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Case Report

Occurrence of *Ozobranchus margoi* (Hirudinea), an Important Sea Turtle Ectoparasite, on a *Caretta caretta* Individual at Kızılot Beach, Antalya

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Abstract: Sea turtles function as keystone species within subtropical and Mediterranean marine ecosystems, playing a crucial role in maintaining ecosystem balance through nutrient cycling and the preservation of critical habitats. However, human activities including bycatch in fisheries, habitat degradation, and climate change pose significant threats to their survival. In addition to these anthropogenic pressures, parasitic infestations represent important biological factors affecting sea turtle health. This study reports the first record of *Ozobranchus margoi* infestation from Kızılot Beach (Antalya, Türkiye), documented on an adult female *Caretta caretta* during nesting on July 10, 2025. Morphometric measurements, including curved and straight carapace length and width, were recorded, and the general health condition of the individual was assessed. A total of 16 *O. margoi* individuals were detected on the ventral axillary surface. Macroscopic examination of the attachment site revealed mild erythema and superficial dermal erosion, although no histopathological analysis was performed. Species of the genus *Ozobranchus* are recognized as potential mechanical vectors of *Chelonid alphaherpesvirus 5* (ChHV5), the causative agent of fibropapillomatosis (FP) in sea turtles; however, no molecular screening for ChHV5 was conducted in this study, and no macroscopic signs of FP were observed. This report contributes baseline ectoparasite data for a newly monitored nesting site and highlights the importance of integrating parasitological assessments into routine sea turtle monitoring programs at Kızılot Beach.

Keywords: Sea turtle, Ectoparasite, Hirudinea, Mediterranean, Population health

1. Introduction

Sea turtles are keystone species of critical importance for the health and balance of marine ecosystems. The Mediterranean basin provides important nesting grounds, particularly for *Caretta caretta* (Loggerhead sea turtle) and *Chelonia mydas* (Green sea turtle). However, these populations are under intense anthropogenic pressure due to habitat loss, marine pollution, bycatch, and climate change [1, 2]. Apart from these physical threats, parasitic infestations are among the significant biological factors affecting the health status, immune system, and reproductive success of turtles [3]. While conservation efforts in the Mediterranean have gained momentum in recent years, parasitological studies have revealed that a wide range of parasitic organisms adversely affect sea turtle health. Specifically, parasitic prevalence and its associated physiological and pathological effects vary depending on the parasite species, seasonality, and host factors such as age and sex [4–7]. Among the ectoparasites of sea turtles, members of the family Ozobranchidae belonging to the class Hirudinea (leeches) occupy a specialized ecological niche [8]. Within this family, *Ozobranchus margoi* (Apáthy, 1890) and *Ozobranchus branchiatus* (Menzies, 1791) are known as obligate ectoparasites of sea turtles [3, 8]. While *O. margoi* shows host specificity mainly toward *Caretta caretta* and *O. branchiatus* mainly toward *Chelonia mydas*, cross-infestations have also been reported [9]. These hematophagous organisms survive by attaching to the soft tissues of turtles, especially under the flippers, in the neck region, and around the cloaca [8].

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Heavy infestations of *Ozobranchus spp*., where a single host may carry more than one hundred leeches, cause debilitating conditions including anemia, ocular injuries, and ulcerative lesions in the dermis. This extensive tissue damage not only compromises the turtle's health but also creates entry points for secondary infections, potentially leading to host death [9, 10]. However, the primary importance of these leeches in terms of ecology and veterinary medicine lies in their relationship with fibropapillomatosis (FP), a disease that can be fatal in sea turtles. Molecular studies have revealed that *Ozobranchus* species have the potential to serve as mechanical vectors for *Chelonid alphaherpesvirus 5* (ChHV5), the causative agent of FP [11]. The hypothesis that leeches can carry the virus with a high viral load during blood feeding and transmit it to healthy individuals represents a major concern regarding the epidemiology of this disease [12].

On the Turkish Mediterranean coast, *O. margoi* was first reported by İşler et al. [13] from a severely infested *C. caretta* individual admitted to a sea turtle rescue center in Hatay province. More recently, Düşen et al. [14] conducted a comprehensive parasitological survey on 34 loggerhead and green sea turtles from the eastern Mediterranean coast of Türkiye, reporting *O. margoi* among the ectoparasite fauna and providing detailed data on prevalence. Despite these contributions, reports of *O. margoi* from the Turkish Mediterranean coast remain limited. Notably, no parasitological data have been reported from Kızılot Beach, a relatively newly monitored nesting site. The present study therefore constitutes the first record of *O. margoi* infestation from this locality and aims to provide baseline ectoparasite data for the local *C. caretta* population, while documenting the associated dermal pathology at the individual level.

