ANNALES

Anali za istrske in mediteranske študije
Annali di Studi istriani e mediterranei
Annals for Istrian and Mediterranean Studies
Series Historia Naturalis, 36, 2026, 1

UDK 5 Annales, Ser. hist. nat., 36, 2026, 1, pp. 1-256, Koper 2026 ISSN1408-533X

UDK 5

ISSN 1408-533X
e-ISSN 2591-1783

ANNALES

Anali za istrske in mediteranske študije
Annali di Studi istriani e mediterranei
Annals for Istrian and Mediterranean Studies

Series Historia Naturalis, 36, 2026, 1

KOPER 2026

Anali za istrske in mediteranske študije - Annali di Studi istriani e mediterranei - Annals for Istrian and Mediterranean Studies

ISSN 1408-533X
e-ISSN 2591-1783

UDK 5

Letnik 36, leto 2026 številka 1

Izdajatelja/*Editori/Published by:*

Zgodovinsko društvo za južno Primorsko - Koper */ Società storica del Litorale - Capodistria*©
Inštitut IRRIS za raziskave, razvoj in strategije družbe, kulture in okolja */ Institute IRRIS for Research, Development and Strategies of Society, Culture and Environment / Istituto IRRIS di ricerca, sviluppo e strategie della società, cultura e ambiente*©

Sedež uredništva/*Sede della redazione/*
Address of Editorial Board:

Nacionalni inštitut za biologijo, Morska biološka postaja Piran / *Istituto nazionale di biologia, Stazione di biologia marina di Pirano / National Institute of Biology, Marine Biology Station Piran*
SI-6330 Piran /*Pirano*, Fornače/*Fornace* 41, tel.: +386 5 671 2900, fax +386 5 671 2901;
e-mail: annalesSHN@nib.si, *internet:* www.zdjp.si

Redakcija te številke je bila zaključena 20. 06. 2026.

Sofinancirajo/*Supporto finanziario/*
Financially supported by: Javna agencija za znanstveno-raziskovalno in inovacijsko dejavnost Republike Slovenije (ARIS)

Annales - Series Historia Naturalis izhaja dvakrat letno.

Naklada/*Tiratura/Circulation:* 300 izvodov/copie/copies

Revija Annales, Series Historia Naturalis je vključena v naslednje podatkovne baze / *La rivista Annales, series Historia Naturalis è inserita nei seguenti data base / Articles appearing in this journal are abstracted and indexed in:* BIOSIS-Zoological Record (UK); Aquatic Sciences and Fisheries Abstracts (ASFA); Elsevier B.V.: SCOPUS (NL); Directory of Open Access Journals (DOAJ).

ANNALES · Ser. hist. nat. · 36 · 2026 · 1

Anali za istrske in mediteranske študije - Annali di Studi istriani e mediterranei - Annals for Istrian and Mediterranean Studies

UDK 5 Letnik 36, Koper 2026, številka 1 ISSN 1408-53 3X
e-ISSN 2591-1783

VSEBINA / *INDICE GENERALE / CONTENTS*

received: 2026-01-28 DOI 10.19233/ASHN.2026.18

SUBSTANTIATED RECORD AND PRELIMINARY BIOLOGICAL INSIGHTS OF *MICROLIPOPHRYS DALMATINUS* (STEINDACHNER & KOLOMBATOVIĆ, 1883) FROM THE SEA OF MARMARA, TÜRKIYE

İsmail Burak DABAN
Department of Fisheries and Processing Technology, Çanakkale Onsekiz Mart University, Çanakkale, Türkiye
e-mail: burakdaban@gmail.com

Yusuf ŞEN
Department of Marine Biology, Faculty of Marine Science and Technology, Çanakkale Onsekiz Mart University, Çanakkale, Türkiye

ABSTRACT

This study reports the first evidence-based record of Microlipophrys dalmatinus *in the Sea of Marmara, Türkiye. Six specimens were collected using a beach seine between June and October 2024, at Çardak Lagoon in the Çanakkale Strait. The total lengths of the specimens ranged from 19.84 to 37.97 mm (mean: 29.8 ± 3.1 mm), and total weights ranged from 0.08 to 0.41 g (mean: 0.26 ± 0.05 g). The sample consisted of three juveniles collected from the lagoon inlet in August and October, and three ripening females (Stage III) collected from the inner lagoon in June. The current detection of* M. dalmatinus *in the Sea of Marmara may be either attributed to the species' cryptobenthic nature and small size, which may have led to it being historically overlooked, or to a recent range expansion driven by the species' thermophilic nature and rising seawater temperatures.*

Key words: Blenniidae, beach seine, coastal habitat, lagoons, morphometric characteristics

