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New records of rarely reported species in the Mediterranean Sea (March 2025)

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Abstract

This collective study presents information on fifteen (15) species recorded across five countries (Greece, Italy, Slovenia, Spain, and Türkiye) and four (4) ecoregions, ranging from the Alboran Sea to the Aegean Sea. The recorded species belong to three phyla: Mollusca (3 species), Arthropoda (3 species), and Chordata (9 species). Among mollusks, *Martadoris mediterranea* is reported for the first time in the Aegean Sea at two different locations, while *Opisthoteuthis calypso* and *Octopoteuthis sicula* are newly recorded in the western Mediterranean. Regarding arthropods, *Ocypode cursor* is reported from the Tyrrhenian coast of Sicily, *Pachygrapsus transversus* is recorded for the first time in the Tyrrhenian Sea, and *Cancer pagurus* in the Sea of Marmara. Among chordates, *Lobotes surinamensis* and *Zu cristatus* are newly recorded in the Alboran Sea, while *Callionymus fasciatus* and *Symphodus doderleini* are reported from Slovenian coastal waters. *Tripterygion delaisi* and *Gymnothorax unicolor* are documented for the first time in the waters of the Sea of Marmara and Crete, respectively. Additionally, new records of rarely reported fish species include *Arctozenus risso*, *Chromogobius zebratus*, and *Epinephelus aeneus* in Turkish, Spanish, and Italian waters, respectively.

Introduction

The Mediterranean Sea is widely recognized as a biodiversity hotspot (Coll *et al*., 2010), where both temperate and subtropical biota converge (Bianchi & Morri, 2000). However, despite its high diversity, the distribution of many species remains poorly understood, particularly for small-sized organisms with cryptic behavior or those inhabiting deep-water environments, which are challenging to explore and study scientifically. Some of the species reported in this study, such as *Chromogobius zebratus* and *Octopoteuthis sicula*, exemplify these knowledge gaps.

Moreover, the Mediterranean Sea is undergoing significant warming due to climate change, leading to the poleward expansion of thermophilic species, a phenomenon known as "tropicalization" (Báez *et al*., 2019). This shift in species distribution is exemplified by the presence of *Pachygrapsus transversus* and *Epinephelus aeneus*, both of which have been recorded in this study. The combined effects of tropicalization and improved understanding of the biology and distribution of rarely encountered or cryptic species highlight the need for continuous updates on biodiversity distribution patterns in the Mediterranean.

The Collective Article Series B, "New Records of Rarely Reported Species in the Mediterranean Sea," published in *Mediterranean Marine Science*, aims to bridge knowledge gaps by providing a platform for periodically documenting new records of rarely encountered species in the region. In this article, we present new records of 15 such species, including taxa of special conservation interest (e.g., protected and/or threatened species) (Fig. 1). These records are organized into sub-chapters according to their respective phyla –three species of Mollusca, three of Arthropoda, and nine of Chordata– each authored by the respective contributor(s). The documented records span five Mediterranean countries and four ecoregions, covering a time frame from 2010 to 2025. The reported depth range extends from the shoreline (e.g., *Ocypode cursor*) to 943 meters (e.g., *Opisthoteuthis calypso*), further emphasizing the ecological breadth of these observations (Table 1).

The herein reported species were recorded and documented using a wide variety of methods and information sources. One mollusk (*Octopoteuthis sicula*), one arthropod (*Cancer pagurus*), and four fishes (including *Lobotes surinamensis*, *Gymnothorax unicolor*, *Arctozenus risso* and *Epinephelus aeneus*) were caught by professional or scientific surveys fishers (such as *Arctozenus risso*), using various types of fishing gear (e.g., lobster traps, longline, or bottom net trawling). Six fishes were recollected or photographed during SCUBA diving or snorkelling surveys (*Martadoris mediterranea*, *Tripterygion delaisi*, *Callionymus fasciatus*, *Symphodus doderleini*, *Zu cristatus* and *Chromogobius zebratus*) while the mollusk *Opisthoteuthis calypso* was photographed with a Remotely Operated Vehicle (ROV). *Ocypode cursor* and *Pachygrapsus transversus* were photographed and recollected onshore, respectively.

For six species (*Martadoris mediterranea*, *Pachygrapsus transversus*, *Tripterygion delaisi*, *Callionymus fasciatus*, *Gymnothorax unicolor* and *Arctozenus risso*), the identification was based on morphological analysis of captured specimens while three species (*Martadoris mediterranea*, *Pachygrapsus transversus* and *Tripterygion delaisi*) were also molecularly identified. Specimens for two fish species (*Tripterygion delaisi* and *Gymnothorax unicolor*) were deposited in zoological collections under a reference code. Nine species (*Opisthoteuthis calypso*, *Octopoteuthis sicula*, *Ocypode cursor*, *Cancer pagurus*, *Lobotes surinamensis*, *Symphodus doderleini*, *Zu cristatus*, *Chromogobius zebratus* and *Epinephelus aeneus*) were photographically identified.

The present study contributes to the ongoing effort to document and update the distribution of rarely reported species in the Mediterranean Sea. Our findings highlight the importance of continuous monitoring, particularly in light of the ongoing tropicalization process driven by climate change, which is facilitating the northward expansion of thermophilic species. Additionally, improved sampling techniques and increased research efforts have led to a better understanding of the biology and distribution of cryptic and deep-water species.

Notably, three ecoregions –the Levantine Sea, the Tunisian Plateau/Gulf of Sidra, and the Ionian Sea, as classified by Spalding *et al*. (2007)– did not yield any records in the present compilation. This absence could be partially attributed to the poleward expansion of species, but it may also reflect the socio-economic gradient between the northern and southern Mediterranean regions. Previous

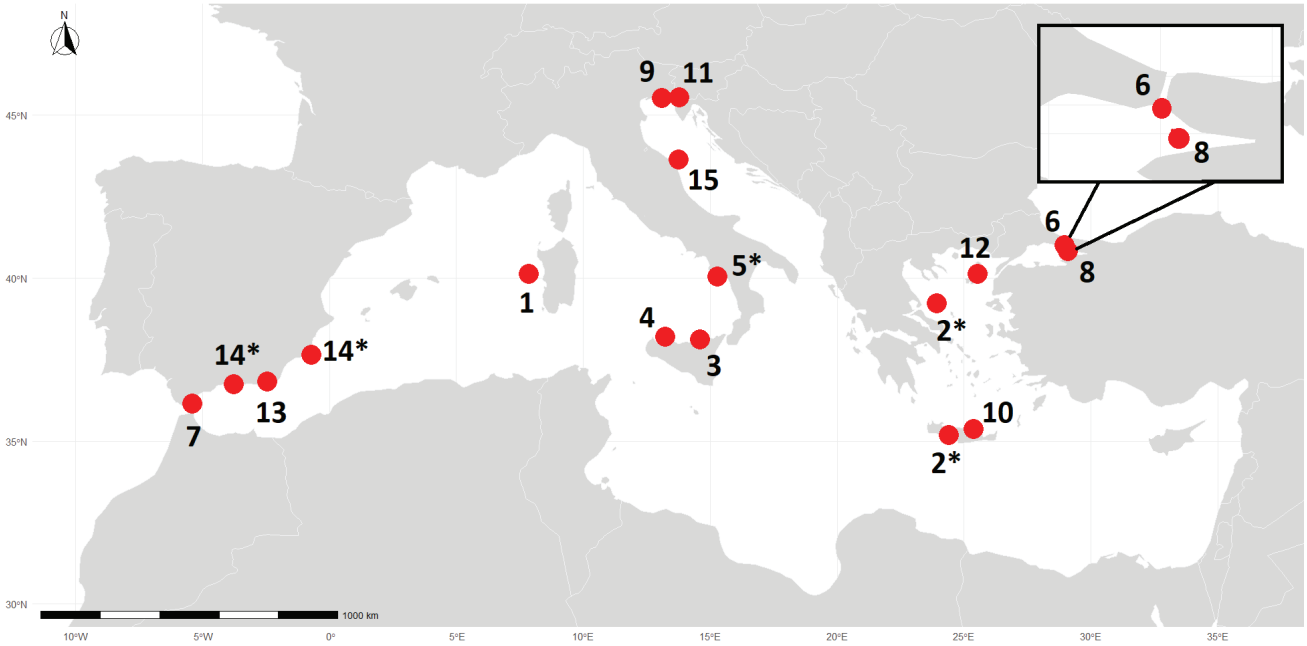

Fig. 1: Approximate locations of records for the species presented in the current article. Location numbers (LN) correspond to those on Table 1 (*: multiple records of the same species in the broader area).

studies have pointed to a significant lack of distributional data for numerous species in North Africa, which poses challenges for spatial management and the conservation of many threatened marine species (Digenis *et al*., 2024).

Addressing these knowledge gaps requires coordinated international efforts to enhance research coverage in data-deficient areas, particularly in the southern Mediterranean. Strengthening scientific collaborations, improving accessibility to taxonomic and ecological studies, and expanding monitoring programs will be essential for achieving a more comprehensive understanding of Mediterranean marine biodiversity and ensuring the effective management of its resources.

Table 1. Information about species records by phylum. Sub-chapters (SC), basin (WMED – Western Mediterranean, CMED –Central Mediterranean, ADRIA – Adriatic Sea, and EMED – Eastern Mediterranean), ecoregion (*sensu* Spalding *et al*., 2007), country, and location number as in Figure 1 (LN) [*: more than one site in the broader area], [**Corresponds to the Marmara Sea subregion, which was not included in Spalding et al. (2007) but possesses its own distinct biogeographic identity].

