

SPERM WHALE PRESENCE OFF SOUTH-WEST CRETE, GREECE, EASTERN MEDITERRANEAN

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INTRODUCTION Although it is known that the sperm whale (*Physeter macrocephalus*) inhabits the entire Mediterranean Sea (Notarbartolo di Sciara, 1997), the relative literature is sparse. No long-term studies have been undertaken and no consistent information exists concerning the species presence and distribution in the eastern Mediterranean basin. Most data come from strandings or unpublished opportunistic sightings (Marchessaux, 1980; Frantzis, 1997). In Greece, sightings and strandings have been recorded in both Ionian and Aegean Seas: North-West Zakynthos Island (Drouot & Gannier, 1999), West Peloponnisos coasts (Anonymous, 1998), North and North-west Aegean (Frantzis, unpublished data), Cyclades Islands area (Frantzis, 1997), South-east Aegean (Marini et al., 1996) and Cretan Sea (this paper). According to the above preliminary data, the two most important areas of the Greek Seas for sperm whales seem to be the Chalkidiki Peninsula - northern Sporades area and South-west Crete. This paper summarises the results of opportunistic sightings and one dedicated survey off South-west Crete. The objective of this survey is to initiate a long term sperm whale project off South-west Crete as well as in other areas of Greece.

Data gathered before our survey: In 1992, two reports from individual observers (local mariners) suggested that sperm whales were present off South-west Crete. In 1995 photographic evidence confirmed these reports, and S. Gialinakis started to record opportunistic sighting data while operating dolphin-watch vessels in the above area. Although few opportunities exist for observations during the cold months, the data gathered from 1995 to 1998 indicate year round presence of sperm whales. In total, 32 sightings have been made in January, April, May, June, July, August, September and October. These sightings were of 25 single individuals (most of them 9-12 m. long), six schools of 2-8 individuals and a big social group of 15-20 sperm whales. In at least one case, a 4-4.5 meter long calf was present among adult sperm whales.

Dolphin-watch vessels operate on average twice a week from mid April to mid October, and trips typically last for 3 hours. Although it is not possible to make any useful estimates from the existing data due to lack of scientific methodology, the “sighting frequency” of sperm whales is approximately one every 18 hours of visual search, for sea states 0 to 4 Beaufort scale. Figure 1 shows that almost all sightings were made at 1-4 miles from the coast in depths of 500 to 1200 meters. Although this is not surprising (considering that sperm whales prefer steep slopes of the sea bottom at the edge of the continental shelf), it could be just an artifact of the routes followed by the dolphin-watch vessels, which usually stay close to the coasts.

Our survey: Visual and passive acoustic surveys were conducted, between 22nd Sept 1998 and 2nd Oct 1998. A stereo towed hydrophone array and simple monitoring system allowed us to cover 229 nm (nautical miles) actively listening and searching for cetaceans (in 57.6 hours) with positive sea conditions (<3 Beaufort scale) and 69 nm tracking sperm whales that had been localised (in 16.7 hours). Twenty-eight nm (10.3 hours) were spent “with cetaceans”, observing surface behaviour and taking photo-ID shots. The survey area extended from the 200 m contour to 6 nm offshore (1,500-2,500 m depth) along 50 nm of South-west coastlines of Crete. Sperm whales were both located and tracked acoustically, then observed and photo-identified when they surfaced. Sperm whale clicks could be heard over ranges up to 7 nm, as a result of which whales were always detected before being sighted.

Twenty five sightings of four positively identified species were made: seven of sperm whales (*Physeter macrocephalus*), four of Cuvier's beaked whales (*Ziphius cavirostris*), three of Rissos' dolphins (*Grampus griseus*), ten of striped dolphins (*Stenella coeruleoalba*) and one of common or striped dolphins (*Delphinus delphis* or *S. coeruleoalba*).

Sperm whale sightings and diving behaviour: Sperm whales were encountered or heard on six of the ten working days in the field. All sightings were of single individuals, although in one case two sperm whales surfaced at 0.5 nm from each other. Photo-identification methods revealed the presence of two or three different individuals in the study area. Figure 2 shows the positions of sperm whale sightings. All individuals observed were engaged in “deep dive” behaviour except in one case, when one of the two whales present in the area fluked and shallow dived before breaching on the surface. Subsequently this individual re-fluked and reverted to normal deep dive behaviour.

Dive and surface times were recorded in 7 and 14 occasions respectively. Average dive time was 50.6 min (n=7, SD=5.6) and varied from 45 to 61 min. The average surface interval between successive deep dives was 9.8 min (n=14, SD=1.6) and varied from 7 to 12 min.

Sperm whale acoustic behaviour: Vocalisations of all species have been recorded. However, here we present only the most interesting results concerning sperm whales. Apart from regular clicks and creaks, two types of codas were recorded in two different kinds of situations: i) at the end of a long dive e.g. after the animal stopped clicking and before it reached the surface, ii) at the beginning of a deep dive e.g. after fluking and before the animal produced its first click. In total, twelve typical Mediterranean “3+1” codas (Pavan et al., 1998) and twelve new, “2+1” codas were recorded on three occasions. The “2+1” coda we recorded had never been heard before in the Mediterranean or other seas, as far as we know. The interval between the first and second click of this coda is very short, c. 0.03 sec, then the third click comes approximately 0.260 seconds later (Fig. 3).

