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# Short Note

# First Leucistic Bottlenose Dolphin (*Tursiops truncatus*) Sighting Registered in the Gulf of California, Mexico

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The bottlenose dolphin (*Tursiops truncatus*) is one of the most widely distributed and well-studied cetacean species in the world (Norris & Prescott, 1961; Wells & Scott, 2002). It is a cosmopolitan species distributed in temperate and tropical oceans and is very common in the Gulf of California (GOC). There are two ecotypes, coastal and oceanic, which are differentiated morphologically, ecologically, and genetically (Díaz-Gamboa, 2003; Segura et al., 2006; Segura-García et al., 2018). Bottlenose dolphins are distinguished from other species of dolphins by their medium size, robust bodies, short rostrum, moderately falcate dorsal fin, and coloration pattern. The coloration pattern is light gray to dark gray on the dorsal and lateral areas and lighter in the ventral area of the body. The body can have a distinct dark layer over a lighter area, which is sometimes not very visible when the overall coloration pattern is very dark (Wells & Scott, 2002).

As with all mammals, coloration patterns of the skin, and of the eyes in cetaceans, depends almost entirely on the quantity of melanin in the organism (Fertl & Rosel, 2002; Fertl et al., 2004). The enzyme tyrosinase plays an important role in the biosynthetic production of melanin. Genetic variations in this process affect the production of melanin (Fertl & Rosel, 2002). Leucism can result when the production of melanin is minimal but not completely absent; the deficiency of pigmentation of the skin results in an abnormally white appearance (hypo-pigmentation), while the eyes maintain a normal color. This normal eye color distinguishes leucism from albinism (total absence of pigmentation) in which the skin is completely white and the eyes are reddish in color due to capillary exposure (Fertl & Rosel, 2002; Acevedo et al., 2009; Lydersen et al., 2013; Filatova et al., 2016).

Leucism is a different condition than piebaldism in which only a few areas of the body present low levels of pigmentation (Fertl & Rosel, 2002). Previous reports have not often differentiated between albino and leucistic animals, but, rather, sightings were usually classified as animals with abnormally white pigmentation. Although little is known about how common abnormally white cetaceans are, several potential problems associated with this condition have been discussed—for example, they can be more vulnerable to predation, due to lack of camouflage, or more notable to prey (Hain & Leatherwood, 1982; Fertl & Rosel, 2002). In addition, abnormal pigmentation conditions are thought to affect function and adaptation (Caro et al., 2011), and appear to be associated with various pathologies such as anemia, nervous system and sensory conditions, susceptibility to infection, low survival rates, low ability to protect against UV rays, and problems with fertility and thermoregulation (Searle, 1968; Fertl & Rosel, 2002; Lydersen et al., 2013; Martinez-Levasseur et al., 2013). Also noted are socialization problems within a group due to the fact that coloration patterns often function as visual "releasers" (Searle, 1968)—for example, a mother and white bottlenose dolphin calf pair were observed swimming on the outskirts of a group of 60 bottlenose dolphins recorded feeding on a shrimp boat's discard bycatch in shallow coastal waters off western Panama (Fertl et al., 2004).

Abnormal pigmentation has been recorded in at least 25 cetacean species (Fertl et al., 1991, 2004; Forestell et al., 2001; Speckman & Sheffield, 2001; Fertl & Rosel, 2002; Acevedo et al., 2009), including *Tursiops truncatus*. Few sightings of those cetaceans with abnormally white pigmentation have been recorded in Mexico, including

records of two mysticete species—the gray whale (*Eschrichtius robustus*; Fertl et al., 1991, 2004) and the blue whale (*Balaenoptera musculus*)—both sighted in the GOC (Fertl et al., 2004). The only species of odontocete with this condition recorded in Mexico is the Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) sighted in the waters off Baja California (Fertl et al., 1991). The majority of bottlenose dolphin sightings with this abnormally white pigmentation have been recorded on the Atlantic coasts from Texas to North Carolina (Fertl et al., 1991, 2004). Therefore, the sighting reported herein represents the second odontocete in Mexico and the first confirmed sighting of a leucistic bottlenose dolphin in the GOC.

