

New records of Fraser's dolphin (*Lagenodelphis hosei*) for the Caribbean

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Abstract

Fraser's dolphins (*Lagenodelphis hosei*) are found in oceanic tropical waters around the world, but only seventeen records are known from the entire Atlantic Ocean. Five of these are from the Caribbean. We present two new records of Fraser's dolphin for the Caribbean and the first records for the Puerto Rican bank. The first stranding, a sub-adult male, occurred at Guánica Bay, while the second, a female calf, occurred in Ponce, both on Puerto Rico's south coast. The animals stranded singly and in a fresh state of decomposition. Post-mortem examinations were carried out on both specimens and histopathology analyses were conducted, determining natural cause of death for both animals. Endoparasites collected and identified from one of the specimens included *Phyllobothrium delphini*, *Monorygma grimaldii* and *Tetrabothrius forsteri*. Stomach contents of the subadult included squid beaks and shrimp. Skeletal remains were collected for the University of Puerto Rico Marine Mammal Osteological Collection.

Introduction

The oceanic Fraser's dolphin (*Lagenodelphis hosei*) was described in 1956 from a single skeleton found on a beach in Sarawak, Borneo, prior to 1895 (Fraser, 1956). It was not rediscovered until 1973 when it was described again including for the first time the species' external features (Perrin *et al.*, 1973). The species is found in tropical waters around the world and strandings in temperate areas typically represent extralimital occurrences in association with oceanographic anomalies such as El Niño phenomenon. The extent of the geographical range for this dolphin is poorly known, since

oceanic cetacean fauna have not been very systematically or extensively studied, with the exception of cetacean distribution in the eastern tropical Pacific (Wade & Gerrodette, 1993; Perrin *et al.*, 1994). In the Atlantic Ocean, only seventeen records have been reported. We present two new records of Fraser's dolphins for the Caribbean and the first records for the Puerto Rican bank.

Methods

As part of a study by the Caribbean Stranding Network to document and analyze marine mammal strandings and mortality in Puerto Rico and the Virgin Islands (Mignucci-Giannoni, 1996), dolphin carcasses were collected and alpha-level information. More detailed data were gathered opportunistically. Necropsies following the protocols in Geraci & Lounsbury (1993), were carried out on freshly-dead (code 2) and moderately-decomposed (code 3) animals, in an attempt to determine the cause of death and to obtain life history data in terms of morphometrics, age, diet and parasitic fauna associated.

Results

Analysis of stranding and mortality data, as well as sighting records from Puerto Rico and the Virgin Islands from 1950 to 1989 revealed no indication of Fraser's dolphins inhabiting the study area (Mignucci-Giannoni, 1989). Notwithstanding, continued studies on marine mammal strandings by the Caribbean Stranding Network between 1990 and 1997 (Mignucci-Giannoni, 1996), resulted in

