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Article in *Brazilian Journal of Oceanography* · March 2009

DOI: 10.1590/S1679-87592009000100006

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SIGHTINGS OF FRANCISCANA DOLPHINS (*PONTOPORIA BLAINVILLEI*):
THE DISCOVERY OF A POPULATION IN THE PARANAGUÁ ESTUARINE
COMPLEX, SOUTHERN BRAZIL

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Franciscana dolphins (*Pontoporia blainvillei*) are small cetaceans distributed along coastal Atlantic waters of South America from Itaúnas (18°25'S), Brazil (SICILIANO, 1994), to Golfo Nuevo (42°35'S, 64°48'W), Argentina (CRESPO et al., 1998). This distribution is not continuous as two gaps which occur within this range have been described: the first extending from Regência (19°40'S) to Barra de Itapoana (21°18'S), Espírito Santo State, and the second from Macaé (22°25'S) in Rio de Janeiro State to Ubatuba (23°18'S) in São Paulo State (SICILIANO et al., 2002). *P. blainvillei* is usually found in shallow, turbid waters, out to the 30 m isobath on the continental shelf (PINEDO et al., 1989; PRADERI et al., 1989), generally associated with estuarine and riverine discharges (CRESPO, 2002; SICILIANO et al., 2002). The species is considered as a particular conservation concern because of its restricted distribution and vulnerability to incidental captures in fishing gear (SICILIANO, 1994; OTT et al., 2002; REEVES et al., 2003). As a consequence, four management areas known as "Franciscana Management Areas (FMA)" have been established to implement the efforts directed towards franciscana research and conservation (see map and description in SECCHI et al., 2003). Although the IUCN includes *P. blainvillei* in the "Data Deficient" category (CETACEAN SPECIALIST GROUP, 2007), in recent years the population found in the FMA III, which includes the Uruguayan coast and the coast of Rio Grande do Sul State in Brazil, was listed as vulnerable to extinction (SECCHI; WANG, 2003). Therefore, efforts to assess the conservation status of *P. blainvillei* in the remaining management areas are urgently needed.

Most of the information gathered on the species biology came from studies of dead individuals found stranded or incidentally captured in fishing operations, as *P. blainvillei* is difficult to be sighted in its habitat (CRESPO, 2002). However, several sightings made within the area of the species' distribution have been described (e.g. BORDINO et al., 1999; DI BENEDITTO et al., 2001; MORENO et

al., 2003; CREMER; SIMÕES-LOPES, 2005; SANTOS et al., 2007). Franciscana dolphins have been sighted frequently in the Babitonga estuary (26°S), southern Brazil (CREMER; SIMÕES-LOPES, 2005), thus representing the only known population to inhabit inner estuarine waters. However, the present note gives additional sighting records of *P. blainvillei* in Brazil, presenting convincing evidence of the existence of another population in inner estuarine waters within its coastal range.

Franciscana dolphins were sighted during boat surveys undertaken to evaluate ecological aspects of Guiana dolphins (*Sotalia guianensis*) in inner estuarine waters, as well as along the coast of southern and southeastern Brazil (~24°30'S to 25°30'S). *S. guianensis* photo-identification surveys have been conducted in almost every season since April 2006 in the Lagamar estuary, from Iguape (São Paulo State) to Paranaguá (Paraná State) (see Fig. 1). In the Paranaguá Estuarine Complex (PEC) *sensu* NOERNBERG et al. (2006), surveys were conducted over from 6 to 10 days in the following seasons: fall, winter and spring 2006, summer and winter 2007, and summer and winter 2008. In the Cananéia estuary, surveys took place over from 7 to 11 days in winter 2006, summer and winter 2007, and in summer and winter 2008. Single-day coastal surveys were conducted on 4 occasions: in April and July 2006, February and May 2007. In all the field campaigns, a digital camera with a 400 mm lens was used for *S. guianensis* identification purposes (see WURSIG; WURSIG, 1977), as well as to gather photographs of *P. blainvillei*. On all the inner water surveys during which sightings occurred, the following environmental data were collected: water transparency (Secchi disk), depth (depth-sounder), temperature (alcohol thermometer), and salinity (portable refractometer). Only the water depth was collected on the coastal surveys. For inner water observations, a 6-m long boat with a 15hp outboard propeller was used, and for coastal water observations a 10-m long speed-boat with two 75hp outboard propellers.

