

Marine Mammals on the Egyptian Mediterranean Coast "Records and Vulnerability"

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Abstract: This work documents strandings and sightings of vulnerable marine mammals on the Egyptian Coast of the Mediterranean Sea, with an emphasis on 2013 to 2018 as well as previous non documented strandings observed by other persons. Marine mammal cases were described and identified to six species: the fin whale (*Balaenoptera physalus* Linnaeus, 1758), the sperm whale (*Physeter microcephalus*), Gervais' beaked whale *Mesoplodon europaeus* (Gervais, 1855), the common bottlenose dolphin (*Tursiops truncatus*), the rough-toothed dolphin (*Steno bredanensis*) that which was stranded on the Gamasa coast and was not completely confirmed. The sixth species was California sea lion (*Zalophus californianus* Lesson, 1828) which was reported for the first time. Moreover, the monk seal (*Monachus monachus*) was also reported here but has not been observed by the authors; this observation increases the reported species on the Mediterranean coast of Egypt into seven species. The first five species are cetaceans including a baleen whale (Mysticeti) for first whale and toothed species (Odontoceti) for the remaining four species, while the last two ones belong to Pinnipeds (sea lion and monk seal). Most of the observed cases were strandings, while the sea lion was sighted alive. The sea lion is not endemic for Mediterranean sea and its presence may be an accidental or may escape from aquarium. There were also few other records of dead delphinid carcasses that were in a highly decomposed state and could not be identified. In conclusion, this work is important issue in term of documenting marine mammals in the Egyptian Mediterranean water and indicates that the coast has increasingly become a visiting area for many marine mammals, with a concomitant increase in stranding's. These observations reflect their vulnerability due to anthropogenic activities such as fishing operations, shipping, and seismic activities. Moreover, the Egyptian coast has shallower and wider continental shelf in the Nile Delta region which may increase the probability of marine mammals' visitors stranding's, particularly a mong species that inhabit deep water. The repeated sightings of these species may be due to climatic changes that affect their migration and mobility from one place to another. Stakeholders should pay more attention to marine mammals in Egypt through increased awareness and the continuous monitoring, documentation and mapping of recorded strandings to further suggest measures on how to protect these important and vulnerable species.

Keywords: Marine Mammals, Vulnerability, Anthropogenic and Climatic Changes, Mediterranean Sea, Egypt

1. Introduction

The Mediterranean Sea is suffering from severe alterations as a result of high levels of anthropogenic pressure and its

synergistically interaction with the effects of climate change which has affected marine biodiversity [1, 2]. Marine mammals populations decline is considered to be an important issue in terms of the biodiversity of vulnerable species and numerous cases of strandings have been

documented in the Mediterranean Sea were particularly in the eastern part of the basin [3-7].

The monitoring of cetacean populations is important and is a priority for conservation worldwide. Indeed many cetaceans such as fin whale and sperm whales, are found over a wide range across the Mediterranean Sea [8, 9], and are impacted by various to anthropogenic pressures [10-12].

Studies of cetaceans in the Mediterranean Sea began in the late 1980s [13]. Since then, approximately 18 cetaceans' species were recorded in the Mediterranean by William [14]. Among them were, six species in the family Delphinidae; the bottlenose dolphin *Tursiops truncatus* (Montagu, 1821), which has an extended distribution on the eastern coast, with no difference in abundance on either side of the Mediterranean [5]; the striped dolphin (*Stenella coeruleoalba* (Meyen, 1833)); Risso's dolphin (*Grampus griseus* (G. Cuvier, 1812)); the long-finned pilot whale (*Globicephala melas* (Traill, 1809)) which is the largest dolphin species in the Mediterranean and is usually limited in its distribution to the western basin; the short-beaked common dolphin (*Delphinus delphis* Linnaeus, 1758); the rough-toothed dolphin (*Steno bredanensis*), and Cuvier's beaked whales (*Ziphius cavirostris* G. Cuvier, (1823)). Some other species were considered visitors such as killer whales (*Orcinus orca* (Linnaeus, 1758)), which sometimes move from the Atlantic to the Mediterranean Sea to feed on tuna species. Other species found included the dwarf sperm whale, which is extremely rare in the entire Mediterranean basin [15]. These species are protected in the Mediterranean through different agreements and conventions, for example, the Agreement on the Conservation of the Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS). In addition, the International Union for Conservation of Nature (IUCN) [15] and in collaboration with ACCOBAMS recognized 21 different cetacean species and three subspecies sighted in the Mediterranean and Black Seas. Eight of these have resident populations in the Mediterranean Sea, the three subspecies are endemic to the Black Sea and 12 species are visitors that have been sighted in the basin [15].

