

First report of false killer whale *Pseudorca crassidens* in Bizerte, Tunisia

Primer reporte de falsa orca *Pseudorca crassidens* en Bizerta, Túnez

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Abstract. False killer whale (*Pseudorca crassidens*) is a species of oceanic dolphin that is the only extant representative of the genus *Pseudorca*. It is found worldwide but mainly frequents tropical regions. This manuscript deals with the first sighting and stranding event recorded of the false killer whale in Mediterranean waters of Bizerte, northern Tunisia. The species has never been reported in the area despite years of collecting anecdotal and scientific information of cetaceans. This report extends previous knowledge of the false killer whale in the Mediterranean Sea.

Key words: False killer whale, Mediterranean Sea, Tunisia

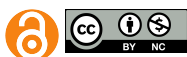
INTRODUCTION

False killer whale *Pseudorca crassidens* (Owen, 1846), is one of the largest cetaceans in the family Delphinidae; it is a deep-diving dolphin, primarily found in open ocean waters (Baird 2002). The species appears highly social and typically lives in groups including females, males, juveniles, and calves. Calving interval for one population has been reported as almost 7 years, and calving may occur year-round, with a peak in late winter (Baird 2002).

False killer whales are long-lived, slow to reproduce, upper-trophic level predators, and as such are subject to effects of a number of different anthropogenic stressors. The overlap of their diet with species targeted by fisheries, in particular high-value species like tunas and billfishes, results in a number of types of interactions that can reduce local populations, although the sparseness of observer coverage in most hook-and-line and other fisheries within the range of false killer whales limits the available information (Baird 2018). In addition, false killer whale is one of several species known to mass strand, which could have the potential to affect local populations (Liebig *et al.* 2007, Reeves *et al.* 2009).

False killer whales have a worldwide distribution, occurring mainly in deep tropical to warm temperate waters, although they appear occasionally in higher latitude areas or move into shallow waters (Jefferson *et al.* 2015, Palmer *et al.* 2017, Baird 2018). They are occasionally observed in some semi-enclosed seas such as the Mediterranean, for which they are recognized as a visitor species (Reeves & Notarbartolo Di Sciara 2006, Jefferson *et al.* 2015). Nonetheless, frequent occurrences of the species in the Levantine Sea, may prompt a future reconsideration of its status from visitor to locally regular (Notarbartolo Di Sciara 2016). Notarbartolo Di Sciara (2016) explains the occurrence of small groups and individuals of false killer whales in the Mediterranean by their crossing from warmer waters of the Atlantic Ocean, and possibly from the Red Sea through the Suez Canal as Lessepsian migrants.

The aim of the present note has been to describe the first record of *Pseudorca crassidens* in Tunisia, which is considered valuable information for the general knowledge of the Mediterranean distribution of this species.



MATERIALS AND METHODS

The study of stranded cetaceans in Tunisia was strengthened at the beginning of 2004 through the creation of National Stranding Network; this program was included in the activities of the marine biodiversity laboratory, National Institute of Sea Sciences and Technology (INSTM). For each stranding event, different data is recorded, such as date and time, GPS coordinates or geographic location, environmental conditions (including coast topography), body measurements, sex, and species. Species identification was carried out based on Jefferson *et al.* (2015). Necropsy was performed using Jauniaux *et al.* (2002) methodology, and the skeletal recovery was carried out at Sidi Thabet National School of Veterinary Medicine's Anatomy Service (ENMV).

RESULTS AND DISCUSSION

SPECIES IDENTIFICATION

On March 29 of 2019, a dolphin was observed at the fishing port of Zarzouna (Bizerte) by Mediterranean Action Nature (MAN), a non-governmental organization (Fig. 1a). The external appearance of this cetacean (black body, rounded head, and sickle-shaped dorsal fin) allowed it to be identified as a false killer whale, approximately two meters in length (Fig. 1b). Surveys made by INSTM researchers on March 30 (one day after reporting) failed to locate the animal.