SEGNALAZIONE DOCUMENTATA E PRIME OSSERVAZIONI BIOLOGICHE SU *MICROLIPOPHRYS DALMATINUS* (FRANZ STEINDACHNER & JURAJ KOLOMBATOVIĆ, 1883) NEL MAR DI MARMARA, TURCHIA

SINTESI

Lo studio riporta la prima segnalazione documentata di Microlipophrys dalmatinus *nel Mar di Marmara, in Turchia. Sei esemplari sono stati catturati mediante sciabica da spiaggia tra giugno e ottobre 2024, presso la laguna di Çardak nello stretto dei Dardanelli. Le lunghezze totali degli esemplari variavano da 19,84 a 37,97 mm (media: 29,8 ± 3,1 mm), mentre i pesi totali variavano da 0,08 a 0,41 g (media: 0,26 ± 0,05 g). Il campione era composto da tre individui giovanili raccolti all'ingresso della laguna in agosto e ottobre, e tre femmine in maturazione (stadio III) raccolte nella laguna interna in giugno. L'attuale rilevamento di* M. dalmatinus *nel Mar di Marmara potrebbe essere attribuito sia alla natura criptobentonica e alle piccole dimensioni della specie, sia a una recente espansione dell'areale, favorita dal carattere termofilo della specie e dall'aumento delle temperature delle acque marine.*

Parole chiave: Blenniidae, sciabica da spiaggia, habitat costieri, lagune, caratteristiche morfometriche

INTRODUCTION

The family Blenniidae, commonly known as combtooth blennies, is one of the most diverse families of marine bony fishes currently comprising 59 genera and about 413 valid species worldwide (Fricke *et al.,* 2025). Despite their small size, these benthic fish play important ecological and biological roles in coastal marine environments, contributing to biodiversity and supporting coastal food webs (Patzner *et al.,* 2009). Combtooth blennies are primarily tropical and subtropical marine species, but they also occur rarely in freshwater and occasionally in brackish waters of the Atlantic, Indian, and Pacific Oceans (Patzner *et al.,* 2009; Nelson *et al.,* 2016).

In the Mediterranean Sea, direct research focusing specifically on combtooth blennies remains relatively limited. However, a few notable studies have provided valuable insights into their habitat preferences, ecological roles, and distribution patterns (*e.g.*, Orlando-Bonaca & Lipej, 2006; Tiralongo *et al*., 2016; Ergüden *et al*., 2024). Due to their small body size, specialized morphological and behavioral adaptations, and occurrence in habitats largely untargeted by commercial fishing gear, this group is considered 'cryptobenthic.' As specialized bottom-dwellers, combtooth blennies exhibit distinct morphological and ethological adaptations – such as specialized dentition and cryptic behavior – that enable them to occupy diverse ecological niches within the upper meters of Mediterranean rocky shores (Zander, 1972; Tiralongo *et al*., 2016). Despite their lack of commercial value, these species play a fundamental role in the functioning of coastal ecosystems, acting as both abundant predators and prey within the shallow infralittoral zone (Golani *et al*., 2014). Their distribution is often governed by fine-scale habitat requirements, including the availability of endolithic bivalve holes or photophilic algal covers, which provide essential shelter for their small bodies (Kotrschal, 1988; Lipej & Orlando-Bonaca, 2006).

Given the interspecies similarity in external morphology, the taxonomy of the family has undergone extensive revisions and reclassifications (Almada *et al.,* 2005). Consequently, over the past decade, researchers have increasingly relied on phylogenetic and biogeographic data to determine the distributional ranges of these species (Almada *et al.,* 2005; Levy *et al.,* 2011).

The genus *Microlipophrys* was first established by Almada *et al.* (2005) based on mitochondrial DNA and morphology of north-eastern Atlantic and Mediterranean blenniids, encompassing a total of seven species. Three species only occur in the tropical Atlantic (*Microlipophrys bauchotae, M. caboverdensis, M. velifer*), two are endemic to the Mediterranean Sea (*M. adriaticus, M. nigriceps*), and the remaining two (*M. canevae, M. dalmatinus*) have an Atlanto-Mediterranean distribution (Levy *et al.,* 2011).

Microlipophrys dalmatinus is one of four species of the genus recorded in Turkish waters, with occurrences reported from the northern Levant and Aegean Sea shores (Bilecenoğlu *et al.,* 2014; Bilecenoğlu, 2024). Due to its small size and peculiar habitat, this species is not captured by any commercial fishing gear and is seldom encountered during visual census surveys or snorkeling observation (Patzner *et al.,* 2009; Williams *et al.,* 2014). Consequently, available occurrence information might not reflect the actual distribution of the species. Until now, the presence of *M. dalmatinus* in the Sea of Marmara has been disputed, as previous records lacked essential taxonomic data needed to verify species identity (Bilecenoğlu, 2020). The only evidence suggesting its possible occurrence in the region comes from Kara and Yüksek (2023), who barcoded a single larva using 16S rRNA, but failed to obtain a COI sequence.