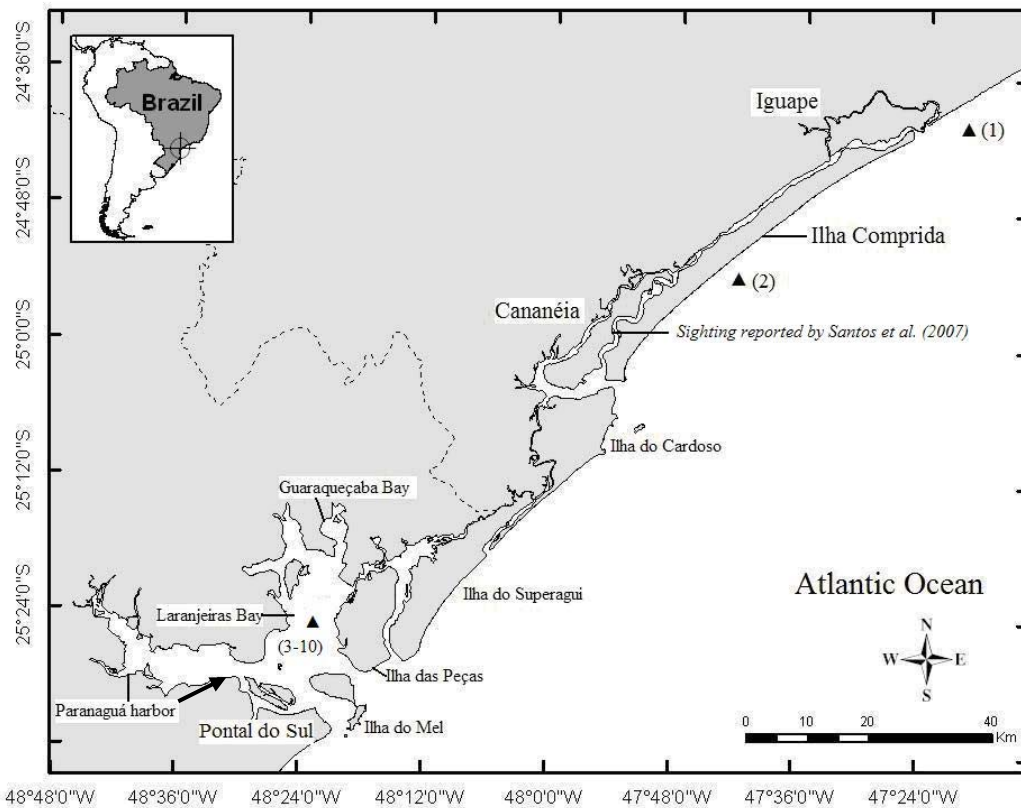


Fig. 1. Map showing the exact locations where franciscana dolphins (*P. blainvillei*) were sighted in coastal (1 and 2) and estuarine (3 to 10) waters of southern and southeastern Brazil.

Ten franciscana sightings are presented in Table 1: two along the shore, close to Ilha Comprida, São Paulo State, and eight in inner estuarine waters of the PEC, Paraná State (Fig. 1). Most sightings were made in calm sea conditions (Beaufort ≤ 1). The yellowish color pattern and the long, thin rostrum (Fig. 2) were the diagnostic evidences for the identification of the species. In coastal waters, *P. blainvillei* was found in shallow waters (10-15 m) close to the shore (up to 1 nm). In estuarine waters, sightings occurred in Laranjeiras Bay and in the Mixture Zone *sensu* NOERNBERG et al. (2006). Water depth where inshore sightings occurred varied from 3.8 to 13.4 m and water transparency from 1.3 to 2.5 m. In winter, water salinity ranged between 30 to 31 ppm and its superficial temperature ranged from 16°C to 20°C. In summer, these values were 10 ppm and 27°C, respectively. These environmental conditions are usually found in the area surveyed (see BRANDINI, 1985; KNOPPERS et al., 1987; LANA et al., 2000).

