A record of the rare false killer whale dolphin *Pseudorca crassidens* of Abo-Gallum marine protecting area, south Sinai, Egypt

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**Abstract**

The false killer whale (*Pseudorca crassidens*) is one of the lesser-known large odontocetes. These are large members of the delphinid family. One male of 5m total length (TL) and one-ton body weight (BW), characterized by 6 pairs of long slits and a single short dorsal fin of *P. crassidens*, incidentally found (caught) by fishermen in Red sea (6Km nearest Abo-Gallum protectorate) of South Sinai on 7 April, 2017 is documented here being a rare record from Egypt. These specimens are unknown from Egyptian waters from Red sea and Mediterranean Sea regions possibly appear in unspecified area in Saudi and Yemen and AL-Aqaba bay, but only published record was from Abo-Gallum. The present record appears to be the first published from Egypt with detailed collection data. Unusual mortality events are usually unexpected and infrequent. As discussed below, unusual Environmental conditions are probably responsible for most unusual mortality events and marine Mammal die off.

**Key words:** Dolphin, *Pseudorca crassidens*, South Red Sea, Abo-Gallum protection, Distribution Ecology, biometric, behavior

**Introduction**

The false killer whale (*Pseudorca crassidens*) is one of the lesser-known large odontocetes. These are large members of the delphinid family, adult males reaching 6 m, while adult females reach 5 m in length. The skull is similar to that of *Orcinus orca*, but the two species don’t seem to be closely related. The color is largely black or dark grey, with a white blaze on the ventral side between the flippers. The head is rounded, without a beak, the body shape elongate, the dorsal fin falcate and positioned in the middle of the back. In males, the melon protrudes farther forward than in females ([Fig.1](#)). The jaws of *P. crassidens* hold 8-11 pairs of thick teeth and have an overhang, with the upper jaw protruding forward past the lower jaw. The thin sickle shaped dorsal fin of the false killer whale is also slightly tapered and can measure as much as 40cm tall [2][3].

False killer whales are known for their depredation of fishing loglines and this behavior has resulted in being hunted and fired upon by fishermen in several parts of their range, including Japan where they are a target of the annual drive-hunt fisheries. (*Pseudorca crassidens*), Other name : False pilot whale Blackfish Maximum length : Male: 6m, Female: 4.5m, Calf: 2m Maximum weight: Male: 2, 200kg [4]. Female: 1, 200 kg. Calf: unknown

*P. crassidens* generally does not range beyond 50° latitude in either hemisphere [5] and is found world-wide in tropical and warm-temperate waters. It ranges north to Maryland, Scotland, Japan, Hawaii, and Alaska and south to Patagonia in Argentina, Cape Province, South Australia, Tasmania, South Island of New Zealand, Chatham Islands, and southern Chile [6]. Although there are numerous records of animals seen in cool temperate waters, these appear to be outside the normal range. Wanderers have been recorded as far afield as Norway and Alaska [7].
Although widely distributed, the species is not really abundant anywhere. There is no estimate of global abundance or of global or regional population trends [1][6].

**Reproduction**: The false killer whale is suspected to be using a polygynandrous or promiscuous mating systems where any member of a single sex can breed with any member of the opposing sex [10]. *Pseudorca crassidens* can breed throughout the year without dependence on any season [5] although there is a peak in December and January which is followed again by another peak in March [3]. Female false killer whales continuously ovulate until conception occurs. Sexual maturity occurs at 8-11 years in females and 8-10 years in males; females are not reproductively active beyond 45 years old [3]. After giving birth females do not breed for about 7 years afterwards [10]. This species has been known to mate with *Tursiops truncatus* (common bottlenose dolphin), to produce a reproductively viable hybrid offspring referred to as a wholphin [11].

**Food**: Although false killer whales eat primarily fish and cephalopods, they also have been known to attack small cetaceans and, on one occasion, even a humpback whale [5]. Depending on location, stomach contents included salmon (*Oncorhynchus* sp.), squid (*Bberypeithis magister* or *Gonatopsis borealis*), sciaenid and carangid fish, bonito (*Sarda* sp.), mahi mahi or dolphin-fish (*Coryphaena hippurus*), yellowfin tuna (*Thunnus albacares*), yellowtail (*Pseudosciana* spp.), perch (*Lateolabrax japonicus*), mackerel, herring and smelt [9].