2. Materials and Methods

2.1. Study Area

This study was carried out at Kızılot Beach (approximately 36S 0372662 E, UTM 4063138 N), located within the borders of Antalya province in southwestern Turkey. This beach is one of the most important *Caretta caretta* nesting areas in the Eastern Mediterranean and hosts the nesting activities of hundreds of females turtles every year. Fieldwork was conducted within the scope of the local sea turtle conservation and monitoring program permits.

2. 2. Examination of the Host Animal and Sampling

On the night of July 10, 2025, at approximately 02:00 local time, an adult female *Caretta caretta* individual coming ashore for nesting was detected. During the tagging and routine health check of the individual, clustered ectoparasites were observed in the ventral axillary surface. The general condition of the individual was evaluated as good; however, localized lesions were recorded in the region where the parasites were located. Morphometric measurements of the turtle were made using a tape measure and calipers in accordance with standard techniques. Measurements were recorded as Curved Carapace Length (CCL), Curved Carapace Width (CCW), Straight Carapace Length (SCL), and Straight Carapace Width (SCW).

2.3. Collection and Identification of Parasites

Parasites were carefully removed using soft-tipped forceps in order to avoid additional tissue damage to the host. A total of 16 leech specimens were collected and preserved in 70% ethanol for subsequent laboratory examination. In the laboratory, specimens were examined under a stereo microscope (Nikon SMZ745T). All individuals exhibited a clearly distinguishable body division into a trachelosome (anterior region) and urosome (posterior region), with a well-developed posterior sucker clearly visible. The urosome bore five pairs of lateral, digitiform branchiae (gills), which were symmetrically arranged along the midbody segments (Fig. 1). The anterior sucker was comparatively smaller than the posterior sucker, and the overall body morphology was consistent with members of the family Ozobranchidae. Based on the combination of these diagnostic morphological characteristics—particularly the presence of five pairs of lateral branchiae and the distinct trachelosome–urosome differentiation—the specimens were identified as *Ozobranchus margoi* (Apáthy, 1890), following the descriptions provided by the relevant taxonomic literature [15, 16].

3. Results

The morphometric measurements of the examined female *Caretta caretta* individual are presented in Table 1. All 16 parasite specimens collected from the host were identified as the marine leech *Ozobranchus margoi* based on morphological analysis (Fig. 1).

Table 1. Morphometric measurements of the *Caretta caretta* individual infected with *Ozobranchus margoi*.

Parameter	Abbreviation	Value (cm)
Curved Carapace Length	CCL	76.7
Curved Carapace Width	CCW	67.6
Straight Carapace Length	SCL	72.3
Straight Carapace Width	SCW	54.1

All parasites were found clustered in an area of approximately 2–3 cm in diameter in the ventral axillary surface. Macroscopic examination of the attachment site revealed mild erythema (redness) and superficial dermal erosion. It should be noted that these observations were based solely on visual inspection; no histopathological or microbiological analyses were performed to further characterize the tissue damage.

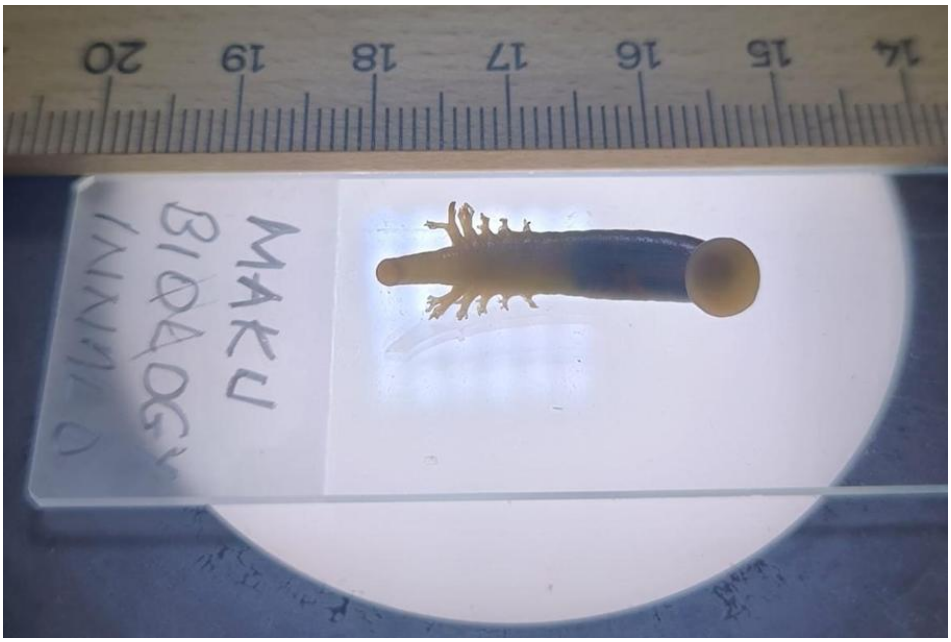


Figure 1. Stereo microscope image of an *Ozobranchus margoi* specimen collected from the infected *Caretta caretta* individual and fixed in 70% ethyl alcohol.