After three days (April 02, 2019), a dolphin was reported stranded at El Houichette beach (Fig. 1c, d), which is located northwest of Bizerte city (37°17'38"N, 09°34'27"E) (Fig. 2). The stranded animal was approximately the same size (~2 m total length) as the one recorded at fishing port of Zarzouna (Bizerte) several days earlier, suggesting that it might be the same individual.



Figure 1. *Pseudorca crassidens* specimen. a-b) Animal observed at the fishing port of Zarzouna. Photo taken by MAN. c-d) Stranded specimen (carcass) on El Houichette beach, north of Bizerte. Photo taken by Hassen Jerbi / *Pseudorca crassidens*. a-b) Animal observado en el puerto pesquero de Zarzouna. Foto tomada por MAN. c-d) Ejemplar varado (cadáver) en la playa El Houichette, norte de Bizerta. Foto tomada por Hassen Jerbi

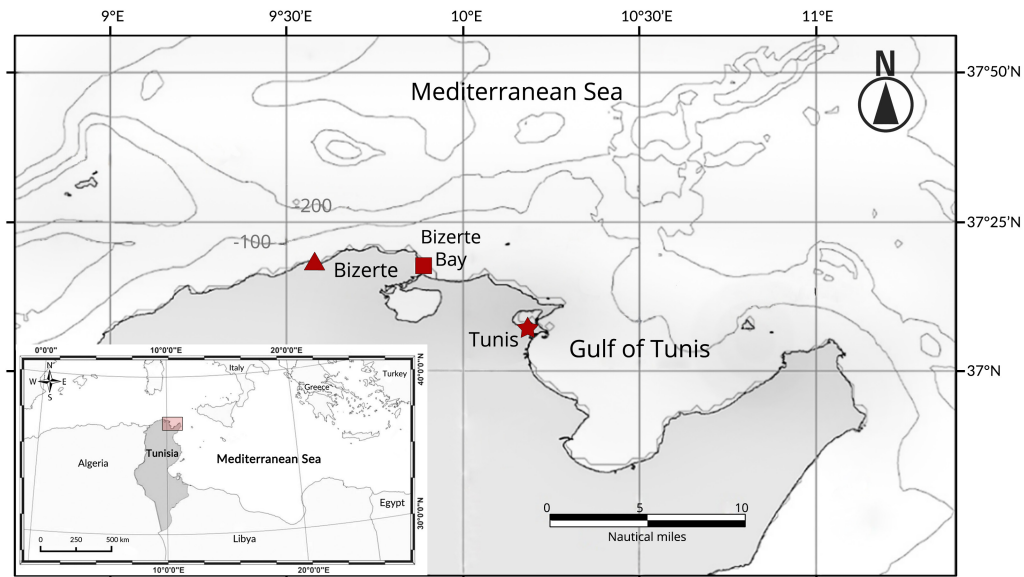


Figure 2. Map of northern Tunisia. The square indicates the location of Zarzouna fishing port and the triangle the location of *Pseudorca crassidens* stranded specimen in the north of Bizerte city / Mapa del norte de Túnez. El cuadrado indica la ubicación del puerto pesquero de Zarzouna y el triángulo la ubicación del espécimen varado de *Pseudorca crassidens*, al norte de la ciudad de Bizerta

External examination of the specimen, and particularly the: i) rounded head of gracile shape, ii) small falcate dorsal fin located at the midpoint of the back, and iii) long strongly curved pectoral flippers with a pronounced corner, allowed the classification of the specimen as false killer whale.

Morphometric measurements of the animal are shown in Figure 3 and reported in Table 1. The animal, which had a total length of 197 cm and a weight of 54 kg, is considered as a newborn calf according to Jefferson *et al.* (2015). This result corroborates those of Odell & McClune (1999), who noted that the typical size of a new-born calf is generally 1.6-2.0 m long.