This event was recorded as part of the weekly cetacean surveys conducted from 2009 to 2018 using a 7 m skiff (known as "panga") powered by a Yamaha 115 HP outboard motor to document the temporal and spatial distribution and abundance in the eastern Midriff Islands Region of the GOC (Figure 1). The region is characterized by a series of large islands which divide the northern and southern zones of the GOC, and by upwelling and tidal currents which are especially strong in winter (Badan-Dangon et al., 1985; Álvarez-Borrego & Lara-Lara, 1991; Valdez-Holguín et al., 1999; Marinone & Lavín, 2003), and which result in high levels of productivity (Santamaria-Del-Angel et al., 1994), sustaining a wide diversity of fish, seabirds, and marine mammals. Data collected during each survey included geographic position (using an eTrex Garmin GPS), group size and composition, behavior, and associated species. In general, observations were made in conditions of Beaufort 3 or less (wind speed < 15 km/h). In addition to recording all cetacean species, photo-identification techniques were applied to all possible individuals within every group using a digital Canon 6D camera with a 75-300 mm lens. Underwater video was occasionally taken using a GoPro Silver 4.

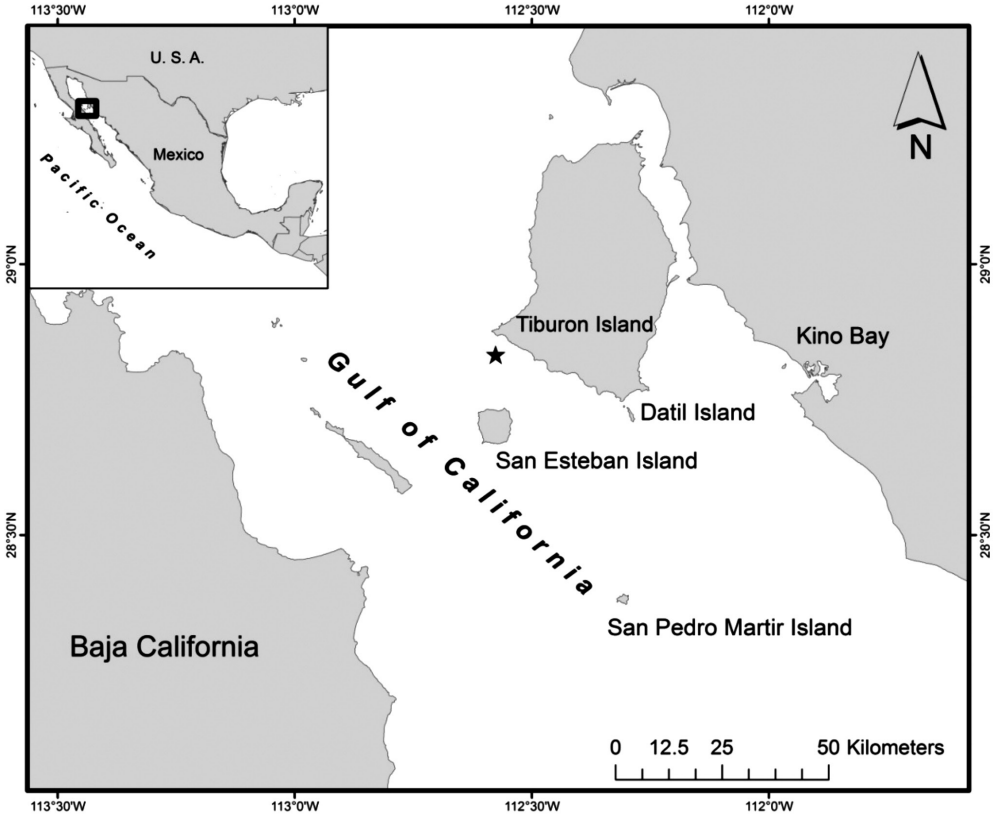


**Figure 1.** Study area in the eastern Midriff Islands Region of the Gulf of California, Mexico, and location of the leucistic bottlenose dolphin (*Tursiops truncatus*) sighted on 27 May 2016

