



New record of the southern right whale dolphin, *Lissodelphis peronii* (Lacépède, 1804), in the coastal waters of Brazil

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Abstract

The southern right whale dolphin, *Lissodelphis peronii* (Lacépède, 1804), is a species of cetacean that is distributed in cold and deep waters throughout the Southern Hemisphere, with records in coastal waters of the western Atlantic Ocean being extremely rare. On January 7, 2019, a specimen still alive, was recorded entangled in a fishing gillnet on the beach at Cardoso Beach (28°44'S, 48°58'W), in the state of Santa Catarina, on the southern coast of Brazil. The recording was made by a lifeguard using a GoPro camera and was made available through citizen science. The animal was untangled and released while still alive and was not found stranded again after the date of the event. Based on existing literature, this is the second record of the species in Brazilian waters. Analyzing meteorological and oceanographic features from the days preceding the record, it was not possible to make any association between the entanglement and the variables analyzed, and no explanatory driver could therefore be established for this unusual event.

Keywords Cetacea · Delphinidae · Extralimital records · Brazilian coast

Introduction

The southern right whale dolphin, *Lissodelphis peronii* (Lacépède, 1804), is a species that is distributed in circum-polar subantarctic and cold temperate waters in the Southern Ocean, occurring mainly in waters with temperatures

varying between 1 and 20 °C throughout the Southern Hemisphere (Newcomer et al. 1996; Lipsky and Brownell 2018). In general, the occurrence ranges from approximately 30°S to 60°S, with the southern limit defined by the Antarctic Convergence. However, records further north are associated with cold-water marine currents, mainly the Humboldt Current in the Pacific Ocean and the Benguela Current on the Atlantic coast of South Africa (Newcomer et al. 1996; Bastida et al. 2007). Verified sightings have a predominantly offshore distribution, for example in southwest Africa and New Zealand (Rose and Payne 1991; Visser et al. 2004). Sightings in coastal areas are comparatively rare events. However, the species has been observed coastally in Chile and Namibia, particularly within upwelling systems (Aguayo 1975; Rose and Payne 1991; Pinto Torres et al. 2019).

In the western South Atlantic Ocean, the few confirmed records of the species are documented in cold waters off Tierra del Fuego (Goodall 1978), in the Falkland Islands (Malvinas) (White et al. 2002; Otley 2012) and South Shetland (Bastida et al. 2007), with records also occurring in coastal regions further north, close to Mar del Plata (McClennen et al. 2017) and Golfo Nuevo, in Argentina (Yazdi 2002). In Brazil, the only documented record to date is a stranding of a dead male individual at Una Beach

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(23°68'S, 45°65'W), on the coast of the state of São Paulo, in 1994 (Martuscelli et al. 1996). Here we report a new and unusual sighting of a live southern right whale dolphin in Brazilian coastal waters.

Methodology

The entangled dolphin was reported to the authors via citizen science through the Right Whale Environmental Protection Area stranding protocol to map cetacean occurrences, having been initially noticed by beachgoers who subsequently notified the lifeguards. The lifeguards recorded the entangled dolphin using a GoPro camera, and information of the event including a video was shared with the authors. Species identification was based on morphological characteristics and color pattern (see Supplementary Material—Fraser 1955; Jefferson et al. 1994; Bastida et al. 2007). Adult southern right whale dolphins vary in size 1.8 to 3 m in length, and the species has unique morphological characteristics including the absence of a dorsal fin and distinctive black and white coloration (Fraser 1955; Jefferson et al. 1994; Bastida et al. 2007).

We used meteorological and oceanographic data to investigate environmental conditions around the time of the dolphin entanglement event. The daily average pressure values at sea level (maximum in hPa), wind speed (m/s), precipitation (mm), and maximum temperature (°C) were determined for the period 1–7 January 2019 from the automatic meteorological station of Farol de Santa Marta located in Laguna, Santa Catarina (A866, Lat.: 28°44'S; Long.: 48°58'W and Alt: 34.36 m; (tempo.inmet.gov.br/TableEstacoes/A866). Satellite images of GOES-16, channel 16 (13.3 μ m), available from the Division of Satellites and Environmental Systems (DSA) were used to assess cloud cover and weather systems in the region (satellite.cptec.inpe.br/acervo/goes16.formulario.logic). Additionally, synoptic charts made available by the Aeronautics Command Meteorology Network corresponding to the entanglement date and a representative time of 12:00 UTC (redemet.aer.mil.br) were analyzed.

