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RESEARCH ARTICLE

Sperm whale (*Physeter macrocephalus*) sightings in the Aegean and Mediterranean part of Turkish waters

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Abstract

Between 1994 and 2012, 43 sightings of sperm whales (*Physeter macrocephalus*) were reported in the Turkish part of the Aegean and Mediterranean Sea. Most of the sightings were located near the Fethiye Canyon which is one of the deepest parts of the Mediterranean Sea. The eastern limit of the sperm whale sighting in the Turkish part of the Mediterranean Sea is Alanya and the northern limit is Gökçeada in the northern Aegean Sea.

Key words: Sperm whale, *Physeter macrocephalus*, Aegean Sea, Mediterranean Sea, distribution, Turkish waters.

Introduction

The sperm whale (*Physeter macrocephalus*) is a cosmopolitan species and known to occur in the Mediterranean Sea, which includes the Turkish waters (Northern Aegean Sea: Saroz Bay, Gökçeada Island; Middle Aegean Sea: Müsellim, Sığacık; Mediterranean Sea: Fethiye, Antalya) (Öztürk 1996). Sperm whales prefer mostly deep continental slope waters where mesopelagic cephalopods are most abundant and also deeper offshore waters in the Mediterranean Sea (Notarbartolo di Sciara and Birkun 2010).

According Toynbee (1973), there is the oldest record of a 45-feet- (13.7 m)-long whale which was described as a sperm whale (Kinzelbach 1980) in Istanbul in late Roman period (AD 5-6c.). The single stranding record (8 March 1964, 580cm) was given by Marchessaux (1980) on Gökçeada Island coast in the northern Aegean Sea in the Turkish waters. Other single strandings were

reported in Karataş, Adana (1972, 12 m) on the eastern Mediterranean Sea coast whose skeleton has been exhibited at Natural History and Application Centre, Ege University, Izmir and also in Seferihisar (Jan. 1990, 525 cm) (Öztürk and Öztürk 1998) on the central Aegean Sea coast. Some recent records of sperm whale in the Turkish waters include those by Öztürk *et al*. (2010), Dede *et al*. (2012) and (Öztürk *et al.* 2012). Öztürk *et al*. (2010) summarized the sightings reported by researchers, local fishermen and sailors during 1999-2009. Dede *et al*. (2012) collected cetacean sighting data during the research cruise carried out in summer 2008 in the international water of the Eastern Mediterranean Sea, as well as the Turkish, Lebanese and Syrian territorial waters. Öztürk *et al.* (2012) reported that there were at least 34 sperm whale sightings made by local swordfish fishermen in the upwelling canyon zone between Rhodes and Fethiye in 2010.

The Mediterranean subpopulation of this species has recently been listed as Endangered by IUCN and major threats for this species are entanglement in drift nets and collision with large vessels and noise pollution (Notarbartolo di Sciara *et al*. 2012). The inter-basin movement which is important for gene flow between the eastern and western Mediterranean sperm whales has been proved by Frantzis *et al*. (2011).

Agreement on the Conservation of the Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS) has been in force since 2001 and the agreement area includes all waters surrounding Turkey, namely the Black Sea, Aegean Sea, and Eastern Mediterranean Sea. Although Turkey has not signed the agreement up to present (May 2013), considering the transboundary nature of highly migratory cetaceans, it is expected that Turkey fulfills its responsibility and commitments to monitor and protect cetacean fauna in its territorial waters.

The aim of this review is to compile all existing sighting data of sperm whales in the Turkish waters to provide basic information on the distribution of the species and to understand the seasonal variation to be used for a better conservation plan for this species in the eastern Mediterranean and Aegean Sea.

Material and Methods

Sighting data of the sperm whale were collected from articles published in journals, newsletters, and newspapers, news footages broadcasted on TV, reports from fishermen, sailors, and harbour masters to the Turkish Marine Research Foundation (TUDAV) between 1994 and 2012. Personal observations were also taken into consideration. In addition, Fethiye, Kaş, Kemer Antalya and Alanya fisheries cooperatives provided sighting information collected during their swordfish longlining.

Results and Discussion

During 1994-2012, there were 43 sightings in total: 24 sightings were made off Fethiye on the south-western coast of Turkey along the Mediterranean, 10 between Fethiye and Antalya especially in the Finike Basin, 6 were made in the northern-middle Aegean Sea coast and 3 in Antalya Bay on the central Mediterranean coast of Turkey (Table 1, Figure 1).

