

**SOCIAL STRUCTURE AND MALE PARENTAL CARE  
IN A LONG FINNED PILOT WHALE (*Globicephala melas*) POD  
OFF VENTOTENE ISLAND (SOUTHERN TYRRHENIAN SEA, ITALY).**

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**INTRODUCTION:** Long finned pilot whale (*Globicephala melas*) is a rare species in the Mediterranean Sea (Notarbartolo di Sciarra *et al.*, 1990; Gannier & Gannier, 1990, 1992; Giordano and Tringali, 1992; Marini *et al.*, 1992; Airoidi *et al.*, 1999), relatively common only in the Alboran Sea (Cañadas and Sagarminaga, 1995, 1998, 1999) and in the Strait of Gibraltar (Das, 1999).

In 1995 we encountered for the first time a free-ranging pod of long finned pilot whales off the south-western coast of the island of Ventotene in the Archipelago Pontino (Tyrrhenian Sea, Italy). This area has been the object of a long term study on Cetaceans since 1991. From 1995 to 1999 we observed, every year, this single stable pod of long finned pilot whales that seems to be seasonally resident off Ventotene island (Mussi *et al.* 1997, 1998)

**METHODS:** The observations were carried out on board of the "Barbarian", a 15 m sail boat equipped for underwater listening with towed hydrophones (system response 10 Hz, 20 KHz) and underwater vision (underwater Panasonic CCD Camera WV-KS152 placed on the bow). Audio and video signals are synchronically recorded with a BETACAM support (BETACAM SP Sony). The videos recorded were analysed by a Studio DC10 video bluster which allows to collect also single shots for further computer image analyses. The audio signal is recorded also on a digital support (DAT Hitachi 88EX). The routes were chosen to optimise the sights and were determined daily on the basis of previous sightings, particular attention was paid to follow the bottom topography and depth profiles. No trip was performed in conditions greater than sea state 5 (Beaufort). Shots were made using automatic cameras with objectives 70-200 mm/f:1-2,8 zoom, films Kodak ektacrome 200 Asa, with exposure time inferior to 1/250 sec. Together with weather conditions (sea and wind), also the distance from the coast and depth were recorded. Shots for individual identification were made during all the research period; the features utilised for pod member identification are in accordance with the methods suggested by Shane and McSweeney (1990). All the individuals of the pod have been photo-identified, and for 5 of them also the sex was determined. The following observations concern photo-identified animals belonging to the same social group.

**RESULTS:** A total of 148 outgoing were performed for 495 hours of navigation. During this period, 44 sightings of long finned pilot whale have been recorded, for a total of 72 hours of direct observations.

In 1995 the pod was composed by six individuals: three adult males (Cagliostro ~7m length, Santiago ~6,5 m and Enea ~6 m), one adult female (Señora ~5,5 m), one juvenile female (Emma ~3 m; estimated age: 5 years), and one immature of unknown sex (Pan ~2,5 m; estimated age: 1-2 years). In 1996 Enea disappeared and was never sighted again. The pod is headed by the largest male, the "pilot" Cagliostro, as observed in other social groups of this species (Amos *et al.*, 1993). The mean number of members of the group observed at once was 4.7.

The sightings occurred from June to October, with a peak in September, when the animals occurred for 4 sequential days. Long finned pilot whales were followed for a period that varied between 10 minutes and 357 minutes (average 123 minutes,  $\pm$  79.9 SD). Sightings were located within a relatively small area (3 Km<sup>2</sup>), mainly between 500 and 700 m depth (average depth 663.6 $\pm$ 96.6 m, range 150/800); the average distance from the nearest coast (Ventotene island) was 7.8 km ( $\pm$ 1.6 SD; range 2.1/12.6).

In this area the local fisherman use to fish with a traditional tool called "palma", which consists of several palm tree leaves, moored on the bottom, floating at about 1 m from the water surface. The shelter and shadows conditions due to the "palma" attract many fishes, such as *Naucrates ductor*, *Coryphaena hippurus*, *Engraulis encrasicolus*, and cephalopodes (e.g., *Todarodes sagittatus*). These organisms on the other hand, attract larger pelagic predators such as sharks (*Scyliorhinus stellaris*, *Hexanchus griseus* and *Oxynotus centrina*), tuna fish (*Thunnus* sp.), sword fish (*Xiphias gladius*), mantas (*Mobula mobular*) and moonfish (*Mola mola*), as well as Cetaceans such as *Stenella coeruleoalba*, *Tursiops truncatus* and *Grampus griseus*. Fin whales (*Balaenoptera physalus*) and sperm whales (*Physeter macrocephalus*) have also been recorded in this area.

During the early morning hours the long finned whales were feeding with fast swimming behaviour and long and deep diving (> 4 minutes, Heimlich-Boran & Heimlich-Boran, 1990) recognizable by the strong bending of the caudal part. The resting behaviour was characterised by slow swimming, synchronous breathing and passive drifting

into the current. These behaviours were interspaced with social interactions between pod members evidenced by modular whistles. The animals showed strong signs on the head, on the dorsal fin and caudal part (Bloch *et al.*, 1993). Adult males suffered from abrasions and scars caused by co specific encounters. However, such abrasions changed or disappeared rapidly and were not suitable as photoidentification features.

In June 1999 we had a newborn in the pod .

Literature data on population genetics of this species (Amos, 1991, 1993) revealed that pods contain related individuals and that males are rarely the fathers of the calves they accompany. It is unknown also if adult males stay with the original, native pod, or live apart and move from one pod to another. Due to the fact that field observations of this species are limited, it's still unclear in which way adult males may help and interact with their relatives.

Our direct observations in 1999 suggest that Cagliostro, the largest adult male (the "pilot"), was taking constantly care of the young Pan (now 5-6 years-old), isolating him from the rest of the pod. On the other hand, the two females and the smaller male of the group were taking care of the newborn, in a way that it was impossible to approach the juvenile closer than 100 m distance. While the boat was approaching, the animals were diving and emerged far from the boat itself. At the same time the pilot Cagliostro and the young Pan apparently tried to divert our attention from the other members of the group, by following the back of the boat and crossing its route and anterior part with spy hoping and breaching. Observation with the underwater camera pointed out the strong dependence of Pan from the pilot Cagliostro, which apart from encouraging him in fast swimming (like a mother), was protecting him and inter placed himself with the boat.

**CONCLUSIONS:** The opportunity to perform direct and continuous "*in situ*" observation on a wild pod of long finned whales off Ventotene island, confirmed the time stability of social groups in this species. The evident interaction between the pilot and the youngest member of the pod brings new insight on the role of adults, dominant males in the complex social structure of *Globicephala melas*. In fact, this behaviour may represent a sort of "baby sitting" aimed to avoid Pan's extended suckling or contingent disturb to the newborn. Probably this behaviour may act also as a kind of "teaching" from the oldest member of the pod to the juvenile one.

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**FIGURES:**



**Fig. 1 Cagliostro, adult male, 7,5 m long.**



**Fig. 2 Santiago, adult male, 7 m**



**Fig. 3 Enea, adult male ~ 7 m**



**Fig. 4 Senora,, adult female, 6 m long**



**Fig. 5 Emma, young female 5 m long**



**Fig. 6 Pan, sub adult of unknown sex, 5m long**