Koen-Alonso et al. [12] examined the stomachs of false killer whales from both coasts of the Strait of Magellan, Chile. The most important prey was the oceanic and neritic-oceanic squids *Martialia hyadesi* and *Illex argentinus*, followed by the neritic fish *Macruronus magellanicus*. The prey species were subantarctic, with twoantarctic species, abundant over the Patagonian shelf and adjacent oceanic waters around Tierra del Fuego. There are reports that *Pseudorca* fed on and chased other dolphins in the eastern tropical Pacific during chase and backdown operations of tuna purse seine fishing, a habit that has also been attributed to the pygmy killer whale (*Feresa attenuata*) [9].
Threats

Direct catch: *Pseudorca* are occasionally taken in Japan for food and at St. Vincent Island in the Caribbean for meat and cooking oil [5][9]. In a molecular monitoring of 'whalemeat' markets in the Republic of South Korea, false killer whale meat was detected. Significant inconsistencies were found in the expected frequencies of products from most species, including a large over-representation of false killer whales [13].

Incidental catch: Incidental take of small numbers of false killer whales in gill nets has occurred off northern Australia, the Andaman Islands, and the southern coasts of Brazil and in tuna purse seines in the eastern tropical Pacific. Dolphin entrapment in tuna purse seine nets may be providing artificial feeding opportunities for *Pseudorca* on other marine mammals [9][14].

Ocean Noise Pollution
Ocean noise pollution from such things as military sonar, seismic surveys and vessel traffic imperils marine wildlife. To decrease the incidence of cetacean strandings and other ecological tragedies, Sea Shepherd Legal works to bolster protective laws, demand enforcement and respond to activities that add to the deafening roar.

Marine Pollution
Congested with pollution ranging from plastics to derelict fishing gear, the oceans have become a veritable minefield for marine species. Sea Shepherd Legal aims to address these concerns by working to strengthen responsive laws, enhance enforceability and discourage irresponsible practices.

Climate Change
Climate change exacerbates all other threats to marine wildlife and habitats - disastrously skewing ocean temperatures, ecological cycles, and food sources. Sea Shepherd Legal is committed to ensuring that decisionmakers take the impacts of climate change into consideration when determining the adequacy of marine species protections, Yang et al. [15] reported on by-catch rates in Chinese coastal fisheries (trawl, gill and stow net) which may number in the hundreds per year for *P. crassidens* alone. Between 1994 and 2006, 24 false killer whales were observed hooked or entangled in Hawaii-based longline fisheries, with approximately 4-34% of all effort observed. Fifteen additional unidentified cetaceans, which may have been false killer whales based on the observer's descriptions, were also taken (hooked or entangled) in this fishery [16]. The rate of mortality and serious injury to false killer whales within the Palmyra Atoll EEZ in the Hawaii-based longline fishery is estimated at 1.2 animals per year [17]. There was 1 reported fisheries-related stranding of a false killer whale in the Gulf of Mexico during 1999-2006 [18]. Stuck in the mangroves, most of the animals either died or had to be euthanized. Despite their threatening name, false killer whales largely feed on fish and cephalopods and are part of the dolphin family. The mammals are known to travel in large groups. On Saturday, officials found 95 of them stranded near the western boundary of Everglades National Park, north of Highland Beach. They ranged from young calves to mature adults, which can weigh about 1,500 pounds. Efforts to herd the animals into deeper water were unsuccessful, as the mammals had become deeply embedded in the mangroves, the National Oceanic and Atmospheric Administration said. Of the 95 whales spotted, 82 have died: Most died on their own, while about 10 beached animals were euthanized by scientists after being found in "extremely poor" condition. As of Monday, 13 animals remained unaccounted for.