On 27 May 2016, at 1139 h, we observed and photographed a bottlenose dolphin with abnormally white coloration associated with a group of approximately 350 individuals with normal pigmentation (Figure 2). The group, composed of three subgroups of different age classes (adults, juveniles, and calves), was slightly evasive as we approached. This group was sighted 4.8 km SE of Punta Willard (28.83302º N, 112.57610º W) at the western extreme of Tiburon Island in an area with a depth of 85 m, a sea surface temperature of 18ºC, a calm sea state (Beaufort Scale 0), and visibility of > 6 km. This sighting was corroborated by good quality photos, eliminating the possibility of error or confusion with species such as Risso's dolphin (*Grampus griseus*). During the photo-identification process of the group, certain priority was given to photographing and filming this individual which had not been seen previously, even though we regularly monitor this zone throughout the year. This individual was completely white on all of its body with the exception of the dorsal fin and the anterior dorsal surface of the head, which were light gray–white and did not contrast with the rest of its atypical coloration, except when seen in certain light conditions. In addition, the trail edge of the dorsal fin and the edges of the lips had a light gray color common to the species. Photos of the head were taken during respirations at the surface, and the dark color of the eyes was documented (Figure 2), proving that this animal was a leucistic individual and not an albino which would have had reddish eyes.

This leucistic bottlenose dolphin appeared to be a subadult, with an estimated length of 2 m. Although the ribs were noticeable, the animal did not appear to be severely emaciated or to show any evidence of illness or disadvantage in comparison to the animals in the rest of the group—no abnormal behaviors were observed nor did the animal appear to be traveling in a solitary manner. This abnormally white dolphin was completely integrated within a group of approximately 20 individuals and had tooth track marks on the body and caudal peduncle (normally evident in adult individuals), which suggest frequent interaction with the other individuals in the group. In general, this individual did not maintain a consistent navigational direction and demonstrated socialization behaviors, including jumping out of the water, head lifting, tail slapping, and rapid movements among nearby individuals. The photographs, underwater video, and description recorded during the sighting will help to identify this individual if it is sighted again.

This is the only record of a leucistic bottlenose dolphin in 7 years of monitoring within the region and appears to be the only sighting ever recorded in the GOC. This dolphin has not been re-sighted during subsequent surveys in the same zone. The rarity of recorded observations of cetaceans with this coloration is evidence of low birth rates or low survival rates of animals with this condition within the GOC. We suggest that this leucistic bottlenose dolphin corresponds to the oceanic ecotype due to external characteristics such as the animals' coloration pattern in the group (darker-colored in dorsal part of the body without evident differences in color pattern between dorsal and lateral layers) and according to characteristics mentioned by other authors such as the size of the group (> 100 individuals) and the site's depth (> 50 m) (Segura-García, 2004; Salinas Zacarías, 2005; Díaz-Gamboa et al., 2018; Segura-García et al., 2018). This suggests that this animal could have a wide range of distribution throughout the GOC, or it could be part of a group that visits the region only occasionally.

Globally, over 25 species of cetaceans have been reported with abnormally white coloration, and the disadvantages of this condition have been discussed (e.g., low survival). Despite these potential disadvantages, there are reports of some individuals who have survived to adulthood; for example, "Migaloo," the 23- to 25-year-old humpback whale who regularly visits the east coast of Australia (Polanowski et al., 2012), or an orca of at least 20 years of age in the Aleutian Islands of Alaska (Renner & Bell, 2008). Given the estimated age class of this leucistic bottlenose dolphin (subadult), the above examples could support the hypothesis that this is a group with a wide distribution, resulting in a low probability of re-sightings. It is noteworthy that this is the only leucistic individual recorded out of 1,300 bottlenose dolphins observed and photo-identified from 206 sightings in the region during a 7-year period. This atypical coloration has never been reported in other studies on this species in the same or adjacent regions in the GOC (Ballance, 1990, 1992; Heckel, 2006; Guevara-Aguirre & Gallo-Reynoso, 2015).

Although the causes of the presence of this leucistic bottlenose dolphin are unknown, this event demonstrates how little we know about the movements and habitat use of this species within the Midriff Islands Region and the GOC. Information sharing about other such sightings, including anecdotal information, could contribute to insights about the ecological and biological implications of the presence of this species in the region.


**Figure 2.** Photographs taken during the sighting record of a leucistic bottlenose dolphin: (A) Abnormal white coloration of a leucistic bottlenose dolphin and a bottlenose dolphin with normal coloration side by side; and (B) head and part of the body of the leucistic bottlenose dolphin; note the black eyes.

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