Taxon	SC	Basin	Ecoregion	Country	LN
Phylum Mollusca					
Opisthoteuthis calypso	1.1	WMED	Western Mediterranean	Italy	1
Martadoris mediterranea	1.2	EMED	Aegean Sea	Greece	2*
Octopoteuthis sicula	1.3	WMED	Western Mediterranean	Italy	3
Phylum Arthropoda					
Ocypode cursor	2.1	WMED	Western Mediterranean	Italy	4
Pachygrapsus transversus	2.2	WMED	Western Mediterranean	Italy	5*
Cancer pagurus	2.3	EMED	Sea of Marmara**	Türkiye	6
Phylum Chordata					
Lobotes surinamensis	3.1	WMED	Alboran Sea	Spain	7
Tripterygion delaisi	3.2	EMED	Sea of Marmara**	Türkiye	8
Callionymus fasciatus	3.3	ADRIA	Adriatic Sea	Slovenia	9
Gymnothorax unicolor	3.4	EMED	Aegean Sea	Greece	10
Symphodus doderleini	3.5	ADRIA	Adriatic Sea	Slovenia	11
Arctozenus risso	3.6	EMED	Aegean Sea	Türkiye	12
Zu cristatus	3.7	WMED	Alboran Sea	Spain	13
Chromogobius zebratus	3.8	WMED	Western Mediterranean	Spain	14*
Epinephelus aeneus	3.9	ADRIA	Adriatic Sea	Italy	15

1. MOLLUSCA

1.1. First *in situ* observation of the deep-sea cirrate octopus *Opisthoteuthis calypso* in the Mediterranean Sea

Pietro BATTAGLIA, Teresa ROMEO and Silvestro GRECO

Opisthoteuthis calypso is a deep-sea cephalopod described by Villanueva *et al.* (2002), which recently revised the taxonomy of the genus *Opisthoteuthis.* Originally confused with the Atlantic cirrate octopus *O. agassizi*, this species is now recognized as the only member of the family Opisthoteuthidae in the Mediterranean Sea, although its geographical distribution also extends to north-eastern Atlantic Ocean. According to Villanueva *et al.* (2002; and references hereby reported), the first record attributable to *O. calypso* arises to 1913 when four individuals were collected from Irish waters, while, later, this octopus was also caught in the Mediterranean basin (Morales, 1959) and misidentified as *O. agassizi*.

To date, the most important study on the Mediterranean population of *O. calypso* was performed in Sardinian waters and investigated morphological, biological and molecular aspects on 38 individuals caught by trawling on hard bottoms between 871 and 1420 m depth (Cuccu *et al*., 2009). However, it is difficult to assess the real abundance of *O. calypso* in the Mediterranean basin, because this species is very difficult to observe and collect due to the high depths where it usually lives (Cuccu *et al*., 2009). As for other deep-sea cephalopods, the use of remotely operated vehicles (ROVs) is an excellent tool for extending the current knowledge of uncommon Mediterranean cephalopods, providing *in situ* observations of species and new information on their ecology, biology and behaviour (Battaglia *et al*., 2023).

Here we report the first *in situ* observation of an individual of *O. calypso* (Fig. 2) in the Mediterranean Sea. It was encountered on 2023 July 6 (local time 20:08) at 943 m depth off western Sardinia (40.12533° N, 7.85416° E). Underwater observations were carried out by means of an ROV Tomahawk SubAtlantic – unit n. 001 and were conducted on depths ranging between 55 m and 1055 m for a total length of about 59 linear km and 179:26 h of HD ROV footage.

When the ROV approached, the individual was resting with the arm web well spread on the bottom. After about 3 minutes it escaped by take-off, swimming using fins and pumping motion, displaying a behaviour already described for other cirrate octopuses of the genera *Cirroteuthis* and *Grimpoteuthis* (Villanueva *et al*., 1997). It would be interesting to deepen the knowledge on deep-sea Mediterranean cephalopods by increasing the exploration of the bathyal zone in the next future.

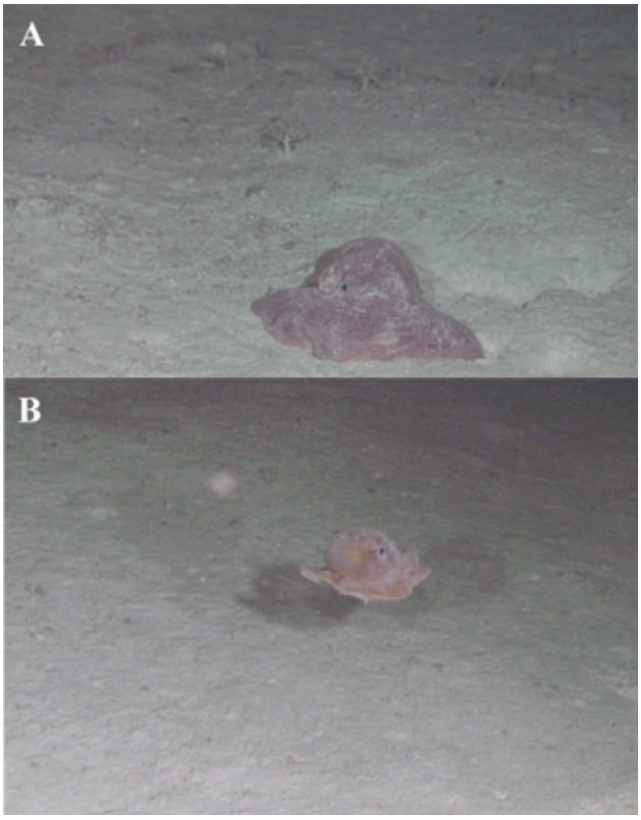

Fig. 2: *Opisthoteuthis calypso* observed by ROV off the western Sardinian coast (A). *O. calypso* resting with the arm web spread on the bottom (B). The same individual swimming using fins and pumping motion.

1.2. *Martadoris mediterranea* (Domínguez, Pola & Ramón, 2015), a new arrival in the Aegean Sea

Dimitris POURSANIDIS and Chrysoula GUBILI

The quest for the discovery of new species, either as new for science or new for a region, is part of the biodiversity assessment towards the global biodiversity cataloguing, such as the Catalogue of Life. Not surprisingly, new species for a region are often detected during scientific field campaigns when studying coastal ecosystems. This also applies to the species reported here, namely *Martadoris mediterranea* (Domínguez, Pola & Ramón, 2015). Two gastropod specimens (2 and 5 mm) were collected at a depth of 22 m on *Posidonia oceanica* (Linnaeus) Delile, 1813 leaves, in the National Marine Park of Alonissos (39.220764°N, 23.945714°E) in June 2021. The same species was also spotted in South Crete, Plakias area (35.172189° N, 24.399302° E) at a depth of 10 m crawling on a brown sponge, presumably on *Chondrosia reniformis* (Nardo, 1847), in October 2021 (Fig.

3). All three specimens were identified as *M. mediterranea* based on external morphological characteristics, such as the orange colour of the very soft elongated body, the white protuned whitish/yellowish dots across the body, and the white tip at the end of the laminated rhinophores (Domínguez *et al*., 2015).

Species identification was verified with DNA barcoding. Genomic DNA from both specimens from Alonissos was extracted using the DNeasy Blood & Tissue Kit (Qiagen, Germany) according to the manufacturer's protocol. A partial region of the mitochondrial cytochrome c oxidase subunit 1 (COI) and the universal primer pair LCO1490 and HCO219 were used following Folmer *et al*. (1994). Amplicons were sequenced commercially (Macrogen, The Netherlands) generating two partial COI sequences (GenBank Accession Number PQ012993-4). A BLASTn search (http://blast.ncbi.nlm.nih.gov/Blast.cgi) produced clear matches with > 99% similarity to *M. mediterranea* records from the Balearic Islands and Malta (GenBank Accession Numbers: KP793056-8). Additionally, Barcode of Life Data System (BOLD) comparisons showed similar matching rates. Therefore, our results confirmed the morphological species identification.

The species has a wide distribution in the West Mediterranean Sea (Sánchez-Tocino, 2018; Pontes *et al*., 2023), while one record without details is reported in the OPK-Opistobranquis portal (https://opistobranquis.info/en/) from Samos Island in the Aegean Sea (Greece). These records confirm the presence of this newest opisthobranch species (Domínguez *et al*., 2015) in the East Mediterranean Sea.

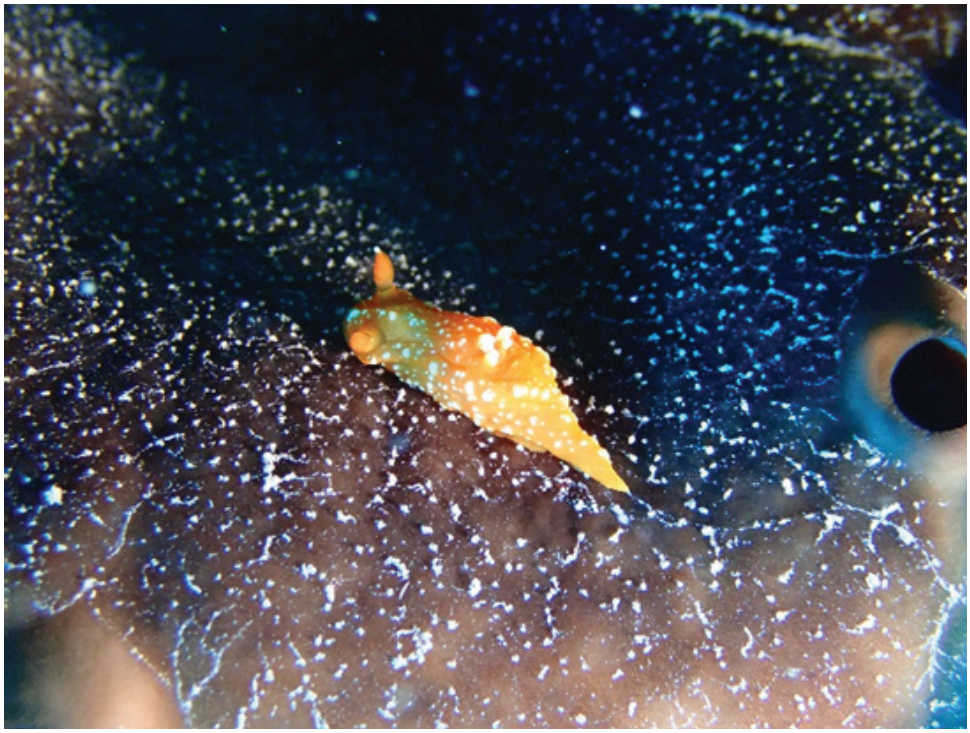

Fig. 3: *Martadoris mediterranea* (Domínguez, Pola & Ramón, 2015), from South Crete, Plakias. Photo credits: Jeron Smeets.