The sea surface temperature (SST) and chlorophyll concentration (CHL) information was obtained from remote sensing data from the Terra-Aqua MODIS satellite/sensor using the Level 3 Standard Mapped Image (L3SMI) product (oceancolor.gsfc.nasa.gov/resources/docs/product-levels). The SST and CHL values were extracted for the specific geographic position of the record with a spatial buffer of 500 m and filtered on an 8-day and monthly scale, corresponding to the month of January 2019. The presence of phenomena such as El Niño Southern Oscillation was also investigated through the data repository registered by the National Oceanic and Atmospheric Administration (NOAA 2019).

We searched the public databases of the Marine Mammal Monitoring Support System (SIMMAM, simmam.acad.univali.br) and the Aquatic Biota Monitoring Information System (SIMBA, simba.petrobras.com.br) to look for evidence that the dolphin had re-stranded in the days following the entanglement event. SIMMAM has logged data on sightings, accidental captures, and strandings of aquatic mammals along the entire Brazilian coast from 1980 to 2019. The SIMBA database has stored beach monitoring data on marine tetrapods strandings between Laguna city in Santa Catarina state (28°24'S, 48°40'W) and Saguarema city in Rio de Janeiro state (22°87'S, 42°77'W) since August 2015, including more than 1500 km of coastline that has been monitored daily (Fig. 1—PMP/BS 2019). We also contacted, the researcher Maurício Tavares of the Natural Sciences Museum (MUCIN) of the Center for Coastal, Limnological, and Marine Studies (CECLIMAR) at the Federal University of Rio Grande do Sul (UFRGS) who monitors beaches in the state of Rio Grande do Sul (Fig. 1), to ask about possible strandings of the species in that region.

Results and discussion

An individual southern right whale dolphin was recorded by civil lifeguards, after being bycaught, less than two meters deep at Cardoso Beach, in Laguna (Santa Catarina) (28°44'S, 48°58'W), on 7 January 2019 (Fig. 1).

The animal was entangled in a trammel gillnet (locally known as “feiticeira”) that is fixed in the supralittoral zone and placed in the surf-zone (in this case water depth was < 2 m), in order to capture demersal and pelagic species, such as mullet (*Mugil liza*), anchovy (*Pomatomus saltatrix*), king weakfish (*Macrodon atricauda*) and king croaker (*Menticirrhus spp.*) (Pinheiro et al. 2021a, b). The individual was alive, approximately 2 m long and showed no signs of human interaction or ill health. It was untangled by lifeguards in a few minutes, who tore the net with their hands and caused no harm to the animal. After being untangled, the animal moved away from the coast, and no significant change in its behavior was observed. Neither that individual, nor any other southern right whale dolphin was re-sighted in subsequent days. The search of the SIMMAM and SIMBA databases, and the interview with Maurício Tavares, did not return any records of strandings of southern right whale dolphins in regions adjacent to the capture area reported here, nor for the locations between Laguna and Saguarema on the southern and southeastern coast of Brazil (Fig. 1).