Moreover, a humpback dolphin sighting was reported by Marchessaux [16] at the entrance of the Port Said harbour in Egypt via the Suez Canal. This record increased the number of cetaceans in the Mediterranean Sea reported in previous studies. There is some knowledge regarding cetaceans in the eastern part of the Mediterranean Sea [16], with records of eight species in the existing literature, including information from strandings and live samples from Israel, [17], Greece [5] and Turkey [6].

Egypt borders the eastern part of the Mediterranean Sea, and there is a gap in the knowledge regarding marine mammals in this country, with no recently updated information. The country also has a long coast bordering the Red Sea, and the cetacean fauna in that area appears to be composed of a total of 16 species: three mysticetes (Bryde's whale (*Balaenoptera edeni*); Omura's whale (*B. omurai*) and humpback whale (*Megaptera novaeangliae*)) and 13

odontocetes (the dwarf sperm whale, (*Kogia sima*); the killer whale (*Orcinus orca*); the false killer whale (*Pseudorca crassidens*); the short-finned pilot whale (*Globicephala macrorhynchus*); Risso's dolphin (*Grampus griseus*); the Indian Ocean humpback dolphin (*Sousa plumbea*); the rough-toothed dolphin (*Steno bredanensis*); the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*); the common bottlenose dolphin (*T. truncatus*); the pantropical spotted dolphin (*Stenella attenuata*); the spinner dolphin (*S. longirostris*); the striped dolphin (*S. coeruleoalba*) and the Indo-Pacific common dolphin (*Delphinus delphis tropicalis*) [18].

Recently, many marine mammal species have been observed along the Egyptian coast of the Mediterranean Sea may be for feeding or breeding or migration behaviour; however, there have been no scientific records of these cases. Hence, our objective in this paper is to compile and review the records and strandings of marine mammals along the Egyptian Mediterranean coast as a step towards mapping the marine mammals in the entire Mediterranean basin and along the Egyptian coast and to provide further suggestions to protect these vulnerable species.

2. Materials and Methods

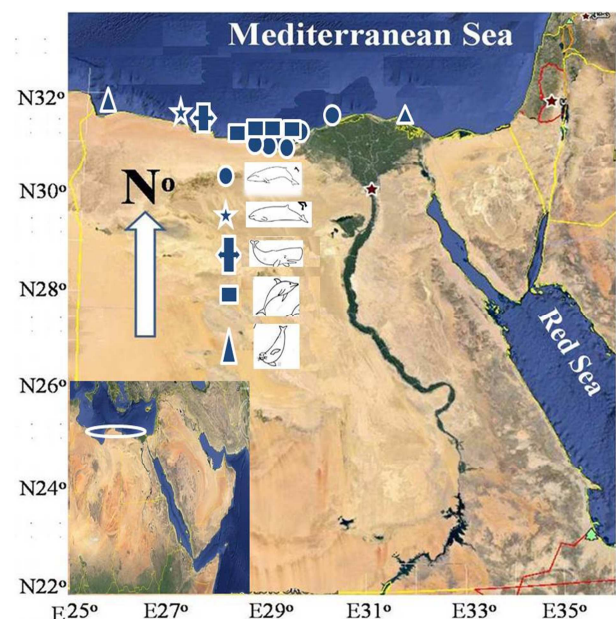


Figure 1. Locations at which, the marine mammals on the Egyptian coast of the Mediterranean Sea were recorded.

Information on the presence of marine mammals' and strandings/ beaching cases were compiled and synthesized along the Egyptian coast of the Mediterranean Sea were compiled and synthesized (Figure 1). Each case was observed and documented by the authors, and the location was noted.