4. Discussion

This study presents the first record of *Ozobranchus margoi* infestation from Kızılot Beach, Antalya, documented on a nesting *Caretta caretta* female, along with the local pathological effects caused by the parasite on the host. The findings are consistent with the global literature confirming that this leech species is a common ectoparasite in *C. caretta* populations [9, 16].

The infestation intensity observed in this study (16 leeches on a single individual) is relatively low compared with the ranges reported in the Mediterranean literature. A severe infestation case was previously described in Hatay province, Türkiye, where hundreds of *O. margoi* individuals were detected on a single injured *C. caretta*; the parasites were densely clustered in the nasal cavity, neck, and cloacal regions, and were also found on the flippers, soft tissues, and even on the skull and jaw areas [13]. In contrast, Sterioti et al. [16] reported more than 1,000 individuals on two turtles from Greece. In a more comprehensive and recent study conducted on the eastern Mediterranean coast of Türkiye, Düşen et al. [14] reported the presence of *O. margoi* in 2 out of 34 turtles; however, the number of leeches per host was not quantified.

It is important to note that in those studies, turtles were examined as injured or dead individuals in laboratories or rehabilitation centers, whereas the *C. caretta* individual detected at Kızılot Beach in the present study had come ashore for nesting and was in good general health condition. Furthermore, only the leeches visible during the nighttime field survey were evaluated; additional parasites may have been present in other body regions (e.g., neck, cloaca, or under the rear flippers) that were not accessible during the brief

examination. Therefore, the recorded intensity of 16 leeches likely represents an underestimate of the actual parasite burden. Systematic and long-term surveys, ideally including thorough body examinations, are essential to establish reliable infestation trends and to evaluate the health status of the local sea turtle population.

The lesions detected in the axillary region of the examined turtle reflect the typical tissue damage caused by *Ozobranchus* species. Mild erythema and superficial dermal erosion were observed at the attachment site, likely resulting from the feeding activities of the leeches. Although these macroscopic findings are consistent with previously reported leech-associated tissue damage [9], the absence of histopathological examination in the present study precludes definitive conclusions regarding the depth and nature of tissue injury. Previous studies conducted on the Turkish coast also reported that *O. margoi* was found in similar attachment areas (neck and under flippers) and caused dermatitis [14]. These observations suggest that *O. margoi* attachment may compromise local skin integrity, although the broader physiological impact on the host cannot be determined from macroscopic assessment alone.

In the broader context of sea turtle health, *Ozobranchus* species have been identified as potential mechanical vectors for *Chelonid alphaherpesvirus 5* (ChHV5), the causative agent of fibropapillomatosis (FP), a debilitating neoplastic disease in sea turtles [11]. Previous studies have demonstrated that these leeches can harbor high viral loads acquired during blood feeding on infected hosts [12]. It is important to note, however, that in the present study, no molecular screening for ChHV5 was conducted on the collected leech specimens, and no macroscopic signs of FP (such as cutaneous or ocular tumors) were observed in the examined *C. caretta* individual. Therefore, while the presence of *O. margoi* at Kızılot Beach raises the theoretical concern of potential ChHV5 transmission within the local population, this remains speculative and requires dedicated molecular investigation in future studies.

Monitoring ectoparasites is important for understanding the general health status of sea turtles and detecting changes in the marine ecosystem. It has been predicted that shifts in the distribution of parasite populations and infestation rates may occur in response to climate change. Therefore, focusing on parasite load and associated health parameters, in addition to turtle population numbers, in monitoring studies conducted at important nesting areas such as Kızılot Beach is essential for the success of conservation strategies.

A further limitation of the present study is that species identification was based exclusively on morphological characters without molecular confirmation (e.g., COI barcoding). Although the morphological features observed were consistent and diagnostic for *O. margoi*, future studies should incorporate molecular tools to provide definitive species-level verification.

5. Conclusions

This case report documents the occurrence of *Ozobranchus margoi* on a nesting *Caretta caretta* female at Kızılot Beach, Antalya, representing the first ectoparasite record from this locality. The infestation of 16 leeches was associated with localized macroscopic tissue alterations at the attachment site. While the broader health implications cannot be determined from a single observation, this finding underscores the importance of incorporating parasitological assessments into routine monitoring protocols at Kızılot Beach, particularly given the potential role of *Ozobranchus* species as mechanical vectors of ChHV5. Future studies at this site should aim to: (I) determine the prevalence and intensity of *O. margoi* infestation across multiple nesting seasons; (II) perform molecular screening of collected leeches for ChHV5; and (III) conduct histopathological analyses of leech-associated lesions to better characterize tissue-level impacts.