1.3. A new record of the rare cephalopod *Octopoteuthis sicula* Rüppell, 1844 (Oegopsida, Octopoteuthidae) from Italian waters (central Mediterranean Sea)

Francesco TIRALONGO and Emanuele MANCINI

The deep-water cephalopod *Octopoteuthis sicula* Rüppell, 1844 is the only species in the genus reported so far in Mediterranean waters (Villari & Ammendolia, 2009; Jereb *et al*., 2016; Battaglia *et al*., 2023). This squid, which has no commercial value, is characterized by soft and gelatinous body and lives mainly in mesopelagic and bathypelagic environments (Jereb *et al*., 2016); in addition, exhibits useful adaptations for living in deep lightless water. In fact, it uses bioluminescence produced by photophores localized on the body for predation, intraspecific communication and camouflage (Jered *et al*., 2016; Battaglia *et al*., 2023). *Octopoteuthis sicula* occurs in the diet of several top predators, including large pelagic fish, sharks and cetaceans. However, due to scarce capture on fishing gears, few scientific works have been done on this species, leaving its biology, systematics and ecology largely unknown (Jareb *et al*., 2016). There are nine species in the genus *Octopoteuthis* worldwide, although there is probably an undescribed species in the Canary Islands waters (Jereb *et al*., 2016). Specimens collected in Mediterranean waters were often stranded, caught incidentally in bottom and pelagic trawls, or found in the stomach contents of predators (Jareb *et al*., 2016; Battaglia *et al*., 2023). In most cases, the individuals were damaged or partially digested, which made the identification of this species difficult. However, a recent study (Jereb

et al., 2016) confirmed the presence of only one species in the Mediterranean, providing important morphological and molecular information useful for the correct identification of *O. sicula*. Individuals of this squid in the Italian waters have been documented in Sicily (mainly in the Strait of Messina and Sicilian Channel), Sardinia and Calabria (Villari & Ammendolia, 2009; Cuccu *et al*., 2013; Jereb *et al*., 2016; Battaglia *et al*., 2023; Giordano *et al*., 2024). On 30th June 2024, a specimen of *O. sicula* was caught by a professional fisherman off Sant'Agata di Militello (N.E. Sicily, southern Tyrrhenian Sea) (38.1111°N; 14.6010°E). The individual (Fig. 4), characterized by an overall mantle length of 22 cm and a weight of approximately 1.2 kg, was captured using a squid jig-lines baited with *Sardinella aurita* at a depth of 152 m (bottom depth about 750 m). The identification as *O. sicula* was carried out through the analysis of the only photograph taken by the fisherman and was conducted through the identification of the following distinctive morphological characteristics: shape of mantle and head, presence of hooks on arms and distance between fins and mantle terminal tip. Being the only species present in Italian waters and thanks to a careful comparison with other photographs of the species (e.g., Battaglia *et al*., 2023; Giordano *et al*., 2024), we can state that our identification is correct. This work represents a new record for this uncommon and poorly-studied squid confirming the species occurrence off the north-eastern coasts of Sicily, where it had been only suggested by a single finding in the stomach content of a swordfish caught in this area (Romeo *et al*., 2012).

Fig. 4: Specimen of *Octopoteuthis sicula* caught in the Sicilian waters (Tyrrhenian Sea).

2. ARTHROPODA

2.1. First record of the tufted ghost crab *Ocypode cursor* in northern Sicily (Tyrrhenian Sea)

Chiara SIDDIOLO and Carlo PIPITONE

The tufted ghost crab *Ocypode cursor* (Linnaeus, 1758) is the only member of family Ocypodidae Rafinesque, 1815 in the Mediterranean, known for its burrowing behaviour and nocturnal activity in sandy beaches. It is a scavenger feeding on dead fish and human food remains, as well as a predator feeding mainly on mollusks, crustaceans, and sea turtle eggs and hatchlings (Tiralongo *et al*., 2020a). Historically, *O. cursor* has shown a disjointed distribution with occurrences in the eastern Mediterranean and along the Atlantic coasts of Africa. However, more recently, its Mediterranean range has spread westwards along the Ionian coasts of Greece and Italy (Marchessaux *et al*., 2024). Recent studies have investigated its range expansion in the Mediterranean, possibly facilitated by rising sea temperatures due to climate change (Tiralongo *et al*., 2020a; Marchessaux *et al*., 2024). In Sicily it was spotted for the first time in Lampedusa (Pelagian Islands, Strait of Sicily) in 1987, and later on along its southern and eastern coasts (Tiralongo *et al*., 2020a). Its first record in the Tyrrhenian Sea was from Palmi (southwestern Calabria) in July 2020 (Santin *et al*., 2021).

The sighting reported here was made during the night of 15 July, 2024 by Roberto D'Uscio, who was moni-

Fig. 5: *Ocypode cursor* at Capaci Beach, NW Sicily. Photo credits: Roberto D'Uscio.

toring sea turtle nesting at Capaci Beach (northwestern Sicily: 38.183°N, 13.233°E) as a volunteer. He managed to photograph an individual before it hid in its burrow in the sand (Fig. 5). The present occurrence is significant as it represents the first record of the species along the Tyrrhenian coast of Sicily and the third Tyrrhenian record overall, after two previous records about 230 km ENE and 270 km NE from Capaci, respectively (Santin *et al*., 2021; Digenis *et al*., 2024). The presence of *O. cursor* at Capaci Beach also aligns with recent reports of its expanding range in the central Mediterranean and highlights the ongoing changes in the distribution of marine species in response to climate change (Marchessaux *et al*., 2024).

Ocypode cursor is considered a threatened species and as such is protected under the Barcelona Convention (Annex II) and the Bern Convention (Annex II). A decline in its abundance, likely due to the pressure of recreational activities, has been observed in the Levant Sea along the Israeli coast, where it is an abundant and frequent inhabitant of sandy beaches (Galil *et al*., 2024). Further monitoring and research are needed to understand the ecological impacts of its range expansion and at the same time to develop appropriate conservation strategies.

2.2. Here it comes another thermophilic species: *Pachygrapsus transversus* (Gibbes, 1850) (Decapoda: Grapsidae) is spreading northern in the Tyrrhenian Sea

Valentina TANDUO and Fabio CROCETTA

The family Grapsidae MacLeay, 1838 includes four species in the Mediterranean Sea: the Columbus crab *Planes minutus* (Linnaeus, 1758) and three taxa of the genus *Pachygrapsus* Randall, 1840. These are the marbled rock crab *Pachygrapsus marmoratus* (J.C. Fabricius, 1787), a common species widespread all over the basin, and *Pachygrapsus maurus* (H. Lucas, 1846) and *Pachygrapsus transversus* (Gibbes, 1850), two smaller marine crabs that until recently were restricted to the warmer sectors of the Mediterranean (Crocetta *et al.*, 2011). During the last decades, however, these latter species faced different fates. In fact, *P. maurus* has colonized new areas and can be now found also in the Tyrrhenian and the Adriatic Seas. On the contrary, *P. transversus* remained apparently confined to its historical distribution range, and its presence in Italy was never published beyond Sicily (Crocetta *et al.*, 2011; Grech *et al.*, 2023).

During August 2023, a rocky platform of about 200 m, located in Palinuro (Salerno, Tyrrhenian Sea, central-western Mediterranean Sea) (40.0363° N, 15.2850° E) and characterized by rock pools with a wide algal coverage (Fig. 6A-B), was walked through by one of the authors (F.C.) in order to investigate the resident biota. Among the species commonly observed in the area, an "unusual" small grapsid species characterized by a yellowish-greenish colour of the carapace, and strongly resembling *P. transversus*, was noticed hiding and running at tide level (Fig. 6C-D). To confirm the field identification, specimens were processed through an integrative taxonomic approach. To do so, morphological characters listed in Crocetta *et al.* (2011) were observed with a Zeiss Axio Zoom.V16 microscope and a partial sequence of the 16S rRNA gene was amplified from two specimens fixed in 99.9% ethanol, following the methods described in Tanduo *et al.* (2021). To evaluate the dominance and the population structure of the newly detected species, all grapsid individuals encountered in the investigated area (Fig. 6B, red rectangle) were collected, whenever possible, within a 6-hours period, and fixed in 70% ethanol to gain easier carapace measurements. Then, in the laboratory, all collected individuals were first divided *per* species, subsequently separated into males and females (ovigerous and non-ovigerous), and finally measured for their maximum carapace width including spines (CW) with a digital Vernier calliper (accuracy 0.01 mm).