At each location, the stranded marine mammals (whales, dolphins and seals) were described and identified using identification keys [15, 19- 21]. In addition, Their descriptions and available measurements such as total length (TL), standard length (SL), caudal fin length, and jaws length

were recorded when possible. This information ~~were noted down~~ and the locations of the stranding events were recorded (Table 1). Data regarding other strandings or mammals observed along the Egyptian coast of the Mediterranean Sea were collected from a questionnaire given to the scientists from the National Institute of Oceanography and Fisheries (NIOF) at Alexandria, observers from the Egyptian Environmental Affair Agency and fishermen.

3. Result and Discussion

The observed cases of marine mammals along the Egyptian coast of the Mediterranean Sea included stranded/beached individuals. Most of the specimens were photographed and identified to six different species.

3.1. Fin Whale (*Balaenoptera Physalus* (Linnaeus, 1758))

The first observed individual was a fin whale (*B. physalus* (Linnaeus, 1758)) that was stranded near Stanley Beach, Alexandria (31° 23' 522" N, 29° 949' 516" E), in January 2018 (Figure 2). Its morphometric measurements were TL 12.47 m; SL 11.85 m; Pre D L 8.50 m; Post D L 9.30 m; Dorsal L 40 cm; low jaw 2.40 m; upper jaw 2.30 m; gill racker L 43 cm; gill arch L 1.70 m; caudal long fin 3.60 m; pectoral L 1.59 m and total rounded 4.40 m. Its sex was male. This species was previously observed along the Egyptian coast of Rosetta (Rashid) during 1936 and a sample was deposited at the museum of the National Institute of Oceanography and Fisheries (NIOF) at Alexandria. After more than 70 years, this species was observed again in different regions during a short period as shown (Table 1). It was observed in 2008 on the Baltim coast, on the Alalmain coast in 2014, and in the Alexandria marina in July 2016 where it was found in at shallow small area for one day. Due to the stressed conditions shown by the animal, it was assumed that it would become stranded and die, but it swam out of the shallow area and was not sighted again. Despite these frequent sightings, the literatures have indicated that fin whales do not go far in the eastern Mediterranean Sea [9, 22].

The fin whale is known as 'common species' in the Mediterranean basin. It is distributed mainly in the western and central Mediterranean Sea, and its occurrence is believed to be related to water depth and circulation patterns which also affect the presence of its prey [15]. It usually occurs usually in deep offshore waters (Balearic Islands to the Ionian Sea). The repeated sightings in Egypt in the eastern Mediterranean may indicate that this area becomes a visiting area for feeding or breeding or that the whale may be exhibiting migration behavior. These repeated sightings are becoming increasingly common, and these repetitions were more than before, which may be an effect of climatic changes. However its appearance and stranding indicates its vulnerability due to different reasons; death caused by hunger as a result oligotrophic conditions in the the eastern part than in the western part or collision with ships and the topography of the Nile Delta region, which has become shallower throughout the huge region of the Egyptian coast. The

present situation of its vulnerability is an agreement with the findings of the IUCN [15], as a report from this organization mentioned that the population in the Mediterranean may reach 5,000 adults in the Mediterranean Sea [15]. This species is particularly abundant in the Corso-Ligurian basin and the Gulf of Lion. However, the population declined from 900 individuals in 1992 to 147 in 2009 in the Pelagos Sanctuary, which is the largest marine protected area for the Mediterranean marine mammals [15]. This indicates that this species has become a vulnerable and endangered species. Individuals of this species move to the coastal waters off the island of Lampedusa (Italy), in late February and early March to feed on small crustaceans, mostly the krill species (*Nyctiphanes couchii*). According to the IUCN [15], this whale may fall victim to ship strikes, particularly from the high-speed ferries.