In 2013, 30 of the dolphins beached themselves in shallow sands in northeastern Brazil, halfway between the cities of Fortaleza and Natal. In June 2015, Hurghada Misdemeanour Court affirmed a six-month-imprisonment sentence for a boat captain for harassing dolphins. The captain was also fined on charges of disturbing dolphins, threatening their lives and compelling them to flee areas where they take care of their young, violating the Natural Protectorates law. Established in 1983, Law No 102 for Nature Protectorates forbids catching, transporting, killing or disturbing wildlife, and stipulates that an aggressor will be fined between EGP 500-5000 with the possibility of imprisonment for up to a year. For repeat offenders, the fine reaches between EGP 3000-10,000. Little is known about false killer whales, the fourth-largest member of the dolphin family, which lives in warm, deep waters in all three major oceans. Stranding of false killer whales has happened before, with the largest occurring in

Fig 3 A total of 95 false killer whales were stranded near the Florida Everglades

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1946 when an estimated 835 became stranded near an Argentinean beach.
The pod of dolphins beached in Florida was first spotted on Saturday in a remote site near Hog Key, a stretch of the mainland that sits amid a dense network of islands off southwest Florida, according to the Miami Herald. After the Coast Guard confirmed the sighting of the black dolphins, efforts to herd the mammals into deeper waters failed on Saturday and Sunday, Ms. Mase of NOAA told reporters.
The dolphins – in a group which included adults, juveniles, and calves – were “deeply embedded in some of the mangroves, making response efforts extremely difficult,” Mase told the Herald. Rescuers ended up euthanizing nine dolphins too sick to survive, while 72 died on their own by Sunday, said Mase.

Because of insufficient data, it is unknown how many false killer whales there are worldwide, according to the IUCN Red List, one of the most comprehensive databases of the conservation status of animal and plant species.

Pods in the northern Gulf of Mexico number 1,038, according to a 2004 study that IUCN (International Union for Conservation of Nature and Natural resources) cites, IUCN (also cites a 2006 study that found that false killer whales, like beaked whales, are “likely to be vulnerable to loud anthropogenic sounds, such as those generated by navy sonar and seismic exploration.”

As NOAA plans to study samples of the dead dolphins to determine why they swam ashore, previous stranding offer different clues

January 17, 2017 —in the largest recorded stranding of false killer whales in Florida history, at least 81 of the large black dolphins died after they became trapped over the weekend near a mangrove-filled shoreline in the Gulf of Mexico.

April, 2017 one specimen of P. crassidens was record by fishermen in the Red sea South Sinai-Egypt. The specimen is fully documented here along with data for other Egyptian specimens.

Material and Methods

Research area

Abu Galum is a Managed Resource Protected Area that covers an area of about 400km², situated on the east coast of South Sinai, right between Dahab and Nuweiba. It protects various coastal and mountain ecosystems that are unique to the Gulf of Aqaba. The coral reef is mostly undisturbed with a high diversity of reef fish, whose richness of its flora and fauna is overwhelming. (Fig 4)

A one-ton and five-meter dolphin was found dead on the coast of Abu Galum, a protectorate in Southern Sinai [37].

The Environment Ministry dubbed it one of the biggest dolphins in the world, comparing its size to the Killer Whales, or Orca, according to Egypt Independent.

The administration for South Sinai protectors provided support to the Abu Galum team with the help of the local community there, Egypt Independent reported. Sheikh Salama Masmah, head of al-Hayawat tribe, provided safe transportation to take the dead dolphin to where it will be buried in the protectorate[37].

The protectorate, headed by Ahmed al-Sadeq, took the necessary samples needed for studies. Its skeleton will be taken to an Egyptian museum for scientific research purposes. The cause of the death is, so far, unknown[37].

While the area is diverse with marine creatures, dolphins are quite the sight roaming around the Red Sea. However, pollution and disruption often endanger the ecosystem

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The captain was also fined on charges of disturbing dolphins, threatening their lives and compelling them to flee areas where they take care of their young, violating the Natural Protectorates law.

Taxonomy

Kingdom:Animalia
Phylum:Chordata
Class:Mammalia
Order:Cetacea
Family:Delphinidae
Genus:Pseudorca
Species:crassidens

The specimen was transported to the Abu Galum protectorate, where it was photographed and measured to (0.1 cm).