Table 1. Morphometric measurements of a *Pseudorca crassidens* specimen stranded at El Houichette beach, northern Bizerte city, Tunisia / Medidas morfométricas de un espécimen de *Pseudorca crassidens* varado en la playa de El Houichette, al norte de la ciudad de Bizerta (Túnez)

Landmark N°	Measurements	Length (cm)
1	Total length	197.0
2	Snout to base of dorsal fin	102.0
3	Snout to blowhole	31.5
4	Snout to center of eye	27.5
5	Snout to anterior insertion of flipper	19.0
6	Posterior length of the pectoral fin	16.0
7	Maximum width of the pectoral fins	10.0
8	Maximum length of the pectoral fins	22.0
9	Tip of the lower jaw in the center of the genital slit	118.0
10	Snout to anus	123.0
11	Fluke width	26.0
12	Width of the middle of the tail	11.5

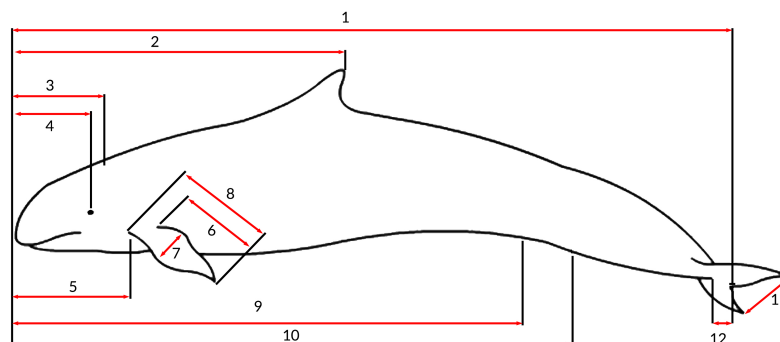


Figure 3. Morphometric parameters of stranded *Pseudorca crassidens*. See Table 1 for the meaning of landmark numbers / Parámetros morfométricos de *Pseudorca crassidens*. Ver Tabla 1 para conocer el significado de los números de referencia

NECROPSY

The false killer whale was likely a few weeks old since there is persistence of the umbilical artery (Fig. 4); this fact was verified by the absence of erupted teeth. Mammary slits were present on each side of the genital slit. Both sides of the body were carefully examined; there were no injuries related to death from a shark attack or a ship collision. This animal appeared thin and had several traces of superficial wounds, which were most possibly caused after his death. The necropsy revealed no signs of infection, such as foul smell, ulcers or suppuration that might be present in the blowhole, mouth, throat, anus or the urogenital opening. Corpse examination showed a normal appearance and size of the internal organs, as no alteration, hemorrhage or parasitic infection was noted (Fig. 4).

A complete examination of the digestive tract was performed: there were no ulcers, hemorrhages, bruises or lacerations in the stomach. For the intestines (from the pylorus to the anal opening), there was no obstruction, foul odor nor ulcer of any kind. There was no trace of food in the digestive tract either. Because there was no trace of food in the digestive tract, it is assumed that hunger was related to the death of this specimen, who was probably separated from its mother before finishing the nursing period.