The present study provides the first substantiated record of *M. dalmatinus* in the Sea of Marmara, along with some of the biological data (including morphometric measurements and observations on reproductive biology) that are currently lacking for the species reported from the Mediterranean Sea.

MATERIAL AND METHODS

Sampling was conducted at seven coastal stations: at the lagoon inlet (BS1), outside the lagoon (BS2, BS3), and inside the lagoon (BS4, BS5, BS6, BS7) (Fig. 1). At each station, two hauls were performed using a beach seine deployed from a boat. Monthly sampling was carried out from May 2024 to April 2025, resulting in a total of 168 hauls.

The beach seine used in this study consisted of two 30 m-long wings, each 1.8 m in height and attached to a 15 m hauling rope. The net included a cod end (bag) measuring 2 × 2 × 2 m with a 4 mm mesh size, while the wings had larger, 6.5 mm meshes (Fig. 2). To ensure comprehensive ecological representation, the sampling gear was designed to be non-selective across all size cohorts.

The captured individuals were fixed in 4% formaldehyde and immediately transferred to the laboratory for species identification (Fig. 3). They were photographed and identified taxonomically based on morphological characteristics following Zander (1972) and Whitehead *et al.* (1984–1986).

Morphometric measurements were taken in millimeters (mm) using a digital caliper, and meristic characteristics were counted and recorded. Total weight and gonad weight were measured to the

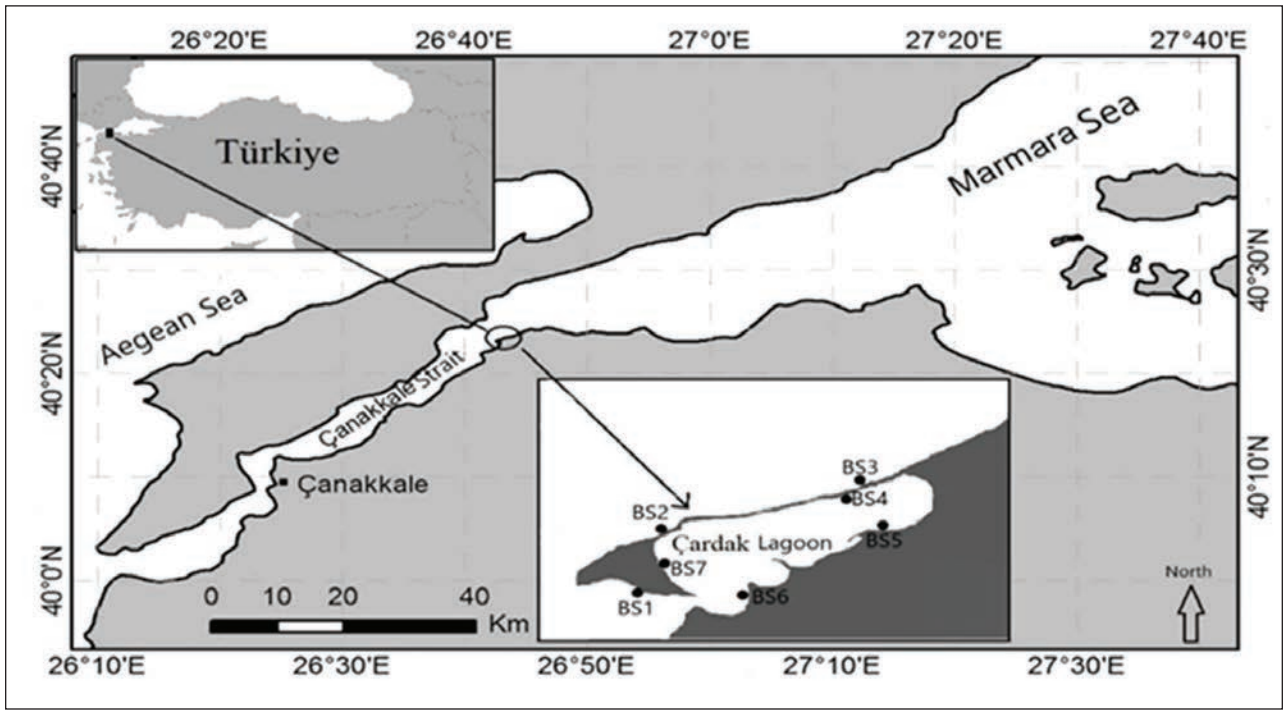

Fig. 1: Sampling locations of** M. dalmatinus **in the Çardak Lagoon, Sea of Marmara.
Sl. 1: Lokacije vzorčenja vrste** M. dalmatinus **v laguni Çardak v Marmarskem morju.

