

Tunisia sea turtle rescue centre: eleven years of conservation activities



Oifa CHAIEB¹, Kaouthar MAATOUK¹, Nouredine CATTI² and Mohamed Nejmeddine BRADAI¹
¹ Laboratory of Marine Biodiversity and Biotechnologies- National Institute of Marine Sciences and Technologies- Tunisia
² Laboratory of Genetics, Biodiversity and Bio-resources Development - Higher Institute of Biotechnology of Monastir, Tunisia

INTRODUCTION

International conventions on marine turtle conservation were ratified by Tunisia (Southern Mediterranean) and were sustained by a national decree which forbids the catch of sea turtles and their eggs (decree of Minister of Agriculture of 28 September 1995). In this framework, a sea turtle rescue centre was founded in 2004 by INSTM (National Institute of Marine Sciences and Technologies) in collaboration with RAC/SPA (Regional Activity Centre of Specially Protected Areas) and APAL (Agency of Protection and Management of Littoral). It is the unique of its kind established at the central coast of Tunisia, in front of the most important loggerhead nesting site (the Kuriat islands: Monastir Fig. 1). Its mission is conservation through rehabilitation of suffering sea turtle, education and research.

In this work, we present data collected over 11 years of sea turtles rescue activities in the Tunisian centre.

METHODS

Rescue and education activities

Sick and injured turtles are carried to the centre (Fig. 2) owing to field prospecting (on beaches, ports, markets...) or reported by local citizens and fishermen. Initial diagnostic evaluation and first aid are undertaken. Medical treatment depends on turtle ailment. The animal is maintained in convalescent pool during an observation period where it is regularly fed, cleaned and cured. After full recovery, the turtle is tagged before release into the wild. Dead specimens are necropsied in order to determine the possible causes of death.

Education for marine turtle protection is promoted by visits and workshops organized in the centre, school and university meetings and field awareness campaigns on beaches and in ports. Information diffusion is supported by the media and didactic materials.

Genetic research

Genetic analysis was carried out on 60 patient sea turtles in order to determine the origins of turtles hospitalized in the rescue centre of Tunisia. Genomic DNA extraction, PCR and sequencing were realized following Chaieb et al. (2012). Mitochondrial DNA sequences were compared to previously described 380 bp loggerhead haplotypes.

RESULTS

Rescue and education

A total of 112 turtles were hospitalized in the centre over 11 years (2004 to 2014). They were all loggerhead turtles. The annual number of admission was not stable and fluctuated from 0 to 22 turtles per year. This trend was low especially in the last years (Fig. 3).

They were mainly large juveniles with a mean curved carapace length (CCL) of 51.79±16.28 cm (n = 110; range: 19.5 to 91 cm). The size distribution was large and included animals of all size classes, from neritic juveniles to adults (Fig. 4).

Most of these turtles were stranded and incidentally caught (96.4%). Three individuals were seized from fishermen and one from a restaurant. The four turtles were healthy. About half of the total specimens (41.9 %) were brought dead and were necropsied. We reported the following problems and diseases: hook and line ingestion, entanglement, watercraft injuries and flipper amputations, emaciation, ingestion of plastic debris, anoxic submergence and buoyancy problem. The cause of death was not identified in 27% of individuals because of the decomposition of their bodies (Fig. 5).

Educational strategy which took place throughout the years targeted fishermen, school children, local people and authorities. Greater involvement and collaboration of citizens especially NGOs were observed in the past few years.

Genetic analysis

Six distinct haplotypes were detected: CC-A1, CC-A2, CC-A3, CC-A6, CC-A10 and CC-A26 (Tab. 1). The endemic Atlantic haplotype CC-A1 was detected in 8 juvenile and sub-adult turtles. Four individuals carried endemic Mediterranean haplotypes of which 1 subadult and 2 adults, showing CC-A6, came from the Greek nesting site and 1 adult, carrying CC-A26 came from Libyan rookery. Haplotypes CC-A2, CC-A3 and CC-A10 are shared between Mediterranean and Atlantic nesting populations. The majority of the analyzed patients (75%) carried the most common haplotype CC-A2.

DISCUSSION

Only loggerhead individuals were hospitalized in the rescue centre of Monastir. In fact *Caretta caretta* is the most common species in Tunisia. Green and leatherback turtles are rarely observed. The annual number of patients was not stable through the years and is probably attributed to the irregular detection effort. It was particularly low during the last years which does not reflect decreased anthropogenic interactions but is rather linked to the unstable general state of the country.

