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Time and space distributions of cetaceans (whales and dolphins) in the Syrian coast (eastern mediterranean)

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ABSTRACT

The distribution of cetaceans' species through the time and space along the Syrian coast has been studied from 2003-2021. Visual monitoring had been done to record the species encountered, whether alive, freshly dead, or stranded dead. Thirty sightings had been recorded as follow: Five alive (three short-beaked common dolphins and two bottlenose dolphins), four freshly dead (three bottlenose dolphins and one Minke whale calf), and 21 stranded dead (11 bottlenose dolphins, four Cuvier's beaked whales, two Risso's dolphins and 1 for each of striped dolphin, fin whale, sperm whale, and humpback whale). Total species sightings were distributed as follows: Bottlenose dolphin (16 cases), Cuvier's beaked whale (four cases), short-beaked common dolphin (three cases), Risso's dolphin (two cases), and one case for each of fin whale, humpback whale, Minke whale, sperm whale and striped dolphin. These species accounts for 5 dolphin species (Suborder Odontoceti) and four whale species (Suborder Mysticeti). Some concluding remarks, death causes, and protection measures of cetacean along the Syrian coast had been also pointed at.

Keywords: Syrian coast, Cetaceans, Dolphins, Whales, Threats, Mediterranean Monk Seal.

1. INTRODUCTION

Recent decades, it has become known as the degradation of marine ecosystems and their biological components is globally increasing, due to the increase in human and ecological stresses and the consequent decrease in the ability of these ecosystems to restore themselves (Ibrahim et al., 2022; McKenna et al., 2020; Radchuk et al., 2019). The Syrian coast, as a phenomena, had been exacerbated by many factors such as: The increased natural and anthropogenic pressures, also particularly the steady increase in the growth of coastal cities, and the intensity of pollutions of various sources too (EEA, 2006; Ibrahim, 2009). Cetaceans have been affected by various factors such as boats and fishing nets operations Nachiket and Subhasis, (2020), which cause a significant decrease in cetaceans' populations (Cavanagh and Gibson, 2007). This decrease in the number of cetaceans as top

predators affects the food webs and alters the strength of the ecosystem (Sala, 2004; Robert et al., 2022; Lennox et al., 2022). Cetaceans' diversity on the Syrian coast has been subjected to high pressures, especially climate changes; preferred by intensive human activities (Ibrahim et al., 2020; Ibrahim et al., 2021; Ibrahim et al., 2023). The present paper presents a checklist of cetacean species that currently available in the Syrian coastal water, and documents their distribution along the coast of Syria. This study can be used as a basis for future surveys to highlight any changes in the species composition of cetaceans.

2. MATERIAL AND METHODS

Field surveys along the Syrian coast from Al- Samra in the north, (N35.928018 E35.917321) to the Lebanese border in the south (N34.62128 E35.97190), were done from 2003-2021. At the beginning of this study, a network had been established, which includes the coast guard officers, skilled fishermen, and local peoples to exchange the information about marine mammal presence along the coast. In addition, an enlightening leaflet about the importance of cetaceans was distributed on the local communities to get their support and inform the authors about any sighting instantaneously, then a field visit was done to collect the required information.

Cetacean species had been identified according to ACCOBAMS Identification Sheets, (Folkens and Reeves, 2002; Franzosini et al., 2013). Photographs had been taken for all individuals except the live ones. The geographical coordinates had been recorded from the nearest point on the shore or the sea (for the live individuals). When it's possible, the entire body or the skeleton was taken as reference sample, and deposited at the Marine Biodiversity Museum of the High Institute of Marine Research-Tishreen University. For the purpose of this study, individual sightings were categorized as alive (witnessed alive at sea), newly dead (still bleeding at the moment of observation), or stranded dead (found dead on the beach or at the sea, with no sign of freshness). All cases presented were of a single individual unless otherwise indicated.

3. RESULTS AND DISCUSSION

A total of 30 sighting cases of whales and dolphins were seen along the Syrian coast, as follows:

Cetaceans seen alive

Table 1 presents the alive dolphins encountered on five occasions in three different areas of the Syrian coast: The first area is south of Lattakia commercial port on 18 Oct. 2019, where a single individual of bottlenose dolphin *Tursiops truncates* was found entangled in a purse seine. It had been trawled to a nearby swimming pool, given the required pharmacological treatments and released out to sea: this was the only case where alive specimen could be photographed (Figure 1). The second one is the area facing off Lattakia port, where another single individual of bottlenose dolphin had been observed on 16 Sep. 2019. The third one is Al-baseet area, where the short-beaked common dolphin *Delphinus delphis* had been found in three different occasions, several kilometers from the shore.

