MARINE MAMMAL SCIENCE, 25(2): 450–454 (April 2009)

DOI: 10.1111/j.1748-7692.2008.00275.x

Sexual coercion and aggression towards a newborn calf of marine tucuxi dolphins (*Sotalia guianensis*)

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Aggressive behavior in intraspecific interactions has been documented in several cetacean species, (Connor *et al.* 2001, Herzing 1996), most commonly between adult males, but also between adult males and adult females (Clapham 1996, Scott *et al.* 2005). This is most noticeable for bottlenose dolphins (*Tursiops* spp.), with conspecific aggression among males often involving several individuals in intrasexual competition, when male alliances compete with one another to maintain consortships with females (Connor *et al.* 1992*b*), and in intersexual competition (*i.e.*, sexual coercion, Connor *et al.* 1992*a*, Smuts and Smuts 1993). Although aggressive behavior is common between adult marine tucuxi dolphins (*Sotalia guianensis*) during the breeding season (Silva and Best 1996), this note reports the first record of aggression of adults against a newborn calf for this species.

Our observations were made in Sepetiba Bay (State of Rio de Janeiro, Brazil; 22°35'S, 44°03'W), which has an area of 519 km^2 and is comprised of a variety of habitats, including beaches, islands, rocky cliffs, and mangrove and intertidal swamps (Marques *et al.* 2002). Since 1994, our group has been conducting field studies in this area with the objective of creating a visual database to assist in the study of the ecology and behavior of marine tucuxi dolphins. Fieldwork was conducted using a 7-m-long boat, which traveled on a non-systematic route until one or more groups of dolphins were sighted. The geographical position of the target was marked and pictures were taken using a Canon EOS digital camera (Canon EOS 20D digital camera, Tokyo, Japan) fitted with a Canon EF 75–300-mm zoom lens. Due to the poor underwater visibility, approximately 1.5 m, we could not conduct detailed underwater observations.

Figure 1. A female of *Sotalia guianensis* trying to escape from the attack of other adults, exposing the belly.

The following event took place on 5 December 2006, and was observed for 17 min. The sea state was Beaufort 1, very calm. At 0836, a mother and a newborn calf, with evident fetal folds, were photographed in close association. At 0853, a group of six adults of unknown sex approached the mother–newborn pair, approximately 5 m from our boat. From this moment, the newborn calf was separated from its mother by two adults. The female, at this point, began to attempt avoidance maneuvers while four other adults aggressively herded her, hitting the female with flukes and ramming her. Any attempt by the mother to escape toward her offspring was prevented by the dolphins that chased or blocked her. The aggressive behavior towards the female included charging, downward-pointed head and flukes, and flip rams. The female frequently exposed her belly at water surface (Fig. 1), and belly-to-belly contact, known as a sexual behavior for this species (Flores 2002) was recorded at 0900. There was much surface activity and body rubbing among the adults, who swam in a circular pattern.

Approximately 4 m distant from the mother and the others, two adults flip rammed the newborn calf, held it underwater, threw it in the air (Fig. 2) and pushed it again underwater. The newborn calf swam with some difficulty and seemed disorientated, until it disappeared at 0905. At 0910, all the adults and the female went away in opposite directions. The newborn calf was not seen again. The subgroup compositions remained stable during the observation, two of the adults with the calf and the four other adults with the mother. All individuals were identifiable. The female was re-sighted without her calf for the first time 3 d later, in 8 February 2007, and many times thereafter, always accompanied only by adults. The calf, never seen again, is believed to have died.

Figure 2. The newborn calf of *Sotalia guianensis*, moments before being pushed by an adult. The fetal folds are still evident.

Despite extensive observations of male consortships and indirect evidence for aggression, agonistic interaction between conspecifics are not frequently observed among wild dolphins (Scott *et al.* 2005). The episode of a sexual coercion that occurred in Sepetiba Bay was in many ways similar to those observed by Connor *et al.* (1992*a*) in Shark Bay, Australia, among Indian Ocean bottlenose dolphins. There, females are aggressively herded by alliances of adult males for sexual/reproduction purposes. Sexually related behavior such as belly-to-belly contact was also observed in Shark Bay and the authors suggest that the aggression of males toward females seems to be related to male attempts to enforce and maintain consortships. The events described here are consistent with these observations and interpretations. In Shark Bay, aggression is observed in about one-half of the consortships with individual females and they may last from a few minutes to over a month (Connor *et al.* 1992*a*, 1996). In Sepetiba Bay, although we cannot be certain that all the adults involved were males, the related behavior (*e.g.*, belly-to-belly contact during the encounter) is consistent with this suggestion.

The case presented here is also the first aggressive interaction recorded of adults against a newborn calf of *Sotalia guianensis*. Infanticide, defined as conspecifics killing or causing enough harm to a dependent offspring that it will die, is widely reported in many mammalian species (Hrdy 1979, Wolff 1997). Early delphinid captive studies provide accounts of aggression, sometimes fatal, directed towards dolphin calves (McBride and Hebb 1948, McBride and Kritzler 1951, Tavolga and Essapian 1957) and similar behavior was just recently documented in wild cetaceans by Patterson

et al. (1998) and Dunn *et al.* (2002) whose reported evidences of infanticide for two different populations of bottlenose dolphins. The calves examined in these places died from severe blunt-force trauma due to aggressive interactions by conspecific adults of unknown sex.

In this observation, extensive and sustained calf-directed aggression was exhibited by adults, suggesting an attempt at infanticide. The behavior observed is consistent with patterns of behaviors likely to cause blunt force trauma injuries, as documented. We believe that probably the injuries the newborn calf received from this encounter were fatal, once the mother was seen a few days later without the newborn and it seems unlikely that the offspring survived due to its early age. Female dolphins have a long interbirth period, 2–4 yr, and become sexually receptive within a few days of losing a calf (Connor *et al.* 1996). Males may engage in infanticide to gain the chance to mate with the newly receptive female whose infant has been killed and therefore increase their individual reproductive fitness (Hrdy 1979, Pusey and Packer 1994). Wolff (1997) also mention that infanticide may be caused by mammal females when resources are limited. The factors associated with attacks on calves are not well understood for cetaceans and further studies focusing on metabolic requirements, growth rate, and reproductive rate are strongly recommended to examine the ecologic and evolutionary reasons behind the killing of an infant. Although infanticide is suspected in wild dolphin populations, infanticidal behavior such as that described above has rarely been directly observed (Dunn *et al.* 2002). This observation adds to the growing evidence that dolphins may be included in the list of mammals that practice infanticide. As both mating and aggressive behaviors are rarely observed in Sepetiba Bay tucuxi dolphins, systematic surveys monitoring this population may shed further light on the observations reported here of intense aggression and infanticide in *Sotalia*, possibly by males, for sexual coercion.

Acknowledgments

Part of this research was funded by Fundação O Boticário de Proteção à Natureza. We want to thank Romildo da Silva for his skill in maneuvering the research boat and for his friendship. M. Espécie, R. H. O. Tardin, and F. Torres provided valuable assistance in the field. We thank J. P. Torres-Florez, A. L. G. Carvalho, and Dr. H. R. da Silva for their constructive comments on earlier drafts of this manuscript.

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Received: 15 August 2007
Accepted: 28 August 2008