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# New records of the olive ridley sea turtle *Lepidochelys olivacea* (Eschscholtz, 1829) from the Cape Verde Islands

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ABSTRACT

The olive ridley sea turtle *Lepidochelys olivacea* has been recorded in the Cape Verde Islands, but the most recent published data (1998-2000) are of stranded individuals and remains only. This article presents new data on olive ridleys recorded during the years 2001-2011 on Boavista and Sal islands. The presence of this species does not appear to be related to nesting activity. The possible geographical origin of these turtles is discussed. In addition, we propose some studies that could help to reinforce the conservation of sea turtles in West Africa.

RESUMO

A tartaruga olivácea *Lepidochelys olivacea* tem sido descrita nas ilhas de Cabo Verde. Os dados publicados mais recentes (1998-2000) dão conta de indivíduos encalhados e a restos encontrados nas praias. Este artigo reúne novos dados desta espécie registados nos últimos anos (2001-2011) nas ilhas de Boavista e Sal. A presença desta tartaruga nas águas do arquipélago não parece ter relação com a actividade de desova. Para esclarecer a possível origem destas tartarugas em Cabo Verde são discutidas algumas hipóteses. São igualmente propostas algumas pesquisas que poderiam contribuir para fortalecer a conservação das tartarugas marinhas na África Ocidental.

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## INTRODUCTION

On a global scale, the olive ridley sea turtle *Lepidochelys olivacea* is considered the most abundant species of marine turtle (Marcovaldi 2001), although its conservation status varies among different populations (Spotila 2004). At present the species is categorized as vulnerable on the IUCN Red List (IUCN 2011). The species is distributed in tropical and subtropical waters worldwide. In the Pacific Ocean, the nesting distribution ranges from the beaches of southern Mexico to Ecuador (Spotila 2004, Alava *et al.* 2007). In the central Indian Ocean, the beach holding the largest number of nests is located on the eastern coast of India, while nesting also occurs in Sri Lanka, Pakistan and Bangladesh (Spotila 2004). In the western Indian Ocean basin there are nesting beaches in Oman, Kenya, Tanzania and Mozambique (Spotila 2004). In the western Atlantic Ocean, nesting areas are scarce, with some nesting areas in the Guyanas and Brazil (Reichart & Fretey 1993, Marcovaldi 2001, da Silva *et al.* 2007, Kelle *et al.* 2009). Olive ridleys nest *en masse* on some beaches, especially in Ostional and Nancite (Costa Rica), La Escobilla (Mexico) and Gahirmatha (India) (Spotila 2004). This kind of event is known as *arribada* and consists of thousands of females emerging to nest on the same beach, with each laying event lasting several days (Marcovaldi 2001). Nevertheless, solitary nesting is the more common laying strategy on most nesting grounds (IUCN 2011).

The olive ridley sea turtle is an omnivorous species, with a rather unspecialized diet. Like the loggerhead sea turtle *Caretta caretta*, it appears to show a more plastic foraging behavior than other sea turtle species (McMahon *et al.* 2007). While Australian females feed in neritic waters (McMahon *et al.* 2007, Whiting *et al.* 2007), males and females from the eastern tropical Pacific spend most of their time outside the breeding season in an oceanic environment and have been characterized as nomadic, highly migratory oceanic wanderers (Plotkin 2010). On the other hand, some adult females from Oman appear to be sedentary (Papathanasopoulou 2009). Thus far, little is known about the early life ecology and movements of olive ridleys (Spotila 2004). In the Central Pacific, juveniles from both eastern and western Pacific populations are found in an oceanic habitat (Polovina *et al.* 2004).

Compared to other areas, knowledge about the life cycle and distribution of marine turtles in the eastern Atlantic is poor (Formia *et al.* 2003, Fretey 2001). According to current knowledge, the olive ridleys' northern limit of distribution could be in Mauritania (Carr 1957), as its presence there was recently confirmed by at sea captures of adult individuals (Mint-Hama *et al.* in press). The occurrence of olive ridleys north of the Canary Islands and Madeira seems to be accidental (Fretey 2001).