Fig 4. South Sinai, Abu-Galum

Observations and Discussion

The specimen was a male of 5meter total length (TL) and one-ton body weight(BW), characterized by 6 pairs of long slits and a single short dorsal fin (Fig 5). The dorsal body surface was bluish-grey with dark spots, the ventral surface being uniformly white (Fig 5).The upper jaw teeth were sharp, can in –like without serrations, whereas the lower jaw teeth were incisor-like with outwardly angled. Serrations, being thought to be a characteristic of P. crassidens
**Fig. 5** *Pseudorca. Crassidens* on the coast of Abu Galum, a protectorate in Southern Sinai.

*Pseudorca crassidens* or false killer whales are a large toothed whale that lives in the tropical and sub-tropical open ocean. Migration is not well documented, although it has been suggested that closely related globicephalid whales including *Globicephala, Pseudorca* and *Grampus* species in the western North Pacific move from warmer, southern waters in winter to cooler, northern waters in summer. Apparent seasonal movements in the western North Pacific may be related to prey distribution. False killer whales have been seen travelling in line formation, and one large herd of about 300 individuals was distributed over an area several km long and about one km wide. Reported travelling speeds are 3-6 knots and as high as 10 knots [9].

*Pseudorca* have long-term bonds. They share their prey, not only with their companions, but also with humans. A *Pseudorca* that was alone in British Columbia and Washington from the late 1980s until a few years ago, far from their normal range of Mexico, repeatedly caught large salmon and would offer them to boaters.

The terms “beached” and “stranded” often are used interchangeably in regard to marine mammals. However, for the purpose of this discussion, we will follow the definitions of [19], using the term “beached” to refer to any dead marine mammal that washes up on shore, and “stranded” to refer more restrictively only to live cetaceans or sirenians that swim onto or are unintentionally trapped onshore by waves or receding tides. Animals outside of their “normal” habitat are also sometimes considered “stranded” even though they may not have beached themselves [20]. For shorelines with high human usage, a live pinniped, sea otter, or polar bear found ashore may be considered stranded if it is seen as a potential threat to human health or safety. Other wise, in the United States, it is considered by the NMFS to be “in its element,” even if it is ill or injured, and therefore is not stranded [21]. Accordingly, because death usually occurs at sea, beached animals almost always occur individually, whereas stranding can occur singly or as a group or mass stranding defined by [22] as three or more individuals of the same species stranded in the same general area at approximately the same time. Mass stranding events usually involve social odontocetes including pilot whales (*Globicephala*) and Atlantic white-sided dolphins (*Lagenorhynchus*). Stranding frequency varies geographically and population sizes and nearness to shore are among the factors that are thought to influencing stranding patterns.

For a review of the occurrences and causes of marine mammal mass strandings see [23] [24]. The occurrences of several recent mass strandings of beaked whales have been correlated with military uses of LFA sonar systems. Panic flight responses to predators (including humans); cohesive social bonds causing the entire herd to follow one strander; and near-shore disorientation of echolocation or geomagnetic signals used for navigation. The latter explanation is based on an assumption that odontocetes are capable of detecting and responding to the Earth’s magnetic field direction or intensity or both. Biological magnetic detectors (small crystals of a magnetic form of iron oxide, magnetite) have been found in diatoms, intertidal mollusks [25], and sharks and rays [26] and have been suggested for insects and birds [27] and fin whales [28]. Magnetic material has been found in the brains, bone, blubber, and muscle of the bottlenose dolphin, Cuvier’s beaked whale, Dall’s porpoise, and the humpback whale [29]. Magnetite crystals are thought to continually orient themselves in line with the earth’s magnetic field, just like a compass. By sensing changes in the orientation of these crystals, the host animal is thought to be able to determine the direction in which it is traveling, a useful ability during extended open-ocean migrations. Normally, the natural magnetic force fields run north to south at an even intensity. In some places, however, the field is distorted by certain types of geological formations, such as those rich in iron. Such distortions are called geomagnetic anomalies.

Because some live strandings of whales occur in areas where geomagnetic anomalies are present, it has been suggested [30, 31, 32] that these strandings may be the result of navigational mistakes on the part of whales attempting to use their magnetic sense.

