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First Record on Loggerhead Nest in Gökçeada, Türkiye in Northern Aegean

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Abstract: This study presents the first report of a loggerhead turtle nest in the northern latitudes in the Aegean Sea of Türkiye, which was found on the Gökçeada Island of Çanakkale Province, Turkey. The nest contains a total of 129 eggs, 103 of which produced hatchlings and 100 of these hatchlings reached to the sea safely. This sporadic record may be a result of mechanisms developed to overcome the limitations of philopatry and increase their ability to adapt to the predicted global climate change.

Keywords: *Caretta caretta*, North Aegean Sea, Gökçeada Island, sporadic nesting

Kuzey Ege Gökçeada'da İribaşlı Deniz Kaplumbağası Yuvasına İlişkin İlk Kayıt

Öz: Bu çalışma, Türkiye'nin Ege Denizi'nin kuzey enlemlerinde, Çanakkale ilinin Gökçeada Adası'nda bulunan bir *Caretta caretta* yuvasının ilk raporunu sunmaktadır. Yuvada toplam 129 yumurta bulunmuş; bunlardan 103'ünden yavru çıkmış ve bu yavrulardan 100'ü güvenli bir şekilde denize ulaşmıştır. Bu düzensiz kayıt, filopatri sınırlamalarının üstesinden gelmek ve öngörülen küresel iklim değişikliğine uyum sağlama yeteneklerini artırmak için geliştirilen mekanizmaların bir sonucu olabilir.

Anahtar kelimeler: *Caretta caretta*, Kuzey Ege Denizi, Gökçeada, düzensiz yuvalama

The Mediterranean is a very important breeding and feeding habitat for sea turtles (Casale et al., 2018). Two species of sea turtles' nest in the Mediterranean are the loggerhead sea turtle (*Caretta caretta*) and the green turtle (*Chelonia mydas*) and both species nest on sandy beaches in Türkiye. The *C. caretta* is globally classified as 'Vulnerable' (VU) (Casale & Tucker, 2015), while the Mediterranean subpopulation is classified as 'Least Concern' (LC) with conservation dependency (Casale, 2015) according to the International Union for Conservation of Nature (IUCN). Loggerheads are the most abundant sea turtle species in the Mediterranean. Greece, Türkiye, Cyprus, and Libya have the highest concentration of nesting activity (Margaritoulis et al., 2003). Türkiye has the second largest population in terms of the number of nests (Margaritoulis et al., 2003; Casale et al., 2018). It is reported that the mean 8179 *C. caretta* nests were recorded annually in the entire Mediterranean, of which 2822 were on Turkish coasts (Casale et al., 2018).

Caretta caretta nesting is mainly concentrated along the western Mediterranean coastline of Türkiye including Dalyan, Dalaman, Fethiye, Patara, Kumluca, Çıralı, Belek, Anamur, and Göksu Delta (Türkozan & Kaska, 2010). In addition to the established nesting sites, there has been a notable spread in sporadic nesting along the northwestern Mediterranean coastline in recent years (Carreras et al., 2018; Hochscheid et al., 2022; Tomillo et al., 2022). Furthermore, sporadic loggerhead nesting has recently been reported along the Aegean coast including Muğla/Marmaris, Aydın/Kuşadası, and İzmir/Urla for the Turkish nesting population (Sürücü et al., 2017; Başkale et al., 2018). The first nesting record in the northern Aegean region occurred in 2020 when a *C. caretta* nest was reported on Kum beach, Gallipoli Peninsula, Çanakkale and it was recommended that there may be suitable beaches for nesting in this region (Yalçın Özdilek et al., 2020).

This report presents a detailed report of the sporadic loggerhead nest found on Aydıncık beach, Gökçeada, northernmost Aegean, Turkey. On 26 September 2023, a *C. caretta* turtle nest was found on Aydıncık beach on the northern Sea of Aegean coast of Gökçeada Island, Çanakkale (nest coordinates: 40°08'37.3"N 25°58'49.2"E) (Fig. 1). The nest was discovered when the hatchlings emerged from the nest. Aydıncık beach is 1.9 km away from Eşelek village. The beach is 2000 meters long and between 5 and 100 meters wide. Due to the strong and constant wind, natural sand dunes have been formed and the sand is fine-grained.

The distance of the nest to the sea is 10 m and the distance to vegetation is 1 m (Fig. 2A). The total depth of the nest was also measured to be 42 cm. After the nest was excavated, 129 eggs (clutch size) were found and 103 of these eggs hatched (Fig. 2B). Hatching success, i.e. the percentage of eggshell to clutch size, was 79%. Twenty-six eggs were found as unhatched eggs, of which 2 were identified as early embryonic stage and 24 as late embryonic stage (Whitmore & Dutton, 1985) and 100 hatchlings safely reached the sea (Fig. 2C).