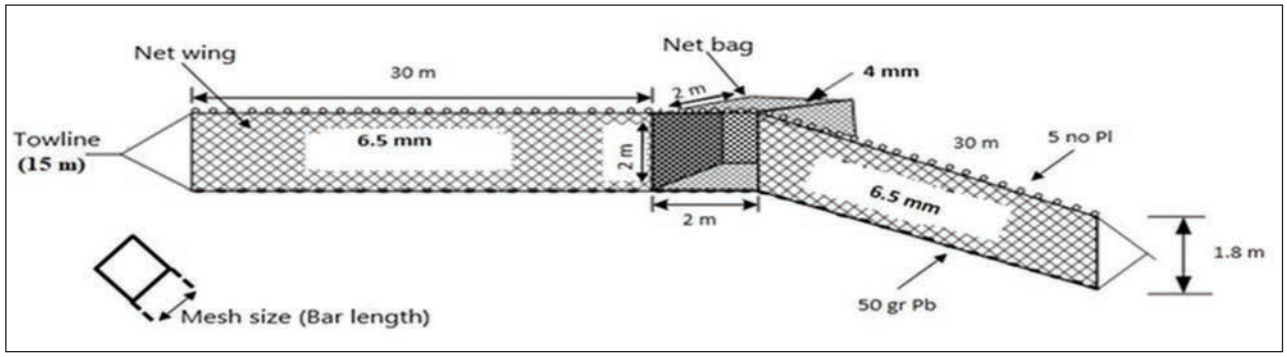

Fig. 2: Design and technical specifications of the beach seine net.
Sl. 2: Zasnova in tehnične specifikacije obmorske potegalke.

nearest 0.01 g. Specimens were subsequently dissected to determine sex and gonadal maturity stages through macroscopic examination of the gonads, with sexual maturity stages classified following Holden and Raitt (1974). Oocyte diameters were measured using a stereomicroscope in combination with the Q-Capture digital imaging program.

RESULTS

The sampled individuals were identified based on a combination of features: absence of supra-orbital tentacles, presence of a notch between spiny and soft part of dorsal fin, tip of pectorals not reaching level of the anus, and meristic counts of dorsal fin rays XII+16, anal fin rays II+18, pectoral fin rays 12, and pelvic fins I+3. All these traits perfectly match the descriptions of *M. dalmatinus*. Detailed morphometric measurements are presented in Table 1.

During the course of our study, a total of 164 individuals belonging to six Blenniidae species were sampled. In addition to *M. dalmatinus*, the species included *Salaria pavo*, *Parablennius gattorugine*, *P. sanguinolentus*, *P. tentacularis*, and *Lipophrys trigloides*, all of which have previously validated occurrences in the Sea of Marmara.

Tab. 1: Morphometric measurements and meristic counts of the six individuals of *Microlipophrys dalmatinus* ***sampled in this study. Each column represents a single specimen (n=6).***
Tab. 1: Morfometrične meritve in meristična štetja šestih primerkov vrste *Microlipophrys dalmatinus****, vzorčenih v tej raziskavi. Vsak stolpec predstavlja en primerek (n=6).***