Franciscana dolphins usually came to the surface on 2 to 4 occasions before diving after the

boat's approach. Probably they engaged in hyperventilation before diving. In the winter of 2008, dives lasted from 60 to 90 seconds (mean = 80.6 seconds, $n = 11$). On all sighting occasions in estuarine waters, adult individuals presented films of algae attached to their bodies (Figs 2 and 3). On 17 February 2008, the authors spent 70 minutes observing franciscana dolphins in Laranjeiras Bay. Groups were fluid and composed of from two to six individuals. Calves were observed in close association with adult individuals. One adult individual followed by a calf was photographed and showed a small notch on the top of the dorsal fin (Fig. 3A). In July 2008, several individuals were observed from closer distances (5 to 20 m) when 6 distinct groups were under observation. Five individuals presented distinguishable marks on the top or on the posterior border of the dorsal fin, including the female observed in February 2008 (Figs 4A-E). Franciscana groups were observed in close proximity to Guiana dolphins (ca. 20 m) on several occasions, but no interactions between them were seen.

Table 1. Sightings of franciscana dolphins (*P. blainvillei*) in inner estuarine and coastal waters of southern and southeastern Brazil.

# of Sightings	Date	Location	Area	# of Individuals
(1)	25 April 07	24°40'S; 47°20'W	Coastal	1
(2)	25 April 07	24°54'S; 47°42'W	Coastal	3
(3)	8 August 07	25°24'S; 48°21'W	Estuarine	1
(4)	17 February 08	25°25'S; 48°21'W	Estuarine	10-12
(5)	18 July 08	25°23'S; 48°21'W	Estuarine	1
(6)	18 July 08	25°23'S; 48°21'W	Estuarine	3
(7)	20 July 08	25°23'S; 48°21'W	Estuarine	10
(8)	27 July 08	25°24'S; 48°21'W	Estuarine	3
(9)	29 July 08	25°26'S; 48°21'W	Estuarine	2
(10)	29 July 08	25°27'S; 48°21'W	Estuarine	12

(#) = number

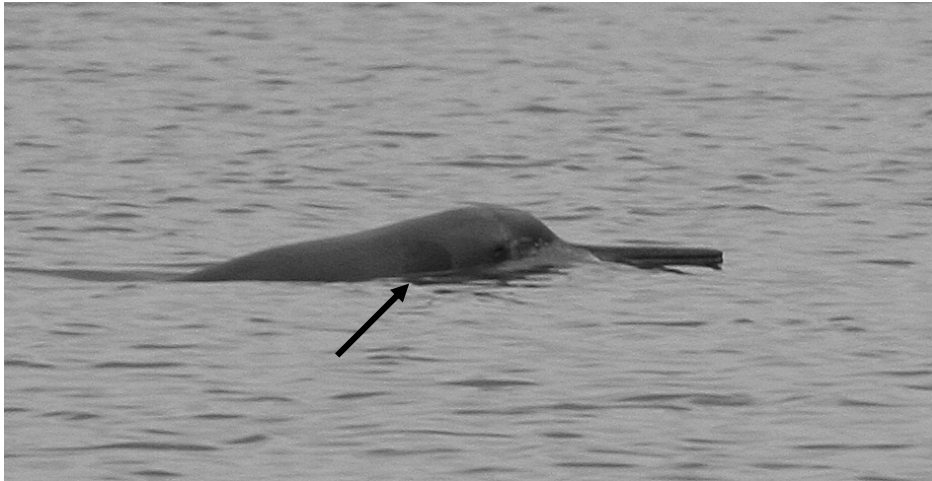


Fig. 2. Adult franciscana dolphin (*P. blainvillei*) sighted in the Paranaguá Estuarine Complex with algae attached to its body.