The morphometric characteristics of the 24 hatchlings were measured and detailed information is given in Table 1. Straight measurements were taken with manual calipers with an accuracy range of 0.1 mm and curved measurements were taken with a plastic measuring tape.

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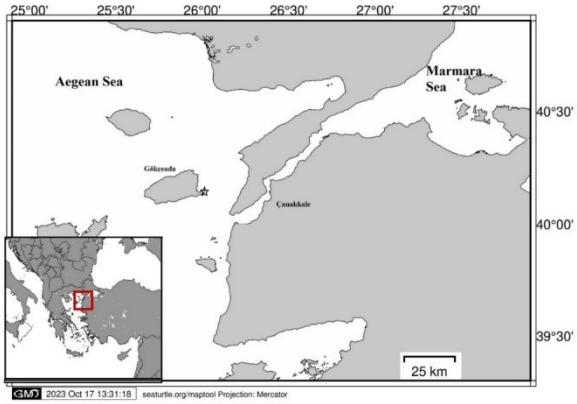

Figure 1. Location of the first recorded nest in Gökçeada on the coast of the North Aegean Sea (* indicates the nest location, maps were created using MAPTOOL (available at www.seaturtle.org/maptool).

Figure 2. First detected nest images on the Aydıncık beach on Gökçeada Island (a: general view of the beach, b: hatched and unhatched eggs, c: alive hatchlings and reach to the sea).

Table 1. Descriptive statistics of the morphological traits of the 24 hatchlings (SCL: straight carapace length, SCW: straight carapace width, CCL: curved carapace length, CCW: curved carapace width, Min: minimum, max: maximum, sd: standard deviation)

	CCL (mm)	CCW (mm)	SCL (mm)	SCW (mm)
N	24	24	24	24
Mean ± sd	43.8 ± 0.76	39.5 ± 1.35	40.0 ± 1.15	31.1 ± 1.68
Min - Max	42.0-45.0	37.0-42.0	36.2-42.0	29.0-35.8

Current nesting in Gökçeada is similar to the northern limit of the nesting range of loggerhead turtles in the Mediterranean (Hochscheid et al., 2015). The sporadic nesting in Gökçeada may be the result of the development of mechanisms to overcome the habitat limitations of loggerhead turtles. By increasing their ability to disperse, loggerhead sea turtles increase their ability to adapt to the projected changes in global climate (Carreras et al., 2018). This is because it has been noted that the nesting areas of sea turtles may expand as a result of climate change (Pike, 2013). Furthermore, this sporadic nesting may be a search for a potential new breeding area, especially under the scenario of increasing temperatures in the Mediterranean Sea. Sporadic nesting has been recorded in recent years both in Turkey and in other parts of the Mediterranean (Sürücü et al., 2017; Carreras et al., 2018; Başkale et al., 2018; Yalçın Özdilek et al., 2020).

In previous studies, fishermen in the northern Aegean reported that loggerhead turtles were caught in their nets in this region. (Akdeniz et al., 2012). However, an isotopic study conducted around Gökçeada in the northern Aegean revealed that the loggerhead sea turtles are a food web species (Yalçın Özdilek et al., 2018a). It was reported that 76.5% of the 37 stranded loggerhead sea turtles on the northern coasts Aegean and Marmara seas were from Çanakkale (Yalçın Özdilek et al. 2018b). The first nest detection in the northern Aegean region was reported in 2020 at Kum beach, Ecebat, Çanakkale (Yalçın Özdilek et al., 2020). In the present study, a loggerhead sea turtle nest was recorded for the first time on Aydıncık beach, Gökçeada Island, Çanakkale. Natural sand dunes was formed on the beach under the influence of the constant wind, and natural vegetation on the dunes was observed during the field study. In addition, the presence of caravans in the region during the nesting season poses a threat. Vehicle traffic on the beaches undermines the sand and prevents possible nesting. Gökçeada is surrounded by several pristine bays that remain unexplored. It is important to establish regular monitoring and surveillance protocols to effectively manage potential nesting sites throughout the designated reproductive period. Further research is needed to reveal the nesting behavior and reproductive patterns of sea turtles throughout Gökçeada and the North Aegean coast.

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Ethics committee approval: Ethics committee approval is not required for this study.

Conflict of interest: The authors declare that there is no conflict of interest.

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References

Akdeniz, B., Yalçın Özdilek, Ş., Okur, E., & Gürsoy, S. (2012). Assessment of Çanakkale coasts as sea turtle (*Caretta caretta* and *Chelonia mydas*) habitat. *Journal of Anatolian Nature. Science*, 3 (1), 37–45.

