

RESEARCH ARTICLE

**First records of leatherback turtle (*Dermochelys coriacea*)  
in the Black Sea, Türkiye**

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**Abstract**

This study presents the first confirmed records of the leatherback sea turtle (*Dermochelys coriacea*) from the Black Sea coast of Türkiye, documenting both a stranded dead individual and a live occurrence. A dead female recorded from Karasu Beach, Sakarya, located at the western Black Sea coast of Türkiye, on 13 April 2025 was subjected to a detailed necropsy, including external and internal examinations, morphometric measurements, and biological sampling. A second record involved a live individual observed off the coast of Rize Province on 7 April 2026. Leatherback turtles are considered rare and irregular visitors in Turkish waters and are typically recorded in the Mediterranean and, less frequently, in the Aegean Sea. These records represent the first confirmed occurrences of the species from the Black Sea coast of Türkiye and the northernmost confirmed occurrence in Turkish seas, following a recent observation of a live individual in the Istanbul Strait, Marmara Sea, in July 2024. The findings contribute to the limited knowledge of leatherback turtle occurrence in marginal habitats and further highlight plastic pollution as an increasing threat in the Black Sea, with potential impacts even on rare and vagrant marine species. The study underlines the importance of continued monitoring, reporting, and conservation efforts for both threatened megafauna and the growing pressure of marine litter in the region.

**Keywords:** Sea turtle, distribution, endangered species, plastic pollution, Black Sea

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The leatherback turtle (*Dermochelys coriacea*) is the marine turtle species with the widest geographic distribution (Camiñas 1998). While the species is globally listed as Vulnerable on the IUCN Red List, the Northwest Atlantic subpopulation, which includes the Mediterranean Sea, is listed as Endangered (Wallace *et al.* 2023). Recently a total of seven regional management units (RMU's) are described for the leatherback turtles globally (Wallace *et al.* 2023).

Leatherback turtles occur in the Mediterranean throughout the year, with no well-defined seasonal patterns of immigration or emigration. Nonetheless, some seasonal movements between northern and southern coastal areas have been reported (Casale *et al.* 2003). The leatherback turtle nests primarily on tropical and subtropical beaches and undertakes extensive transoceanic migrations outside the nesting season, returning to breeding areas at intervals of approximately two to four years (McDonald and Dutton 1996; Hughes *et al.* 1998; Ferraroli *et al.* 2004; Hays *et al.* 2004; Eckert 2006; Doyle *et al.* 2008). Although confirmed nesting by leatherback turtles has not been previously documented in the Mediterranean Sea, a recent report from Syria describes the first observed nesting attempt on a Mediterranean beach, where an individual was seen engaging in nesting behaviour before returning to the sea due to disturbance (Jony *et al.* 2025).