Fig. 3. Another adult franciscana dolphin (*P. blainvillei*) sighted in the Paranaguá Estuarine Complex showing algae attached to its body.

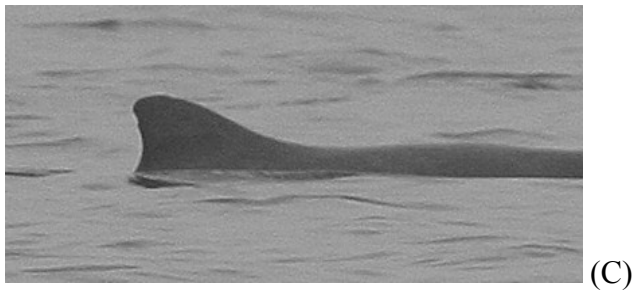
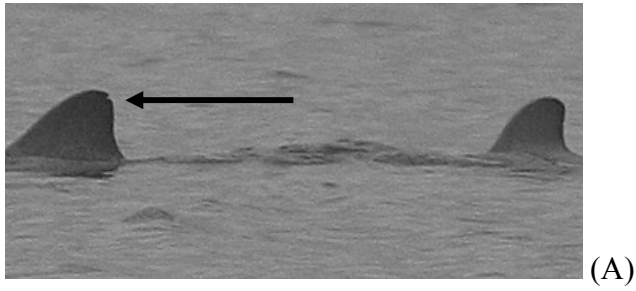


Fig. 4. Five marked franciscana dolphins (*P. blainvillei*) (A - E) identified through notches on the dorsal fin in the Paranaguá Estuarine Complex from 2007 to 2008. Individual PB#1 (A) was sighted twice, in the summer and winter of 2008.

After the first observation of franciscana dolphins in inner waters of the northern Paraná State in August 2007, local fishermen were interviewed in order to gather information on the species' occurrence. All the statements made were related to the year-round presence of *P. blainvillei* in the local, protected waters, extending from the main estuary entrance located between the Ilha do Mel and the Ilha do Superagui to the Laranjeiras Bay (see Fig. 1). Although the Cananéia estuary has been meticulously surveyed since 1996 in a long-term study of *S. guianensis* (SANTOS et al., 2001; SANTOS; ROSSO, 2008), only one unusual sighting of franciscana dolphins has been reported (SANTOS et al., 2007) (Fig. 1). The fishermen from Cananéia who were interviewed reported that *P. blainvillei* had only been observed in shallow coastal waters, never in inner waters. These statements, added to the sightings reported in distinct seasons (summer and winter) in the PEC with the notification of calves in 2007 and in 2008, and the re-sighting of a naturally marked female in two distinct seasons of 2008 are the main evidences leading the authors to conclude that another population of *P. blainvillei* is likely to be found in another estuarine area within its coastal range.

Although the areas surveyed were investigated on several occasions during the period from 2006 to 2008 ($n = 122$ days), on only seven distinct days were franciscana dolphins sighted. On most occasions, the state of the sea (Beaufort ≤ 1) was appropriate for *P. blainvillei* sightings. After the first sightings made in the Mixture Zone and the Laranjeiras Bay in the PEC, special attention was given to the detection of franciscana dolphins when covering the area mentioned, when the sea conditions were good. This is the main reason why sightings were concentrated in the last season of the survey presented. The authors spent approximately 310 minutes observing *P. blainvillei* but no detailed information on behavioral displays other than the dolphins' moving away to avoid the boat's closer approach was gathered. It would be better to attempt further observations with the engines turned off as franciscana dolphins tend to move away from approaching boats (BORDINO et al., 2002; SANTOS et al., 2007). In all the observations made, efforts were concentrated on taking good quality photographs. As a result, it was possible to identify five distinct individuals based on the natural marks on their dorsal fins (Fig. 4). On the other hand, fewer observations were made on the duration of their dives. Efforts were directed towards lone adult individuals to avoid biasing the data collected when larger groups were being followed. During future observations, efforts must be concentrated on gathering data on diving duration time as that information is an important parameter for density estimation studies (see SECCHI et al., 2001).