Along the western African coast, the olive ridley sea turtle nests from Guinea Bissau (Bijagós archipelago) to Angola, regularly at some localities and incidental at others (Carr & Campbell 1995, Fretey 1999, Fretey *et al.* 2005, Pauwels & Fretey 2008, Godgender *et al*. 2009, Catry *et al.* 2010, Ségniagbeto *et al.* in press, J. Gómez pers. comm.). The possibility of the olive ridley nesting in southern Senegal (Casamance region) cannot be dismissed, but there are as yet no confirmed records (Diagne 1999).

Immature olive ridleys have been captured incidentally (Angoni *et al.* 2010) along the coast of Cameroon, suggesting that these waters (which are rich in sediment and shrimp) may be developmental areas. Adults are widespread year-round in oceanic waters off Angola (Weir *et al.* 2007) and in waters off Congo (Godgender et al. 2009) and this area probably constitutes a

feeding ground for turtles nesting along these coasts.

In the Cape Verde Islands, most recent (1998-2000) records of olive ridleys are of stranded individuals (both dead and alive) and remains (carapaces) (Fretey 2001). L.F. López-Jurado (in Fretey 2001) reported carapaces displayed in gift shops on Sal island and mentioned stranded olive ridley turtles on Sal and São Nicolau. Fretey (2001) reported six records of carapaces or remains of dead turtles on Maio (1), Santa Luzia (1), Santiago (1) and Boavista (3), as well as an entangled live individual on Boavista. Here we present new data on olive ridleys recorded during the past decade (2001-2011) on two islands in the Cape Verde archipelago (Boavista and Sal) and discuss their possible geographical origin.

Fig. 1. Olive ridley *Lepidochelys olivacea*, found at Atalanta beach, Boavista, 4 November 2004 (Nuria Varo-Cruz). Fig. 2. Olive ridley, Baía Grande, Boavista, 26 January 2010 (Jon Crighton).

## RECENT OCCURRENCES IN THE CAPE VERDE ISLANDS

The records here reported were brought to our attention by fishermen and local inhabitants as well as tourists, who informed Cabo Verde Natura 2000 or SOS Tartarugas, both NGOs working in the archipelago.

On 4 November 2004, an olive ridley was delivered alive to the staff of Cabo Verde Natura 2000. This turtle was found stranded along the shore of Atalanta beach, northern Boavista, showing obvious dehydration symptoms, malnutrition and buoyancy difficulties. Despite treatment, it died after a few days (Fig. 1).

On 26 January 2010, an olive ridley was found at Baía Grande beach, northern Boavista. The turtle was floating near the shore and appeared to be in poor shape. After pictures being taken, the turtle was released (Fig. 2).

On 27 November 2010, local fishermen caught an olive ridley, with a deformed carapace and both left flippers missing, off southern Sal. This turtle was delivered to the staff of SOS Tartarugas and after a veterinarian checkup an euthanasia was done. The deformity of the carapace entailed a strong shift in the configuration of scutes and scales (Fig. 3).

On 28 March 2011, tourists found an entangled olive ridley at Atalanta beach, northern Boavista. After being disentangled it was released into the sea (Fig. 4).

Fig. 3. Olive ridley *Lepidochelys olivacea* with deformed carapace, captured off Santa Maria, Sal, 27 November 2010 (Jacquie Cozens/SOS Tartarugas Cabo Verde). Fig. 4. Olive ridley, Atalanta beach, Boavista, 28 March 2011 (Ian Ford).