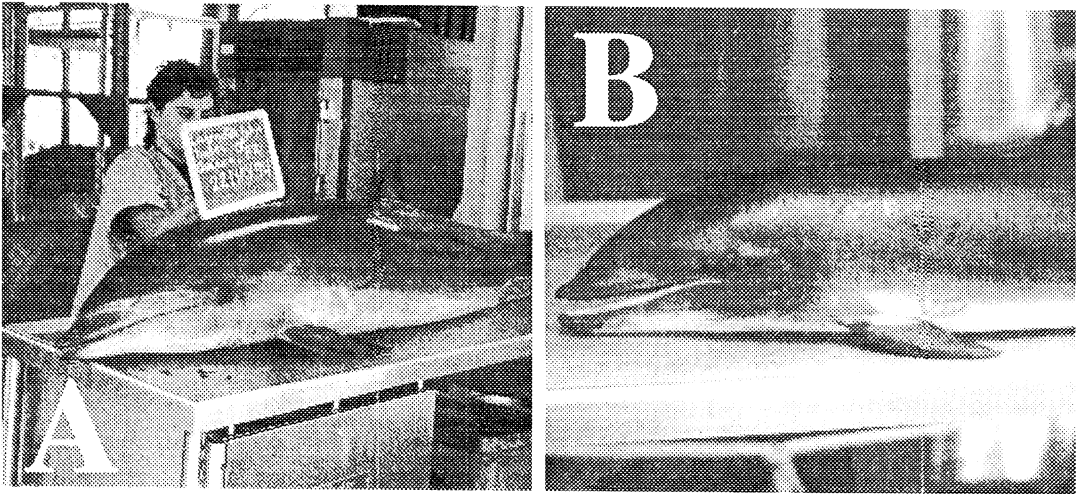


Figure 1. Lateral views of two Fraser's dolphin specimens stranded in Puerto Rico. (A) Subadult specimen from Guánica (NEPST319), (B) calf specimen from Ponce (NEPST528).

the salvage of two Fraser's dolphin found stranded in Puerto Rico.

Case 1: NEPST319

On 22 May 1994 a 227-cm subadult male specimen of *L. hosei* stranded at El Farito, west of El Malecón in Guánica Bay (17°58'N, 66°54.5'W) on the southwest coast of Puerto Rico (Fig. 1a). The animal was found in a freshly-dead condition and a complete necropsy was carried out. The animal weighed 110 kg and complete morphometrics were taken (Table 1). During necropsy, tissues from both lungs, two lymph nodes, heart, pancreas, spleen, kidney, urinary bladder and testis were collected for histopathology analysis. The right lung showed moderate to marked diffuse congestion with multifocal alveolar hemorrhage. Tissue from the left lung revealed multifocal, chronic histiocytic and lymphoplasmocytic interstitial pneumonia with alveolar histiocytosis and type II pneumocyte hyperplasia, with many intrahistiocytic clear vacuoles and occasional multinucleated giant cells. The lymph nodes were found to be hyperplastic with eosinophilic infiltrates, which is common in wild dolphins and is attributed to parasitism. The kidney was found to be congested. The testis tissue showed aspermatogenesis, indicating the immature status of the animal. No significant lesions were found in the heart, pancreas, spleen or urinary bladder. No morbilliviral RNA was detected by polymerase chain reaction (PCR) testing of the tissues. The most significant pathologic condition was pneumonia, although from the tissues examined, the cause of the pneumonia was not evident. Notwithstanding, the predominant cause

of death category was determined to be illness (natural cause).

The animal was found to be parasitized by the cestodes *Phyllobothrium delphini* in the blubber, *Monorygma grimaldii* in the abdominal wall adjacent to the testes, and *Tetrabothrius forsteri* in the intestines (Mignucci-Giannoni et al., 1998). Both *P. delphini* and *M. grimaldii* have been reported to occur in Fraser's dolphin (McColl & Obendorf, 1982; Perrin et al., 1994), but *L. hosei* appears to be a new host record for *T. forsteri* (Perrin et al., 1994). There was an unidentified species of pelagic shrimp in the stomach. Robison & Craddock (1983) and Perrin et al. (1994) reported that Fraser's dolphins feed on mesopelagic fishes, shrimps and squids. Watkins et al. (1994) observed schools of Fraser's dolphin feeding on herding fish (rainbow runner, *Elagatis bipinnulatus*) off Dominica in the southeastern Caribbean.

The age of the animal was estimated at 3 GLGs (growth layer groups) by counting GLGs in the dentine and cementum of a tooth. The dental formula of the animal was 41UR, 42UL, 43LR and 41LL, and its vertebral formula was: 7 cervical, 14 thoracic, 21 lumbar and 24 caudal vertebrae; consistent with that reported for the species by Perrin et al. (1994). The complete skeleton was collected for the University of Puerto Rico's Marine Mammal Osteological Collection (Mignucci-Giannoni et al., 1997).