The "unusual" individuals showed a trapezoid-shaped carapace with strong transverse ridges and narrowing at the posterior end, and one strong tooth on the lateral margin of the carapace behind the exorbital tooth (Fig. 6D, green arrowhead). These characters excluded both *P. minutus* (that has a smooth carapace, oval to quadrangular in outline, and one small and rounded tooth on the lateral margin of the carapace) and *P. marmoratus* (that has a quadrangular carapace and two strong teeth on the lateral margin of the carapace). Moreover, they showed distal spines on the ventral margin of the meropodite of the fifth pereiopod (Fig. 6D, red arrowhead), a character that also excluded *P. maurus* (that lacks such spines). Conversely, the characters observed perfectly matched those of *P. transversus* (see also Crocetta *et al.*, 2011). BLASTn queries of the 549 base pairs obtained (with the two sequences being one identical to each other) yielded a 98.78–99.81% similarity with 21 sequences ascribed to *P. transversus*, but also a 98.93% similarity with a single sequence (AM946022) ascribed to *P. marmoratus*. However, this was evidently based on a misidentification of the sample. All the other taxa showed a lower similarity (≤96.49%). Therefore, DNA barcoding definitely confirmed the identification as *P. transversus*. A single sequence was deposited in GenBank with the accession number OR535060, while the two sequenced individuals were deposited in the collection of the Laboratory of Benthos-Napoli (Stazione Zoologica Anton Dohrn, Naples) with the codes SZN-B-3860CR213A and SZN-B-3862CR213C. The field work yielded 164 *P. transversus* (102 ♂, CW: 4.95–18.91 mm; 30 ♀, CW: 5.87–14.37 mm; 32 ♀ ovigerous, CW: 6.88–14.30 mm) (Fig. 7) and 22 *P. marmoratus* (16 ♂, CW: 6.21–30.60 mm; 5 ♀, CW: 12.06–32.22 mm; 1 ♀ ovigerous, CW: 21.24 mm). No *P. maurus* was found. Populations of both species were characterized by a higher presence of males, and *P. transversus* strongly outnumbered *P. marmoratus*.

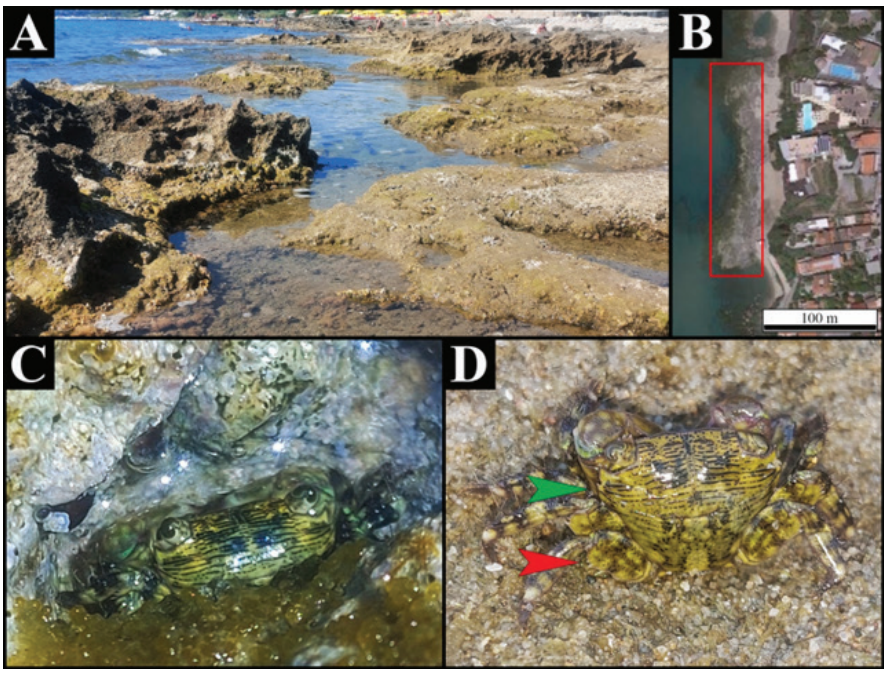

Fig. 6: *Pachygrapsus transversus* from Palinuro (Salerno, Tyrrhenian Sea, central-western Mediterranean Sea). (A–B) Field and aerial views of the investigated area (red rectangle). (C–D) Individuals hiding and running at tide level, with highlights on the strong tooth on the lateral margin of the carapace behind exorbital tooth (green arrowhead) and the distal spines on the ventral margin of the meropodite of the fifth pereiopod (red arrowhead).

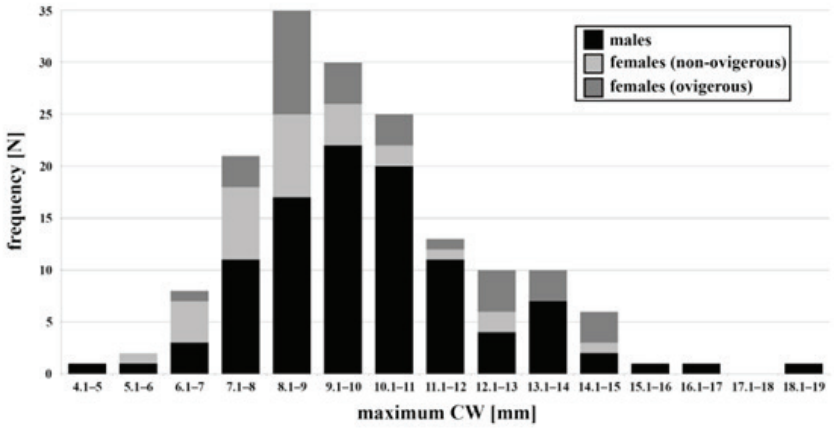

Fig. 7: Carapace Width [mm] – frequency [N = 164] distribution of *Pachygrapsus transversus* in the investigated area, with collected individuals divided in males and ovigerous/non-ovigerous females.

The present work, therefore, first testifies the northern spreading of *P. transversus* along the Tyrrhenian Sea and its massive presence in Palinuro. A further research in online databases also revealed the presence of this species between the localities of occurrence already published (Sicily) and the one newly found here, and particularly at San Nicola Arcella (39.8375ºN, 15.7698ºE), where a single individual was photographed in 2020 (https://www.inaturalist.org/observations/48556254). Such records immediately raise the question on the origin of these specimens. Recent sightings of *P. maurus* often cast doubts on whether its true distribution in the Mediterranean was hindered by taxonomic impediments and a lack of scientific interest in marine crab diversity. However, this does not apply at least to the record in Palinuro. In fact, the area where *P. transversus* was found has been constantly sampled by one of the authors (F.C.) for over 10 years (see also the material examined in Valdés *et al.*, 2013; Barco *et al.*, 2013; Abalde *et al.*, 2023). During that time period, *P. transversus* was never noticed in the area, even as a sporadic occurrence. Indeed, the presence of large adult individuals indicates an earlier arrival of the species in the study area. However, its presence cannot have been overlooked for an entire decade, and it is surely more recent. No certainties also occur on how the species reached these two new localities. The lack of major harbours in the nearby suggests that these records are more likely the result of an unaided spread from a southern area. Therefore, it is highly possible that the expansion of the distribution of *P. transversus* in the Mediterranean is being facilitated by the continuous rise of the water temperature in the basin, as in several other species that manage to establish themselves in areas where they never occurred before.

2.3. A new record of edible crab *Cancer pagurus* (Decapoda) from the Sea of Marmara

Okan AKYOL and Vahdet ÜNAL

The edible crab (or brown crab), *Cancer pagurus* Linnaeus, 1758 (family Cancridae), is a large decapod crustacean that inhabits the North-east Atlantic Ocean. Its distribution extends from the Canary Islands in the south to Finnmark County in northern Norway, with occasional sightings in the Mediterranean (Bakke, 2019). The edible crab fishery represents the second largest crustacean fishery in northern Europe, with an annual catch of approximately 50,000 tonnes, of which about 90% has been harvested by the UK, France, Ireland and Norway (Bakke, 2019).

Cancer pagurus inhabits mostly on rough grounds where adults can be found often on pebble and shell gravels, and it occurs at depths ranging from the intertidal zone to the deeper waters (commonly 100 m), exceptionally to 520 m, while juveniles inhabit the intertidal zone and shallow inshore waters (Barfield, 2004). They may live up to 20 years, and due to their continuous moulting throughout their lives, they grow to the very large sizes (Barfield, 2004). Therefore, Brown & Bennett (1980) reported from the English Channel that the largest male crab measured was 267 mm in carapace width, and weighed approximately 4200 g, while the maximum size recorded for a female was 242 mm and 2000 g, respectively.

Despite a comprehensive examination of numerous checklists, no confirmed instances of *C. pagurus* were identified, neither in Turkish waters nor in the eastern Mediterranean. In their recent check-list, Bakır *et al*. (2024) reported that *C. pagurus*, although documented solely by name in Turkish coastal studies, has not been definitively identified through interviews with authors. However, Terbıyık-Kurt & Yılmaz-Zenginer (2016) identified its larvae in a zooplankton study from Mersin Bay in the north-eastern Mediterranean Sea, leading to its inclusion in the species list. The authors have stated that the presence of adult individuals is necessary for a formal confirmation of this species on the Turkish coast. Therefore, this study confirms the presence of *C. pagurus* in the Sea of Marmara, expanding the knowledge on the distribution of this rare crab in the Mediterranean Sea.

On 21st November 2024, a male *C. pagurus* specimen (Fig. 8) was captured by a trammel net (160 mm mesh size) on the shore of Kumkapı, Istanbul, close to entrance of Bosphorus (41.00068°N, 28.96651°E) at a depth of 18 m on a rocky bottom with patches of shell gravels. The commercial fisher took photos and measured both carapace length (CL) and width (CW), and weighed of the specimen. However, the live edible crab was promptly sold a fish restaurant in Ataköy Marina, Istanbul.