Table 1 summarizes information of records of olive ridley sea turtles in the Cape Verde Islands. Information obtained from photos and measurements taken of some individuals show that records no. 1 and 7 were the smallest turtles recorded, their size being indicative of juveniles (cf. Fretey 2001). These two records are of carapaces found in a house at Praia Gonçal (Maio island) and in the capital Praia (Santiago island) and, therefore, we cannot be entirely sure that they were captured or found in Cape Verde. The remaining records may concern either adults or large juveniles.

| Record | Date | Location | Island | CCL/CCW | A/D/C | Condition |
|---|---|---|---|---|---|---|
| 1 | 22 August 1999 | Praia Gonçal | Maio | 47/48 | C | unknown |
| 2 | 20 October 1999 | Praia do Castelo | S. Luzia | – | C | unknown |
| 3 | 01 December 1999 | Ponta do Sol | Boavista | 66/68 | D | S, E |
| 4 | 02 December 1999 | Praia Atalanta | Boavista | – | A | S, E |
| 5 | 08 April 2000 | Praia de Galeo | Boavista | 60/64 | C | unknown |
| 6 | 09 April 2000 | Baía Pedra Alvim | Boavista | 71/71.5 | C | unknown |
| 7 | 16 April 2000 | Praia | Santiago | 20/– | C | unknown |
| 8 | 04 November 2004 | Praia Atalanta | Boavista | – | A | S |
| 9 | 26 January 2010 | Baía Grande | Boavista | – | A | S |
| 10 | 27 November 2010 | Off Santa Maria | Sal | – | A | F |
| 11 | 28 March 2011 | Praia Atalanta | Boavista | – | A | S, E |

Table 1. Records of olive ridley sea turtle *Lepidochelys olivacea* in the Cape Verde Islands during the years 1999-2011. Record 1 from Varo-Cruz *et al.* (1999) and Fretey (2001), records 2-7 from Fretey (2001), records 8-11 this paper. CCL: curve carapace length (cm), CCW: curve carapace width (cm). A: alive, D: dead, C: carapace or remains, S: stranded, E: entangled; F: floating.

## DISCUSSION

Two factors need to be considered in relation to Fretey's (2001) Cape Verde records and those presented in this paper: 1) the condition of the individual turtles and 2) the location of the records (Fig. 5). Nine individuals found along the shore were either entangled, in bad health or dead. Since 1998, intensive surveys of sea turtle nesting have been conducted on large stretches of Boavista's beaches, during which no nesting olive ridleys have been recorded. Thus, the presence of olive ridley in the Cape Verde Islands does not appear to be related to nesting activity. Therefore, we must seek another explanation for the presence of this species in the archipelago.