3.2. Sperm Whale (*Physeter Macrocephalus* Linnaeus, 1758)

The sperm whale (*P macrocephalus* Linnaeus, 1758) was the second species observed and was stranded in May 2016, on beach on the western Egyptian coast in Matrouh Province (31°15'20.8"N, 29°15.4'59"E). It is among the toothed whales (Odontoceti) and is a member of the family: Physeteridae. It is approximately 36 tonnes in weight and 15 m in total length (Figure 3); and has a caudal width of 3 m. The whale was heavily decomposed, so additional measurements could not be taken. The population of this species in Mediterranean was at least 30 individuals until the 1950s. However, current sightings of this species are rare, with an increase in annual strandings (stranded, floating dead or entangled sperm whales) observed in France and Italy. According to the IUCN [15], sperm whales are mainly threatened by entanglement in fishing gear (especially swordfish drift gillnets and tuna driftnets), ship strikes and disturbance from maritime traffic. They mostly occur on continental slopes where they can dive very deep (more than 1,000 m) to feed, mostly on cephalopods. They can stay submerged for over an hour although; on average their dives are 20–50 minutes long on average at depths of 300–600 m. This species is considered to be highly migratory and to lead a solitary lifestyle particularly for males, which migrate to join the female groups during the breeding season [15]. According to Goffman et. al. [23], some sperm whales strandings have actually been cases of accidental straying or of the drifting of floating carcasses. Furthermore, this has been encountered in the Greek waters [24].

3.3. Gervais' Beaked Whale (*Mesoplodon Europaeus* (Gervais, 1855))

Gervais' beaked whale (*M. europaeus* (Gervais, 1855)) was the third observed stranded whales species; it was recorded in Sept. 2018, on the beach on the Northern coast of Matrouh Province (31°39'35.8"N, 27°30.4'59"E). It is an odontocetie (toothed whales), belonging to from the family: Ziphiidae (Figure 4). The standard length (SL) was 5.3 m; the

pectoral fin length was 50 cm, the lower jaw length was 35cm; the upper jaw length was 27cm, the weight was approximately 900 kg; the caudal fin was loosed and the status of the whale was heavily decomposed. In addition, the body was elongated, and laterally compressed, the mouth line was somewhat straight, and the head was overall small and tapering in outline. The whale was dark gray on top and lighter grey on the bottom. These features are in agreement with the description provided by IUCN [15]. Gervais' beaked whale occurs from temperate North Atlantic to tropical Central Atlantic waters, lives mostly in deep waters (200 m to around 1,000 m depth) and feeds on squid and mesopelagic fish [19]. Only one specimen has been reported to have become stranded in the Mediterranean basin, which occurred in Livorno, Italy. It may be the first finding of (*M. europaeus*) stranding in Mediterranean in 2001 (Podesta et al., [4]. This species, like other beaked whales, is likely to be vulnerable to loud underwater noises, such as those generated by navy sonar and seismic exploration; poisoning due to swallowing rubbish; and becoming by-catch in fishing nets [15].

According to Podesta *et al.*, [4], the presence of two beaked whales (genus *Mesoplodon*) that were stranded alive along the coasts of the French Riviera indicated the presence of *Mesoplodon* in the Mediterranean. They have documented 238 Cuvier's beaked whale stranding in the Mediterranean Sea consisting of 327 animals in the Mediterranean Sea over a 204-year period. The stranding locations generally occur where regions of steep bathymetry occur close to the coast [4]. The current stranding location located in the western part of Egypt along the Mediterranean coast and it is characterized by relatively deeper water and the presence of the steep bathymetry close to the coast. Moreover, the absence of this species in different regions of the Mediterranean basin may indicate that this species is not endemic and may be considered to be a visitor as stated by the IUCN [15].

3.4. Common Bottlenose Dolphin (*Tursiops Truncatus* (Montagu, 1821))

The fourth stranded marine mammal was a common bottlenose dolphin (*T. truncatus* (Montagu, 1821)). This specimen was found on the coast of El Shatby, Alexandria (31° 21' 511" N, 29° 911' 586" E) in June, 2017 (Figure 5a, b). This individual had the following characteristics; TL 3.33m, Standard length (SL) 2.95 m, total weight (TW) 370Kg, head length 95cm, jaw length 35cm, caudal fin width 70cm, 42 teeth in each jaw (upper and lower), dorsal fin length is 50 cm, pectoral fin length 55 cm, eye opening 3 cm and nostril opening, 3cm. The presence of bruises on the front of the body may indicate its death due to a collision with a boat. This accident was previously repeated in May, 2017 on Gelim Beach in Alexandria City near the previously mentioned stranding site, but at that time the dolphin was found in a stressed state with no caudal fin which may have been served by boat engine. Another very recent incident also occurred involving the same species on 22 December 2018