Sampling time (2024)	**August**	**October**	**October**	**June**	**June**	**June**	
Location	**BS1**	**BS1**	**BS1**	**BS7**	**BS7**	**BS7**	
Specimen No.	**1**	**2**	**3**	**4**	**5**	**6**	**Mean ± SE**
Measurements (mm)							
Total length	19.89	28.53	19.84	37.97	36.37	35.96	29.8 ± 3.1
Standard length	16.96	24.49	16.15	32.93	31.88	31.4	25.6 ± 2.8
Body depth	5.63	5.45	4.51	8.74	7.94	7.73	6.7 ± 0.6
Eye diameter	1.25	1.64	1.41	1.5	1.38	1.27	1.4 ± 0.1
Preorbital length	1.05	1.79	1.29	2.47	2.18	2.15	1.8 ± 0.2
Interorbital length	1.37	1.06	1.05	1.2	1.02	1.01	1.1 ± 0.1
Head length	4.42	5.58	4.93	6.94	6.71	6.32	5.8 ± 0.4
Head width	2.62	3.16	3.07	4.72	3.88	3.73	3.5 ± 0.3
Mouth width	1.22	1.35	1.29	1.89	1.82	1.85	1.6 ± 0,1
Prepelvic length	4.07	4.53	4.43	5.69	5.53	6.42	5.1 ± 0.3
Predorsal length	3.92	6.21	4.62	7.2	6.95	6.82	6.0 ± 0.5
Preanal length	8.35	11.3	8.92	16.93	16.09	14.93	12.8 ± 1.4
Prepectoral length	4.47	5.62	4.84	8.7	6.82	6.73	6.2 ± 0.6
Postpelvic length	14.33	22.57	15.68	31.02	28.67	29.92	23.7 ± 2.7
Postdorsal length	3.5	5.13	3.95	7.39	6.79	6.9	5.6 ± 0.6
Postanal length	2.71	4.63	4.19	7.73	7.08	6.79	5.5 ± 0.7
Postpectoral length	11.67	16.58	11.84	21.19	20.41	18.71	16.7 ± 1.6
Dorsal fin base	11.81	17.2	11.94	23.07	21.1	21.02	17.7 ± 1.8
Anal fin base	3.9	11.8	7.92	14.67	14.11	12.82	10.9 ± 1.6
Pelvic fin length	2.12	4.45	2.52	4.73	3.91	4.55	3.7 ± 0.5
Pectoral fin length	4.55	5.91	5.11	8.02	7.25	7.12	6.3 ± 0.5
Caudal peduncule length	3.16	4.15	3.35	6.6	5.17	5.61	4.7 ± 0.5
Caudal peduncule height	2.41	2.98	2.57	4.17	3.53	5.24	3.5 ± 0.4
Total weight (g)	0.08	0.22	0.11	0.41	0.37	0.35	0.26 ± 0.05

Fig. 3: Sampled individuals of** M. dalmatinus **from Çardak Lagoon.
Sl. 3: Vzorčeni osebki vrste** M. dalmatinus **iz lagune Çardak.

Regarding *M. dalmatinus*, a total of three juvenile specimens were collected from the lagoon inlet: one in August 2024 and two in October 2024. An additional three specimens were collected from inside the lagoon in June 2024. Specimens ranged from 19.84 mm to 37.97 mm in total length, with a mean of 29.8 ± 3.1 mm (mean ± standard error). Individual weights ranged from 0.08 g to 0.41 g, with a mean of 0.26 ± 0.05 g (Tab. 1).

The gonadal development of females was classified as Stage III (ripening), based on the observation of ovaries occupying about two thirds of the body cavity. Their gonad weights were 0.0197 g, 0.0183 g, and 0.0073 g, respectively.

The number of mature oocytes was 88, 167, and 34 (Tab. 1). Diameters were measured for a total of 54 oocytes from these gonads. The minimum, maximum, and mean ± se of oocyte diameters were 0.39 mm, 0.69 mm, and 0.57 ± 0.009 mm, respectively (Fig. 4).

DISCUSSION

The documentation of *M. dalmatinus* in the Sea of Marmara addresses a long-standing ambiguity in the region's ichthyofauna (Bilecenoğlu, 2020). However, a critical question remains: does this occurrence reflect a recent range expansion or a historical presence that has been systematically overlooked? We argue that the latter is more likely, primarily due to the cryptobenthic nature of the species and the historical lack of specialized scientific monitoring in the region's littoral zones. In the Sea of Marmara, *M. dalmatinus* likely escapes capture by conventional commercial fishing gear, such as gillnets, trammel nets, purse seines, and beam trawls, which are not designed to sample such small benthic specimens. Furthermore, our study area – Çardak Lagoon – provides an ideal refuge, with a muddy substrate and dense algal cover, that may serve as a nursery for this species. As this is the first scientific study specifically focusing on the fish fauna of Çardak Lagoon and its surrounding waters, the confirmation of the occurrence of *M. dalmatinus* in the region may be attributed to the detailed coastal sampling methodology employed. Therefore, the perceived absence of this species in previous records may have resulted from the lack of scientific coastal sampling

Fig. 4: Oocyte maturation of** Microlipophrys dalmatinus**: Representation of Stage III (Ripening phase.)
Sl. 4: Zorenje jajčnih celic vrste** Microlipophrys dalmatinus**: predstavitev III. stopnje (faza zorenja).

surveys using non-selective beach seine nets and non-destructive visual census methods. While non-destructive visual censuses aided by SCUBA diving have become standard for monitoring Mediterranean blennies (Koppel, 1988; Lipej & Orlando-Bonaca, 2006), these techniques have significant limitations in lagoon environments such as Çardak. The high turbidity and sedimentation levels often observed in these areas can severely reduce visibility, making the detection of small, cryptobenthic species like *M. dalmatinus* extremely challenging for divers. Furthermore, the secretive behavior of this species – often burrowing or hiding within dense algal mats – necessitates more direct sampling approaches. In this regard, the use of specifically designed, non-selective sampling gear provided a more reliable alternative to visual methods, allowing the capture of individuals that would otherwise have remained inconspicuous in turbid lagoon waters.