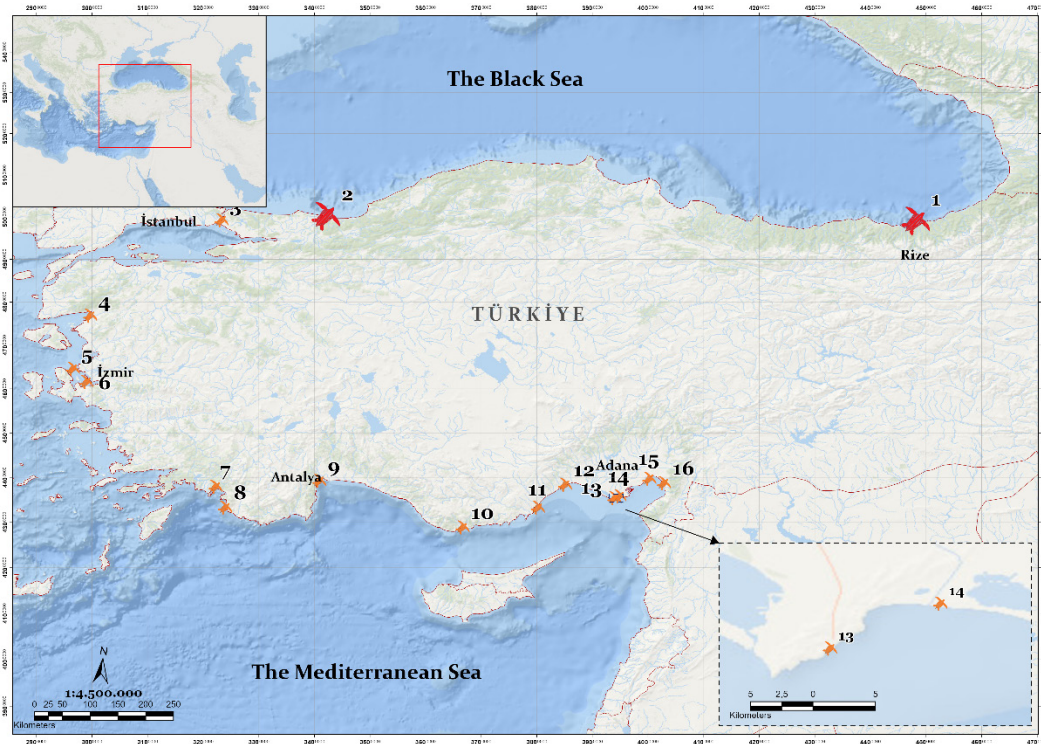
Three sea turtle species are living along the Mediterranean and Aegean Sea coasts of Türkiye: the loggerhead turtle (*Caretta caretta*), the green turtle (*Chelonia mydas*), and the leatherback turtle (*Dermochelys coriacea*) (Turkozán and Kaska 2010). Türkiye hosts some of the most important nesting areas for *C. caretta* and *C. mydas* in the Mediterranean (Canbolat 2004; Turkozán and Kaska 2010). However, nesting of the leatherback turtle has not been recorded in Türkiye so far. The leatherback turtle is regarded as a visitor species in the region, and recent documented records provided information on the Atlantic origin of the species (Roden *et al.* 2017). Similarly, genetic analysis of stranded leatherbacks from the Adriatic and Tyrrhenian Seas suggested western Atlantic origin (Garofalo *et al.* 2020). So far, 14 records consisting of observations, bycatch and strandings have been reported from Türkiye (Baran *et al.* 1998; Oruç 2001; Sönmez *et al.* 2008; Taşkavak *et al.* 2015; Ergene and Uçar 2017; Candan and Canbolat 2018; ACCOBAMS 2021; Türkozán and Tonay 2024) (Figure 1). These records are spatially distributed along the Turkish coastline, with occurrences documented in Antalya, Adana, Balıkesir, İzmir, Mersin, Hatay and Istanbul Strait (Baran and Kasperek 1989; Oruç *et al.* 1997; Baran *et al.* 1998; Taşkavak and Farkas 1998; Sönmez *et al.* 2008; Candan and Canbolat 2018; Türkozán and Tonay 2024). The occurrence of the leatherback turtle in Türkiye is predominantly associated with the Mediterranean shoreline, especially in bay systems, while records from the Aegean coast are comparatively limited. This distribution appears to be influenced by surface current pathways in the Mediterranean basin (Millot and Taupier-Letage 2005; Candan and Canbolat 2018).

Previous studies have documented the presence of the green turtle in the Black Sea from Bulgaria, as well as from the Turkish Black Sea coast, including Kastamonu and Trabzon (Nankinov 1998; Öztürk *et al.* 2011; Ak *et al.* 2016; Tonay and Oruç 2016). The loggerhead turtle records in Black Sea have been reported from Romania, Bulgaria (Nankinov 1998), Russia (Pestov and Kletnoy 2012), and Ukraine (Zinenko *et al.* 2021). However, no previous records of the leatherback turtle, from the Black Sea existed until this study.

