

## KILLER WHALE (*ORCINUS ORCA*) PREDATION ON A FRANCISCANA DOLPHIN (*PONTOPORIA BLAINVILLEI*) IN BRAZILIAN WATERS

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Killer whales (*Orcinus orca*) have been reported as predators of at least 40 different species of fish, squid, sea turtles, sea birds, and marine mammals (Heyning and Dahlheim, 1988; Jefferson *et al.*, 1991; Baird and Dill, 1995; Ott and Danilewicz, 1998; Secchi and Vaske Jr., 1998; Visser *et al.*, 2000; Ford, 2002; Pitman *et al.*, 2003; Sheldon *et al.*, 2003; Reyes and García-Borboroglu, 2004; Visser, 2005). Prey species have been identified through studies of stomach contents of stranded individuals, as well as through direct observations. Based on long-term studies in the temperate eastern North Pacific, two types of killer whales are known: fish-eating, and mammal-eating specialists (Bigg *et al.*, 1990; Barrett-Lennard *et al.*, 1996; Ford and Ellis, 1999). In two other areas in Península Valdés, Argentina (see Lopez and Lopez, 1985), and in Possession Island, Crozet Archipelago (see Guinet, 1991), killer whale foraging and feeding near-shore allowed land-based observers to record predation of both birds and mammals. Off New Zealand, water transparency, killer whales' distribution, and foraging and feeding behavioral activities displayed in coastal waters have provided adequate conditions for investigators to document their feeding habits (see examples in Visser, 1999; Visser *et al.*, 2000; Visser, 2005). However, in most part of the range of killer whales, information on their feeding habits is still scarce. Reduced research efforts added to difficult access to these predators in the wild may represent the main causes for the lack of information in many areas.

Killer whales have been recorded along the Brazilian coast through stranding events (*e.g.* Castello, 1977; Bittencourt, 1983; Geise and Borobia, 1988; Dalla Rosa, 1995; Ott and Danilewicz, 1998; Dalla Rosa *et al.*, 2002<sup>3</sup>), opportunistic sightings (*e.g.* Lodi and Hetzel, 1998; Siciliano *et al.*, 1999; Dalla Rosa *et al.*, 2002), and dedicated surveys for cetaceans (*e.g.*, Dalla Rosa, 1995; Lodi and Hetzel, 1998; Secchi and Vaske Jr., 1998; Zerbini *et al.*, 2004). Up to 2002, a total of 20 known strandings have been reported on the Brazilian coast, of which 16 (80%) were reported on the southern coast (Dalla Rosa *et al.*, 2002). Thus, killer whale occurrence patterns, distribution and feeding habits in Brazilian waters are still poorly known.

Based on stomach content analysis of eight stranded

individuals in southern Brazil, predation had been documented on: eagle stingrays from the genus *Myliobatis* (Castello, 1977; Dalla Rosa, 1995; Dalla Rosa *et al.*, 2002); franciscana dolphins, *Pontoporia blainvillei* (Ott and Danilewicz, 1998); salps (*Iasis zonaria*); several cephalopod species; weakfish (*Cynoscion guatucupa*); and Burmeister's porpoises (*Phocoena spinipinnis*) (see Dalla Rosa, 1995; Dalla Rosa *et al.*, 2002). A survey conducted from 1987 to 1991 with longline fisheries in southern Brazil (30°S to 35°S) showed that killer whales commonly attacked hooked tuna (*Thunnus* spp.), and swordfish (*Xiphias gladius*), thus reducing fishermen's profits (Dalla Rosa, 1995; Secchi and Vaske Jr., 1998). In the late 1990s, predation on manta rays, *Manta birostris* (Lodi and Hetzel, 1998) and on unidentified ray species (Siciliano *et al.*, 1999) were reported along the coast of Rio de Janeiro state (21-23°S), southeastern Brazil.

