CIRCÉ in 2001 show that in this season one individual was sighted again (*Champi*), while other one (*Curro*) was observed for first time.

DISCUSSION and CONCLUSIONS. The data show that the sperm whale is frequently observed in the study area, the Straits of Gibraltar. There is a peak in the sightings during the summer months due to the higher number of whale watching trips in these months, however when correcting for sightings effort these preliminary data suggest that sperm whales are more abundant in spring and that their number decrease in summer with a possible increase of sighting rates in fall but more work should be conducted in winter to precise the occurrence and the movement of sperm whales around the Strait.

The photo-identification techniques reveal that at least 3 individuals were observed in this area at different years indicating that some individuals may be seasonally resident in the area. Exchange of data collected by CIRCÉ within the Straits of Gibraltar with other research group and association-working elsewhere in the Mediterranean Sea should help us to precise the status of the species within the Mediterranean Sea. However these preliminary results emphasize the importance of this region as an important study area to investigate these topics.

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Table 1. Distribution of sightings of sperm whales in seasons 1999 and 2000, according to time spent at the sea.

Month	Hours at the sea	Nautical miles	Number of trips	Sightings per trip (%)
April	42	268	21	38,1
May	56	358	28	32,1
June	85	537	42	14,3
July	284	1790	140	13,6
August	387	2443	191	3,7
September	213	1343	105	0,0
October	111	703	55	9,1
Total	1178	7442	582	9,3

Table 2. Individuals sighted in the different seasons 1999, 2000 and 2001

NAME	APR 99	MAY 99	JUN 99	JUL 99	AUG 99	SEP 99	OCT 99	APR 00	MAY 00	JUN 00	JUL 00	AUG 00	SEP 00	OCT 00	FEB 01	MAR 01	APR 01
<i>Zeus II</i>																	
<i>Walti</i>																	
<i>Champi</i>																	
<i>Amanita</i>																	
<i>Papillon</i>																	
<i>Gitano</i>																	
<i>Curro</i>																	

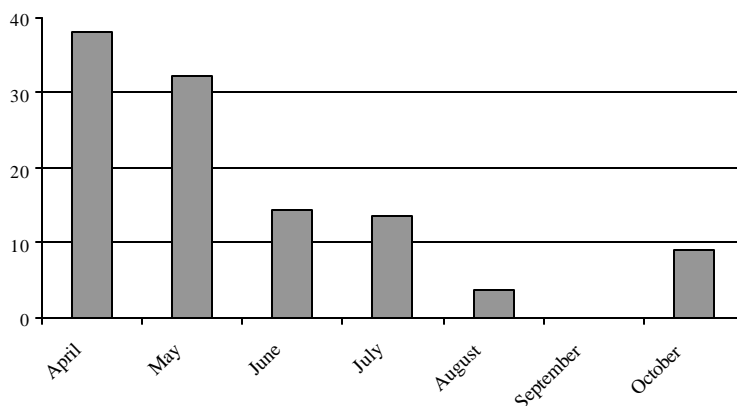


Fig. 1. Distribution of sightings of sperm whales in seasons 1999 and 2000, according to time spent at the sea.

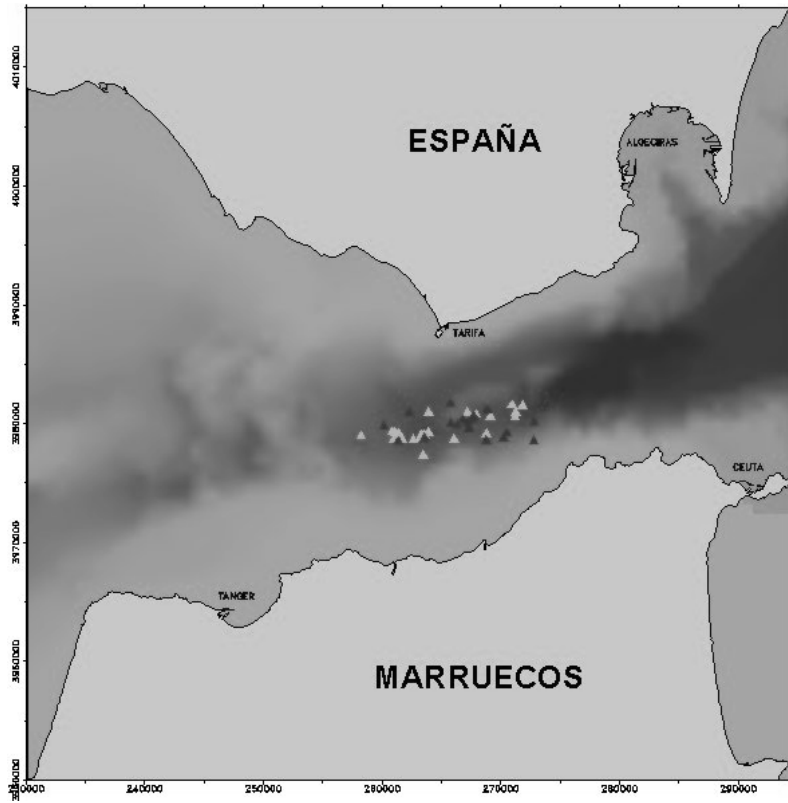


Fig. 2. Map of the study area with the recordings of sightings of sperm whales

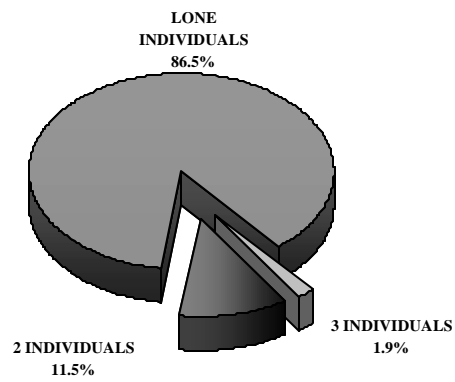


Fig. 3. Composition of the observed groups of sperm whale