at Abu-Qir beach (31°18'0"N, 30°10'0"E). The following data were taken from this male specimens; SL 205 cm, TW 300 kg, and 44 teeth in each jaw, it is male specimen (Figure 5 c, d, e, f, g). It has been noted that some predator may attacked such dolphin and removed the lower part of the body when attaching such dolphins, which may have been the reason for its death. When this dolphin appeared on the beach, one of the fishermen started to dissect and cut away its fins and was going to cut its head before the author, was able to evaluate this stranding. The behaviour of the fisherman in which he began to filet the dolphin reflected the absence of the awareness to protect and conserve the marine mammals. This finding may also extend to live mammals when they compete with fishermen in the sea during fishing operations. For example, fishermen remove the fins of dolphins down when they they are captured in their nets, and then they and then they are thrown back into the water.

This species is distributed in tropical and temperate waters around the world, including coastal and offshore environments, bays, estuaries and lakes [25]. It is found in the Red Sea [18], and is a well known a famous dolphin in the Mediterranean basin [15, 26- 27]. It occurs the waters off Albania, Algeria, Croatia, Cyprus, France, Gibraltar (United Kingdom), Greece, Israel, Italy, Montenegro, Morocco, Slovenia, Spain, Tunisia and Turkey [27]. Many of the Mediterranean areas inhabited by these dolphins are subject to intensive human use and this species included on the Red list of vulnerable marine mammals [15]. The occurrence of stranding indicates the tendency of some vulnerable marine mammals to become endangered. Many other cases of stranded dolphins were observed for a dolphin with no clear identification to species was not possible due to the bad status of their morphology.



Figure 2. Photos of the stranded fin whale (*B. physalus*) from the Mediterranean coast, Egypt (a; shows the head, b; shows the anterior body with the caudal fin and male sexual organ, c; shows the whole body).



Figure 3. Photos of the stranded sperm whale (*P. microcephalus*) from the Mediterranean coast, Egypt (a; shows the whole on the beach and b shows the dorsal view of the head and lower jaw).

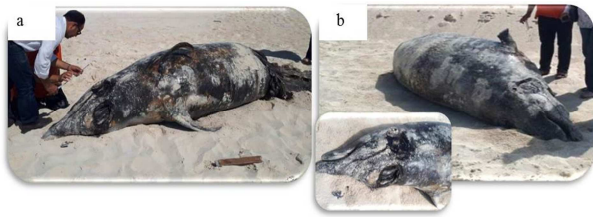
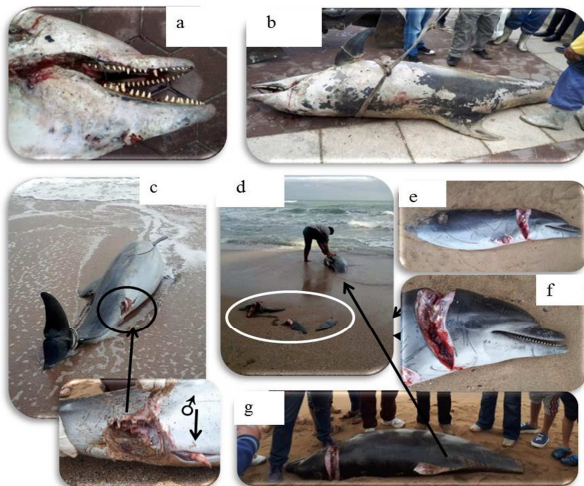


Figure 4. Photos of the stranded Gervais' beaked Whale *M. europaeus*; from the Mediterranean coast, Egypt (a; shows the ventral view of the whale and b shows the dorsal side with enlarged head).



Figures 5. Photos of the stranded common bottlenose dolphin *T. truncatus* from the Mediterranean coast, Egypt. (a; shows head region with the teeth rows, b; the whole body, c; shows the attacked part of the other specimen with male sexual organ, d; the fisherman when dissects the stranded dolphin with signal to insufficient awareness and bad behaviour, e; the dissected body, f; shows the enlarged head while g; shows the dorsal side of the dolphin with removed fin by fisherman).



