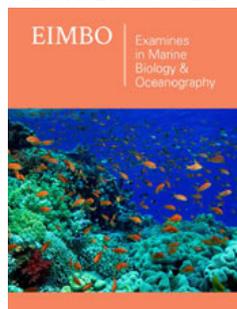


# Evidence of Mediterranean Monk Seal Predation on Loggerhead Sea Turtle in Lesvos Island, Greece

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**\*Corresponding author:** Antonis Chatzipavlis, Department of Marine Sciences, University of the Aegean, University Hill, 81100, Mytilene, Lesvos, Greece

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**Nagore Quintano<sup>1,2</sup> and Antonis Chatzipavlis<sup>1\*</sup>**

<sup>1</sup>Department of Marine Sciences, University of the Aegean, University Hill, 81100, Mytilene, Lesvos, Greece

<sup>2</sup>University of the Basque Country (UPV/EHU), Plentzia Marine Station, Areatza Hiribidea, 47, 48620 Plentzia, Biscay, Spain

## Abstract

A corpse of an adult female loggerhead sea turtle (*Caretta caretta*) (Stejneger 1902) and an adult female Mediterranean monk seal (*Monachus monachus*) (Hermann 1779) individual were spotted at a close distance from each other during a diving survey offshore Tarti beach, Lesvos island, NE Mediterranean sea. Further examination of the turtle's corpse revealed injuries and a main opening at the plastron area towards the rear, while some internal organs were missing. The latter provides evidence of predation of the Mediterranean monk seal on the loggerhead sea turtle.

**Keywords:** Loggerhead sea turtle; Mediterranean monk seal; *Caretta caretta*; *Monachus monachus*; Predation; Trophic interactions

**Abbreviations:** IUCN: International Union for Conservation of Nature; LC: Least Concern; CCL: Curved Carapace Length; CCW: Curved Carapace Width; TTL: Total Tail Length; PTL: Post-cloacal Tail Length

## Introduction

Loggerhead sea turtle (*Caretta caretta*) is globally classified as a Vulnerable (VU) species by the International Union for Conservation of Nature (IUCN) Red List, but its subpopulation in the Mediterranean sea is classified as Least Concern (LC) being the most common turtle species of the region [1,2]. Their nesting period takes place between May and October, while 75% of the nesting grounds are located in Greece and Turkey, with Laganas Bay in Zakynthos Island (Ionian Sea) being the largest one [3]. The northern Aegean Sea is primarily visited by loggerhead turtles for foraging and are often found to approach the coasts at a short distance [4,5], probably due to the wide continental shelves of this area [6].

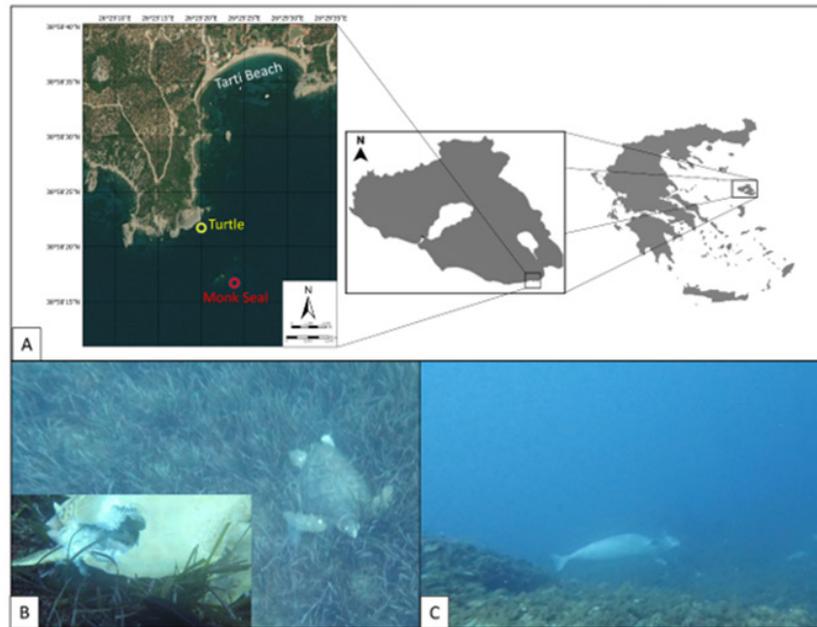
Mediterranean monk seal (*Monachus monachus*) is considered as the most endangered mammal in Europe with a world population estimates between 400-600 individuals [7]. It is classified as a Critically Endangered (CR) species, comprising of 3-4 isolated sub-populations that are highly dispersed across the Mediterranean Sea [8]. The drop in monk seal population over the last decades makes its distribution becoming even more restricted, especially in the Aegean Sea [9]. Concerning their diet, they can ingest a high variety of food, preferably cephalopods and fish, while they show an opportunistic behaviour, praying upon the most abundant or/and vulnerable organisms at the time. Predation of Mediterranean monk seals on sea turtles is not a usual case and seems to take place at times when turtles are more vulnerable. Between 1984-2010, 29 cases of Mediterranean monk seal predation on loggerhead turtles have been documented in Zakynthos island during the *Caretta caretta* nesting season (when turtles are exhausted) showing a higher frequency in 2010 [10,11]. In addition, a video showing a monk seal attacking a loggerhead turtle was captured in late October 2017 by fishermen in Elounda bay, NE Crete [12], while remains of a green turtle (*Chelonia mydas*, Linnaeus 1758) were identified in the stomach content of a monk seal found

stranded on the Turkish eastern Mediterranean coast near Antalya in May 2013 [13].