While the secretive ecology of the species likely played a major role in its delayed detection, the potential influence of changing environmental conditions on its northward distribution should also be considered. The northward extension of several thermophilic native species in the Mediterranean Sea, primarily as a result of seawater warming, is an ongoing trend (Bianchi *et al.,* 2018), and *M. dalmatinus* is known for its affinity for warm-temperate conditions (Levy *et al*., 2011). Mean surface water temperatures in the Sea of Marmara have increased by approximately 1.4 °C since the early 1970s (Bilecenoğlu & Öztürk 2019), which may have facilitated the penetration of this species from the Aegean Sea along the prevailing bottom flow layer.

Only six specimens of *M. dalmatinus* were obtained from 168 beach seine samplings, revealing the species' conspicuous rarity and low abundance. Despite the limited sample size, which is a direct consequence of the species' elusive nature, these specimens allow preliminary observations regarding the biological characteristics of *M. dalmatinus* in the Sea of Marmara. While these findings should be interpreted with caution due to the small number of individuals, they provide initial insights into life-history traits of the species that have remained largely undocumented in this region. Specifically, the presence of both mature females and juveniles across different months suggests a potential reproductive cycle, although further extensive sampling is necessary to fully characterize the species population dynamics and spawning phenology in the area. The occurrence of mature female *M. dalmatinus* in June suggests that Çardak Lagoon may

serve as a potential spawning ground for the species. Furthermore, the occurrence of juveniles at the lagoon inlet just two months after the presumed spawning period (between August and October) indicates that the area may also function as a nursery habitat. These observations are consistent with Zander (1986), who reported a reproductive period extending from May to July. Similarly, Verdiell-Cubedo *et al*. (2006) recorded 68 individuals of *M. dalmatinus* in the Mar Menor lagoon, Spain. Furthermore, our observations align with Patzner *et al*. (2009) and Nelson *et al*. (2016) regarding the species' preference for brackish-water habitats. Thus, the lagoon and its adjacent waters may provide a vital environment for Blenniidae species.

Returning to the species' characteristics, *M. dalmatinus* is relatively small-bodied (Patzner *et al.,* 2009). While Zander (1986) reported a maximum total length (TL) of 41 mm, subsequent studies documented variations, including a TL of 32 mm in Malta (Falzon, 2009) and a wider range of 16–58 mm in the Mar Menor coastal lagoon, Spain (Verdiell-Cubedo *et al.,* 2006). The total lengths recorded in the present study (19.9–37.9 mm) are consistent with these established size ranges. Notably, morphometric measurements for this species had not been documented in the literature prior to this study. Our meristic counts align with Zander (1986), further confirming the clear morphological differentiation of *M. dalmatinus* from its congeners within the genus Microlipophrys. Furthermore, this study provides the first formal data on sexual maturity and oocyte development, including detailed measurements of oocyte diameter.

CONCLUSIONS

Water pollution, eutrophication, and the deterioration of water quality can negatively affect the survival rates and habitat of Blenniidae species (Vinyoles & De Sostoa, 2007; Laportea *et al.,* 2014). Reports show that Çardak Lagoon has been affected by similar adverse impacts (Ateş *et al.,* 2023; İşcan *et al.,* 2025). Our findings demonstrate that the use of a specifically designed, non-selective beach seine is an effective and advantageous method for documenting cryptobenthic assemblages in turbid lagoon environments where visual censuses and conventional sampling gear may fail.

This study provides the first material-based record of *M. dalmatinus* in the Sea of Marmara, highlighting the critical role of Çardak Lagoon as a potential spawning habitat, and establishing an important baseline the for conservation and monitoring of this ecologically significant species in the face of anthropogenic threats.

ACKNOWLEDGMENTS

The authors are grateful to Prof. Dr. Murat Bilecenoğlu for his expert assistance in confirming species identification. We also thank Umut Tunçer and Samet İşcan for their support during field sampling, and Fatma Nur Gün for her contribution to the laboratory work. This study was supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) under Project No. 124O118.

