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MISCELLANEOUS SKIN LESIONS OF UNKNOWN AETIOLOGY IN HUMPBACK WHALES *Megaptera novaengliae* FROM SOUTH AMERICA.

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INTRODUCTION

Southern Hemisphere humpback whales (*Megaptera novaengliae*) migrate from their feeding grounds in Antarctic waters to the tropics where they reproduce in the austral winter (Matthews, 1937). Recently the whales have been recorded in the west of the Antarctic Peninsula during the austral summer and off Ecuador and Colombia during the austral winter (Florez-Gonzalez *et al.* 1998, Scheidat *et al.* 2000, Felix and Haase 2001). In recent years, southeast Pacific humpback whales have been found further north, off Panama and Costa Rica during the austral winter (Acevedo and Smultea 1995; Florez-Gonzalez *et al.* 1998).

In Southwestern Atlantic the Abrolhos Bank is the main breeding area of humpback whales (Engel, 1996; Andriolo *et al.* 2006a). The population in Brazilian waters (Breeding Stock A) was estimated in 6.251 humpbacks in 2005, mostly in Abrolhos Bank (Andriolo *et al.* 2006b; Andriolo *et al.* *subm.*). There are evidences that humpback whales from Brazil feeding near South Georgia and South Sandwich islands (Stevick *et al.* 2006; Zerbini *et al.* 2006).

Before the onset of commercial whaling the number of humpback whales in the Southern Ocean was estimated to lie around 100,000 (Nowak 1999). In 1964 hunting humpback whales in the Southern Hemisphere became illegal (Stevick *et al.* 2004). Curry-Lindahl (1972) estimated that in 1965 less than 3,000 animals were left in the Southern Ocean. Information on population size, migration and diseases in the eastern Pacific are scarce. In this paper we will describe skin lesions on humpback whale of both South Pacific and South Atlantic, with some inference about possible causes.

MATERIALS AND METHODS

Study area

Ecuador and Colombia

In the Pacific Ocean, the Machalilla National Park extends from 01° 00' S to 01° 16' S, limited in the west by Isla de la Plata (81° 06' W) and in the east by the Ecuadorian coast (See Figure 1). It is a large bight that forms part of the continental shelf with an approximate length of 25 nautical miles and a maximum width of 20 nm (40 km.). The sea bottom is mostly made up of sand, gravel, rocky areas and coral reefs (Ayón 1988). Beyond the Isla de la Plata the continental shelf drops down rapidly to depths of more than 3000 m. The Coqui Cove is located in the north of Columbia (06° 00' N to 77° 16' W).

Brazil

In the Atlantic Ocean the photographs were taken in Abrolhos Bank (16°40' to 19°30'S, 37°25' to 39°45'W) located on an extension of the Brazilian continental shelf, on the east coast of Brazil (Figure 2). Abrolhos Bank is a mosaic of coral reefs, mud and calcareous alga bottoms with warm 24-28o C and shallow waters (near 30 meters).

Data collection

Brazil

The photos in Brazil were taking from research cruises in Abrolhos Bank, from July to October in 2006 and 2007. All images was taking by mean of digital camera (Nikon D-70) and record in high resolution. Data of number of whales, social composition of the group and geographic position were register.

Ecuador

Boat-based photo-identification of humpback whales was conducted daily, weather permitting. Data was collected opportunistically in the form of digital photographs, audio tape recordings, and real time observations recorded on preformatted data sheets. Digital photographs of the left and right views of the lateral body, ventral surface of the tail flukes and genital areas (when presented) were obtained using Canon D10 cameras equipped with motor drives and 100-300 mm lenses.

Colombia

Observations took place from whale cruise surveys conducted in Coqui Cove, from July to September from 2001 to 2006. Data was collected opportunistically in the form of digital photographs. Digital photographs of the left and right views of the lateral body and ventral surface of the tail flukes. All images were taken by means of digital camera (Nikon D-70).

All these images from a detailed photo-identification catalog of humpback whales were analyzed for the presence of skin lesions. Lesions were categorized as white lesions or blister lesions and each of those categories were further divided based on lesion morphology and location. Also, if each image presented any evidence of dermatologic diseases, trauma, deformation and marks were selected and scored according to their quality (good, regular, poor).

RESULTS AND DISCUSSIONS

In Ecuador, between 1997 and 2007, 4,116 humpback whales were observed during 868 trips on 629 days on water. In Colombia, between 2001 and 2006, 120 humpback whales were observed and analyzed. And in Brazil, between 2006 and 2007 from a total of 13,040 images obtained during cruise surveys 186 were selected and analyzed.

A total of 159 individuals were sighted, described and recorded in database. Of these, 109 cases were sighted in Abrolhos Bank in Brazil. Forty three were sighted in Machalilla National Park in Ecuador and seven were sighted in Coqui Cove in Colombia. However, more information exists without analyzing that it will be annexed in reports in the future. Next, we review the miscellaneous skin lesions and their possible or suspected causes.