Başkale, E., Sözbilen, D., Katılmış, Y., Azmaz, M., Uzuner, M., Sürücü, B., & Kaska, Y. (2018). The sporadic nesting sites of loggerhead and green turtles on western Anatolian coasts. In: Proceedings of the 38th Annual Symposium on Sea Turtle Biology and Conservation, p. 237

Carreras, C., Pascual, M., Tomás, J., Marco, A., Hochscheid, S., Castillo, J. J., ... & Cardona, L. (2018). Sporadic nesting reveals long distance colonisation in the philopatric loggerhead sea turtle (*Caretta caretta*). *Scientific reports*, 8(1), 1435. https://doi.org/10.1038/s41598-018-19887-w

Casale, P. (2015). *Caretta caretta* (Mediterranean subpopulation). The IUCN red list of threatened species 2015: e.T83644804A83646294.

Casale, P., & Tucker, A. D. (2015). *Caretta caretta*. The IUCN Red List of Threatened Species 2015: e. T3897A83157651.

Casale, P., Broderick, A. C., Camiñas, J. A., Cardona, L., Carreras, C., Demetropoulos, A., ... & Türkozan, O. (2018). Mediterranean Sea turtles: current knowledge and priorities for conservation and research. *Endangered species research*, 36, 229-267. https://doi.org/10.3354/esr00901

Hochscheid S., Ciampa M., Cascone C., Capo L., Treglia G., Fusco M., Sorrentino R., & Travaglini, A. (2015). Loggerhead nesting at northern latitudes in the Mediterranean Sea. In: Kaska Y, Sonmez B, Turkecan O, & Sezgin C. (eds), Book of abstracts of 35th Annual Symposium on Sea Turtle Biology and Conservation. MACART press, 250pp. Turkey

Hochscheid, S., Maffucci, F., Abella, E., Bradai, M. N., Camedda, A., Carreras, C., ... & Tomás, J. (2022). Nesting range expansion of loggerhead turtles in the Mediterranean: Phenology, spatial distribution, and conservation implications. *Global Ecology and Conservation*, 38, e02194. https://doi.org/10.1016/j.gecco.2022.e02194

Margaritoulis, D., Argano, R., Baran, I., Bentivegna, F., Bradai, M. N., Camiñas, J. A., ... & Lazar, B. (2003). Loggerhead turtles in the Mediterranean: present knowledge and conservation perspectives. In: Bolten AB & Witherington BE (eds). Loggerhead Sea Turtles. Smithsonian Institution Press, Washington, DC, USA, 175-198.

Pike, D. A. (2013). Forecasting range expansion into ecological traps: Climate-mediated shifts in sea turtle nesting beaches and human development. *Global Change Biology*, 19(10), 3082-3092. https://doi.org/10.1111/gcb.12282

Sürücü, B., Çetinkaplan, B., İnanç, S., Taşcı, A., Kurt, G., Yavaş, A., Yavaş, M., Yavaş, Y., Ergenç, Y., Uzuner M., Türkozan, O., & Kaska, Y. (2017). Deniz kaplumbağa yuvalama bölgeleri dışında yuva; Kuşadası (Aydın)'nda, iribaş deniz kaplumbağa yuvaları. V. Ulusal Deniz Kaplumbağası Sempozyumu, Kuşadası, Aydın, Turkey. pp: 41

Tomillo, P. S., Tomás, J., Marco, A., Panagopoulou, A., & Tavecchia, G. (2022). Environmental changes in the Mediterranean Sea could facilitate the western expansion of loggerhead turtles. *Marine Ecology Progress Series*, SHIFTav1. https://doi.org/10.3354/meps14149

Türkozan, O., & Kaska, Y. (2010). Turkey. In: Casale, P, Margaritoulis, D. (Eds.), Sea Turtles in the Mediterranean: Distribution, Threats and Conservation Priorities. Gland. IUCN, Switzerland, pp. 257–294.

Whitmore, C.P, & Dutton, P.H. (1985). Infertility, embryonic mortality and nest site selection in leatherback and green sea turtles in Suriname. *Biological Conservation*, 34:251–272. https://doi.org/10.1016/0006-3207(85)90095-3

Yalçın Özdilek, Ş. , Kırbeci, S. , Yalçın, S. , Altın, A. , Uzatıcı, A. , Tosunoğlu, M. , Ayaz, A. , Öztekin, A. & Sönmez, B. (2020). The first record of loggerhead turtle (*Caretta caretta*) nesting on the northernmost Aegean coast, Turkey. *Natural and Engineering Sciences*, 5 (3) , 198-203. https://doi.org/10.28978/nesciences.833003

Yalçın Özdilek, Ş., Sert M., Perinçek F., Ataç F., Toprak H., Barın E. (2018a). *Trophic position of loggerhead in the food web of Northern Aegean, Gökçeada coasts*. II. International Fisheries Symposium 4-8 November 2018. Girne, Turkish Republic of Northern Cyprus.

Yalçın Özdilek, Ş., Sönmez, B., Sert M. (2018b). Stranded sea turtle records between 2010 and 2017 in northern Aegean and Sea of Marmara. *Regional Studies in Marine Science* 24: 17–22. https://doi.org/10.1016/j.rsma.2018.07.002