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RESEARCH ARTICLE

MORTALITY OF SEA TURTLES *CHELONIAMYDAS* AND *LEPIDOCHELYS OLIVACEA* DUE TO ENTANGLEMENT IN FISHING NETS, IN MANDAPAM REGION

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ABSTRACT

The increasing anthropogenic activities, especially plastic dumping and fishing operations in the ocean have become potential threats to several marine animals including sea turtles. Directly or indirectly, turtles are reported to face mortality due to the lack of regular monitoring of coastal activities, mainly the fisheries operations. The present study documented the mortality of two sea turtles, the green turtle *Chelonia mydas* (Linnaeus, 1758) and olive ridley sea turtle, *Lepidochelys olivacea* (Eschscholtz, 1829) due to entanglement of fish nets. The infestation of epibiotic obligate commensal turtle barnacles, *Chelonibia testudina* (Linnaeus, 1758) was also found on dorsoventral sides of sub-adult green turtle *Chelonia mydas*, while there were evidence of barnacles infestation on adult *L.olivacea.* We infer that effective monitoring of fishing operations, implementation of conservation awareness programs and training on rescuing turtles will protect these endangered and long-lived animals.

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INTRODUCTION

Marine environment is a vast ocean treasure to humans for exploring food and drugs. However, lack of knowledge on the conservation of ocean treasures has made global population careless about dumping of plastics and fishing operations. Scientists and marine biologists are aware of the consequences of these activities on marine animals. However, the main problem is lack of awareness about the importance and conservation need of these marine animals among the citizens and fishermen. Consequently, mortality of several marine animals like turtles, birds and mammals have been documented (Bergmann *et al*., 2015). All Indian turtles are protected under schedule species (reptiles) Indian wildlife (protection) act, 1972. The long-lived green turtles are one of the endangered turtles included in IUCN red list and are protected under different laws and treaties (Seminoff, 2004). Sea turtles are facing several anthropogenic threats likefishing operations, ghost gearand plastic debris ingestion (Duncan *et al*., 2017; Nelms *et al*., 2015), as well as natural threats from parasitic isopods (Junior *et al*., 2014) and turtle barnacles (Epibiont Research Cooperative, 2007). Therefore there is urgency for taking effective actions to protect these marine animals.

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MATERIAL AND METHODS

Freshly dead sea turtles were sighted during field surveys at Hare Island under Mandapam group Islands, southeast coast of India, Tamil Nadu. The dead sub-adult green turtle *Chelonia mydas* was sighted towards oceanic province of northern side of Hare Island, while adult logger head turtle was found washed ashore on southern side of Hare Island. Specimen of *C. mydas* was collected by hands, placed on board and investigated to check damages or causes responsible for mortality. Subsequently, specimen was dissected to observe the gut contents for plastic debris occurrence. Specimens were measured with scale and photographs were taken using Nikon Coolpix underwater camera. The turtle barnacles observed on *C. mydas* were removed using small sharp knife and were collected and identified using available literature (Epibiont Research Cooperative, 2007).

RESULTS AND DISCUSSION

Meticulous observations revealed no signs of carapace damage or neck tissue damage on *C. mydas.* Evidently, tissues of both right and left front arms were observed to be teared. The carapace length and width sizes of *C. mydas* were 40 cm and 32 cm respectively. Gut contents of *C. mydas* were as usually green in color and observed no plastic debris in nose, mouth

and gut contents. Infestation of *Chelonibia testudina* (Cirripedia: Balanomorpha: Coronuloidea) on this sub-adult *C. myd as* was less intensive, representing 13 barnacles on ventral and 9 on dorsal sides (Fig. 1). While, the adult olive ridley sea turtle, *L.olivacea* carapace size was 60 cm. Apparently, an obvious slit with fully damaged neck tissue due to fishing net was observed for *L. olivacea* and no other cuts were observed on arms. There were no other suspected symptoms such as diseases or plastic in both the turtles (Fig. 1). The increasing fishing activities around the world have raised a great concern to protect many marine animals like endangering sea turtles and mammals (Duncan *et al*., 2017). Thus effective steps are needed to be undertaken and implemented for turtle conservation around the globe.

Conclusion

Intensive fishing activities in coastal waters are indirectly killing many marine reptiles through entanglement of fish nets. Hence, immediate conservation awareness programs on the same issue needed to be spread to the fishermen through local government and NGOs working on the conservation and welfare of marine animals. Although legislations have been issued to protect turtles, somehow during fishing activities these animals are being trapped. Therefore, training programs on rescuing turtles and other protected marine animals shall be performed to protect these animals.

Fig. 1. Dorsal and ventral sides of dead specimen of *C. Mydas* (a & b); turtle barnacle *C. testudina* on *C. mydas* (c); tissue damage at left and right front limbs (d & e);a image showing cut on the neck region of *L. olivacea* (Image source: Reef Recharge)(f); dissection and gut content analysis (g & h); examining turtle nose and mouth for plastic debris blocks (i).

On the other hand, the aggregation patterns of turtle barnacles, *C. testudina* on green turtle *C. mydas* are inferred to be an indicator of the health condition of *C. mydas* (Nájera-Hillman *et al*., 2012). Although, barnacles observed in this study were very less on the sub-adult *C. mydas*, this shows that *C. mydas* health condition was good. However, turtle conservators are needed as natural servicing centers for removing epibiotic barnacles. It is well understood that fishing operations, fishing nets and plastics debris in the ocean have become the major concerns which are to be monitored effectively and managed for protecting these endangering animals.

Conflict of interest: We do not have any conflict with this manuscript.

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