



Stranding of a pregnant dwarf sperm whale (*Kogia sima*) in Utila, Honduras

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The two extant species of the genus *Kogia* - the pygmy sperm whale (*Kogia breviceps*) (Blainville, 1838) and the dwarf sperm whale (*K. sima*) (Owen, 1866) - inhabit deep, temperate and tropical waters near continental shelves and slopes worldwide (Caldwell and Caldwell, 1989; Jefferson *et al.*, 1993). Observing live *Kogia* spp. in the wild is challenging, owing to their inconspicuous movements at the water's surface, deep water ecology, long dive durations, solitary lifestyle, and avoidance behaviors in response to approaching boats (Jefferson *et al.*, 1993; Willis and Baird, 1998). Their occurrence patterns and aspects of their biology are typically inferred from stranded or bycaught specimens (*e.g.* Kami and Lujan, 1976; Jefferson *et al.*, 1993; Cardona-Maldonado and Mignucci-Giannoni, 1999; Moura *et al.*, 2016).

Both species of *Kogia* spp. occur broadly throughout the Caribbean Sea, including the waters of Puerto Rico, Colombia, Cuba, the US Virgin Islands, St. Vincent, the Grenadines, Guadeloupe, Venezuela, Belize, and Mexico (Willis and Baird, 1998; Cardona-Maldonado and Mignucci-Giannoni, 1999; Villapol *et al.*, 2008; Gandilhon, 2012; Niño-Torres *et al.*, 2015; Ramos *et al.*, 2016; Mutis and Polanco, 2019). In the Western Caribbean, periodic strandings of *Kogia* spp. documented along the coast of Mexico and Belize indicate they occur regularly in the region (Xacur Maiza *et al.*, 1998; Cardona-Maldonado and Mignucci-Giannoni, 1999; Niño-Torres *et al.*, 2015; Ramos *et al.*, 2016). To the best of our knowledge, there is only one reported stranding of an adult *K. sima* on the mainland coast of Honduras (Marineros *et al.*, 2013). Populations of *Kogia* spp. in these areas remain poorly studied; live observations are rare and strandings often occur

in remote locations where stranded animals are rarely detected or examined (Jefferson *et al.*, 1993). Thus, gathering biological data on any stranding events of live or deceased dwarf and pygmy sperm whales is critical to better understanding their populations in the wider Caribbean region.

Here, we document the stranding of a pregnant dwarf sperm whale on the southeastern coast of the island of Utila (16°05'13.5" N, 86°53' 20.7" W; Figure 1), the smallest of the Bay Islands of Honduras near the southern end of the Mesoamerican Barrier Reef System and 35 km north of the mainland coast. Upon discovery on 24 June 2019, the specimen was in a state of advanced decomposition (Code

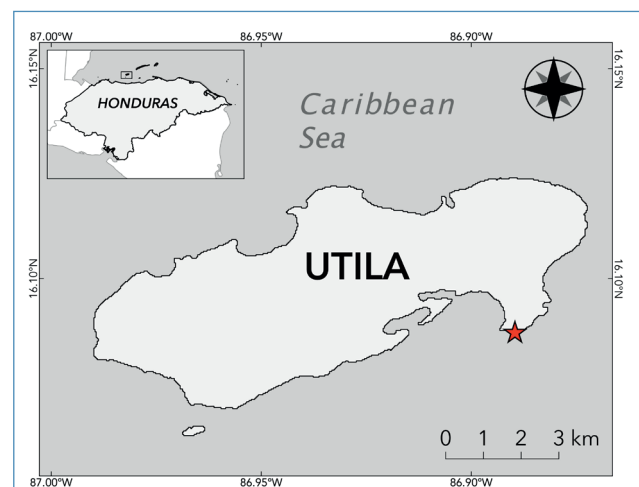


Figure 1. Map of Utila in the Bay Islands of Honduras and the location of the stranded dwarf sperm whale (*Kogia sima*) on the southeastern coast of the island (red star).



Figure 2. A pregnant adult dwarf sperm whale (*Kogia sima*) that stranded on the shores of Utila, Honduras and was found on 24 June 2019. The skin of the animal had sloughed off and its abdomen presented several large cavities. Photo credit: Andrea Izaguirre.

4 according to Geraci and Lounsbury, 2005). The stranding may have occurred up to four days prior to its discovery as the carcass was initially thought to be driftwood¹. Its bloated body was largely intact and most of its skin was sloughed off, leaving it largely white and pink in appearance (Figure 2). It presented a large opening (~0.5–1 m long) on its right side ventral to the dorsal fin, and another large cavity (~1 m long) along its ventrum from its umbilicus to its genital region (Figure 2). These wounds and various other superficial markings on the animal's entire body were likely acquired during its stranding. Images were taken at the time of discovery (Figure 2)¹; however, due to logistical constraints the body was only examined on 25 June 2019.