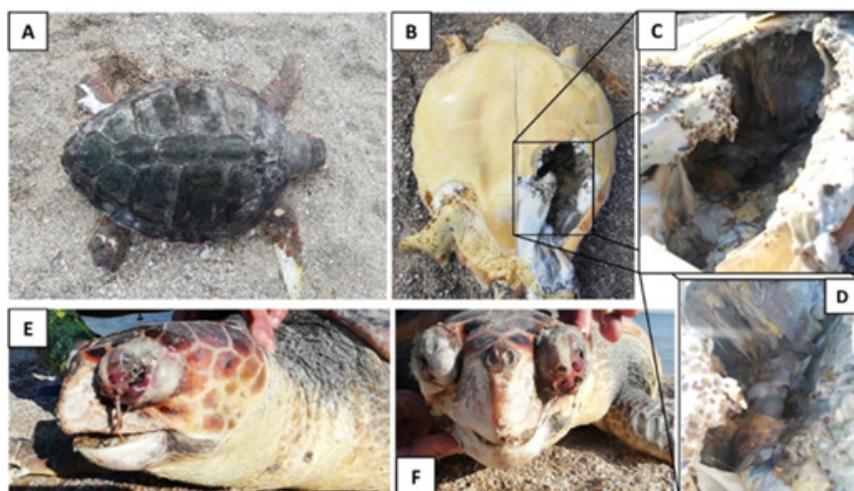
### Methodology and Results

A Mediterranean monk seal was spotted (Lat: 26.490392 °N, Lon: 38.970974 °E, Depth: 26m) and video-recorded during a diving survey that took place on 30<sup>th</sup> March 2021 offshore the western cape of Tarti beach in Lesvos island (Figure 1). At the same time, the corpse of a loggerhead sea turtle was found at about 200m from the monk seal spot (Lat: 26.489042 °N, Lon: 38.972536 °E, Depth: 12m) and was retrieved for further investigations. The

recorded video suggests that the spotted Mediterranean monk seal individual was an adult female. After examination of the turtle's corpse, a main injury was evident at the plastron area towards the rear while there were signs of recent decomposition, especially in the eyes area (Figure 2). Examination of the turtle's tail and body showed that it was an adult female, while further measurements took place. More specifically, the Curved Carapace Length (CCL) and Curved Carapace Width (CCW) were measured at 76.0 and 66.5cm respectively, while Total Tail Length (TTL) and Post-cloacal Tail Length (PTL) were found to be 11.3 and 7.0cm respectively.



**Figure 1:** **A)** Locations of the loggerhead sea turtle (*Caretta caretta*) and the Mediterranean monk seal (*Monachus monachus*) individuals, found offshore Tarti Beach, Lesvos Island, Greece on 30th March 2021. Photos taken from the locations of **B)** Female adult loggerhead turtle (*Caretta caretta*) and **C)** Female adult monk seal (*Monachus monachus*) observed on 30<sup>th</sup> March 2021.



**Figure 2:** Photographs of the *Caretta caretta* corpse. **A)** Full body of the turtle (dorsal side). **B)** Opening of the body cavity through the lower left side of its plastron, through the soft area between the plastron and the rear flipper. **C)** Insight of the opening. **D)** Inner side of the opening, showing the turtle's entrails. **E)** Lateral and **F)** frontal images of the head of the turtle.

## Discussion and Conclusions

The injury spotted at the plastron area towards the rear (Figure 2B & 2C) comes in accordance with previous records of corpses of loggerhead sea turtles that have been attacked by Mediterranean monk seals [10,11]. The majority of the recorded predations of monk seals on loggerhead sea turtles are found to occur in Zakynthos island, during the nesting season [11]. This contribution presents the predation case of a loggerhead sea turtle which was most probably foraging, as the corpse was found in March, out of the turtle's nesting period, while Tarti beach and the surrounding beaches are characterized by coarse sediments that are not suitable for nesting areas. Mediterranean monk seals show an opportunistic behaviour, and their diet varies, but feed normally on cephalopods and fish species that are most abundant at the time. Degradation of marine environment and reduction of the marine resources could possibly explain the reason for the predation on sea turtles, which is also supported by the relevant literature [11,13].

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