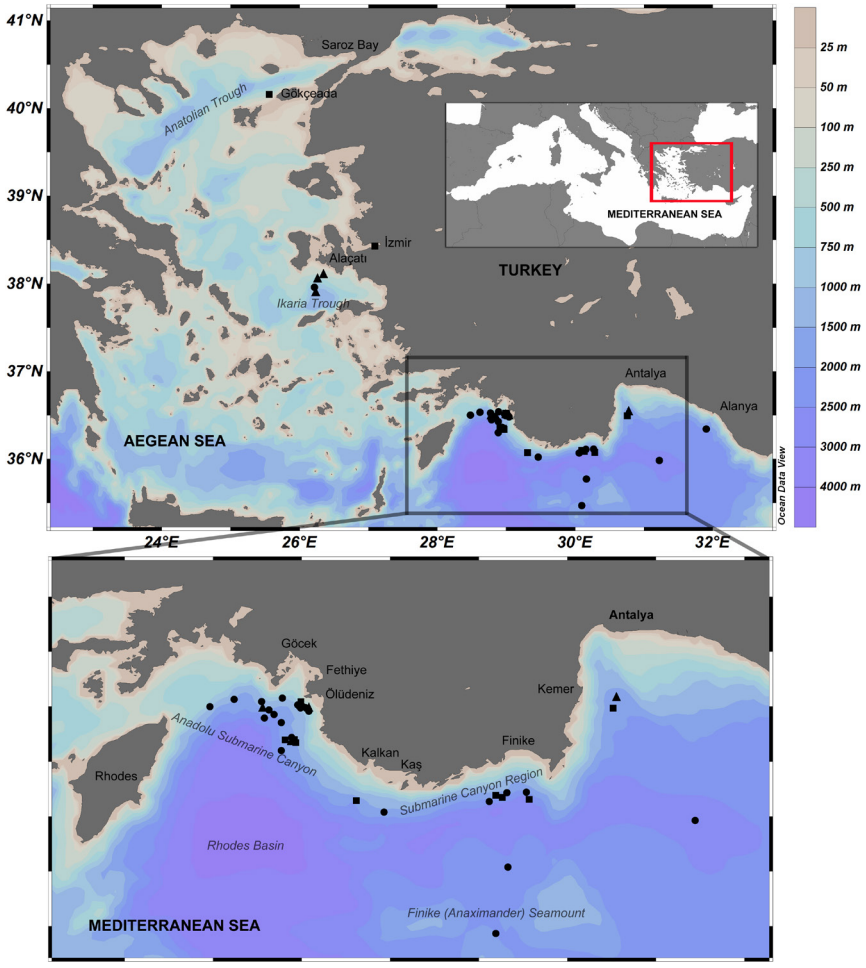

Figure 1. Sperm whale sightings in the Turkish part of the Mediterranean and Aegean Seas 1994-2012

(square: March-May, circle: June-August, triangle: September-November)

Table 1. Details of the sperm whale sightings in the Turkish waters

No	Date	Number of whales	Location (off)	Source
1	14 May 1994	8	Kemer Çamyuva	B. Öztürk
2	March 1995	1	İzmir Bay	B. Öztürk
3	Nov 1996	7-8	Fethiye	Fishermen
4	11 May 1999	5	Ölüdeniz	O. Komut
5	16 May 1999	3	Fethiye	TUDAV
6	6 June 1999	2	Ölüdeniz	TUDAV
7	12 June 1999	1	Ölüdeniz	TUDAV
8	27 May 2000	1	Ölüdeniz	A.Tonay
9	6 June 2000	1	Ölüdeniz	A.Tonay
10	21 June 2002	1	Ölüdeniz	Öztürk and Dede (2002)
11	21 June 2003	2	Ölüdeniz	TUDAV
12	22 May 2004	1	Ölüdeniz	TUDAV
13	20 June 2004	2	Ölüdeniz	TUDAV
14	22 June 2004	1	Ölüdeniz	A. Dede
15	30 Oct 2004	15-18	Alaçatı	M. Özakat
16	6 Sep 2006	4-7	Fethiye	Fisherman, yatchman
17	26 July 2007	1	Fethiye	Boisseau *et al.* (2010)
18	5 June 2007	2	Ölüdeniz	Fisheries Coop
19	3 Aug 2007	3	Fethiye	Fisheries Coop
20	14 Aug 2007	2	Ölüdeniz	Fisheries Coop
21	25Aug 2007	1	Fethiye	Fisheries Coop
22	16 Sep 2007	1	Ölüdeniz	Fisheries Coop
23	1 Oct 2007	1	Alaçatı	M İyiboz
24	11 July 2008	5	Fethiye	Dede et al.(2012)
25	16 Sep 2008	6	Antalya	CNN Türk
26	15 Aug 2009	3	Alaçatı	S. Ababay
27	16 Aug 2009	1	Fethiye	IHA
28	24 June 2010	2	Finike	Fisherman
29	3 July 2010	4	Finike	Fisherman
30	04 May 2010	3-5	Finike	Fisherman
31	16 May 2010	1	Finike	Fisherman
32	17 May 2010	4	Finike	Fisheries Coop
33	26June 2010	3	Finike	Fisheries Coop
34	14July 2010	12-15	Finike	Fisheries Coop
35	3 Aug 2010	8	Finike	Fisheries Coop
36	26 July 2010	3	Antalya Gulf	Fisheries coop.
37	Spring 2011	1	Gökçeada	C. Karakuş
38	23 May 2011	2	Kalkan	Fisheries coop.
39	12 June 2011	1	Kaş	Fisheries coop.
40	August 2011	1	Göcek	Hüseyin Lüleci
41	18 July 2012	2	Alanya	Fisheries coop.
42	4 Sept 2012	1	Ölüdeniz	H. İ. Kılıç
43	7 Nov 2012	8	Alaçatı	DHA