At the time of our arrival at 10:30h on 25 June 2019, tidal shifts and wave action had moved the whale carcass further ashore (~100 m), trapping it in a series of manmade canal-style inlets on private property. The adult specimen had decomposed significantly after one day; it was more bloated and the opening along its ventrum expanded greatly, ejecting its organs into the surrounding waters. Prior to the examination of the carcass, a fetus was found ~30 m from the adult's new location (Figure 3). The fetus (evident from its undeveloped eyes, mouth, and pectoral fins) was light grey in color and presented various external wounds and an opening along its ventrum, presumably from being forcibly disconnected from the umbilical cord (Figure 3). It showed few external signs of decomposition when found the morning of 25 June 2019, but within several hours had decomposed significantly and was classified as Code 4 (Geraci and Lounsbury, 2005).



Figure 3. The expelled dwarf sperm whale (*Kogia sima*) fetus found on 25 June 2019, ~30 m away from the location of the stranded adult female on the shores of Utila, Honduras. Photo credit: Scott Benedict.

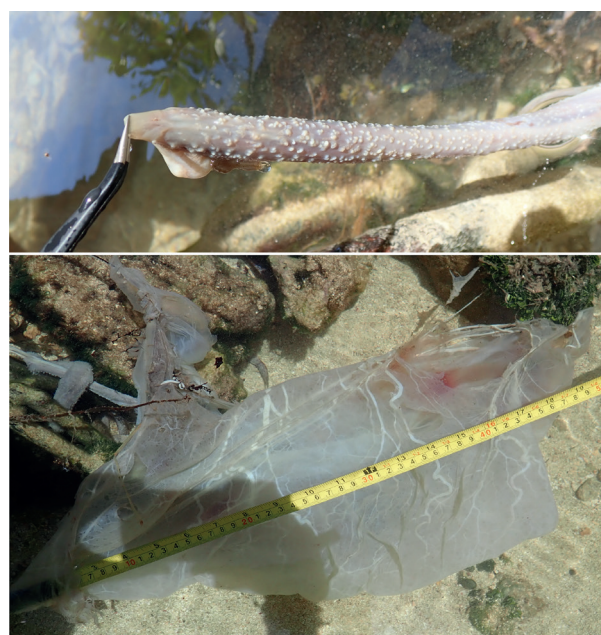


Figure 4. Sections of the umbilical cord and amniotic sac recovered near the location of the stranded adult dwarf sperm whale (*Kogia sima*) and its unborn fetus. Photo credit: Andrea Izaguirre.

Sections of the amniotic sac with the umbilical cord attached were found nearshore in shallow water between the adult and fetus (Figure 4).

Limited resources and logistical challenges prevented detailed necropsies; however, both animals were opportunistically photographed and measured with measuring tape for standard body size data (*i.e.* total body length, right flipper length, right flipper width, dorsal fin width, dorsal fin height, fluke width, and distance from rostrum tip to eye) to determine the species

¹S. Benedict, Property Manager of Paradise, Utila, Bay Islands, Honduras, 24 June 2019, pers. comm.

Table 1. Body size measurements of an adult and a fetal dwarf sperm whales (*Kogia sima*) that stranded on 24 June 2019 on the southeastern coast of Utila in the Bay Islands of Honduras and were examined on 25 June 2019. * indicates measurement was not taken.

Measurements (cm)	Specimen	
	Adult	Fetus
Total body length	234.1	64.5
Internal length of right pectoral flipper	20.8	9.8
External length of right pectoral flipper	28.7	8.8
Tip of rostrum to eye	21.6	23.0
Fluke width	*	15.7
Width at base of dorsal fin	35.9	7.1
Height of dorsal fin	10.2	3.0

and document relevant body size metrics. We also examined the adult for evidence of scarring from interactions with fisheries or other human activity. Two small samples (2 cm x 2 cm) of the skin and blubber of each animal were extracted with a scalpel and stored in a jar with ethanol in a freezer at the Kanahau Utila Research and Conservation Facility on Utila. Detailed body measurements were replicated with the measurement tool in ImageJ using the measuring tape in photographs to scale image size (Abramoff *et al.*, 2004). Body size, the dorsal fin height of the adult relative to its body length, and the placement of its dorsal fin along its body were assessed to distinguish this animal from *K. breviceps* (Handley, 1966; Ross, 1979; Willis and Baird, 1998). Following physical examination, both carcasses were wrapped in a tarp and buried at a nearby site for future excavation and assessment of their skeletons. Following extraction, both specimens will be deposited at the Museo de Historia Natural de la Universidad Nacional Autónoma de Honduras en el Valle de Sula, Honduras (Museum Accession number: MUVS-V 02140).