Figure 6. Photos of the stranded Rough-toothed Dolphin *S. bredanensis* from the Mediterranean coast, Egypt.

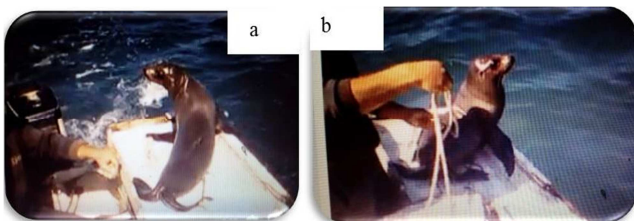


Figure 7. Photos of the California Sea lion (*Z. Californianus*) from the Mediterranean coast, Egypt (a; shows the dorsal side with the shape of caudal fin. and b; shows the head with small ear).

3.5. Rough-toothed Dolphin (*Steno Bredanensis* (G. Cuvier in Lesson, 1828))

Another recently stranded dolphin was observed in June 2018 on the Gamasa coast (TL 2.85 m; pectoral fin L. 37 cm; dorsal fin L. 26 cm; upper jaw L., 31 cm; lower Jaw L. 32 cm) (Figure 6). It is probably rough-toothed dolphin *S. bredanensis* (G. Cuvier in Lesson, 1828) (Family: Delphinidae) with no concrete confirmation of its identification due to the level of decomposition.. This species occurs in the Red Sea [18], but there has been no mention for this species in the Mediterranean Sea. The present record of the occurrence of this species on the Egyptian Mediterranean coast may indicate that the Suez Canal is a pathway of marine mammals entry into the Mediterranean Sea.

3.6. California Sea Lion (*Zalophus Californianus* Lesson, 1828)

The sixth observed species was the California sea lion (*Z. californianus* Lesson, 1828) (Figure 7), which it is in a different order of marine mammals (Class: Carnivora, Order: pinnipeds) and was observed alive in 2013 in the sea off the coast of the Damietta region (31°52'531"N, 31°826'797"E). This individual jumped into a small boat and stayed for about one hour together with the fishermen. This species is famous in Mexican waters. Their geographical distribution goes from the border with the United States of America, to the coasts of Nayarit, Mexico, including the Gulf of [28, 29]. According to Gallo and Ortega [30], they reported two sightings of solitary sea lions south in Acapulco, State of Guerrero, Mexico, while Gallo and Solórzano [31] extended the area of these sightings near the border of Mexico-Guatemala. Sea lions inhabit mainly beaches, rocks, islets and islands [29] estimated 30,000 California sea lions inside the Gulf of California. This species is one of the most abundant and recognized pinniped species from British Columbia, Canada to Baja California, Mexico [32, 33].

On the basis of its recognized distribution, it is noteworthy that there is no mention of this species in the Mediterranean Sea or the Red Sea. The present sighting of the California sea lion in the Mediterranean Sea, Egypt may be its first record in this area. Its appearance was similar to that of the most common pinniped species in the Mediterranean Sea called monk seal *Monachus monachus* (Hermann, 1779). However, the photographs and features of the specimen refers to that this species was not a monk seal and much closely resembles a California sea lion (*Z. californianus* (Lesson 1828)). The California sea lion is used in marketing for tourism, aquatic entertainment and other purposes. Hence, this species is exported and imported from many different locations. Therefore, the authors suggest that the California sea lion is not endemic to the Egyptian Mediterranean waters and that its presence may be related to such importation or tourism activities in various Mediterranean countries, such as Egypt and Lebanon. Individuals of this species may have escaped from aquaria or

may have even been released into the Sea. Such actions may create new populations and change the biodiversity in the region.