POTRJEN ZAPIS O POJAVLJANJU IN PREDHODNA BIOLOŠKA SPOZNANJA O VRSTI *MICROLIPOPHRYS DALMATINUS* (STEINDACHNER & KOLOMBATOVIĆ, 1883) IZ MARMARSKEGA MORJA, TURČIJA

İsmail Burak DABAN
Department of Fisheries and Processing Technology, Çanakkale Onsekiz Mart University, Çanakkale, Türkiye
e-mail: burakdaban@gmail.com

Yusuf ŞEN
Department of Marine Biology, Faculty of Marine Science and Technology, Çanakkale Onsekiz Mart University, Çanakkale, Türkiye

POVZETEK

Avtorja poročata o prvem z dokazi podprtem zapisu o pojavljanju dalmatinske babice (Microlipophrys dalmatinus*) v Marmarskem morju v Turčiji. Z obmorsko potegalko so med junijem in oktobrom 2024 ujeli šest primerkov v laguni Çardak v ožini Çanakkale. Totalne dolžine primerkov so bile med 19,84 in 37,97 mm (povprečno 29,8 ± 3,1 mm), celokupne mase pa med 0,08 in to 0,41 g (povprečno 0,26 ± 0,05 g). Tri primerki, odvzeti iz vhoda v laguno avgusta in oktobra, so bili mladostni, drugi trije so bile dozorevajoče samice (III. faza), vzorčene v notranji laguni junija. Trenutno najdbo vrste* M. dalmatinus *v Marmarskem morju je mogoče pripisati bodisi kriptobentoški naravi in majhnosti vrste, zaradi česar je bila morda v preteklosti spregledana, bodisi nedavni širitvi območja razširjenosti, ki sta jo sprožili termofilna narava vrste in naraščajoče temperature morske vode.*

Ključne besede: Blenniidae, obmorska potegalka, obrežni habitat, lagune, morfometrični znaki

REFERENCES

Almada, F., V.C. Almada, T. Guillemaud & P. Wirtz (2005): Phylogenetic relationships of the north-eastern Atlantic and Mediterranean blenniids. Biological Journal of the Linnean Society, 86(3), 283–295. https://doi.org/10.1111/j.1095-8312.2005.00519.x

Ateş, A.S., A. Mülayim, A.K. Bakir, S. Acar, Y. Büyükateş, E. Dağlı, A. Doğan, S. Uzun-dumlu & Ç. Kedioğlu (2023): Temporal and spatial effects of environmental variables on crustacean communities in Çardak Lagoon (Turkish Straits System) under the influence of domestic pollution. Biologia, 78(9), 2371–2384. https://doi.org/10.1007/s11756-023-01361-2.

Bianchi, C.N., F. Caroli, P. Guidetti & C. Morri (2018): Seawater warming at the northern reach for southern species: Gulf of Genoa, NW Mediterranean. Journal of the Marine Biological Association United Kingdom, 98(1), 1–12. https://doi.org/10.1017/S0025315417000819.

Bilecenoğlu, M. (2020): Comments on "The marine teleost fishes of the Sea of Marmara; an updated and annotated checklist" by Artüz & Fricke (2019). Zootaxa, 4751(3), 597–600. https://doi.org/10.11646/zootaxa.4751.3.12.

Bilecenoğlu, M. (2024): Diversity of fishes along the coast of Türkiye. Turkish Journal of Zoology, 48(6), 589–616. https://doi.org/10.55730/1300-0179.3197.

Bilecenoğlu, M., M. Kaya, B. Cihangir & E. Çiçek (2014): An updated checklist of the marine fishes of Turkey. Turkish Journal of Zoology, 38(6), 901–929. https://doi.org/10.3906/zoo-1405-60.

Bilecenoğlu, M. & N. Öztürk (2019): Occurrence of *Trachinotus ovatus* (Linnaeus, 1758) in the Istanbul Strait, Turkish Straits System. Journal of the Black Sea / Mediterranean Environment, 25(3), 321–324.

Ergüden, D., M. Şereflişan & N. Uygur (2024): On the occurrence of three blennid species in the South-eastern Mediterranean coast of Turkey. Acta Aquatica: Aquatic Sciences Journal, 11(1), 90–93.

Falzon, M.A. (2009): *Lipophrys dalmatinus* (Pisces Perciformes Blenniidae), a new species for Malta (central Mediterranean). Naturalista siciliano, 33, 279–282.

Fricke, R., W. Eschmeyer & J.D. Fong (eds.) 2025: Eschmeyer's Catalog of Fishes. Genera/Species by Family/Subfamily. Online Version, Updated 9 Dec 2025. (https://www.calacademy.org/research/ichthyology/catalog/Species/byfamily.asp (accessed 15 December 2025).

Golani, D., R. Reef-Motro, S. Ekshtein, A. Baranes & A. Diamant (2014): Ichthyofauna of the rocky coastal littoral of the Israeli Mediterranean, with reference to the paucity of Red Sea (Lessepsian) migrants in this habitat. Marine Biology Research, 3(5), 333–341. https://doi.org/10.1080/17451000701635110.

Holden, M.J., & D.F.S. Raitt (eds.). (1974): Manual of fisheries science. Part 2. Method of resource investigation and their application. FAO Fisheries Technical Paper No. 115(1), Rome, 214 Pp.