Most problems encountered reflected the negative impact of fishing activities on patient loggerheads. We believe that interaction with longline fisheries was the main cause of turtle hospitalization which lead in the majority of cases to death due to ingestion of fishing lines.

Ingestion of plastic debris is a further threat that can be lethal due to intestinal blockage and perforation. Furthermore poaching constitutes one of the threatening factors in Tunisia despite fishery legislation which prohibits turtle catch.

All observed problems are caused by interactions with human activities. Although education has been actively promoted all throughout the years, an effective strategy should be urgently developed to reduce negative anthropogenic impact on turtle's survival. Moreover educational effort would not be fulfilled without law enforcement.

Genetic analyses showed that patients rescued in the centre came from two genetically distinct origins: Mediterranean and Atlantic. Thus, the centre contributes to the protection of not only Mediterranean loggerheads but also of Atlantic ones.

Literature cited

Oifa Chaieb, Ali Elouaer, Fulvio Maffucci, Sami Karaa, Mohamed Nejmeddine Bradai, Hedja ElHili, Flegra Bentivegna, Khaled Said, Nouredine Chatti (2012) Population structure and dispersal pattern of loggerhead sea turtles *Caretta caretta* along Tunisian coasts, Central Mediterranean. *Endangered Species Research*. 18: 35-45.

Acknowledgements

I am grateful to ISTS and all the travel grant sponsors for the opportunity they gave me to participate to the 35th annual Symposium on Sea Turtle Biology and Conservation. We acknowledge use of the Maptool program (www.seaturtle.org) for the drawing of the figure 1

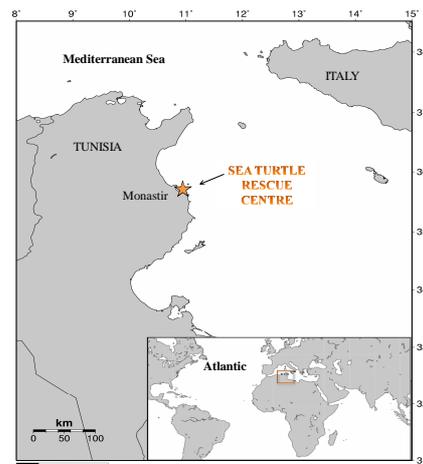


Figure 1. Localization of the Tunisian sea turtle rescue centre



Figure 2. Premises of the sea turtle rescue centre

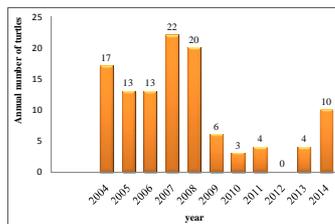


Figure 3. The annual number of loggerheads admitted in the centre from 2004 to 2014. It was not stable and especially low in the last years

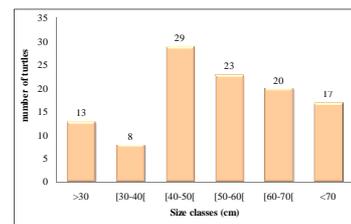


Figure 4. Size classes distribution of loggerheads admitted in the centre. They were mainly large juveniles with a mean CCL of 51.79 cm

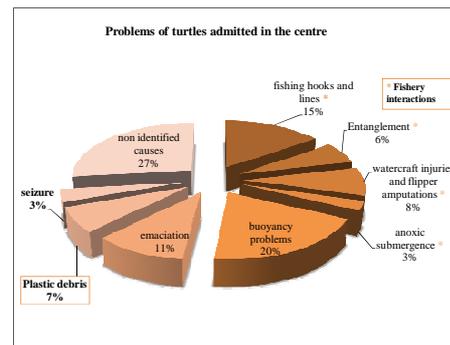


Figure 5. Problems and diseases encountered on loggerheads hospitalized in the centre during 11 years. Most problems are related to fishing activities. Plastic debris and poaching are within the main threatening factors

Haplotype	CC-A1	CC-A6	CC-A26	CC-A2	CC-A3	CC-A10
N (60)	8	3	1	45	2	1
Origin	Atlantic	Mediterranean		Shared		
CCL range (cm)	23.5-70	53.5- 89		19.5-75.1		
Life stage	Juveniles - sub-adults	Large juveniles - adults		Juveniles - adults		

Table 1. Mitochondrial DNA haplotype composition in patient loggerheads rescued in the centre N: number of turtles; CCL: Curved Carapace Length

