Lobomycosis-like disease in a bottlenose dolphin (*Tursiops truncatus*) from Venezuela

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ABSTRACT

We report on a case of severe lobomycosis-like disease (LLD) in an emaciated common bottlenose dolphin (*Tursiops truncatus*) stranded on a beach of Margarita Island, Venezuela, in 2004. Though evolving slowly LLD may eventually cause the death of extensively affected dolphins and hence negatively affect the growth of coastal populations. The role of biological and chemical contamination in the emergence and severity of this disease should be explored.

INTRODUCTION

Caused by a yeast-like organism known as *Lacazia loboi* (Taborda *et al*., 1999) (syn. *Loboa loboi;* Caldwell *et al*., 1975), lobomycosis (or lacaziosis) naturally affects humans, common bottlenose dolphins (*Tursiops truncatus*) and tucuxis (*Sotalia guianensis*) (de Vries and Laarman, 1973; Caldwell *et al*., 1975; Simões-Lopes *et al*., 1993; Reif *et al*., 2006; Van Bressem *et al*., 2007, submitted). *L. loboi* infecting *T. truncatus* from North and South America may be different from the one found in humans (Haubold *et al*., 2000). In humans, lobomycosis is a self-limited, chronic fungal infection of the skin endemic in rural regions in South and Central America. The natural reservoir of *L. loboi* is unknown but soil and vegetation seem to be likely sources of infection for humans (Honda *et al*., 2007). Patients with lobomycosis may have immunoregulatory disturbances possibly responsible for the lack of pathogen containment (Vilani-Moreno *et al*., 2005; Honda *et al*., 2007). Lobomycosis in dolphins is characterized by whitish to slightly pink, verrucous lesions, often in pronounced relief that may ulcerate (Migaki *et al.*, 1971). In *T. truncatus* from the southern part of the Indian Lagoon, Florida, the disease was associated with an impaired immune function possibly caused by anthropogenic factors. Variation in salinity and water temperature may also play a role (Reif *et al*., 2006). The apparent emergence of lobomycosis and lobomycosis-like disease (LLD) in coastal *T. truncatus* from Colombia, Ecuador, Peru and Brazil was recently reported (Van Bressem *et al*., 2007). At least two *T truncatus* from Brazil have died with extensive lobomycosis (Simões-Lopes *et al*., 1993; Van Bressem *et al*., 2007).

Margarita Island is located on the northeast coast of Venezuela in the Caribbean Sea. Tourism is developing at a very accelerated and intense pace with a concurrent increase of hotels and boat traffic as well as a higher people density and contamination by mostly untreated run-off waters. Twenty species of cetaceans have been registered in the island waters (Bermúdez-Villapol and Sayegh, 2007). *T. truncatus* is the dominant coastal species along the northeast coast of the island with a relative abundance of 35 animals and a total population at less than 60 dolphins (Oviedo and Silva, 2005). In the period 2000-2007, three *T. truncatus* (including the case reported below) were found beached along the island coast. They were attended by the Cetacean Research Centre (CIC), the Environment Ministry and local authorities (Bermúdez-Villapol and Sayegh, 2005).

CASE STUDY

On 28 June 2004 an adult male inshore *T. truncatus* was found dead on a beach of the National Park 'La Restinga' (11º01´30´´N, 64º10´30´´W), north fringe of Margarita Island. The dolphin was freshly dead, measured 3,8m and was emaciated. Several teeth were missing, especially at the distal end of the beak and an 8cm *Conchoderma spp.* parasite was attached on the tenth teeth of the right mandible. The dolphin had a very severe LLD with a very high number of whitish, greyish and pinkish, proliferating, verrucoid lesions sometimes bleeding on the beak, back, flanks, dorsal fin, tailstock and tail (Figure). The dorsal fin was seriously affected, the weight of the lesions causing it to bend. The lesions entered the oral cavity, extending between the teeth to the palate. Unfortunately, due to the presence of a very high number of people at that time and limited access to the place, the dolphin could not be transported to an appropriate facility, a necropsy could not be performed and samples were not collected. The cause of death was not determined but the severe emaciation suggested that the dolphin had suffered from a chronic debilitating disease. Whether its poor health status favoured the extensive development of LLD or whether LLD was the primary undermining factor remains unknown.

DISCUSSION

This is the third time that a coastal *T. truncatus* with extensive lobomycosis-like lesions is found dead along the coasts of South America (Simões-Lopes *et al*., 1993; Van Bressem *et al*., 2007). We believe that the disease though evolving slowly may eventually contribute to cause the death of extensively affected dolphins and hence negatively affect the growth of coastal populations. This is the first time that LLD is observed in the oral cavity of dolphins. Until now, lobomycosis lesions had been reported in the skin and subcutaneous layers as well as in a lymph node (Caldwell *et al*., 197; Bossart, 1984, Reif *et al*., 2006). Reports of lobomycosis and LLD in South America small cetaceans were thus far limited to Brazil, Colombia, Peru and Ecuador where *Lacazia loboi* is endemic (Paniz-Mondolfi *et al*., 2007; Van Bressem *et al*., 2007). *L. loboi* was never reported in Margarita Island (Paniz-Mondolfi *et al*., 2006) and thus, its presence in coastal waters cannot be explained by a hypothetical transport by rivers to estuarine and coastal waters. The fungus could have been carried to the island coastal waters by ballast waters as observed for other micro-organisms (Ruiz *et al*., 2000; Drake *et al*., 2007). Two important ports are present along the southwest coast of Margarita Island, harbouring cargo and passenger ships.

This is the first description of LLD in cetaceans from Venezuela. Though studying cetaceans for the last ten years, CIC researchers have never observed this condition before. Hence, we believe that LLD should be considered an emerging disease in cetaceans from Venezuela. These data further demonstrate that lobomycosis and LLD are spreading in South American small cetaceans. The role of biological contamination through run-off and water ballast in the yeast dissemination should be examined. The very extensive LLD in this dolphin suggests immune deficiencies possibly related to environmental contaminants as described (Reif *et al*., 2006). As lobomycosis is zoonotic (De Vries and Laarman, 1973) the presence of *Lacazia loboi* in coastal waters should be considered as a health threat to the many tourists visiting the island.

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FIGURE

Extensive and proliferating lobomycosis-like lesions on the body of a coastal common bottlenose dolphin (*Tursiops truncatus*).