Regarding the other pinniped species in the Mediterranean basin, monk seal (*M. monachus* (Hermann, 1779)). This species was observed before 1990 on the coast of Matrouh, then reported in Marsa Matrouh again in 2011 during a trip along Egypt's Mediterranean coast during the implementation of a National Action Plan for the Conservation of Cetaceans in Egypt, funded by the Regional Activity Centre for Specially Protected Areas (RAC/SPA) of Tunis, the data were taken from the fishermen during the meeting at the offices of the Director of Environmental Affairs of the Marsa Matrouh Governorate (the data were cited as news on the agency website by Mahmoud Fouad, Egyptian Environmental Affairs Agency, Cairo, Egypt) followed by Ras-El Hekma, Mediterranean Sea in 2015 and Sallum in 2017 (personal communications). This species is presently considered to be at the imminent risk of extinction and is the most endangered of all pinniped species in the world. Monk seals have a long history of interaction with humans; they have been caught for subsistence and commercial purposes and have been directly persecuted (mainly with shotguns or dynamite) as they are believed to be strong competitors for fishery resources [15]. In addition, their presence in this fishing area makes it easy for them to be become in static nets (trammel and gill nets). According to IUCN [15], the number of monk seals has been declined due to the loss of good habitat for breeding and feeding pollution, disease, maritime traffic and the poor enforcement of legal protection measures.

More marine mammals occur in the northern and western Mediterranean Sea than in the southern and eastern regions despite the trends of salinity and temperature, which increase towards the east [34, 35]. Furthermore, it includes some unusual features: (1) high homothermy from 300–500 m to the bottom, where the temperature varies from 12.8°C–13.5°C in the west to 13.5°C–15.5°C in the east and (2) high salinity of 37.5–39.5 psu. Additionally, there are no thermal boundaries in the deep areas of the Mediterranean, unlike the Atlantic Ocean, where temperature decreases with depth [36]. Shelf waters represent 20 % of the total Mediterranean waters [37]; these shelves are mainly narrow and steep in the south (e.g., the Moroccan, Algerian, and Libyan coasts, with the exception of the Gulf of Gabés), while those in the north are wider (e.g., the north and central Adriatic Sea, Aegean Sea).

The recent marine biota in the Mediterranean Sea is primarily derived from the Atlantic Ocean, but the wide range of climate and hydrology have contributed to the co-occurrence and survival of both temperate and subtropical organisms [34–35]. Therefore, climatic changes have helped to extend the distribution of many marine mammals in the eastern part such as Egypt as indicated by the repeating appearances of mammals especially, fin whale during recent years. However, many stranded and beached animals have been observed, which may have been caused by the reasons

mentioned above (pollution, seismic activity, fishing operations, and shipping) and the unique topography of the Nile Delta as shallower areas which of course influence the survival of the mammals, particularly whales. This sea has its own set of emblematic species of conservation concern, such as sea turtles, several cetaceans and the critically endangered Mediterranean monk seal *M. monachus* (Hermann, 1779). It is also the main spawning grounds of the eastern Atlantic bluefin tuna (*Thunnus thynnus*) [38–39]. This attracts visitor killer whales (*O. orca*); which live in polar and tropical waters, from the coast to open sea, and are considered residents in the Strait of Gibraltar, with a population that reaches to 32 whales. It is believed that they are linked to the presence of bluefin tuna as a food resource.

The resulting pressure gradient pushes the relatively cool, low-salinity water from the Atlantic across the Mediterranean basin. This water warms up to the east, where it becomes saltier and then sinks in the Levantine Sea before circulating west and exiting through the Strait of Gibraltar [40]. This may also support the pathway also from the west to the east of the Mediterranean basin. In spite of that, the basin is generally oligotrophic, but regional features enrich coastal areas through changing wind conditions, temporal thermoclines, currents and river discharges and municipal sewage [41–42]. The Mediterranean Sea has several unique and endangered habitats, including the seagrass meadows of the endemic *Posidonia oceanica*, vermetid reefs built by the endemic gastropod *Dendropoma petraeum*, coralligenous assemblages [43 - 45] and deep-sea and pelagic habitats that support unique species and ecosystems [46–47]. This supports the vulnerability of some marine mammals particularly in the eastern part.

The national scientists think that the increase in stranding events may be attributed to climate change, but their vulnerability of marine mammals might be due to several reasons. Among them, is the anthropogenic activity which facilitates their endangered status. Based on the protocol related to the Special Protection Zones and the Biological Diversity in the Mediterranean (Specially Protected Areas of Mediterranean Importance (SPAMI) adopted in 1995), which considers those species as endangered or threatened species". Marine mammals are covered by the Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS). Furthermore, these species are classified as "Data Deficient" on the IUCN Red List of Threatened Species (vers. 2017-3) [48].