Here, we report the first documented stranding records of two leatherback turtles from the Black Sea coast of Türkiye. This record follows a recent observation of a live leatherback turtle in the Istanbul Strait (Türkozan and Tonay 2024), raising the possibility that both records may involve the same individual. The present study aims to document the stranding event through detailed necropsy findings, morphometric measurements, and biological sampling and to discuss potential ecological and anthropogenic factors that may have contributed to the occurrence of this species in the Black Sea.

## **Materials and Methods**

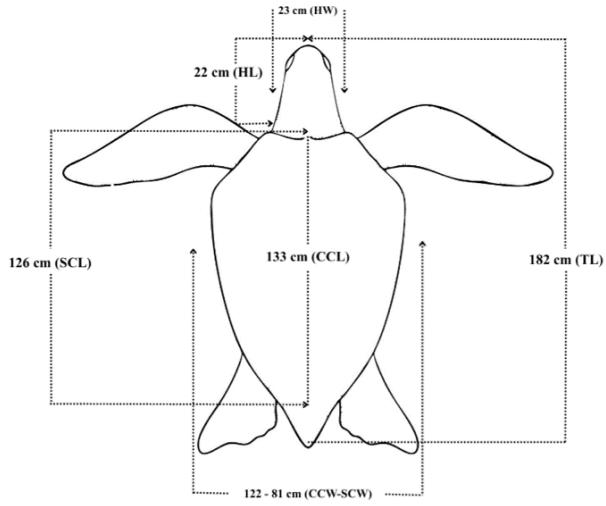
On 14 April 2025, the carcass was transported by Turkish Ministry of Agriculture and Forestry, Sakarya Directorate of Provincial Agriculture and Forestry, Fisheries and Aquaculture Branch Office for scientific examination from Karasu Beach to the Sapanca Inland Fisheries Production, Application and Research Unit of the Faculty of Aquatic Sciences, Istanbul University (Figure 2). The measurements taken from the stranded leatherback are presented in Figure 3. All measurements were made in cm using a flexible measure and a calliper. Necropsy procedures were conducted in accordance with standardized sea turtle post-mortem examination protocols developed under the NETCET guidelines (Poppi and Marchiori 2013). At the time of necropsy, the individual was classified as condition code 2 according to NETCET guidelines (Poppi and Marchiori 2013), indicating moderate decomposition as more than 24 hours had elapsed post mortem. External and internal examinations were performed, standard morphometric measurements were taken (straight and curved carapace lengths and widths), and photographic documentation was conducted. High resolution photographs of the dorsal head view were obtained to document head scale patterns for photo identification.



**Figure 1.** The locations of the leatherback turtle live sightings and dead strandings from the Turkish coasts including the two new records (shown in red) from the Black Sea. 1. Rize, 2. Karasu, 3. Istanbul Strait, 4. Balıkesir, 5. Foça-Karaburun, 6. Gulf of İzmir, 7. Göcek, 8. Off the coast of Asarardı Bay, Fethiye, 9. Antalya Harbour, 10. Bozyazı, 11. Narlıkuyu, Silifke, 12. Mersin, 13. Karataş Harbour, 14. Hurma Strait, 15. Adana, 16. Hatay.



**Figure 2.** A dead individual of the leatherback turtle found stranded on Karasu Beach, Sakarya, Türkiye



- TL: total length
- CCL: curved carapace length notch to tip
- SCL: straightline carapace length notch to notch
- CCW: curved carapace width
- SCW: straightline carapace width
- HL: head length
- HW: head width

**Figure 3.** The measurements taken from the leatherback turtle stranded on Karasu Beach, Sakarya, Türkiye

## Results

On 13 April 2025, a dead female leatherback sea turtle was found stranded on Karasu Beach, Sakarya, Türkiye (Figures 2 and 3). On 7 April 2026, another individual approximately 200 cm in SCL was observed alive off the coast of Province Rize, Türkiye by fishermen (Figure 4). There was also a bloom of moon jellyfish *Aurelia aurita* in the area where this individual was observed. The turtle has a scar on the head, but the rest of the body seems healthy.