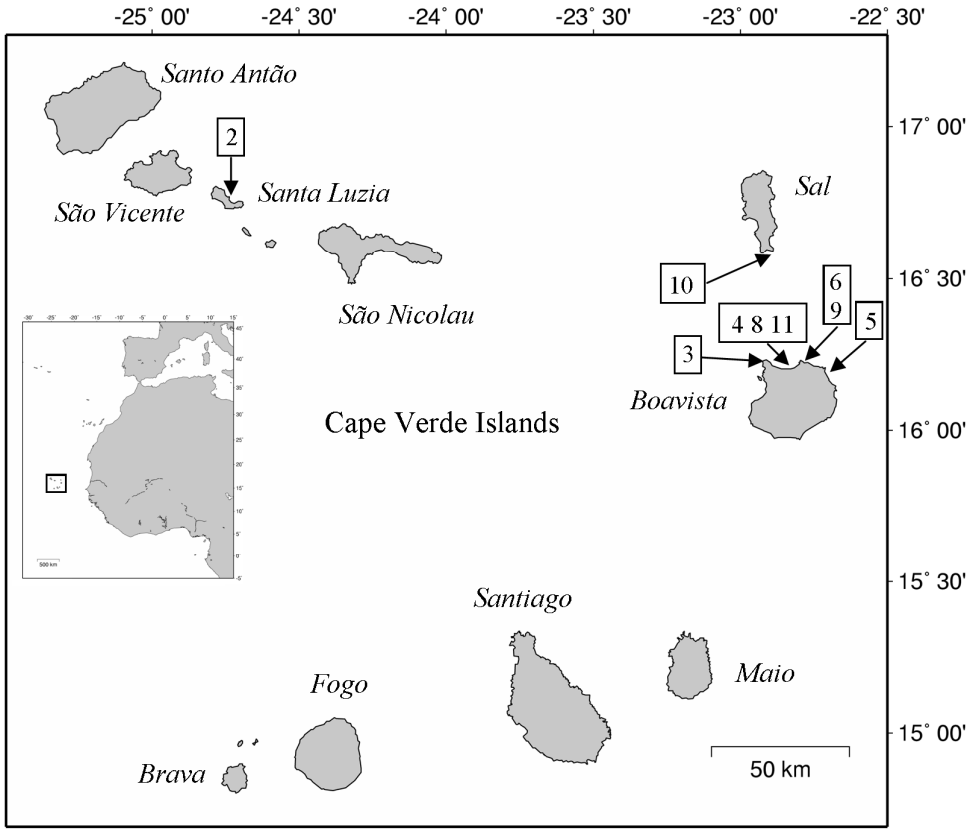


Fig. 5. Map of the Cape Verde Islands showing locations of records in Fretey (2001) and those reported in the present paper (except two carapaces found in private houses; Table 1: records 1 and 7). Adapted from seaturtle.org Maptool http://www.seaturtle.org/maptool/ (accessed 6 September 2011).

The nesting beaches of olive ridleys in Guinea-Bissau (Catry *et al*. 2010), Sierra Leone (Fretey & Malaussena 1991) and Liberia (Stuart & Adams 1990) are not very far away from the Cape Verde Islands. There could exist neritic or oceanic feeding grounds in the waters of this region and sick individuals could drift to the inshore waters of Cape Verde.

As there are important nesting populations in Brazil and the Guyanas, an American origin for olive ridleys in Cape Verde must also be considered. Leatherback *Dermochelys coriacea* (Pritchard 1973, Ferraroli *et al.* 2004) and hawksbill turtles *Eretmochelys imbricata* (Marcovaldi & Filippini 1991, Bellini *et al*. 2000, Grossman *et al*. 2007) equipped

with satellite transmitters or monel tags in South America are known to have crossed the Atlantic from west to east. Olive ridleys belonging to western Atlantic breeding populations may have crossed the ocean and reached Cape Verde coasts.

Regardless of their origin and since olive ridley records in Cape Verde often concern sick or dead animals, they may have been displaced by the currents. Individuals feeding or moving in this part of the Atlantic, i.e. to the north of Cape Verde, may be displaced southwards by the Canary Current and appear on Cape Verde shores, which could perhaps account for the northern position in the archipelago of the stranded animals.

Many different threats to sea turtles in West Africa, including degradation and destruction of habitat, a high rate of by-catch in fisheries and the capture of females and nest poaching on nesting beaches, have been reported (e.g. Fretey 2001, Formia *et al.* 2003, Weir *et al.* 2007, Godgender *et al.* 2009). Our data show an indirect consequence of fisheries, with several entangled individuals (cf. Table 1, records 3, 4, 11).

Nowadays satellite tracking provides accurate information about the routes followed and the areas used by animals equipped with a transmitter. Equipping olive ridleys from both sides of the Atlantic with such devices would disclose usage and distribution of olive ridley habitat and reveal the relative importance of Cape Verde waters for the species. Genetic characterization of African stocks, together with representative samples from the nesting area as a whole (published studies include only a small sample and from one location only; cf. Bowen *et al.* 1998) would allow to establish the genetic structure of the region's populations, the relationships amongst Atlantic and more widely studied (e.g. Bowen *et al.* 1998, López-Castro & Rocha-Olivares 2005) populations and to identify conservation units in the eastern Atlantic. All such information is essential for the much needed implementation of conservation measures for sea turtles, including the olive ridley, in West Africa.

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