Case 2: NEPST528

On 6 May 1997 a 121-cm female calf specimen of *L. hosei* stranded at Playa Carenero in Ponce (17°58.2'N, 66°36.3'W) on the south coast of Puerto

Table 1. Morphometrics for two specimens of *Lagenodelphis hosei* stranded in Puerto Rico (percentage numbers are in relation to the specimen's total length)

Morphometrics	NEPST319	NEPST528
1. From the tip of the snout to the notch of the fluke	227.0 cm (100%)	121.0 cm (100%)
2. From the tip of the snout to the center of the anus	160.0 cm (70.5%)	89.0 cm (73.6%)
3. From the tip of the snout to the genital slits	142.5 cm (62.8%)	85.0 cm (70.2%)
4. From the tip of the snout to the umbilicus	105.0 cm (46.3%)	60.0 cm (49.6%)
5. From the tip of the snout to the flipper	45.5 cm (20.0%)	28.0 cm (23.1%)
6. From the tip of the snout to the tip of the dorsal fin	120.0 cm (52.9%)	71.0 cm (58.7%)
7. From the tip of the snout to the ear	38.5 cm (17.0%)	—
8. From the tip of the snout to the eye	33.0 cm (14.5%)	18.0 cm (14.9%)
9. From the tip of the snout to the angle of mouth	28.0 cm (12.3%)	16.5 cm (13.6%)
10. From the tip of the snout to the melon	4.5 cm (2.0%)	2.5 cm (2.1%)
11. From the eye to the ear	5.5 cm (2.4%)	—
12. Length of dorsal fin base	28.0 cm (12.3%)	—
13. Height of dorsal fin	14.5 cm (6.4%)	—
14. Girth at axilla	105.0 cm (46.3%)	62.0 cm (51.2%)
15. Maximum girth	111.0 cm (48.9%)	63.0 cm (52.1%)
16. Girth at fluke base	21.5 cm (9.5%)	13.0 cm (10.7%)
17. Girth at anus	62.0 cm (27.3%)	36.0 cm (29.8%)
18. From the tip of the snout to the center of the blowhole	30.0 cm (13.2%)	20.0 cm (16.5%)
22. Fluke span	48.0 cm (21.1%)	23.5 cm (19.4%)
23. Fluke width	16.0 cm (7.1%)	7.0 cm (5.8%)
24. Anterior length of flipper	27.5 cm (12.1%)	12.0 cm (9.9%)
25. Posterior length of flipper	20.0 cm (8.8%)	17.0 cm (14.1%)
26. Width of flipper	8.0 cm (3.5%)	—
27. Weight	110.0 kg	—
28. Tooth count upper left	42	42
29. Tooth count lower left	41	41
30. Tooth count upper right	41	41
31. Tooth count lower right	43	43

Rico (Fig 1b). The animal was found in a freshly-dead condition and a complete necropsy was carried out. Complete morphometrics were taken on the carcass (Table 1). The age of the animal was estimated at less than a week old, given that its umbilical scar had not healed completely. This is consistent with Amano *et al.* (1996) and Perrin *et al.* (1973) who suggest calving occurs either during the spring or autumn and newborns are between 100 and 124 cm in length.

At necropsy, tissues from both lungs, bronchi, liver, heart, spleen and kidney, were collected for histopathology analysis. The right lung and bronchi showed necrotizing, acute, multifocal bronchiolitis. In addition, the lung revealed possible syncytial cell formation. The left lung showed moderate lobar edema, hemorrhage and congestion. The liver was found with moderate and diffuse vacuolar degeneration, with diffuse and moderate hemorrhage. The spleen, heart and kidney all revealed diffuse and moderate congestion and hemorrhage. The predominant pathology was found in the lungs, which were characterized by necrotizing bronchiolitis with pulmonary congestion, edema and hemor-

rhage. There were multifocal aggregates of cells that formed what appeared to be syncytial formation. These aggregate cells were undergoing degenerative and necrotic processes and made smudgy inclusions, both intracytoplasmic and intranuclear. The congestion and hemorrhage noted in the heart, spleen and kidney were nonspecific but could be correlated with a systemic infection. Notwithstanding, the predominant cause of death was determined to be illness (natural cause).