The presence of algal film on the skin of many cetacean species including *P. blainvillei* has been described elsewhere (e.g. NEMOTO et al., 1977; MOREJOHN, 1980; FEINHOLZ; ATKINSON, 2000). Several species of diatoms have been known to attach to cetacean skin, though there is no evidence for any distinct pattern of infestation by age class. It was only possible to observe adult individuals with yellowish patches on their bodies whether in winter or in summer. Although no samples were collected for detailed examination, the yellowish patches observed were similar to the diatom infestation described on cetaceans (see NEMOTO et al., 1977). Further studies of dead *P. blainvillei* found in local waters should undertake a detailed investigation of these infestations.

The PEC is part of the Lagamar estuary and lies within a national protected reserve known as the "Área de Proteção Ambiental de Guaraqueçaba" established in 1985 (IPARDES, 1990). It is situated close to the second largest harbor of the Brazilian coast, that of Paranaguá (see Figure 1). Around 12,000 inhabitants live in the surrounding area and this population consumes mainly coastal and estuarine fish and crustaceans, and depends economically on mangrove by-products and tourism. Although new regulations governing fishing in the inner estuarine waters have been implanted, they seem to pose no threat to franciscana dolphins as gillnet fishing is not allowed. However, most gillnet fishing operations are concentrated in coastal waters as has been observed in other areas closer to the Lagamar estuary. *P. blainvillei* was the main by-catch cetacean species of the monitored fleet which operated in coastal waters from the port of Cananéia from 2004 to 2007 (SANTOS, M. C. de O., pers. obs). A previous study conducted in the same area showed the same tendencies (ROSAS et al., 2002). On the other hand, in the last 10 years, tourism has been becoming one of the main economic activities in the Lagamar estuary and the relevant regulations need to be improved (SANTOS; ROSSO, 2008). On several occasions, fast speed boats were seen to cross the area where *P. blainvillei* was observed in Laranjeiras Bay, situated on the route to several local tourist resorts such as Ilha do Mel, Ilha das Peças, and Guaraqueçaba bay. These boats may expose not only franciscana but also Guiana dolphins to the risk of collision.

The presence of franciscana dolphins in the PEC reinforces the importance of the Lagamar estuary for biodiversity conservation. Efforts should be directed towards a detailed investigation into population parameters, giving emphasis to abundance, use of area, and the evaluation of whether calves are present all year round, which could constitute important evidence as to the use of the area as a breeding site. The sea-state must be taken into consideration in all investigations, with a preference

for the concentration of efforts on calm sea conditions (Beaufort ≤ 1).

ACKNOWLEDGEMENTS

The authors wish to thank the following institutions for their financial support: Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), process #s 05/59439-5 and 05/54149-9, Cetacean Society International, Whale & Dolphin Conservation Society and Earthwatch Institute, PROBIO (Projeto de Conservação e Utilização Sustentável da Diversidade Biológica Brasileira) - Ministério do Meio Ambiente, with the support of BIRD/GEF, and CNPq (2004 – 2005). JEFO receives a fellowship from Programa de Recursos Humanos da ANP para o Setor Petróleo e Gás – PRHANP/MCT – Convênio UNESP-MCT-ANP. Support for the fieldwork was received from the Instituto Oceanográfico – Universidade de São Paulo, Núcleo Pró-Ação de Guaraqueçaba – Pontifícia Universidade Católica do Paraná, and the Parque Estadual da Ilha do Cardoso, Fundação Florestal, Instituto Florestal – Secretaria Meio Ambiente do Estado de São Paulo. We also thank the anonymous reviewer for important suggestions for the improvement of the original version of this manuscript.

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(Manuscript received 03 June 2008; revised 16 September 2008; accepted 29 September 2008)