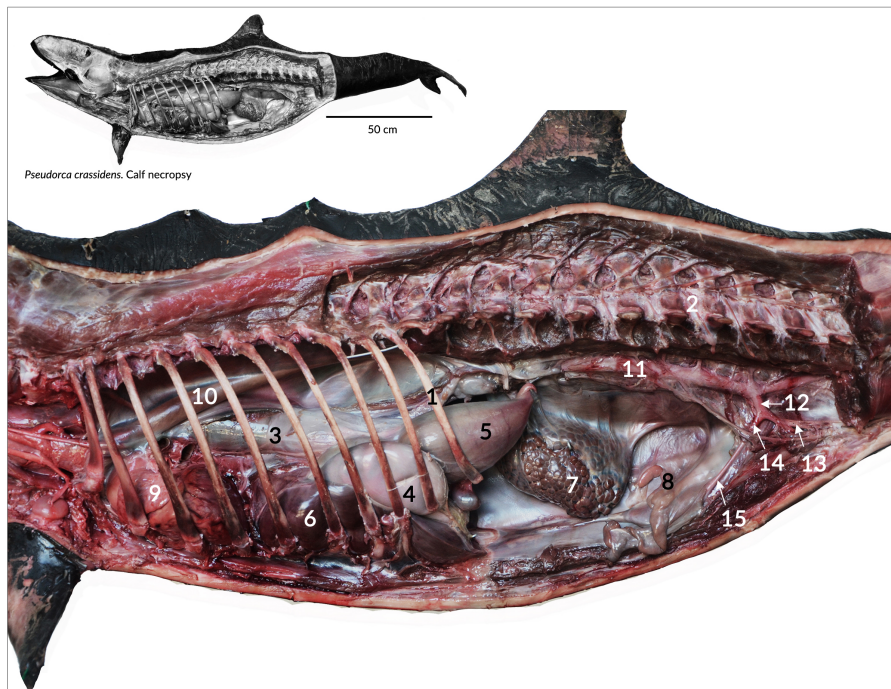


Figure 4. Macroscopic necropsy observations of *Pseudorca crassidens* calf, stranded in Tunisia. Note the persistence of the umbilical artery (15). Photo taken by Hassen Jerbi. 1: Rib, 2: Transverse process, 3: Oesophagus, 4: Main stomach, 5: Forestomach, 6: Liver, 7: Kidney, 8: Uterus, 9: Right auricle, 10: Thoracic aorta, 11: Descending aorta, 12: Common iliac artery, 13: External iliac artery, 14: Internal iliac artery, 15: Umbilical artery / Observaciones macroscópicas de la necropsia de una cría hembra de *Pseudorca crassidens*, varada en Túnez. Nótese la persistencia de la arteria umbilical (15). Foto tomada por Hassen Jerbi. 1: Costilla, 2: Proceso transverso, 3: Esófago, 4: Estómago principal, 5: Preestómago, 6: Hígado, 7: Riñón, 8: Útero, 9: Aurícula derecha, 10: Aorta torácica, 11: Aorta descendente, 12: Arteria ilíaca común, 13: Arteria ilíaca externa, 14: Arteria ilíaca interna, 15: Arteria umbilical

OTHER REMARKS

The cause of mother / calf separation will surely remain a mystery. Several hypotheses are possible: (1) first birth of a primiparous female, (2) death of the mother at the time of parturition, due to an illness or following an anthropic cause (e.g., vessel collision), or (3) separation of mother and calf due to unfavorable weather, assuming that the calf is too weak to follow the mother (Van Waerebeek *et al.* 2007, Flower *et al.* 2018, Li *et al.* 2021).

On April 26, 2019 a group of 30-40 false killer whales (adults and young specimens) was sighted traveling parallel along the coast of Sorrento Peninsula (province of Salerno, South Italy) (Maio *et al.* 2019), which may have been the group that the stranded animal originated from. These dolphins must have crossed northern Tunisian waters during their passage.

Since the late 18th century, there have been 45 records of false killer whales in the Mediterranean Sea: 29 in the western basin and 16 in the eastern basin; 16 strandings, 9 bycatches and 20 free-range animals (Calogero 2021). This work reports the first record of a false killer whale in Tunisia and along the African coast; the complete absence of occurrences in this area is likely explained by the lack of field surveys. So, this record could verify that false killer whales use the central Mediterranean Sea for reproduction as suggested by Calogero (2021).

According to IUCN Red List, false killer whale is currently assessed as Near Threatened (NT) at global level, although the data available seem to be insufficient to understand the population trend (Dede *et al.* 2020). Therefore, any information of such rare species is valuable to understand the distribution of the species as well as the regional biodiversity.

Non-governmental organizations (NGOs), especially those in continuous contact with fishermen and fisherwomen, can contribute to improve our basic knowledge of cetaceans. Cooperation of scientific research institutes with NGOs should be further encouraged through citizen science projects and initiatives.

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