Table 1 lists the physical measurements taken of both animals. The adult's total body length was 234.1 cm, falling within the range of the known body lengths of adult dwarf sperm whales, of <270 cm (Handley, 1966; Willis and Baird, 1998). The adult's smaller relative body size, dorsal fin height relative to total body length (~4.4%), and the medial location of the dorsal fin indicated this individual and its unborn calf belonged to *K. sima*. Its dorsal fin was already decomposing and collapsed when measured and would have been larger than the typical length of >5% of the total animal body length considered diagnostic for this species (Handley, 1966; Ross, 1979; Willis and Baird, 1998). No evidence of interaction with human activity was detected; however, the advanced state of decomposition of the carcass likely inhibited effective examinations of possible scarring patterns or wounds.

The fetus' total body length was 64.5 cm, and the small size of its flippers, flukes, and fins (Table 1), its limited decomposition upon discovery nearby the stranded adult with an open abdomen, and the detection of the umbilical cord and amniotic sac, indicate the fetus was unborn at the time of the adult's stranding. The total body length of *K. sima* neonatal calves has been reported as ranging from 72.5-112.5 cm^{2, 3, 4} (e.g. Kami and Lujan, 1976; Ross, 1979; Caldwell and Caldwell, 1989; Debrot and Barros, 1992; Hetzel and Lodi, 1993; Souto *et al.*, 2009).

We were unable to determine a possible cause of death for the stranded adult *K. sima*. We suggest the unborn fetus was ejected from the deceased adult female due to a combination of wave action, jagged coral reef and rocks in the shallows, and its advanced decomposition, which caused the carcass to split open further, spilling its contents and the fetus into the water. Strandings of pregnant female *Kogia* spp. have been reported in multiple locations including Canada, Brazil, and Colombia (Baird *et al.*, 1996; Moura *et al.*, 2016; Mutis and Polanco, 2019).

This is the second documented stranding of *K. sima* in Honduras. The only other record was of an adult (total length: 235 cm) that stranded on 06 February 2011 at the mouth of the Gamma River in Punta Izopo National Park, 58.5 km southwest of the stranding reported here (Marineros *et al.*, 2013). Utila is surrounded by deep waters (>1500 m) at sharp drop-offs where pelagic species like rough-toothed dolphins (*Steno bredanensis*) and short-finned pilot whales (*Globicephala macrorhynchus*) have been documented (Kuczaj and Yeater, 2008), and may be inhabited regularly by *Kogia* spp. Our documentation of this stranding event on Utila Island provides additional confirmation of *K. sima* occurrence in Honduran waters, as well as key data on adult and fetal body size for the region.

Kogia spp. are considered Data Deficient by the International Union for the Conservation of Nature (Taylor *et al.*, 2012). More information is needed on their regional populations to help understand the causes of strandings and determine their susceptibility to natural and anthropogenic threats. For example, the presence of the neurotoxin domoic acid associated with algal blooms in their offshore habitats may contribute to strandings of dwarf and pygmy sperm whales on the US Atlantic coast (Fire *et al.*, 2009). Threats

²Marcondes, M.C.C., Luna, F.O. and Lima, R.P. (2002) Rescue and care of a neonate dwarf sperm whale (*Kogia simus*) predated by a cookiecutter shark (*Isistius brasiliensis*). In Abstracts, *Proceedings of the Florida Marine Mammal Health Conference*, 4-7 April, Gainesville, USA.

³Soto, J.M.R. and Ternes-Silva, S. (1998) Novos registros de *Kogia breviceps* e *Kogia simus* (Cetacea, Physeteridae, Kogiinae) no sul do Brasil e revisão dos registros em águas brasileiras. Pages 270-272 in Resumos, *XI Semana Nacional de Oceanografia*, October 1998, Rio Grande, Brazil.

⁴Brito, J.L. (1996) Segundo registro de *Kogia simus* para la costa de Chile. Page 82 in Anais, *7ª Reunión de Trabajo de Especialistas en Mamíferos Acuáticos de América del Sur y 1º Congreso de la Sociedad Latinoamericana de Especialistas en Mamíferos Acuáticos*, 22-25 October 1996, Viña Del Mar, Chile.

from anthropogenic activity include ingestion of plastic that can lead to intestinal blockage and death (Stamper *et al.*, 2006), and interactions with fisheries including bycatch-related mortality that are rarely reported. Similarly, the risk of disease transmission to *Kogia* spp. in the region from human activity or other marine mammal species are unknown but may contribute to their mortality or impact their populations. For example, near Honduras, bottlenose dolphins (*Tursiops truncatus*) in several populations across Belize suffer from lobomycosis-like disease and possibly other ailments associated with pollution of their ecosystems (Ramos *et al.*, 2018). Future research is needed on live and stranded *Kogia* spp. and other marine mammals found in Honduras to better understand their population statuses and threats to their wellbeing.

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