Further research is needed in order to better understand the impacts of various threats on marine mammals nature Data are also lacking in the regard to the evaluation of the conservation status of many species [49]. Therefore, more attention should be given to marine mammals particularly in Egypt. In addition, the recording of observations in newspaper is not sufficient in term of documentation, but such records, will be important in term of the implementation of the scientific ways necessary to evaluate the reasons for the vulnerability of these animals and for further suggestions

on how to reduce the number of deaths.

4. Conclusion

In conclusion, this work is important issue in term of documenting marine mammals in Egyptian Mediterranean waters and indicates that the coast has become a visiting area for many more marine mammals than previously observed, combined with concomitant increase in stranding. These observations reflect the vulnerability of marine mammals to anthropogenic activities, such as fishing operations, shipping, and seismic activities. Moreover, the Egyptian coast has a shallow and wide continental shelf in the Nile Delta region which may increase the probability of marine mammal visitors strandings, particularly among species that inhabit deep water. The repeated sightings of these species may due to climatic changes which affect their migration and mobility from one place to another. Stakeholders should pay more attention to marine mammals in Egypt through increased awareness, and the

continuous monitoring, documentation and mapping of recorded strandings to further suggest measures on how to protect such important and vulnerable species.

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Table 1. Marine mammals species observed in different regions in the Egyptian Mediterranean water.

Species	Common name	location	area	date	status
<i>Balaenoptera physalus</i> (Linnaeus, 1758) F: Balaenopteridae	Fin Whale	31°48'187"N, 30°37'9'576"E	Rosetta (Rashid), Mediterranean Sea, Egypt	1936	Beached & stranded
		31°59'8'653"N, 31°14'9'858"E	Baltim, Medit. Sea, Egypt	2008, 2014	Beached & stranded
		30°84'2'515"N, 28°9'56'279"E	ElAlamein, Medit. Sea, Egypt	2014, 2015	Beached & stranded
		31°28'9'47"N, 30°02'1'909"E	Alexandria (Montazah), Medit., Sea, Egypt	June, 2016	live
		31°23'4'522"N, 29°9'49'516"E	Azur beach, Alexandria, Medit., Sea, Egypt	Jan., 2018	Beached & stranded
<i>Physeter microcephalus</i> Linnaeus, 1758 F: Physeteridae	Sperm Whale	31°15'20.8"N, 27°15.4'59"E	Cleopatra beach, Matrouh Province, Medit., Sea, Egypt	May 2016	Beached & stranded
<i>Mesoplodon europaeus</i> (Gervais, 1855) F: Ziphiidae	Gervais' Beaked Whale	31°39'36"N, 27°30'36"E	north coast, Matrouh Province, Medit., Sea, Egypt	Sept. 2018	Beached & stranded
<i>Tursiops truncatus</i> (Montagu, 1821) Family: Delphinidae	Common Bottlenose Dolphin	31°24'1'461"N, 29°9'29'438"E	Gelim, Medit., Sea, Egypt	May, 2017; June, 2017; Sept., 2018	Beached & stranded
		31°21'0'511"N, 29°9'11'586"E	Elshatby Medit., Sea, Egypt	Nov., 2017	Beached & stranded
		31°18'0"N, 30°10'0"E	Abu Qire	December, 2018	Beached & stranded
<i>Steno bredanensis</i> (G. Cuvier in Lesson, 1828) Family: Delphinidae	Rough-toothed Dolphin	31°54'1'229"N, 31°52'3'487"E	Gamas, Medit., Sea, Egypt	June 2018	Beached & stranded (Not confirmed)
<i>Monachus monachus</i> (Hermann, 1779) Family: Phocidae	Monk Seal	31°08'7'258"N, 28°02'7'378"E	Ras Elhekma, Medit., Sea, Egypt	1990	live
		31°15'20.8"N, 27°15.4'59"E	Matrouh, Medit., Sea, Egypt	1990	live
		31°33'09"N 25°09'27"E	Sallum, Medit., Sea, Egypt	2017	live
<i>Zalophus californianus</i>	Sea lion	31°52'5'531"N, 31°8'26'797"E	Damietta, Medit., Sea, Egypt	2013	live

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