İşcan, S., İ.B. Daban, Y. Şen, A. Öztekin, M.A. İhsanoğlu, S. Acar & A. İşmen (2025): Çardak Lagün'ü Balıkçılığının Genel Durumunun Değerlendirilmesi. Mediterranean Fisheries and Aquaculture Research, 8(2), 63–81.

Kara, A. & A. Yüksek (2023): Comparison of morphological and DNA barcoding methods in ichthyoplankton species identification. Acta Biologica Turcica, 36(3), 1–11.

Koppel, V.H. (1988): Habitat selection and space partitioning among two Mediterranean Blenniid species. Marine Ecology, 9(4), 329–346.

Kotrschal, K. (1988): Blennies and endolithic bivalves: Differential utilization of shelter in Adriatic Blenniidae (Pisces: Teleostei). Marine Ecology, 9(3), 253–269. https://doi.org/10.1111/j.1439-0485.1988.tb00332.

Laportea, M., A. Bertolo, P. Berrebi & P. Magnan (2014): Detecting anthropogenic effects on a vulnerable species, the freshwater blenny (*Salaria fluviatilis*): The importance of considering key ecological variables. Ecological Indicators, 36, 386–391. https://doi.org/10.1016/J.ECOLIND.2013.08.006.

Levy, A., P. Wirtz, S.R. Floeter & V.C. Almada (2011): The Lusitania Province as a center of diversification: The phylogeny of the genus *Microlipophrys* (Pisces: Blenniidae). Molecular Phylogenetics and Evolution, 58(2), 409–413. https://doi.org/10.1016/j.ympev.2010.12.008.

Lipej, L. & M. Orlando-Bonaca (2006): Assessing blennioid fish populations in the shallow Gulf of Trieste: a comparison of four in situ methods. Periodicum Biologorum, 108(2), 23–29.

Orlando-Bonaca, M. & L. Lipej (2007). Microhabitat preferences and depth distribution of combtooth blennies (Blenniidae) in the Gulf of Trieste (North Adriatic Sea). Marine Ecology, 28(3), 418–428. https://doi.org/10.1111/j.1439-0485.2007.00185.x.

Patzner, R.A., E.J. Gonçalves, P.A. Hastings & B.G. Kapoor (2009) (eds.): The biology of blennies. CRC Press. Taylor & Francis Group, Boca Raton, 494 pp.

Nelson, J.S., T.C. Grande & M.V. Wilson (2016): Fishes of the world. John Wiley and Sons, Hoboken, NJ. https://doi.org/10.1002/9781119174844.ch1.

Tiralongo, F., D. Tibullo, M.V. Brundo, F.P. De Mendoza, C. Melchiorri & M. Marcelli (2016): Habitat preference of combtooth blennies (Actinopterygii: Perciformes: Blenniidae) in very shallow waters of the Ionian Sea, South-Eastern Sicily, Italy. Acta Ichthyologica et Piscatoria, 46, 65–75. https://doi.org/10.3750/AIP2016.46.2.02.

Whitehead, P.J.P., M.L. Bauchot, J.C. Hureau, J. Nielsen & E. Tortonese (eds.) (1984–1986): Fishes of the North-eastern Atlantic and the Mediterranean. UNESCO, Paris, 1473 pp.

Williams, J.T., J. Herler & M. Kovačić (2014): *Microlipophrys dalmatinus*. The IUCN Red List of Threatened Species 2014: e.T194853A49090054. https://dx.doi.org/10.2305/IUCN.UK.2014-3.RLTS.T194853A49090054.en. Accessed on 16 December 2025.

Verdiell-Cubedo, D., F.J. Oliva-Paterna & M. Torralva (2006): Length–weight relationships for 22 fish species of the Mar Menor coastal lagoon (western Mediterranean Sea). Journal of Applied Ichthyology, 22(4), 293–294. https://doi.org/10.1111/j.1439-0426.2006.00738.x.

Vinyoles, D. & A. De Sostoa (2007): Life-history traits of the endangered river blenny *Salaria fluviatilis* (Asso) and their implications for conservation. Journal of Fish Biology, 70(4), 1088–1108. https://doi.org/10.1111/j.1095-8649.2007.01371.x.

Zander, C.D. (1972): Beiträge zur Ökologie und Biologie von Blenniidae (Pisces) des Mittelmeeres. Helgoländer wissenschaftliche Meeresuntersuchungen, 23(2), 193–231.

Zander, C.D. (1986): Blenniidae. In: Whitehead, P.J.P. , M.-L. Bauchot, J.-C. Hureau, J. Nielsen & E. Tortonese (eds.): Fishes of the North-eastern Atlantic and the Mediterranean, Vol. 3. UNESCO, Paris, pp. 1096–1112.