**Figure 4.** A live leatherback turtle observed off the coasts of Province Rize, Türkiye

Gross external examination of the stranded turtle from Karasu revealed the absence of both eyes, most likely due to post-mortem scavenging, potentially by birds. The carapace showed no ectoparasites (barnacles or leeches) and no external injuries or trauma consistent with fishing gear interaction or vessel strike were detected. The individual measured 126 cm in straight carapace length (SCL) and 133 cm in curved carapace length (CCL). Two cm blister-like subcutaneous swelling was detected on the lateral abdominal region and approximately 18 cm linear incision was present on the abdominal region (Figures 5 and 6). No bloody discharge was observed in the oral or nasal cavities, while localized yellowish discoloration was noted on the tongue and at several areas within the oral cavity (Figure 5). Examination of the cloaca revealed no evidence of discharge. During internal examination, the fat layer showed a normal yellowish coloration, with a measured thickness of approximately 6.5 cm. Incisions made into the heart to examine the cardiac chambers revealed dark, blackish blood coagulation (Figure 7). The oesophagus was opened along its entire length and examined, with no

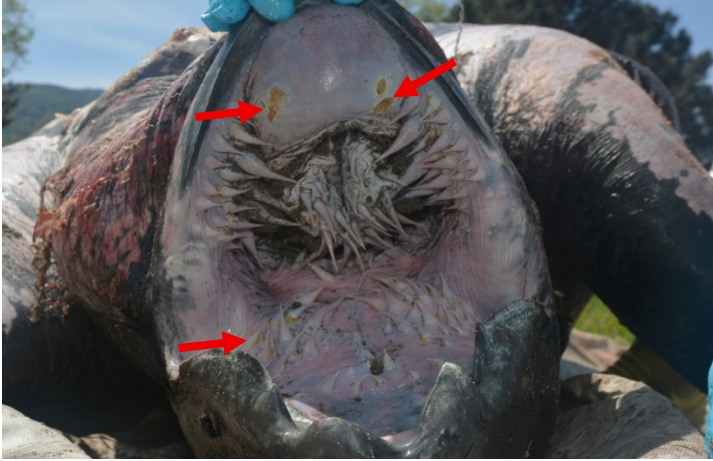
parasites or food content detected. Examination of the trachea and bronchi following standard sectioning procedures revealed no parasites. A rigid plastic stick, measuring approximately 7.5 cm in length, was found attached to the intestinal serosa and can be a lollipop stick (Figure 8). Stomach contents consisted of gelatinous material and mucus, and a possible parasite specimen was collected and preserved in 70% ethanol for further examination. There was no ingestion of plastic materials in the stomach. Ovarian follicles were observed and both the ovary and ovarian follicles were sampled and preserved in 10% neutral buffered formalin (NBF). The cause of death of the individual could not be determined. Plastic ingestion, sickness/infection or drowning could be the potential reasons.



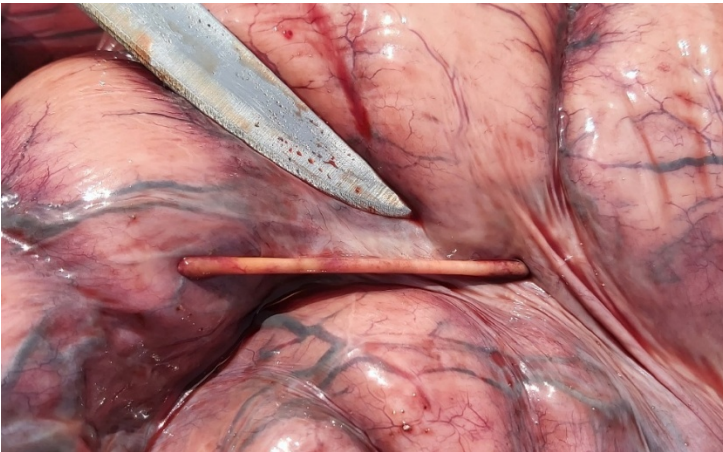
**Figure 5.** Blister like subcutaneous swelling measuring approximately 2 cm on the lateral abdominal region of the leatherback turtle stranded on Karasu Beach, Sakarya, Türkiye