The specimen was identified based on its morphological characteristics, which included a reddish-brown coloration on the dorsal surface, a distinctive pie-crust edge on the carapace, and a ventral surface that ranged from pale yellow to light brown. Additionally, the pincers of the claws were tipped in black. We interviewed the fisherman, who stated that the edible crab was caught during lobster fishing, with a soak time of two days for the net. Additionally, the fisherman had never observed this crab species in his fishing area prior to this instance. Its habitat was characterized by rocky substrate with an abundance of black mussels (*Mytilus galloprovincialis*) and shell gravels. The CW, CL and wet weight were 210 mm, 140 mm and 1768 g, respectively (A. Kevenci, pers. comm.).This size of edible crab can be considered a mature individual, as reported maturity sizes for the species are 110 mm for males and 115-152 mm CW for females from the English Channel and the North Sea (Barfield, 2004). Additionally, Barfield (2004) indicated that they are predators of molluscs, particularly mussels, scallops, and burrowing bivalves. It can be inferred that the individual was present in the area for the purpose of feeding.

The pathway of this individual is unknown. Since this species is sold alive, the possibility that it has been released into the sea and recaptured cannot be ruled out. However, according to Turkish import reports, crabs are not imported live, but only as frozen, smoked or cooked by steaming, in shell or not. Furthermore, there is a common belief among divers that this species has rarely been observed in the Sea of Marmara for many years (B. Yokeş, pers. comm.). Nevertheless, the fact that only a single specimen was captured suggests that this species remains uncommon in the region, necessitating further investigation due to the paucity of available data.

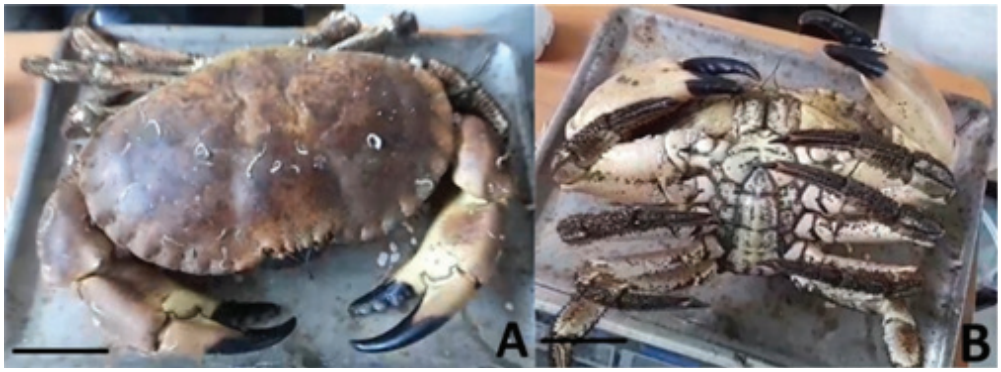

Fig. 8: *Cancer pagurus* caught off Kumkapı, Istanbul, NE Marmara Sea. (A) Dorsal view, (B) Ventral view. Horizontal bar: 50 mm. Photo credits: Arda Kevenci.

3. CHORDATA

3.1. First record of *Lobotes surinamensis* (Bloch, 1790) from the Strait of Gibraltar

Andrea SPINELLI and Francesco TIRALONGO

The Atlantic tripletail, *Lobotes surinamensis* (Bloch, 1790), is a cosmopolitan marine fish of the Lobotidae family living from estuarine to open and brackish waters, between 0 and 70 m depth. This species can be often observed below or close to floating objects (Tiralongo *et al*., 2018). It commonly occurs in the tropical and subtropical waters of all oceans, as summarized by Minasidis *et al*. (2020). In the Mediterranean Sea, the species is distributed in the southern and eastern sectors of the basin and in the central sector where an established population has been reported by Tiralongo *et al*. (2018) from the southern Tyrrhenian Sea (Italy). It has been occasionally reported in the Adriatic Sea and northwestern Mediterranean (Gerovasileiou *et al*., 2020). In Spain this species is considered rare and recently, it has been reported for the first time from the eastern coast, in the Balearic Sea (Tsagarakis *et al*., 2021), and the Gulf of Cádiz, Atlantic Spanish coast (Báez *et al*., 2019). On 9th February 2024, an individual of *L. surinamensis* was captured by a local fisher off the port of Algeciras (Strait of Gibraltar, Spain) (36.13385°N, 5.40112°W). The specimen was photographed immediately. It measured approximately 40 cm in total length and weighed about 3 kg (Fig. 9). Meristic, morphometric and colour pattern characters agreed with the description of *L. surinamensis* reported in the literature (Gerovasileiou *et al*., 2020; Minasidis *et al*., 2020). The body of the fish was typically laterally compressed, with rounded dorsal and anal fins whose posterior tips matched the caudal fin a characteristic that gives this fish the common name "tripletail". The head was subtriangular, with a quite concave forehead. The present finding of *L. surinamensis* represents its first record from the Mediterranean coast of Strait of Gibraltar area, and the westernmost record for this species in the Mediterranean, where it is the only representative of the Lobotidae family. Further studies with the aim of monitoring the presence and expansion of this species in Mediterranean waters are encouraged. The species is thermophilic and can be considered an indicator of increasing water temperature.

Fig. 9: Specimen of *Lobotes surinamensis* caught at the port of Algeciras (Strait of Gibraltar, Spain) on 9th February 2024. Photo credits: Marcos Jorge Castillo.

3.2. First record of the Black-faced blenny *Tripterygion delaisi* Cadenat & Blache, 1971 in the Sea of Marmara

Nur Bikem KESICI and Cem DALYAN

In the Mediterranean Sea, the family Tripterygiidae is only represented by the genus *Tripterygion* Risso, 1826 (Zander, 1986), and includes the following species: *T. tripteronotus* Risso, 1810, *T. melanurus* Guichenot, 1845, *T. delaisi* Cadenat & Blache, 1971 and *T. tartessicum* Carreras-Carbonell, Pascual & Macpherson, 2007. The distribution of *T. delaisi* in Turkish waters encompasses the Levantine and Aegean Seas, as documented by Bilecenoğlu (2014) and Ozen *et al*. (2009). The species distribution is confined to the southern regions of the Çanakkale Strait,

Fig. 10: The collected specimen of the *Tripterygion delaisi* from the Sea of Marmara.

as no records have been documented eastwards from it along the Sea of Marmara (Ozen *et al*., 2009).

On 16th September 2023, a SCUBA dive was conducted at a depth of 0-3 m on the coast of Balıkçı Island, eastern Sea of Marmara (40.820083°N, 29.110879°E). A single specimen of the genus *Tripterygion* was collected from 3 m depth (Fig. 10). The specimen is stored in the Istanbul University Science Faculty, Hydrobiology Museum (IUSHM 2021-1468). The individual showed no intensive colouration of territorial males, which would simplify species identification. Among the three *Tripterygion* species occurring in the eastern Mediterranean Sea, the absence of acute profile of head and permanent red body colouration excludes *T. melanurus.* Females and immature males are hard to distinguish between the other two species, *T. delaisi* and *T. tripteronotus*, since there is no morphological difference and the colouration difference is weak (Zander, 1986; Tiralongo, 2020). The tip pointing posteriorly of the dark blackish saddle spot on the caudal peduncle shows no clear extension onto the base of the caudal fin rays (Zander, 1986), but the dark spot is clearly darker than four brownish bars on body sides (Tiralongo, 2020). Considering the weak and contradictory colouration character, the individual was identified based on molecular data only. DNA from muscle tissue was extracted from the specimen using the TIANamp Marine Animal DNA Kit. To obtain COI barcoding information of the individual, the partial COI gene was amplified using specific primers (COI-TdF:CTCCTTGGGGACGATCAAAT,COI-TdR:CAGAATAAGTGTTGATAAAGAATAGGG), followed by sequencing with the MinION (Oxford Nanopore Technologies) sequencing device, utilizing the metabarcoding approach and the same protocol as in Carreras-Carbonell *et al*. (2005). The resulting COI amplicon sequence data in ".fastq" format were subsequently uploaded to the NCBI SRA database under Sequence Read Archive (SRA) accession number SRR29028226, yielding >99% sequence similarity with *T. delaisi*.

This new record of *T. delaisi* from the Sea of Marmara, extends the distribution of the species eastwards, along the entire Sea of Marmara. This species lives in rocky, shallow coastal waters (Kesici & Dalyan, 2020), preferably in algae-covered substrates. Its ecological preferences may account for its elusiveness, often making it challenging for scientists or divers to detect during SCUBA dives.

3.3. First record of the barred dragonet *Callionymus fasciatus* Valenciennes, 1837 from Slovenian waters

Domen TRKOV and Leon L. ZAMUDA

We report here the first record of *Callionymus fasciatus* Valenciennes, 1837 in Slovenian waters, which also represents the northernmost known occurrence of the species. The species is distributed in the northern Mediterranean, from the Gulf of Genoa to the western Aegean Sea, as well as in the southern and eastern Black Sea (Fricke, 1986). Although some sources (e.g., Fricke, 1986) state that the species occurs throughout the Adriatic, it is a rare species known only from some locations in Italy, the western side of the southern Adriatic (Ungaro *et al*., 1999) and in Croatia from the mouth of the river Zrmanja (Matić-Skoko *et al*., 2007), Split, Crikvenica and Rovinj (Fricke & Ordines, 2017). It is a benthic species that usually occurs on sandy bottoms between 20 and 60 m (Fricke, 1986).

On 8 June 2023, a specimen of *C. fasciatus* was observed during a dive off the Marine Biological Station in Piran (45.51788889°N, 13.56816667°E). It was found at a depth of 3 m on muddy sand, where a seagrass meadow of *Cymodocea nodosa* (Ucria) Ascherson was present until 2017, which then disappeared due to the construction of a beach. The specimen was caught with a hand net (diameter = 40 cm), photographed in the laboratory with an Olympus TG-6 camera (Fig. 11 A and B) and then euthanized with an appropriate dose of Quinaldine, determined and measured under an Olympus SZx16 stereomicroscope with the Olympus DP74 camera, and then preserved in 96% ethanol. The specimen was identified as *C. fasciatus* based on the following characters (Fricke, 1986): preopercular spine with 3 mostly curved points at the upper side and strong antrorse spine at base (Fig. 11 C and D); first dorsal fin with IV spines; second dorsal

Table 2: Morphometric measurements, meristic counts and collection number of *Callionymus fasciatus* Valenciennes, 1837 caught in Slovenian waters.