The eastern limit of the sperm whale sightings in the Turkish part of the Mediterranean Sea is Alanya and the northern part is Gökçeada in the northern Aegean Sea. Most of the sightings along the Mediterranean coast occurred near one of the deepest parts of the Mediterranean Sea and the upwelling zone of the Fethiye Depression (Anadolu Submarine Canyon) which drops down to 4500m deep. Because of this deep sea upwelling canyon, it is assumed that sperm whales feed on deep-water cephalopods in that area (Öztürk *et al.* 2012). The sperm whale is a teuthophagous species (Würtz 2010). Roberts (2003) reported seven cephalopod species in the diet of a sperm whale off the south coast of Crete in the Mediterranean, close to the Turkish waters. In the Turkish waters, 43 cephalopod species have been identified (Salman and Katağan 2002). Öztürk *et al.* (2007) indentified 14 cephalopod species in the stomach content of stripped dolphins (*Stenella coeruleoalba*) and Risso's dolphins (*Gramphus griseus*) which were accidentally caught by swordfish driftnets in the deep zone between Rhodes and Fethiye and this suggests that sperm whales share the same resource with the striped and Risso's dolphins.

The deep sea area of the Rhodes, as an important habitat for cetaceans, and Finike (Anaximander) Seamount where two sightings were reported in this study and as well as the beaked whale (Boisseau *et al.* 2010) have been recommended as High Sea Marine Protected Areas (Öztürk 2009). The canyons between Kalkan and Finike where eight sightings were reported, Ikaria Trough (off the Alaçatı) where four sightings were reported, and Anatolian Trough (Northern Aegean Sea, off Saroz Bay) are also important areas for the sperm whales in the Aegean and Mediterranean Sea.

Seasonally, most of the sightings were made during spring and summer months (March-August 81%). This may be due to the high season for yachting and sailing, but also indicates that these animals migrate to somewhere else outside the Turkish waters during autumn-winter months. Notarbartolo di Sciara (2002) suggests that sperm whales present in the Northern Aegean Sea in fall. But according to our result this prediction of area should be extended to the middle of the Aegean Sea. According to the photo-id studies, the sperm whales are at least seasonally (summer) or year around resident along the Hellenic Trench and in waters off southwestern Crete (Würtz 2010; Frantzis *et al*. 2011). Some of these sperm whales may also use the deepest part of the Turkish Aegean and Mediterranean Seas.

In the western and central Mediterranean Sea, sperm whale males segregate during summer in the northern part, while social units remain in the south in general. In some parts of the eastern basin, social units of females with immature individuals and solitary mature males are both found in the same area year-round, although in the northern of the Hellenic Trench only social units are present and large males are rarely seen (Reeves and Notarbartolo di Sciara 2006). More than half of our sightings records are single or pair individuals, the social units sightings, however, were also recorded in Turkish waters (Figure 2).