The behavioral association between yellowfin tuna and several species of dolphins (particularly *Stenella attenuata*, *S. longirostris*, and *Delphinus delphis*) in the eastern tropical Pacific (ETP) is not well understood. However, it has long
been used by the tuna purse seine fishery to locate and catch yellowfin tuna [33]; small quantities of skipjack and big eye tuna are also taken in this way. When tuna seiners sight dolphin schools and yellow fin tuna, nets are set around all of the animals and the net circle is then tightened and closed, trapping both tuna and dolphins. Dolphins killed in these sets are easily counted; however, an additional unobserved mortality of dependent calves separated from their mothers is estimated to be about 10% of observed deaths [34]. By 1970, 200,000–300,000 dolphins were being killed each year in tuna purse seine operations. Throughout the 1960s and into the early 1970s, the U.S. fleet dominated this fishery and was responsible for more than 80% of the dolphin mortality for example, 133,174 dolphins were killed in the tuna fishery [35].

Michael Greshko. 2017 [writes online science news stories on everything from animal behavior to space and the environment]. Dozens of false killer whales have died under mysterious circumstances after stranding themselves on a remote shoreline in Florida’s Everglades National Park.

The U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries Service reports that 95 false killer whales stranded themselves at Hog Key, on Florida’s southwestern coast. Since the U.S. Coast Guard spotted the animals on Saturday, 82 of the animals have died. The Miami Herald reports that the stranding was the largest for false killer whales ever recorded in the state.

False killer whales are the fourth-largest members of Delphinidae the family of aquatic mammals comprising dolphins and can grow between 16 to 20 feet long. They look similar to killer whales but lack orcas’ distinctive white spots. While false killer whales have been spotted as far north as Alaska and western Canada, they are primarily found in the tropics. They are highly social, typically found in groups of 10 to 20 that comprise schools numbering in the hundreds.

In an interview with the Miami Herald, Blair Mase, the coordinator of NOAA’s mammal stranding network, described the stranding as a rare occurrence. The last known stranding occurred in 1986, when three whales in a pod of 40 stranded themselves at Cedar Key, along Florida’s western coast. Six years before, 28 whales stranded off of Key West. And a January 1970 report from southeastern Florida describes a stranding that may have included 150 to 175 individuals, though researchers at the time could not confirm these estimates.

These numbers pale in comparison to the largest stranding on record, when 835 false killer whales beached themselves on Argentina’s shores in 1946.

Sometimes lasting change takes a lot longer than it should. Consider, for example, the U.S. Navy's testing and training with heavy explosives and high-intensity sonar in species-rich coastal waters around the world.

Baird[1] suggests that local marine mammal species, such as the region’s resident pilot whales, may be used to the sound of the sonar, and thus less affected by it. Baird[1] speculates that Hawai‘i's resident whale and dolphin populations have become accustomed to the sound of sonar. If the frequency of sonar events in certain Hawaiian water is significantly reduced, Baird[1] says, it’s feasible that local animal populations might become increasingly alarmed by the noise as it becomes less familiar. This speculation is based on his own knowledge and experience, but he thinks that the tracking data they’re collecting and analyzing now will eventually support this assumption.

Of course, not all scientists agree with Baird’s theory (2009).

Diane Claridge[38], executive director of the Bahamas Marine Mammal Research Organisation, acknowledges that whales that are accustomed to sonar are less likely to strand themselves and die when they hear the noise. But she says the noise can disrupt their feeding, which can cause lactating females to lose a calf. To that end, it’s her opinion that the limitations might increase whale survival.

IUCN also cites a 2006[36] study that found that false killer whales, like beaked whales, are “likely to be vulnerable to loud anthropogenic sounds, such as those generated by navy sonar and seismic exploration.”

As NOAA plans to study samples of the dead dolphins to determine why they swam ashore, previous strandings offer different clues.

Conservationists have fought the Navy’s use of sonar and explosive testing for years because, they argue, it interferes with marine mammals’ migration and communication patterns, as well as their ability to find feeding and breeding locations.

The future of marine mammal conservation requires better information on the population status and ecological relationships of marine mammals with their ecosystems as well as greater understanding of the effects of human-induced activities.
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1 References


