



## - SHORT COMMUNICATION -

### The first record of loggerhead turtle (*Caretta caretta*) nesting on the northernmost Aegean coast, Turkey

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#### Abstract

This study presents the first documented evidence of a loggerhead turtle nest on the northernmost Aegean coast of Turkey which was found on the Gelibolu Peninsula of Çanakkale province, Turkey. The nest contains a total of 74 eggs; 50 of them produced hatchlings and 46 of those hatchlings reached to the sea safely. This record supports the idea that sea turtles search alternative nesting beaches as a result of climate change.

#### Keywords:

*Caretta caretta*, North Aegean Sea, Çanakkale, Gelibolu Peninsula, Sporadic nesting site

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#### Introduction

There are two species of sea turtles that nest regularly on the coasts of Turkey, which are the loggerhead sea turtle (*Caretta caretta*) and the green sea turtle (*Chelonia mydas*). The conservation status of loggerhead sea turtle for the Mediterranean subpopulation is Least Concern (LC) in IUCN red list (Casale, 2015). The loggerhead sea turtles are the most abundant sea turtle species in the

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Mediterranean; and Greece, Turkey, Cyprus and Libya are the countries with the most intense nesting activities. Moreover, Turkey has the second most important stock in term of the number of nests ((Türkozan & Kaska 2010). Casale et al. (2018) explained that an average of 8179 loggerhead sea turtle nests per year is recorded in the entire Mediterranean in the last five years, and 2822 of those were reported to be on the coast of Turkey. In the 1990s, there were 17 nesting beaches recorded along the Turkish coast of the Mediterranean for both species. Today the number of nesting beaches have been revised as 25, including sporadic nesting beaches such as Yelkovan, Tuzla and Karataş (Türkozan & Kaska 2010). The loggerhead sea turtle nesting activity is mostly on the western Mediterranean coast of Turkey, including Dalyan, Dalaman, Fethiye, Patara, Kumluca, Çıralı, Belek, Anamur, Göksu Delta (Türkozan & Kaska, 2010).

Furthermore, sporadic nesting records of the loggerhead sea turtles have been reported recently on the Aegean coast of Turkey, including Marmaris/Muğla, Kuşadası/Aydın, Urla/İzmir (Sürücü et al., 2017; Başkale et al., 2018). These reports have not given any evidence about the features of the nests such as whole eggs, hatching success, distance from sea and vegetation and nest depth, except for the information of hatchlings that reach the sea. In this study, not only the nest parameters such as clutch size, hatching success, distance from sea and vegetation, nest depth, hatchling success, but also the sporadic loggerhead turtle nest on the northernmost Aegean coast of Turkey was reported in detail for the first time.

On October 10, 2020, a loggerhead sea turtle nest was found on the Kum Beach at the North Aegean coast of the Gelibolu Peninsula, Çanakkale (nest coordinates: 40° 09' 37.5" N 26° 14' 39.97" E) (Figure 1).

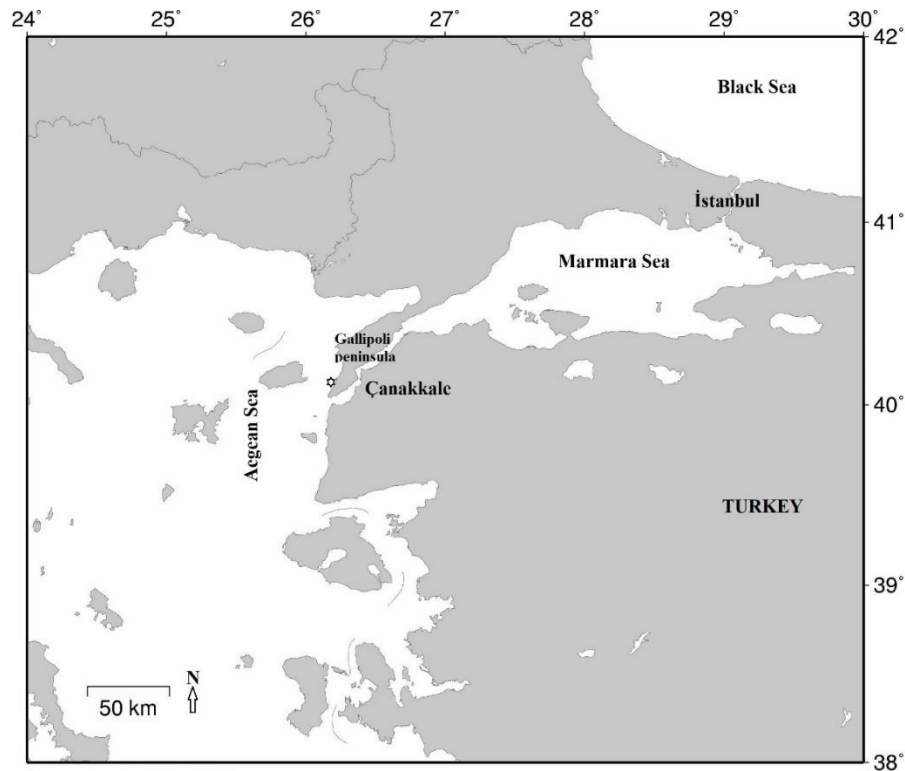


Figure 1. View of the general location of the beach where the nest was detected on the North Aegean coasts (\* indicates the nest location) (adapted from Yalçın Özdilek et al. (2018a)).