**Figure 6.** An approximately 18 cm linear incision observed on the abdominal region of the leatherback turtle stranded on Karasu Beach, Sakarya, Türkiye



**Figure 7.** Localized yellowish discoloration was seen on the tongue and at several areas within the oral cavity in the leatherback turtle stranded on Karasu Beach, Sakarya, Türkiye



**Figure 8.** A rigid plastic stick, measuring approximately 7.5 cm in length, attached to the intestinal serosa in the leatherback turtle stranded on Karasu Beach, Sakarya, Türkiye

## **Discussion**

It is remarkable that both leatherback records resulted within the same season. The occurrence of the leatherback turtle in the Black Sea may be explained by a combination of climate-driven and ecological processes. The ongoing Mediterraneanization of the Black Sea, associated with increasing sea water temperatures and the northward dispersal of Mediterranean species through the Turkish Straits System, has been suggested as a mechanism facilitating the expansion of thermophilic taxa into this basin (Zaitsev and Mamaev 1997; Oğuz

and Öztürk 2011; Türkozan and Tonay 2024). Empirical data suggest that these changes extend to other regional species, including both the loggerhead (*Caretta caretta*) and green sea turtle (*Chelonia mydas*) (Mancino *et al.* 2022; Arslan *et al.* 2023).

Consistence with this, the co-occurrence of the leatherback turtle with an apparent *Aurelia aurita* bloom is ecologically noteworthy, as leatherback turtles are gelatinous zooplankton feeders and seasonal increases in *A. aurita* abundance and biomass during late spring and summer in the Black Sea may provide temporary prey-rich foraging opportunities (Mutlu 2001; Bat *et al.* 2009; Boero 2013). This seasonal prey availability is consistent with the timing of our observations and may help explain sporadic occurrences of the species into this marginal habitat (Türkozan and Tonay 2024).

However, despite these potentially attractive ecological cues, the Black Sea may function as an ecological trap for vagrant leatherback turtles, as prey availability may draw individuals into the basin while suboptimal environmental conditions and intense anthropogenic pressures reduce the likelihood of successful survival. Unlike other sea turtle species, the leatherback turtle can maintain its body temperature that of the surrounding water, enabling it to forage in colder, high latitude environments and contributing to its exceptionally broad geographic distribution (James *et al.* 2006; Jones *et al.* 2011; Caracappa *et al.* 2017). Leatherback turtle movements are strongly influenced by sea surface currents along their routes (Lambardi *et al.* 2008). Given the prevailing surface circulation in the Mediterranean and the outward directed surface flow of the Istanbul Strait, movement into the Black Sea is unlikely to represent an energetically favourable pathway for leatherback turtles and may instead reflect atypical or stress related movements.

The sizes of the leatherback turtles recorded was generally within the range of measured leatherback turtles previously documented from the Turkish coasts (Candan and Canbolat 2018) except the recent Rize record, which has the largest SCL. The size distribution of documented records suggested that these are mostly immature and adult turtles. The size of the stranded turtle suggested 13-20 years of age (Zug and Parham 1996). Casale *et al.* (2003) documented that leatherback turtles do not leave tropical waters until reaching approximately 100 cm.

As Turkish waters are located at the periphery of the Northwest Atlantic subpopulation's distribution range and far from known nesting areas (Candan and Canbolat 2018), the presence of a leatherback turtle in the Black Sea represents a rare and exceptional occurrence, emphasizing the need for continued monitoring of marginal habitats.