Tissue damage (open wound or healed with some deformation)

In the tissue damage category we included animals presenting abrasions or lacerations (open wounds) as well as wounds partially or completely healed from miscellaneous origins. A total of 40 individuals were sighted. Of these, thirty cases were in Brazil, nine individuals in Ecuador and one in Colombia (See Figure 3).

A few photos were available of pectoral fins, ventral body and head of individuals. We speculate that lesions found in cases #7, 49, 90, 104, 131 (Brazil) are likely caused by predation by killer whales or sharks, and lesions found in cases #83 and 130 (Brazil) and CB8, EC1114, EC0093, EC0184, EC0206, EC0314, EC0364, EC0715 (Ecuador) are likely consequence of entanglement. In the case CB7 (Ecuador) are likely caused by ship strike. In some cases intra-specific interaction may have played a role leaving marks.

Disseminated bulla/vesicles

In Brazil a total of 13 individuals with disseminated bulla were observed in 12 individuals, often in the dorsal region, between dorsal fin and head (n=9, cases #12, 21, 25, 31, 56, 71, 95, 108, 113), but also in other regions as flank (n=5, cases #48, 81, 129) and peduncle (n=1, case #56). In Ecuador a total of 2 individuals were observed (CB6 and PL00145).

Ulcerated lesions

Well delimited round ulcers were observed in several regions of the body:

Brazil

Head 6 cases (cases #60, 64, 68, 98, 109, 117). Cases #98 and #117 presented ulcers on the knobs from unknown origin; Flank (n=4, cases #29, 69, 107, 112); Dorsal fin (n=2, cases #19, 94); Dorsal region (n=2, cases #29, 95). Observing the gross aspect and dimensions of the lesions, we believe that ulcers observed in 5 of these cases are likely caused by barnacles (Cases #64, 68, 69, 94, 95).

Ecuador

One individual ENF1 was observed with tooth rakes on back, ulcerated lesion on dorsal fin: most of the skin has disappeared exposing underlying tissues-like in *T. truncatus* from Peru (Van Bressemm comm. pers.).

While that other animal CRW3682 was observed with ulcerated lesion on the grooves and insertion of flippers.

Small whitish rounded lesions

We believe that the small whitish rounded lesions observed could be caused by:

Brazil Cookie-cutter sharks (cases #19, 23, 28, 61, 64, 58). They were observed mostly in the pictures taken of the flank; Barnacle lesions (cases #19, 42, 65, 69). This result is underestimated; we just chose a few selected cases where barnacle marks were present in the flank unusual regions of the body. Barnacles are commonly found in the fluke, edges of pectoral fins and ventrally in the head; Unknown aetiology (case #111). This animal presented erosions on the knobs.

Whitish lesions with associated scar/wound

Whitish lesions were found associated with:

In Brazil, were observed barnacles in the dorsal region and head (case #68); scar in the dorsal fin (case #8 and 79); open wound in/around the dorsal fin (cases #118, 123, 128); open wounds (case #85). This animal also had wrapping scars in the peduncle and wrapping open wounds in the fluke edges and ulcers (case #61).

In Ecuador, ENF14A was observed with rounded marks with a white outline mixed with orange smaller lesions (wounds and diatoms?).

In Colombia the animal 20317 was observed with at least four whitish wounds with a deep, dark center, sometimes on back, below dorsal fin, anterior part of dorsa seems whitish.

Wrapping scar

In Brazil, Wrapping scars were observed in following features:

dorsal fin (n=26, cases #10, 16, 30, 33, 42, 55, 58, 61, 66, 72, 73, 74, 76, 77, 88, 92, 93, 97, 99, 100, 105, 106, 110, 113, 114, 131); Flunk (n=1, case #60); Fluke (n=2, cases #85, 128); Peduncle (n=3, cases #51, 63, 85). In a preliminary analysis, the likelihood of these scars have been caused by entanglement is high in 9 cases. However, this information must be reviewed and addressed using a specific scoring system. In Ecuador were observed two cases where one could observe fishing nets around of the body of the animal.

Irregular light gray patches

In Brazil we observed irregular light gray patches were observed in the Flunk of 9 individuals (cases #17, 21, 28, 41, 46, 58, 65, 85, 122), and in the dorsal fin of 2 whales (cases# 36, 42). We are not sure if this condition is a disease or would be normal pigmentation patterns.

Irregular stippled lesions

Brazil

Irregular stippled lesions were found in the Flunk of Cases #27, 127. In the case 127 it seems disseminated.

Light red granulomatous tissue associated to scars

In Brazil, this condition was observed in both tips of an injured the fluke and is likely a tissue reaction from the healing process.

Irregular reddish spots

Brazil

This condition was observed in the flunk of 2 individuals (cases #53 and 112) as a reddish coloration of lesions/scars. We suppose this color aspect is given by colonization of lesions by whale lice.

Ecuador

We have ENF5 with several linear, orange lesions behind blowhole (diatoms?) and EC00045 was observed with the 70% of their body with an reddish coloration. We suppose this color aspect is given by colonization of lesions by whale lice.

Irregular white marks

In Brazil these marks were observed in 2 individuals (cases #79 and 102) as a lack of pigmentation of scars. Case #79 also presented whitish lesions with associated wound.