Collection number	IC-MBP 335
Sex	male
Morphometric measurements	(mm)
Total length (TL)	30.3
Standard length (SL)	25.5
Head length	7.6
Eye length	2.4
Meristic counts	
First dorsal fin rays (D1)	IV
Second dorsal fin rays (D2)	10
Anal fin rays (A)	9

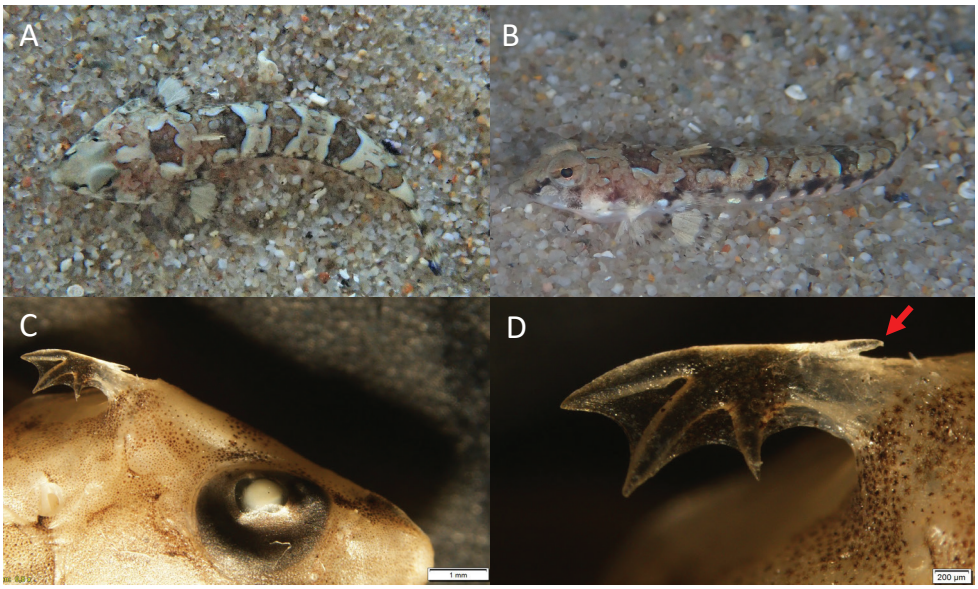

Fig. 11: Specimen of *Callionymus fasciatus* Valenciennes, 1837 caught in Slovenian waters. Specimen with distinctively dark coloured saddles from above (A) and from the side (B). Preopercular spine (C) and closer look of preopercular spine with strong antrorse tip (red arrow) at the base (D).

fin with 10 rays; second dorsal fin higher than the second spine of the first dorsal fin; second dorsal fin with oblique or vertical rows of dark spots (vertical in the present specimen). Additional morphological and colouration characters: length of the eye was 2.5 to 3.3 times that of the head (3.1 times in the present specimen); body olive to red in colour, with 5 to 7 dark saddles. The basic morphometric measurements, meristic characteristics, sex and collection number of the Slovenian specimen, which is kept in the ichthyological collection of the Marine Biological Station in Piran, are listed in Table 2.

3.4. First record of the brown moray eel *Gymnothorax unicolor* (Delaroche, 1809) in Crete (GSA 23)

Georgios CHRISTIDIS and Konstantinos SKARVELIS

The brown moray eel *Gymnothorax unicolor* (Delaroche, 1809) belongs to the Muraenidae family and is native to the eastern Atlantic Ocean and the Mediterranean Sea. In the Mediterranean Sea, this species along with the native moray *Muraena helena* Linnaeus, 1758, the expanding *Enchelycore anatina* (Lowe, 1838) and the non-indigenous *Gymnothorax reticularis* Bloch, 1795, comprise the four muraenid species currently present in the basin. *Gymnothorax unicolor* is considered rare in the Mediterranean, with occasional records in the western basin, mainly during the last decade (e.g., Tiralongo *et al.*, 2020b), and with even fewer occurrences in the eastern basin (e.g., Bariche *et al*., 2020; Ergüden *et al*., 2023). In Greek waters, the species was first sighted in 1948 at the fish market of Piraeus (Belloc, 1948, cited in Papaconstantinou, 2014) and since then no further records were

reported up until 2010, when it was caught in the island of Rhodes (GSA 22) (Corsini-Foka *et al.*, 2015). This study reports the first record of *G. unicolor* in Crete (GSA 23).

On the 1st of June 2024, one specimen of *G. unicolor* was collected off the northern coast of Crete (27 m depth; 35.356333°N, 25.393333°E) onboard a small-scale fishing vessel using a bottom longline (hook size N° 10). The longline was deployed during nighttime on rocky bottom and the sea surface temperature was 22°C at the collection site.

The specimen was transferred to the Hellenic Center of Marine Research (HCMR) in Crete and preserved at -20°C until further processing. It was a maturing male measuring 675 mm and weighing 543 g (Fig. 12A), identified as *G. unicolor* based on the distinctive characters described by Whitehead *et al*. (1986). Specifically, the head and snout were short, with the anterior nostril being tubular and the posterior nostril opening in a single pore. The dorsal fin originated on the head, before the level of the gill opening, and merged with the anal fin to tail tip (Fig. 12B, C). The teeth were not denticulate and premaxillary teeth were also present (Fig. 12D). The coloration of the specimen also matched the description for *G. unicolor*, with a dark brown body, a darker anterior part of the head followed by a lighter area, and ochre yellow fin edges.

To the best of our knowledge, this is the first collected and archived specimen of *G. unicolor* in Greece, deposited in the Natural History Museum of Crete (Code number: NHMC80.1.103.2).

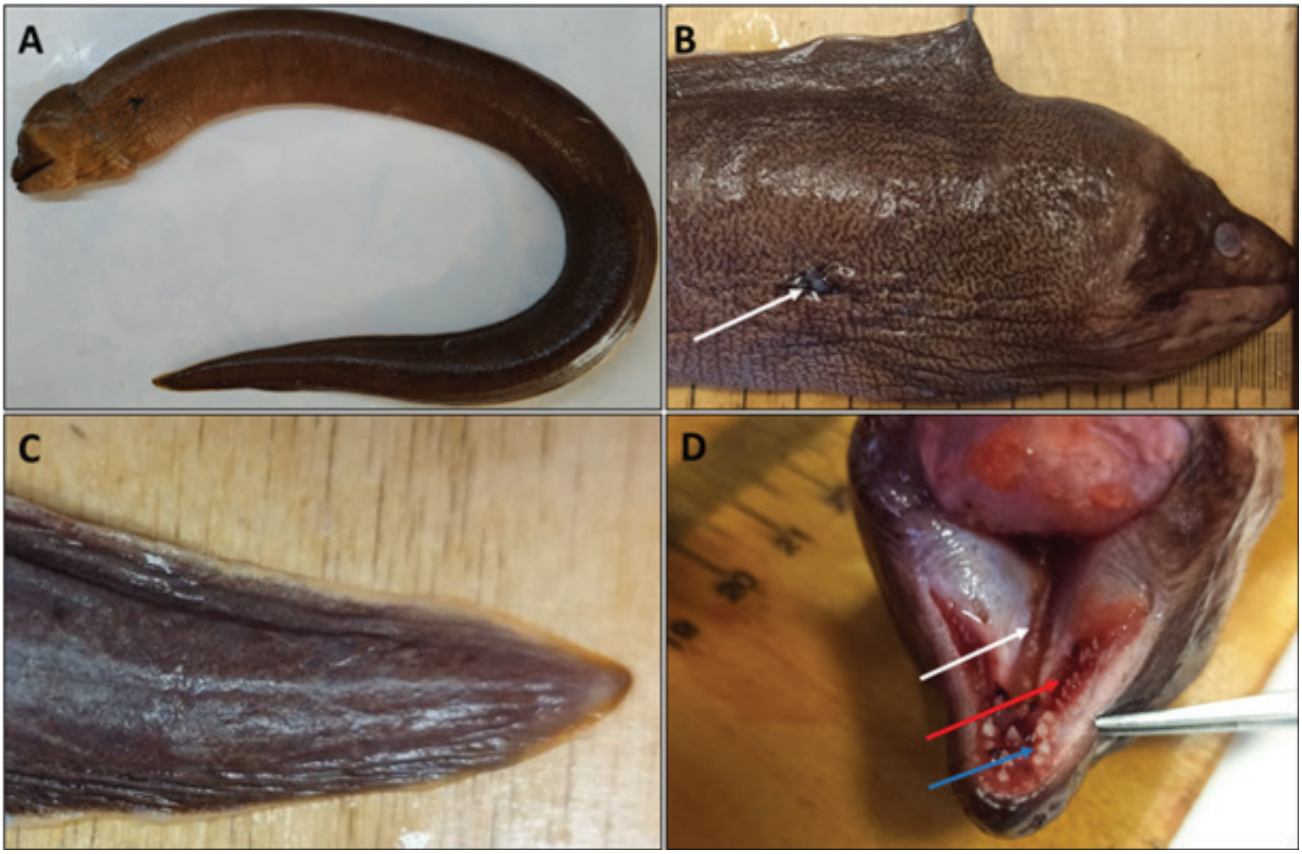

Fig. 12: (A) Lateral view of the *Gymnothorax unicolor* specimen collected on the 1st of June 2024; (B) View of the head demonstrating the origin of the dorsal fin. The white arrow points at the gill opening; (C) View of the tail tip where the dorsal and anal fins merge; (D) View of the upper jaws showing the premaxillary (blue arrow), the maxillary (red arrow) and the vomerine (white arrow) teeth.