The dental formula of the calf was 41UR, 42UL, 43LR and 41LL, and its vertebral formula was found to be the same as that of the animal in the 1993 case in Puerto Rico. No parasites were found in this specimen and stomach contents were basically undigested milk. The skull was collected for the University of Puerto Rico's Marine Mammal Osteological Collection.

Discussion

Only seventeen records of Fraser's dolphin exist for the Atlantic Ocean. The only record for the South Atlantic is of four animals which stranded in March

1991 in Uruguay (Praderi *et al.*, 1980). In the eastern North Atlantic, reports included a mass stranding on 29 May 1984 and a single stranding on 26 June 1984 from France (Duguay, 1985; van Bree *et al.*, 1986), a single animal stranded in the Canary Islands in August 1983 (Vonk & Martel, 1990) and the sighting of 40 animals from a research vessel off the coast of West Africa (Tormosov *et al.*, 1980; although this record has been questioned by Jefferson *et al.*, 1997). From the western North Atlantic documentation exists for a mass stranding in the Florida Keys in November 1981 (Hersh & Odell, 1986), one live stranding on Florida's Gulf Coast on 23 February 1993 (Leatherwood *et al.*, 1993), and five sightings in the Gulf of Mexico on 24 May 1992, 4 June 1992, 1 June 1993, 16 May 1993 and 4 September 1993 (Leatherwood *et al.*, 1993).

Five records exist for the Caribbean, including three specimens harpooned and taken by a fishery at St. Vincent on 2 and 15 October 1972 and 18 May 1976 (Caldwell *et al.*, 1976) and 2 sightings off Dominica on 26 and 28 October 1991 (Watkins *et al.*, 1994). It is worth noting that, despite different dedicated efforts, only five Caribbean records have been documented prior to the Puerto Rican strandings. Watkins *et al.* (1994) reported that previous to documenting the sightings in 1991, they did not observe the species in 11 yearly scientific cruises in the area of the Lesser Antilles since the mid 1980s. No sightings or strandings were reported, based on previous research efforts and on interviews with fisherman in Puerto Rico and the Virgin Islands (Mignucci-Giannoni, 1989) or the Dominican Republic (I. Bonnely de Calventi, Fundemar, pers. comm.). Recent surveys for cetaceans in the Caribbean during 1988, 1990 and 1994 by Palacios *et al.* (1995; 1996), during 1991 by Jefferson & Lynn (1994) and during 1995 aboard the *Oregon II* (K. Mullin, NOAA National Marine Fisheries Service, pers. comm.), also did not yield any sightings of Fraser's dolphin.

Our records constitute the eighteenth and nineteenth records of the Fraser's dolphin for the Atlantic Ocean and the sixth and seventh records for the Caribbean Sea. They are the first documentation of this little-known and elusive tropical delphinid for Puerto Rico.

Acknowledgements

Dolphin carcass salvage and specimen collection were conducted under a letter of authorization from NOAA's National Marine Fisheries Service Protected Species Management Branch and a cooperative agreement with Puerto Rico's Department of Natural and Environmental Resources. We gratefully acknowledge the assistance of CSN

participants, especially G. M. Toyos-González and R. Rosario-Delestre, in the salvage and necropsy of the dolphin carcasses and collection of samples, as well as the Department of Marine Sciences, University of Puerto Rico, for providing facilities for specimen collection and storage. Parasite identification was provided by Dr E. P. Hoberg (Biosystematic Parasitology Laboratory); tissue histology was conducted by Dr T. P. Lipscomb (Armed Forces Institute of Pathology) and Dr C. A. Coletan (Caribe Veterinary Pathology Consulting Group) and teeth were sectioned, etched, stained and read by Dr I. Loder Brooks and Dr H. Anderson (Mote Marine Laboratory).

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