The Kum Beach (Kabatepe, Ecebat, Çanakkale) is located on the Northern Aegean, opposite to Gökçeada island on the east of Gelibolu Peninsula. The beach has yellow-coloured sand, and its average width is 20 meters with a maximum width of 35 meters (Figure 2a). The distance from the sea to the nest is 14 meters, and the distance from the nest to vegetation is 8 meters. Also, total nest depth (from top to bottom) measured was 46 centimeters (Figure 2b). A total of 74 eggs were counted in this nest, and only 50 of them produced hatchlings. Hatching success was calculated as 67.5% (empty eggshells/the clutch size X 100). The remaining 24 eggs, (unhatched eggs) were identified, and include seven early-stage embryos (9.46%), 17 late-stage embryos (22.97%) and one unfertilized egg (1.35%) (Figure 2c). Forty-six hatchlings reached the sea safely while four hatchlings were found dead either the inside or the outside of the nest (Figure 2d).



Figure 2. Some photos of the recorded nest on the Gelibolu Peninsula (a: The Kum Beach, b: nest depth and empty eggshells, c: unhatched eggs, d: a dead hatchling).

Meristic and morphometric characteristics of the two dead hatchlings were given in Table 1. Straight carapace length (SCL) and straight carapace width SCW of the hatchlings were measured using manual callipers with an accuracy gap of 0.1 mm. The curved carapace length (CCL) and curved carapace width (CCW) measurements were taken using a plastic tape measure.

Table 1. The meristic and morphometric characteristics of the two hatchlings (SCL: straight carapace length, SCW: straight carapace width, CCL: curved carapace length, CCW: curved carapace width, L: left, R: right)

No	Measurements				Scutes				
	SCL (mm)	SCW (mm)	CCL (mm)	CCW (mm)	Vertebral	Costal (L)	Costal (R)	Marginal (L)	Marginal (R)
<b>1</b>	37.9	30.7	48	42	5	5	6	12	12
<b>2</b>	37.8	31.7	45	41	6	5	5	12	13
<b>Mean</b>	37.85	31.2	46.5	41.5					

In previous studies, it was reported that the sea turtles inhabit the Aegean Sea during some periods of their lifespan (Schofield et al., 2013). However, the first study on the occurrence of a sea turtle at the Çanakkale coasts (Northern Aegean) was based on a questionnaire with fishers (Akdeniz et al., 2012). Most of the fishermen in Çanakkale province declared that they encountered sea turtles during fishing around Çanakkale coasts. Furthermore, Yalçın Özdilek et al. (2018a) reported 37 stranded sea turtles on the Northern Aegean and Sea of Marmara coasts, and 76.5 % of them were reported from the coast of Çanakkale. Kocabaş & Acarlı (2019) indicated seeing an alive adult male loggerhead sea turtle while scuba diving at Gökçeada island, North Aegean Sea. In addition to these studies, Yalçın Özdilek et al. (2018b) revealed that Gökçeada coasts at the Northern Aegean Sea are foraging habitats of the loggerhead sea turtles from isotopic signatures and they play a carnivorous role in the pelagic food web from the depletion in the mean  $\delta^{13}\text{C}$  value.

As well as our first nest record on the northernmost Aegean coast, there are reports on sporadic loggerhead nests outside of the main nesting beaches on the Mediterranean coast of Turkey. For example, Sürücü et al. (2017) reported six nests in Kuşadası/Aydın between 2012 and 2017 and 344 hatchlings reached the sea. Also, Başkale et al. (2018) reported 15 nests on the seven localities between Muğla province and southern Çanakkale (Babakale Beach) on the Aegean coast of Turkey.

The nest features of this first record such as hatching success, distance from the sea and nest depth are similar to the main nesting beaches on the Mediterranean coast of Turkey (Candan; 2018). However, sea surface temperature (SST) should be taken into consideration because SST is an essential factor in sea turtle reproductive behaviour (Mazaris et al., 2004). It was reported that SST is showing an increase in the northern Aegean Sea (Saraçoğlu, 2020). The nest found on the northernmost Aegean coast supports the idea that sea turtles seek alternative nesting beaches as a result of climate change (Başkale et al., 2018). The North Aegean coasts may host sea turtle nesting beaches in the future because of global climate change.

In terms of latitude, the present nesting ground on Gelibolu coast is similar to the northern limit of loggerhead sea turtles' nesting habitat in the Mediterranean (Hochscheid et al. 2015). The sporadic nesting event in Gelibolu Peninsula might be a result of the mechanisms developed to overcome philopatry limitations. By increasing their dispersal capabilities, loggerhead sea turtles enhance their adaptability to the predicted global climate change (Carreras et al., 2018). Moreover, this sporadic nesting ground might be a potential new nesting habitat in a scenario of rising temperatures, particularly throughout the Mediterranean (Casale et al., 2015).



There are many possible beaches suitable for nesting along the Çanakkale coasts including Saros Bay. Detailed beach surveys and further research should be conducted in order to find the potential new sporadic nesting areas in the northern Aegean region and understand the nesting behaviour of loggerhead sea turtles.

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### Conflict of Interest

The authors declare that they have no conflict of interest.

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