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Data Availability Statement: The relevant data are included in the results file/documentation prepared within the scope of the permit/project issued by the Republic of Türkiye, Ministry of Agriculture and Forestry.

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References

1. Casale P., Broderick A. C., Camiñas J. A., Cardona L., Carreras C., Demetropoulos A., et al. Mediterranean sea turtles: current knowledge and priorities for conservation and research. *Endanger Species Res* **2018**, 36, 229-67.
2. Davenport J. Sea turtles in the Anthropocene. *Biology and Environment (PRIA)* **2024**, 124B(2/3), 103-29.
3. Lockley E. C., Fouda L., Correia S. M. Long-term survey of sea turtles reveals correlations between parasite infection, feeding ecology, reproductive success and population dynamics. *Sci Rep* **2020**, 10, 18569.
4. Kučinić M., Lazar B., Mladineo I., Zavodnik D., Žuljević A., Tvrtković N., editors. Intestinal helminths of loggerhead sea turtle, *Caretta caretta*, from eastern Adriatic Sea. Proceedings of the Twenty-fourth International Symposium on Sea Turtle Biology and Conservation; Part 2: Poster presentation; 2008: Miami (FL): National Marine Fisheries Service (NMFS).
5. Karaa S., Jrıbı I., Marouanı S., Jrıjer J., Bradaı M. N. Preliminary study on parasites in loggerhead turtles. *Am J Biomed Sci Res* **2019**, 5(5), 373-6.
6. Pace A., Rinaldi L., Ianniello D., Borrelli L., Cringoli G., Fioretti A., et al. Gastrointestinal investigation of parasites and Enterobacteriaceae in loggerhead sea turtles. *BMC Vet Res* **2019**, 15.
7. Marangi M., Carlino P., Profico C., Olivieri V., Totaro G., Furii G., et al. Coprological survey on helminth parasite communities of free-living loggerhead sea turtles. *Int J Parasitol Parasites Wildl* **2020**, 11, 207-12.
8. Rittenburg L. T., Kelley J. R., Mansfield K. L., Savage A. E. Marine leech parasitism of sea turtles varies across host species, seasons, and the tumor disease fibropapillomatosis. *Dis Aquat Org* **2021**, 143, 1-12.
9. Rodenbusch C. R., Marks F. S., Canal C. W., Reck J. Marine leech *Ozobranchus margoi* parasitizing loggerhead turtle (*Caretta caretta*) in Rio Grande do Sul, Brazil. *Rev Bras Parasitol Vet* **2012**, 21(3), 301-303.
10. Schwartz F. The marine leech *Ozobranchus margoi* (Hirudinea). *J Parasitol* **1974**, 60, 889-90.
11. Greenblatt R. J., Work T. M., Balazs G. H., Sutton C. A., Casey R. N., Casey J. W. The Ozobranchus leech is a candidate mechanical vector for the fibropapilloma-associated turtle herpesvirus. *Virology* **2004**, 321(1), 101-110.
12. Farrell J. A., Yetsko K., Whitmore L., Whilde J., Eastman C. B., Ramia D. R., et al. Environmental DNA monitoring of oncogenic viral shedding and genomic profiling of sea turtle fibropapillomatosis reveals unusual viral dynamics. *Commun Biol*, **2021**, 4:565.
13. İşler C. T., Orunç Kılınç Ö., Altuğ M. E., Yılmaz A. B., editors. Mustafa Kemal Üniversitesi Deniz Kaplumbağaları İlk Yardım Tedavi ve Kurtarma Araştırma ve Uygulama Merkezine getirilen bir *Caretta caretta* türü deniz kaplumbağasında şiddetli *Ozobranchus margoi* olgusu ve tedavisi. 19 Ulusal Parazitoloji Kongresi & Uluslararası Katılımlı Ekinokokkozis Sempozyumu; 2015; Erzurum, Turkey.
14. Düşen S., Kaska Y., Yılmaz M., Ulubeli S. A. Endoparasites and epibionts of loggerhead and green sea turtles from the eastern Mediterranean, Turkey: A detailed assessment. *Helminthologia* **2025**, 62(1), 40-49.
15. Sawyer R. T. Leech biology and behaviour. *Feeding, Biol, Ecol and Systematics* **1986**, 1:3.
16. Sterioti A., Doxa C. C., Grigoriou P., Vardanis G., Cascarano M. C., Katharios P. *Ozobranchus margoi* infections in loggerhead turtles (*Caretta caretta*) in Greece and potential treatment options. *J Exot Pet Med* **2017**, 26(3), 196-199.