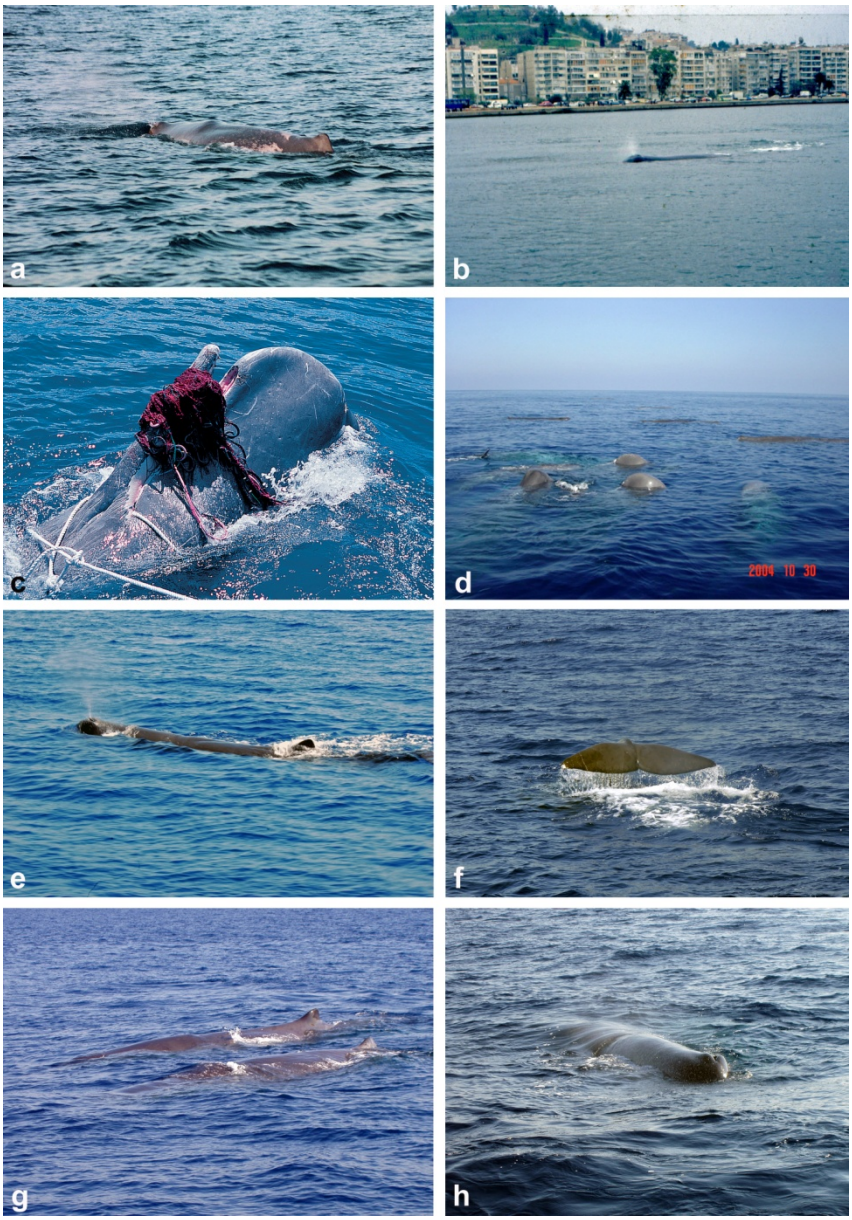

Figure 2. Some photographs of sperm whales in Turkish waters

a: Record 1. (Öztürk B/TUDAV), b: Record 2. (Öztürk B/TUDAV), c: Record 10. (Dede A/TUDAV), d: Record 15. (Özakat M.), e and f: Record 24. (Dede A/TUDAV and Aktan Y.), g and h: Record 26. (Ababay S.)

Although the main threat for sperm whales is entanglement in fishing gears, especially driftnets and this has been a particular problem in the Mediterranean Sea (Reeves and Notarbartolo di Sciara 2006), there is only one record of sperm whale bycatch reported in Turkey. Off Fethiye, a female sperm whale was found by the local fishermen and there were pieces of drift nets entangling the lower jaw and the tail. TUDAV team rescued this whale successfully with the cooperation of the Turkish Navy on 21 June 2002 (Figure 2c) (Öztürk and Dede 2002).

This study provides the basic information on the sperm whale distribution in the Turkish waters. However, in order to better understand their distribution in the Turkish waters, more effort should be made by both dedicated surveys and using opportunistic platforms, especially between Fethiye to Rhodes as it is the deepest part of the region. Combatting against illegal, unreported and unregulated (IUU) fisheries is also important for mitigation of bycatch. More researches shall help to better understanding of distribution, abundance, strandings and bycatch issue in the Turkish waters.

Finally, cetaceans travel across borders as migratory species. Regional and global effort, thus, to protect and sustainable management of the sperm whale populations in the entire Mediterranean Sea is needed.

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Türkiye'nin Ege ve Akdeniz kıyılarında kaşalot (*Physeter macrocephalus*) gözlemleri

Özet

1994 ile 2012 arasında Türkiye'nin Ege ve Akdeniz kıyılarında toplam 43 kaşalot gözlemi bildirilmiştir. Gözlemlerin Akdeniz'deki doğudaki uç noktası Alanya, Ege denizindeki uç noktası ise Kuzey Ege'de Gökçeada'dır. En fazla gözlem Fethiye kanyonu bölgesinden yapılmış olup bu bölge Akdeniz'in en derin kısımları arasındadır.

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