Table 1 Cases of Cetaceans seen alive in the Syrian marine wat

No	Common name	Scientific name*	Location / Coordinates	Date	Notes
1.	Bottlenose dolphin	Tt	South of Lattakia – Commercial port N35.505488 E35.798282	18/10/2019	-
2.	Bottlenose dolphin	Tt	Lattakia port N35.541399 E35.763271	16/9/2019	-
3.	Short-beaked common dolphin	Dd	Al-Baseet- Alsankar N35.829932 E35.816829	22/10/ 2012	Swimming close to the vessel, above, ~200m water depth
4.	Short-beaked common dolphin	Dd	Al-Baseet N35.891337 E 35.851368	17/6/2012	Group of 6 individuals (~2 m long), above ~150m water depth
5.	Short-beaked common dolphin	Dd	Al-Baseet N35.887293 E35.815662	13/5/2012	Group of 5 individuals, ~150m water depth

* Tt=Tursiops truncates, Dd=Delphinus delphis

Figure 1 Alive T. truncates in the swimming pool (right) and on returning to sea (left)

Newly dead cetacean

Table 2 presents four sightings of newly dead bleeding cetacean (Figure 2) in the Syrian marine waters. The bleeding individuals were good evidence of their death while they were in the Syrian water (i.e., they are not drifted from outside as the stranded dead individuals may do (Section c)). The mortality of these species had been associated with fishing gear operated in the area, especially the trammel and gill nets. These sightings were: Minke whale calf, *Balaenoptera acutorostrata*, in Al-Kraab on 8 Mar. 2019 Ibrahim et al., (2020) and bottlenose dolphin, *T. truncates* in each of Ibn Hani, the public swimming pool in Lattakia and Banyas harbor on 14 Feb. 2011, 4 May 2007 and 15 Apr. 2005 respectively.

Table 2 Sighting of newly dead cetaceans in the Syrian marine waters

No	Common name	Scientific name*	Location / Coordinates	Date
1.	Minke whale calf	Ba	Banyas-AlKrab N35°05′45.1 E35°53′17.8	8/3/2019
2.	Bottlenose dolphin	Tt	Lattakia Public Swimming Pool N35.506702 E 35.787347	14/2/2011
3.	Bottlenose dolphin	Tt	Lattakia- Ibn Hani N 35.596407 E 35.759463	4/5/2007
4.	Bottlenose dolphin	Tt	Banyas Harbour N 35.186867 E 35.944378	15/4/2005

* Ba= Balaenoptera acutorostrata, Tt=Tursiops truncates

T. truncates at Lattakia- Ibn Hani *B. acutorostrata* at Banyas-AlKrab

Figure 2 Representatives of the newly dead cetaceans, with fresh blood, from the Syrian marine waters

Stranded dead cetaceans

Table 3 shows that 21 stranded dead cetacean cases were encountered, including 11 cases of bottlenose dolphin, *T. truncates*, four cases of Cuvier's beaked whale, *Ziphius cavirostris*, two cases of Risso's dolphin, *Grampus griseus*, and one case from each of striped dolphin, *Stenella coeruleoalba*, fin whale, *Balaenoptera physalus*, sperm whale, *Physeter macrocephalu*, humpback whale, *Megaptera novaeangliae* (Figure 3). These cases involved three whales and 18 dolphins: All of these cases were of a single individual each, and no mass stranding had been encountered.