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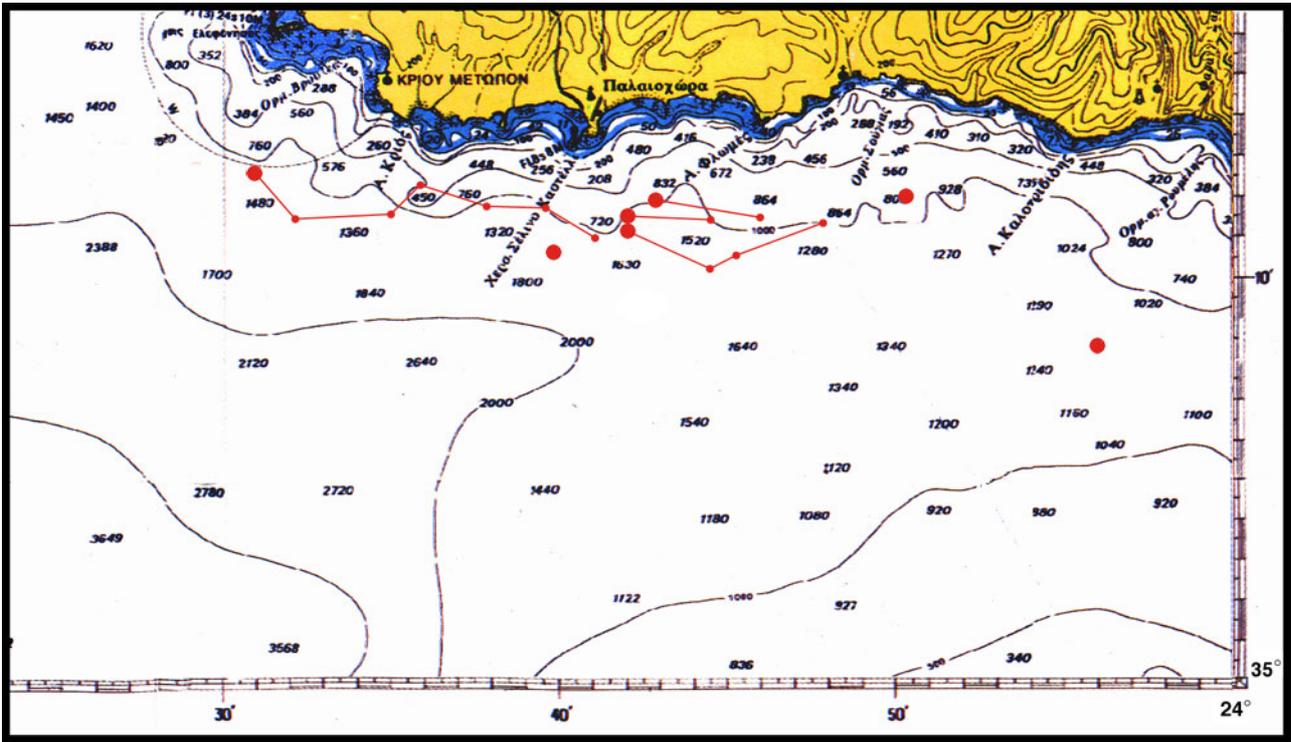


Fig. 2 - Single sperm whale sightings and tracks recorded during our survey. Big circles represent positions of sperm whales when first encountered. Small circles correspond to successive positions where they surfaced, after a deep dive. Lines represent their theoretical track. Note that in all cases, sperm whales stayed very close to the 1,000 m bathymetric contour

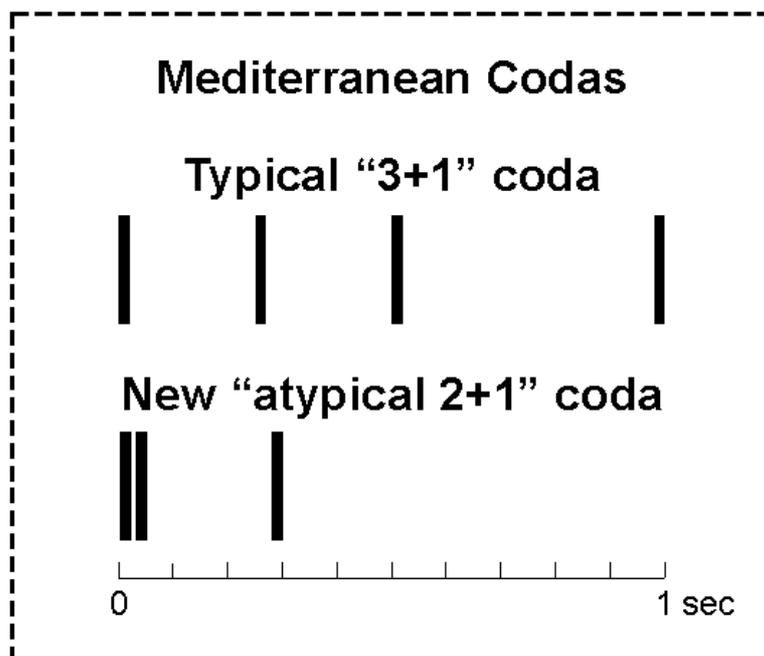


Fig. 3 - Characteristics of "3+1" and "atypical 2+1" codas recorded during our survey. Interclick intervals represent average values