Irregular whitish rounded marks

In Brazil an unusual pigmentation pattern with irregular whitish rounded marks was observed in the Fluke (ventral) of 1 individual (Case #78).

Parallel scars

In Brazil parallel scars were observed in the head of 1 individual (case #80).

Possible Congenital malformation

Brazil

One animal (case #103) was observed with the right lobe of fluke absent. The tissue in the extremity of the lesion is expanded not following the expected anatomical shape. This case presents a different pattern than other cases where parts of the fluke was missing in result of trauma.

Ecuador

One animal CB4 was observed with some rounded marks in the tail and with a white outline, possible malformation.

Abnormal growth of a mass of tissue, possibly tumor

In Brazil one animal Case # 20 in Brazil and two cases (Enf 11A, Enf 7) in Ecuador were observed with a big lump (possibly tumour) on tailstock, right side at the insertion of right fluke. We ignore the causes.

Hypo pigmentation

One animal in Ecuador was observed in 2002 with the 70% of the body white, also it have a congenital malformation in the tail.

Skin lesions were also recently reported in mysticetes and in humpback whales; this was the first report in south America. We are still analyzing the information with experts to know more about individuals. However, we know that this information helped to know but about the natural or acquired possible dangers that the humpbacks could have in South America.

This was the first attempt to analyse and compare data of skin lesions in humpback whales in two different south ocean basin. We intend to standardize methodologies and increase effort in future comparisons to a better understand of how this lesions occurs and how this can affect the conservation of this specie.

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Figure 1. Machalilla National Park (01° 23' S - 80° 58' W) and Coqui Cove in Colombia

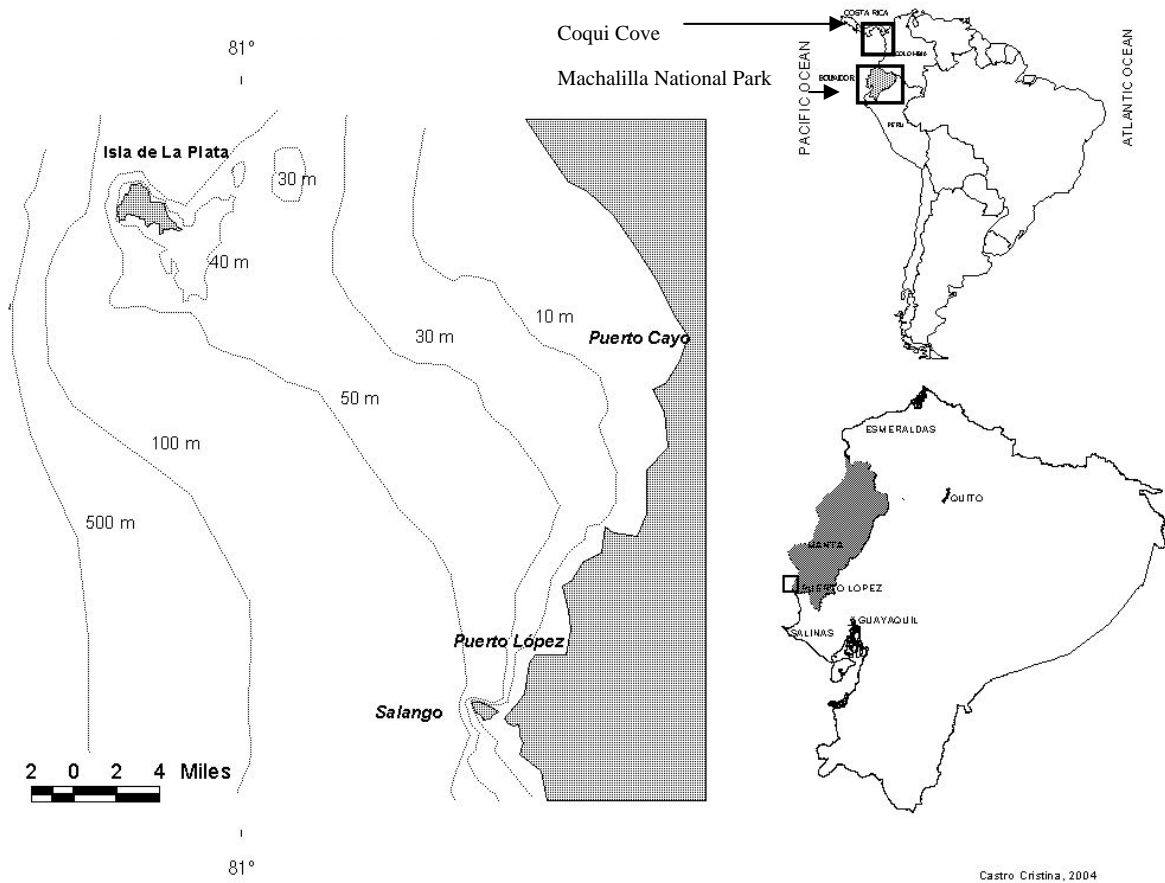


Figure 2. Abrolhos Bank – Brasil (16°40' to 19°30'S, 37°25' to 39°45'W)