During the event, the phenomenon known as the El Niño Southern Oscillation was in a neutral state (NOAA 2019). The automatic meteorological station reported an average maximum pressure at sea level below 1013 hPa (between 1002–1010 hPa), wind speed vary between 3.4 and 11.4 m/s,

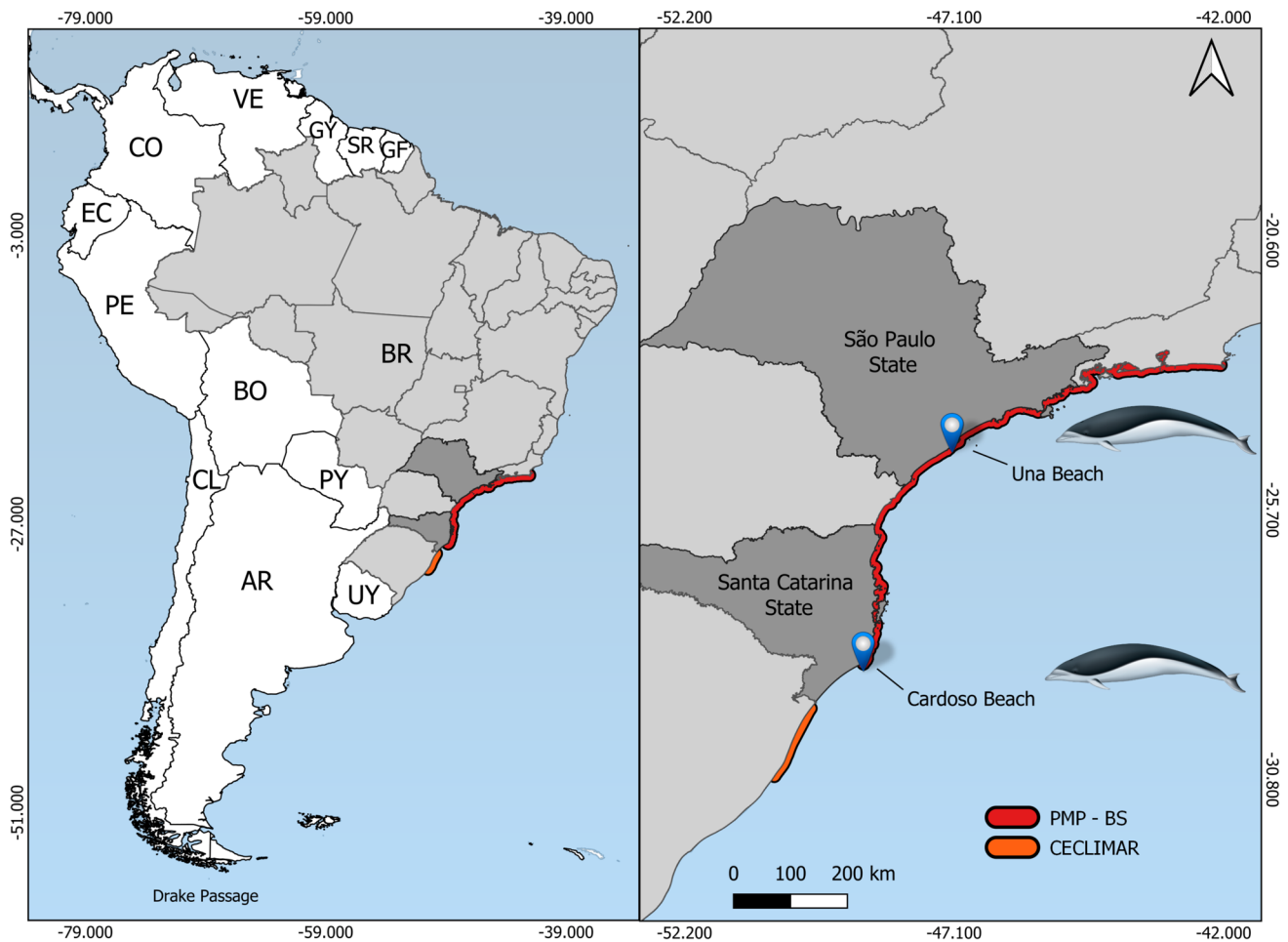


Fig. 1 Records of the southern right whale dolphin (*Lissodelphis peronii*) on the Brazilian coast, at Una Beach, coast of São Paulo state (Martuscelli et al. 1996) and the present record at Cardoso Beach, coast of Santa Catarina state. The red line on the coast represents the area monitored by the Santos Basin Beach Monitoring Project