Table 3 Sighting of stranded dead cetaceans in the Syrian marine waters

No	Common name	Scientific name*	Location / Coordinates	Date
1.	Bottlenose dolphin	Tt	Lattakia-Ras Ibn Hani N35.592361 E35.741231	19/9/2019
2.	Bottlenose dolphins	Tt	Amrit – S.Tartous N34.824732 E35.906589	3/5/2013
3.	Bottlenose dolphins	Tt	Al-Hisha – S.Tartous N34.783236 E35.927240	21/3/2013
4.	Bottlenose dolphins	Tt	Ras Al-Baseet- Alsankar N35.830974 E35.812839	17/3/2013
5.	Bottlenose dolphin	Tt	Al-Nawras Chalet – S.Tartous N34.749372 E35.931723	11/8/2011
6.	Risso's dolphin	Gg	Al-Hisha – S.Tartous N34.776292 E35.929132	9/6/2011
7.	Striped dolphin (Figure 3-B)	Sc	Al-Bassa river outlet N35.465601 E35.864230	12/4/2011
8.	Bottlenose dolphin	Tt	Tartous beach N34.897350 E35.871745	29/5/2010
9.	Bottlenose dolphin	Tt	Alkrabeh-Alhamidiya N34.654039 E35.967805	4/3/2010
10.	Fin whale (Figure 3-F)	Bp	Alkrabeh-Alhamidiya N34.651430 E35.968805	15/12/2009
11.	Bottlenose dolphin	Tt	Banyas-Alkrab N35.069831 E35.888095	31/8/2009
12.	Cuvier's beaked whale (Figure 3-C)	Zc	Tartous-Amrit N34.828135 E35.903560	10/5/2009
13.	Risso's dolphin (Figure 3-D)	Gg	Tartous- Alhamidiya N34.718548 E35.939920	28/3/2009
14.	Cuvier's beaked whale	Zc	Jableh – Rmyleh N35.379298 E35.921015	3/3/2008
15.	Bottlenose dolphin	Tt	Tartous- AlHamidiya N34.693082 E35.951627	16/4/2007
16.	Bottlenose dolphin	Tt	Lattakia-Ras Ibn Hani Reserve N35.583071 E35.719247	8/10/2006
17.	Bottlenose dolphin	Tt	Jableh – Almina N35.358367 E35.919927	24/7/2006
18.	Cuvier's beaked whale	Zc	Lattakia - Borg Islam N35.681817 E35.787340	13/5/2005
19.	Sperm whale (Figure 3-A)	Pm	Tartous beach N34.871253 E35.882379	29/4/2005
20.	Cuvier's beaked whale	Zc	Al-Baseet -Umm Al-Tayour N35.797947 E35.831999	11/3/2005
21.	Humpback whale (Figure 3-E)	Mn	Tartous-Bsereh N34.985512 E35.878158	12/3/2003

* Tt=Tursiops truncates, Gg=Grampus griseus, Mn=Megaptera novaeangliae
Pm=Physeter macrocephalus, Zc=Ziphius cavirostris, Sc=Stenella coeruleoalba

Figure 3 Representatives of the stranded dead cetacean species in the Syrian marine waters: (A)-P. macrocephalus at Tartous beach; (B)-S. Coeruleoalba at Al-Bassa river outlet; (C)-Z. cavirostri at Tartous-Amrit; (D)- G. griseus at Tartous- Alhamidiya; (E)- M. novaeangliae at Tartous-Bsereh; (F)- B. physalus at Alkrabeh-Alhamidiya.

When combining the three categories (alive, newly dead, and stranded dead) altogether, the following conclusions can be drawn:
Nine cetacean species were found along the Syrian coast, divided as follows:
Five species of the Sub-order Odontoceti (toothed cetaceans), and the most abundant species was the bottlenose dolphin with (16 sightings), then the cuvier's beaked whale with (4 sightings), short-beaked common dolphin with (3 sightings), Risso's dolphin with (2 sightings), and stripped dolphin with (1 sighting).
Four species of the Suborder Mysticeti (toothless cetaceans): Minke whale, Sperm whale, Fin whale, and Humpback whale; each species had been presented by one sighting.
All of the mentioned species above are "Regular" in the Mediterranean except the Minke whale and Humpback whale are "Occasional".

The most apparent causes of death observed on the carcass are the entanglement in fishing gears and the injuries caused by ship propeller strikes. Therefore, using acoustic pingers that keep cetaceans away from fishing nets and boats is the most essential measure that should be applied for cetacean protection on the Syrian coasts. In addition to the above-mentioned causes of death, food shortage, disease endemic, and other causes cannot be rolled out. Most cetacean species available in the Syrian waters had been listed in the IUCN Red List. In this contest, a National Action Plan for cetacean's conservation on the Syrian coast had been formulated in 2008 Gonzalvo and Bearzi, (2008), but it stills to be activated. Intensive research work has been carried out to propose sites for cetacean protection and found that the most appropriate one is that area south of Banyas Thermal Power Station, extending from Al-Bassia Bay (N35.149848 E35.922112) to Ras Al-Kharab (N35.058591 E35.8861603) Ibrahim et al., (2023), and this area is the least degraded along the Syrian coast which cetacean species are frequently seen in.

4. CONCLUSION

This study gives information about thirty sightings of whales and dolphins were seen along the Syrian coast, and proposes sites for cetacean protection as the area south of Banyas Thermal Power Station.

Authors' Contributions

All authors have equal participation in this work.

Ethical approval

The Animal ethical guidelines are followed in the study for species observation & identification.

Informed consent

Not applicable.

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Conflicts of interests

The authors declare that there are no conflicts of interests.

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Data and materials availability

All data associated with this study are present in the paper.

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