On 22 March 2005, one of the authors (DFN) was conducting a patrolling survey on predatory fisheries along northern Paraná coastal waters (25°20'S; 48°05'W), southern Brazil. The observer was aboard an inflatable boat with two 140hp outboard engines of the *Instituto Ambiental do Paraná*, known as *IAP II*. At around 12:15pm, while looking for unauthorized fishing boats in coastal waters, observers witnessed a small dolphin been thrown into the air on two occasions. The boat approached the area and observers witnessed a killer whale attacking a franciscana dolphin. Photographs were taken with a 35mm SLR camera with a 70-200mm lens, and using 100 ISO color slide film. Based on the shape and size of the dorsal fin (Figures 1 and 2), the killer whale was an adult or large subadult male. Its total length was estimated at about 5 to 6m. Based on its body and rostrum size (Figures 1 and 2), the franciscana was an adult. However, it was not possible to ascertain its gender. Observers spent an hour watching the killer whale grabbing the franciscana and drowning it. While leaving the area to avoid harassing the killer whale, a small stain of blood on the water's surface was seen after a long dive of the killer whale. Neither of the individuals were seen afterwards, and presumably the franciscana was killed by the killer whale.

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<sup>3</sup>Dalla Rosa, L., Secchi, E.R., Lailson-Brito Jr., J. and Azevedo, A. (2002) *A review of orcas (Orcinus orca) in Brazilian waters*. Pages 46-49 in Abstracts. Fourth International Killer whale Symposium and Workshop, September 23-28, CEBC-CNRS, France.



**Figure 1.** Male killer whale (*Orcinus orca*) attacking a franciscana dolphin (*Pontoporia blainvillei*) in Brazilian waters. Note the killer whale's large dorsal fin with two notches.



**Figure 2.** Male killer whale (*Orcinus orca*) attacking a franciscana dolphin (*Pontoporia blainvillei*) in Brazilian waters. Note the long-sized rostrum of the franciscana, characteristic of an adult individual.

Killer whales are known to commonly attack marine mammals in groups (Ford, 2002). However, killer whales are also known to travel and hunt alone (see Baird and Dill, 1996). During this one-hour observation, only a male killer whale was seen attacking one franciscana dolphin, showing another evidence of a lone killer whale hunt. The attack took place in dark and shallow coastal waters about 8 km from the Ararapira channel, which represents the division between São Paulo and Paraná states. During the observations reported here, water depth ranged from 8 to 12m, as noted on the boat's echo-sounder. Killer whale sightings in southern Brazil have been commonly reported in water depths ranging from 110 to 3500m (Secchi and Vaske Jr., 1998; Zerbini *et al.*, 2004). Along the coast of Rio de Janeiro, southeastern Brazil, sightings have been reported in shallower waters, ranging from 9 to 40m (Lodi and Hetzel, 1998; Siciliano *et al.*, 1999). The present observation, combined with other published records, confirms the wide range of water depths in which killer whales can be found in Brazilian waters.

Onlookers mentioned the live stranding and release of a killer whale two years ago at Ilha do Mel (25°28'S; 48°18'W), a small island on the coast of Paraná state. Occasionally, local fishermen observed killer whales close to coastal fishing areas. Therefore, the presence of killer whales in local waters may be more common than previously thought. For the first time, a documented attack of a killer whale on a franciscana dolphin is reported. The attack took place in the Franciscana Management Area (FMA) II, *sensu* Secchi *et al.* (2003). Franciscana status in this management area has not been yet assessed due to insufficient data (Secchi and Wang, 2002). As franciscana was previously reported as a killer whale prey item in southern Brazil (Ott and Danilewicz, 1998), predation by killer whales must be considered as a potential cause of death in population viability analyses. Franciscanas have also been reported as prey of a few shark species based on stomach content analyses (*e.g.* Brownell, 1975; Praderi, 1985; Di Benedetto, 2004). The present observation on a killer whale attack on a franciscana, added to previous records of franciscana predation by killer whales and sharks, may be important in understanding the population dynamics of the species in the western South Atlantic.

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