(PMP-BS), while the orange line represents the area monitored by the Museum of Natural Sciences (MUCIN) of the Center for Coastal, Limnological, and Marine Studies (CECLIMAR) of the Federal University of Rio Grande do Sul (UFRGS)

the precipitation was between 0 and 0.1 mm and the maximum temperatures recorded between 23.25 and 25.73 °C. The weekly and monthly average SST was 22.68 °C and 23.66 °C, respectively, while the weekly and monthly average CHL was 1.98 and 1.65 mg m⁻³, respectively, in the sighting region. Synoptic charts and satellite images showed that, between the 3rd and 4th of January 2019 (12:00 UTC), a low pressure system passed through the state of Santa Catarina. Furthermore, on the day of the recording, a cold front passed through the state of Rio Grande do Sul (< 1013 hPa), generating instability in the southern region of Brazil, making it difficult to extract daily SST and CHL values.

The occurrence of southern right whale dolphins is limited to cold waters (< 20 °C, Newcomer et al. 1996). Coastal records of southern right whale dolphins in Chile and Namibia have been associated with upwelling systems

(Aguayo 1975; Rose and Payne 1991; Pinto Torres et al. 2019); however, those are regions where the continental shelf is relatively narrow and deep water habitat occurs relatively close to the coast (e.g., Van Waerebeek et al. 1991), which is not the case in southern Brazil. Coastal upwelling in the Cabo Santa Marta region is commonly observed during the austral spring and summer months (Acha et al. 2004; Campos et al. 2013; Pereira et al. 2009). Although the entanglement event occurred in the austral summer, we did not hypothesize that it was associated with this phenomenon since it was an uncommon/single event.

Cetacean bycatch has been a major conservation concern (Brownell Jr et al. 2019). To understand entanglements of cetaceans, some studies have investigated how environmental conditions may drive these events (e.g., Volep et al. 2017). However, the conditions leading to accidental entanglements in *Lissodelphis peronii* are not

yet clear. Studies on entanglement and environmental drivers for other species of *Lissodelphis* (e.g.,: *Lissodelphis borealis*, Ferrero et al. 2002) have found an association with sea surface temperature but not with wind and swell (Ferrero et al. 2002). However, in the southern region of Brazil, strandings of some cetacean species are greater during the austral winter and spring months which are often associated with strong winds and waves dynamics (Vianna et al. 2016). Cold fronts and extratropical cyclones tend to generate intense winds that consequently increase the possibility of strandings (Saavedra et al. 2017). Some studies have associated the occurrence of pelagic cetacean species in coastal waters with wind-driven ocean currents (e.g., Zellar et al. 2021).

Given the distribution patterns of the southern right whale dolphin and the lack of unusual environmental conditions, it wasn't possible to determine the cause of this entanglement event. The record is considered to be atypical, because the animal was found alive in warm water to the north of the cold-water distribution range of the species, during summer when water temperatures in the area amongst their highest, in unusual coastal habitat, and alone when the species is usually gregarious (Jeferson et al. 1994; Bastida et al. 2007).

It is important to highlight that cetacean monitoring data, both of stranded animals on beaches and of live animals at sea, provide a more comprehensive understanding of the diversity and distribution of many species (e.g.,: Di Tullio et al. 2016; Prado et al. 2016; PMP/BS 2019). Finally, this report also reinforces that citizen science has the potential to help in our understanding of the distribution of marine animals in the Atlantic Ocean by sharing photo and video records personally to researchers or through digital media (Wood et al. 2015; Milmann et al. 2019).

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s00300-024-03297-y>.

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Author contribution L.G.A. and R.M. wrote the main text of the manuscript. T.P.C. performed the climate analysis on the day of the event. P.C. assisted in the search for records of southern right whale dolphins (*Lissodelphis peronii*) in databases (SIMBA and SIMMAM). L.G.A. prepared Fig. 1. All authors reviewed the manuscript.

Data availability No datasets were generated or analysed during the current study.

Declarations

Competing interests The authors declare no competing interests.

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