3.5. First record of *Symphodus doderleini* in waters of Slovenia

Lovrenc LIPEJ and Borut MAVRIČ

As part of the regular censuses of coastal fish fauna, which are carried out at the Marine Biological Station (MBS) of the National Institute of Biology using underwater non-destructive sampling techniques from 1999, a specimen of the wrasse *Symphodus doderleini* Jordan, 1890 was recorded on 29 August 2019. It was sighted on the sampling transect in the background of the algal belt covered with brown algae *Cystoseira* spp. at 3 m of depth on the northern Piran coast (45.528875°N, 13.573189°E). The specimen was photographed with an Olympus TG6 underwater camera. The species *S. doderleini* was identified among Mediterranean and North-eastern Atlantic species of *Symphodus* Rafinesque, 1810, based on the following characters (Quignard & Pras, 1986): (1) Snout weakly pointed, longer than postorbital length, but not upwards directed; (2) Caudal fin not black; (3)

Fig. 13: The specimen of the striped wrasse, *Symphodus doderleini*, photographed on 29 August 2019. Photo credits: Lovrenc Lipej.

Upper operculum with no area differently colored from the nearby body and head surfaces; (4) Two wider dark brown stripes run from the snout to the caudal peduncle along upper body, delimited by the narrow whitish stripe between them, lower body whitish, with reddish or yellow-orange shade in some individuals; (5) Caudal mark small, above lateral midline and within the lower dark brown stripe. On Figure 13 second similar caudal mark is visible at the midlateral, where small mark is usually present in three other *Symphodus* species. However, the presence and position of the upper mark, as well as other characters listed here, exclude those species.

This wrasse species, which appears to be regular only in the southern and middle Adriatic Sea, was first time recorded in the Slovenian part of the Adriatic Sea. Previously, Marčeta (1999) listed this species as an expected one in the Slovenian coastal waters. In the long-term monitoring of fish fauna performed by the staff of the MBS Piran lasting since 1999 the species was never sighted before.

Wrassess (framily Labridae) are important coastal fishes inhabiting mainly habitats with dense algal vegetation of seagrass meadows. *Symphodus doderleini* is a small sized labrid reaching up to 10 cm in total length. It lives mainly in the meadows of *Posidonia oceanica* or in the dense algal growth of the coastal rocky bottom, but it is not particularly common or abundant anywhere, like some other *Symphodus* species. It inhabits the Mediterranean and Black Sea.

Scapin *et al.* (2019) mentioned the striped wrasse as a recently discovered fish species in waters of Venice. It is probably still too early, based on a sighting of just one specimen, to attribute the appearance of the striped wrasse to tropicalization. Due to this process, higher temperatures in recent decades facilitate the northward spreading of some southern thermophilous species and their range expansion. The documented sighting of the striped wrasse represents an important contribution to our knowledge on the fish diversity of the northern Adriatic Sea.

Table 3. Morphometric and meristic measurements of *Arctozenus risso* from Gökçeada (North Aegean Sea).

Morphometric Measurements (mm)	Present Study	Cihangir *et al.* (2003)
Total length (TL)	125	-
Standard length (SL)	117	132.5
Body depth (BD)	8	11.51
Predorsal length	72	88.12
Prepelvic length	82	-
Preanal length	92	-
Head depth (HD)	6	-
Snout length (SN)	15	16.07
Eye diameter (ED)	4	4.73
Interorbital width	3	2.78
Pectoral-fin length	10,8	-
Caudal-peduncle length	9	-
Anal-fin-base length	19	-
Meristic Measurements		
Dorsal-fin rays	9	9
Pectoral-fin rays	11	12
Anal-fin rays	30	30
Pelvic-fin rays	-	9

3.6. Rare occurrence of the Spotted Barracudina *Arctozenus risso* (Bonaparte, 1824) in the North Aegean Sea

Elif YÜCEDAĞ BAKIR and Yunus GÖNÜL

The Spotted Barracudina *Arctozenus risso* (Bonaparte, 1824) is a mesopelagic and widely distributed species, occurring in all oceans and the Mediterranean Sea to depths of 2000 m (Whitehead *et al.*, 1986). In the southeastern Aegean Sea, the Spotted Barracudina was reported for the first time during the Danish expeditions (1908-10) (Ege, 1930). In the North Aegean Sea, it was recorded in Turkish waters by Cihangir *et al*. (2003). The species has been also reported in adjacent Greek waters in ichthyoplankton studies (e.g., Isari *et al.*, 2008). In Türkiye, an individual of the species has also been obtained in an ichthyoplankton study from the Gulf of Antalya in northwestern Levant Sea (Mavruk *et al*., 2023).

A specimen of *A. risso* was caught at an average depth of 369 m during bottom trawl surveys near Gökçeada Island in 2023 (40.17687°N, 25.53693°E; 40.17040°N, 25.51398°E). Morphometric measurements were made in the laboratory, and the specimen was preserved in 70% alcohol. The sampled *A. risso* specimen was 125 mm in length and 1.15 g in weight. All morphometric and meristic measurements are given in Table 3.

Paralepididae family is represented by four genera

and six species in the Mediterranean Sea: *A. risso*, *Lestidiops jayakari* (Boulenger, 1889), *L. sphyrenoides* (Risso, 1820), *Paralepis coregonoides* Risso, 1820, *Paralepis speciosa* Bellotti, 1878 and *Sudis hyalina* Rafinesque, 1810 (Kovačić *et al*., 2021). According to Whitehead *et al.* (1986), the genus *Lestidiops* is characterized by a ventral adipose fin located between the pelvic and anal fins, which is absent in *Arctozenus*. The genus *Paralepis* has fewer than 25 anal rays, whereas *Arctozenus* has between 30 and 32. The genus *Sudis* is distinguished by its notably long pectoral fins. All measurements and morphological features confirmed the identification of our specimen as *A. risso* (Fig. 14).

This is the first encounter of this rare species as an adult specimen in the North Aegean Sea (Cihangir *et al.*, 2003) after 2003 is presented in this study. Further detailed studies on deep-sea fish in the Aegean Sea are still needed.

Fig. 14: *Arctozenus risso* (TL= 125 mm) from Gökçeada, North Aegean Sea.

3.7. First record of scalloped ribbon fish, *Zu cristatus* (Bonelli, 1819) (Actinopterygii: Trachipteridae) from Alboran Sea (Western Mediterranean Sea)

José Carlos BÁEZ, Ángel BELMONTE-GALLEGOS and José Antonio ORTEGA CEACERO

Scalloped ribbonfish, *Zu cristatus* (Bonelli, 1819) (Actinopterygii: Trachipteridae), is a cosmopolitan mesopelagic marine species. It is widely recognized as rare and cryptic, with few confirmed observations worldwide (Albano *et al*., 2022a,b; Golani *et al*., 2023). This species occupies a broad range of depths, from shallow waters in juvenile stages to deep-sea environments as adults, reaching up to 2000 meters. This vertical range underscores its meso- to bathypelagic adaptations, strongly tied to ontogenetic shifts in habitat; juveniles often inhabit shallow waters, transitioning to deeper zones as they mature (Albano *et al*., 2022a,b).

Initially described by Bonelli in 1819 from a specimen collected in the Gulf of Spezia, Italy, *Z. cristatus* has subsequently been reported across various parts of the Mediterranean. Comprehensive records (Albano *et al*., 2022a,b) indicate sightings in the Adriatic Sea, Algeria, Balearic Sea, Catalonian Sea, Ionian Sea, Ligurian Sea, Tyrrhenian Sea, Gulf of Tunis (northern Tunisia), and Türkiye, with more recent sightings recorded from Israel and the eastern shores of the Levant (Golani *et al*., 2023). These limited records are further exacerbated by the low commercial interest in the species, which is typically discarded when caught as bycatch.

Zu cristatus may be distributed throughout the Mediterranean basin, with a notable concentration in the Eastern-Central Mediterranean. Evidence from spawning and nursery areas further supports the significance of this region for the species' life cycle, particularly in the Adriatic Sea (Dulčić, 2002) and Israel (Golani *et al*., 2023).

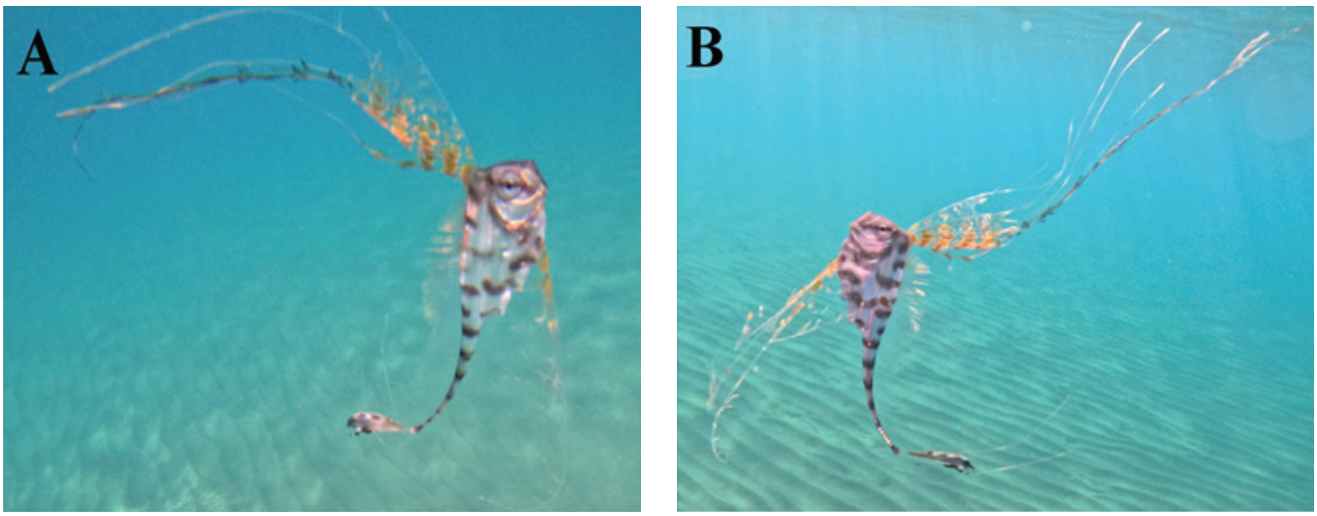

Fig. 15: Scalloped ribbonfish, *Zu cristatus* photographed from the Alboran Sea; (A) specimen from the right side, (B) specimen from the left side. Photo credits: José Antonio Ortega Ceacero.