The detection of a rigid plastic stick attached to the intestinal serosa underscores the potential threat of plastic debris to leatherback turtles. Sea turtles are known

to be highly susceptible to plastic ingestion because floating plastic items can resemble their gelatinous prey (Piboon *et al.* 2025; Fujutani *et al.* 2026). Previous studies have shown that ingested plastics in sea turtles can cause intestinal blockage, perforation, and other severe gastrointestinal injuries, while necropsy-based evidence in leatherbacks has specifically documented intestinal perforation by hard plastic fragments (Mrosovsky *et al.* 2009; Piboon *et al.* 2025). In this context, our finding should be considered biologically significant and adds to the growing evidence that plastic pollution constitutes an important threat to leatherback turtles, even in regions where the species occurs only sporadically. This concern is particularly relevant for the Black Sea, a basin already recognized as highly vulnerable to plastic contamination, where plastic pollution has been described as a major and rapidly growing threat to ecosystem functioning (Aytañ *et al.* 2020). Moreover, plastic contamination has been increasingly reported in Black Sea biota, including copepods, planktonic larvae, and commercial fish, demonstrating that plastics are already entering pelagic food webs and may be transferred across trophic levels (Aytañ *et al.* 2022a, b; 2025; Sentürk and Aytañ 2024 ). Therefore, the present record not only provides evidence of a rare occurrence of *D. coriacea* in the Black Sea but also highlights that even sporadic visitors to this basin may face substantial risk from pervasive plastic pollution.

### **Acknowledgment**

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**Ethics committee approval:** There is not necessity for ethical approval for this research.

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**Author contributions:** U.A., A.D., A.G. and A.A.Ö. carried out the investigation; A.D., A.G. and A.A.Ö. realized the necropsy. O.T., A.G. and A.A.Ö. drafted the manuscript with contributions from all authors.

## **Deri sırtlı kaplumbağanın (*Dermochelys coriacea*) Karadeniz'deki ilk kayıtları**

### **Öz**

Bu çalışma, Türkiye'nin Karadeniz kıyılarından deri sırtlı deniz kaplumbağasının (*Dermochelys coriacea*) hem karaya vurmuş ölü bir bireyini hem de canlı bir gözlemini belgeleyen ilk doğrulanmış kayıtlarını sunmaktadır. 13 Nisan 2025 Türkiye'nin Batı Karadeniz kıyısında yer alan Sakarya, Karasu sahilinde kaydedilen ölü bir dişi birey; dış ve iç incelemeler, morfometrik ölçümler ve biyolojik örneklemeleri içeren detaylı bir

nekropsiyeye tabi tutulmuştur. İkinci kayıt ise 7 Nisan 2026 tarihinde Rize ili açıklarında gözlemlenen canlı bireyi kapsamaktadır. Deri sırtlı kaplumbağalar, Türkiye sularında nadir ve düzensiz ziyaretçiler olarak kabul edilmekte, genellikle Akdeniz'de ve daha az sıklıkla Ege Denizi'nde kaydedilmektedirler. Bu kayıtlar, türün Türkiye'nin Karadeniz kıyılarındaki ilk doğrulanmış bulgularını ve Temmuz 2024'te İstanbul Boğazı'nda (Marmara Denizi) yapılan canlı birey gözleminin ardından Türkiye denizlerindeki doğrulanmış en kuzeydeki kaydını temsil etmektedir.

Bulgular, deri sırtlı kaplumbağaların marjinal habitatlardaki varlığına dair sınırlı bilgi birikimine katkıda bulunmakta ve Karadeniz'de giderek artan bir tehdit olan plastik kirliliğinin, nadir ve göçmen deniz türleri üzerindeki olası etkilerini bir kez daha vurgulamaktadır. Çalışma, bölgedeki hem tehdit altındaki megafauna hem de artan deniz çöpü baskısı için sürekli izleme, raporlama ve koruma çalışmalarının önemini altını çizmektedir.

**Anahtar kelimeler:** Deniz kaplumbağası, dağılım, nesli tehlike altında tür, plastik kirliliği, Karadeniz

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