The purpose of this report is to document the first recorded observation of a *Z. cristatus* specimen in the Alboran Sea (Fig. 15). This juvenile specimen was photographed by two scuba divers (the coauthors of this document, ABG and JAOC) on 1 November, 2024, at 11:40 a.m., in Zapillo Beach, within the city limits of Almería, Spain (Coordinates: 36.8246459°N; 2.4482081°W). The observation occurred 50 meters from shore at a depth of 3 meters, on a sandy substrate, under favourable diving conditions with a water temperature of 20°C.

In line with Albano *et al*. (2022b), who noted that expert underwater photographers occasionally capture juvenile lampriforms, our sighting aligns with this trend, as we observed the juvenile specimen in situ during a dive. This new record not only extends the known distribution range of *Z. cristatus* within the Mediterranean but also provides further evidence of its reproductive and juvenile presence beyond the Eastern-Central region, suggesting that its spawning area may encompass the broader Mediterranean basin.

In line with the species descriptions provided by Lloris (2015), the observed specimen exhibited a dorsoventrally compressed body just anterior to the anus, narrowing sharply towards the posterior end. The eye is notably large. The upper portion of the caudal fin, the most prominent feature, is oriented upwards, with the fin rays fused to form a membrane. In juvenile individuals, the body is silvery, with distinct bars on both the dorsal and ventral sections. Furthermore, the first dorsal fin is highly elongated, with a tuft of rays extending beyond the body's height. The pelvic fin rays also reach a considerable length, further accentuating the distinctiveness of the juvenile form.

3.8. The first Mediterranean record of the rare cryptobenthic *Chromogobius zebratus* (Teleostei: Gobiidae) on the Iberian Peninsula

Víctor ORENES-SALAZAR and Luis SÁNCHEZ-TOCINO

The Kolombatovic's Goby *Chromogobius zebratus* (Kolombatović, 1891) is a small cryptobenthic fish species belonging to the genus *Chromogobius,* along with *C. quadrivittatus* (Steindachner, 1863) and *C. britoi* Van Tassell, 2001. Because of its highly cryptic habit and small size (maximum total length about 6 cm), records of the species are patchy, and its real distribution range remains still unknown. This cryptobenthic species is typically found inside caves, crevices and under solitary stones and boulders of various sizes on sand or flat bedrock, with different bottom inclinations and algal cover at a depth of 0.5-20 m (Kovačić *et al*., 2022). The species is distributed in the Northeastern Atlantic, but only near Gibraltar, in the Mediterranean and in the Black Sea. In the Mediterranean Sea, the species was recorded from the north and the eastern Mediterranean (see references in Engin & Dalgiç, 2008; Kovačić *et al*., 2022). The westernmost records in the Mediterranean are restricted to Marseille and Ibiza, with the largest distributional gap along the coast of the Iberian Peninsula, between Northeastern Atlantic and Ibiza, and along the continental coast eastwards to Marseille, France (see references in Kovačić *et al*., 2022). The record at the France-Spain border in Engin & Dalgiç (2008) has no support in the distributional references they cited and is presumably based on a misinterpretation of the occurrence map of the genus *Chromogobius* from Miller (1971).

Here, we report the presence of Kolombatović's Goby in two different localities distributed along the Spanish Mediterranean of the Iberian Peninsula. In June 2010, the species was documented inside a cave on soft bottom at 10 m depth at Cerro Gordo (approximate coordinates: 36.729444° N, 3.765278° W) (Fig. 16A). More recently, the fish was observed and photographed in June

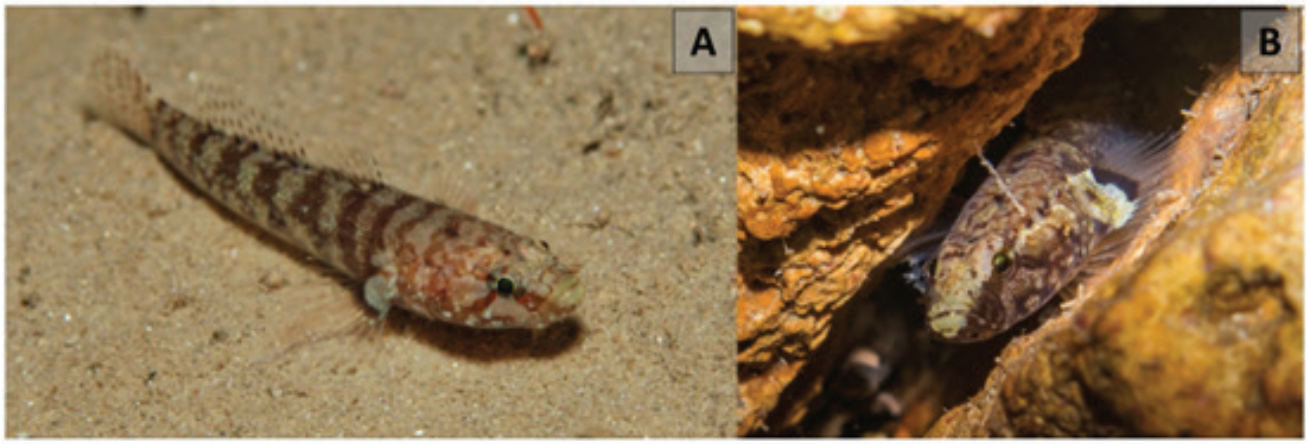

Fig. 16: Kolombatović's Goby *Chromogobius zebratus* observed in June 2010 in a submerged cavity of Cerro Gordo (A), and in June 2021 in a crevice in Cabo de Palos (B), off the Mediterranean coast of the Iberian Peninsula. Photo credits: Luis Sánchez-Tocino (A) and Víctor Orenes-Salazar (B).

2021 during a SCUBA survey in a submerged crevice at 6 m depth, in Cabo de Palos (approximate coordinates: 37.6367°N, 0.6879°W) (Fig. 16B). The species was identified from the photographs (Fig. 16) with the diagnosis based on Kovačić *et al*. (2022): Head clearly depressed (dorsoventrally flattened); body pale brown with 5 or 6 faint pale saddles, distinctly to poorly visible, from origin of the first dorsal fin to just behind second dorsal fin (the individual from Cabo de Palos on Figure 16B with only head and anterior body photographed, so the saddle at origin of the first dorsal fin was the only visible pale saddle); cheeks pale with 2 oblique dark bands radiating downwards from eye in the shape of an inverted V; base of pectoral fin with a narrow black bar preceded by a white or yellowish bar across fin rays. The saddle at origin of the first dorsal fin has been discriminative without other saddles visible, since it is absent in *C. quadrivittatus.*

The present records filled the Iberian Peninsula gap in the geographic distribution of this small cryptobenthic fish in the western Mediterranean. The recorded habitat matches the species' ecological distribution (Kovačić *et al*., 2022).

3.9. Rare sighting of the white grouper *Epinephelus aeneus* (Geoffroy Saint-Hilaire, 1809) in the Central Adriatic Sea

Fabio GRATI and Ernesto AZZURRO

The white grouper *Epinephelus aeneus* (Geoffroy Saint-Hilaire, 1817) is a large, sex-changing species listed as Near Threatened in the IUCN Red List at Mediterranean and global levels (Sadovy *et al*., 2011; Pollard *et al*., 2018). The species is widely distributed across the southern and eastern Mediterranean Sea, the southern Atlantic coasts of Portugal and Spain, and southward along the Atlantic coast of West Africa. In the Adriatic Sea, the white grouper was considered absent by Heemstra & Randall (1993) while Pollard *et al.* (2018) described it as rare and limited to areas south of the Ancona-Zara line. However, occasional captures have been reported in recent decades.

In 1999, two specimens were caught for the first time in the southern Adriatic near Dubrovnik and in 2006 a single specimen was captured near the island of Dugi Otok (central Adriatic, Croatia) (Dulčić *et al*., 2006 and references therein). In 2015 a new capture was reported from near the island of Čiovo (central Adriatic) (Đođo *et al*., 2016), and in 2020 the capture of one individual near Trieste (Italy) was described by Bo *et al*. (2020).

Here, we report the capture of an adult *E. aeneus* specimen (Fig. 17) on January 8, 2025, by a commercial bottom otter trawl off the coast of Ancona (western central Adriatic Sea, Italian coast, 43.635°N; 13.771°E). The capture occurred on a soft, muddy seabed at a depth of 35 m. The specimen weighed 9 Kg, although no length measurements were recorded.

According to Heemstra & Randall (1993), the specimen was identified based on distinctive morphological features, including three or four oblique whitish lines across the operculum. The lowest line, extending from the rear end of the maxilla to the interopercle, is faint and blends with the colouration of the lower interopercle. The next line runs from the eye across the preopercle, just above its angle, and continues onto the subopercle. The uppermost line extends from the eye to the upper end of the preopercle, where it bifurcates and proceeds to the rear edge of the operculum. Additionally, dark bars are discernible on the body, a characteristic that is particularly prominent in juveniles.

This new observation, together with previous records, enhances our understanding of the distribution of *E. aeneus* and its potential range expansion, a phenomenon widely documented in other Mediterranean fish species, including groupers.

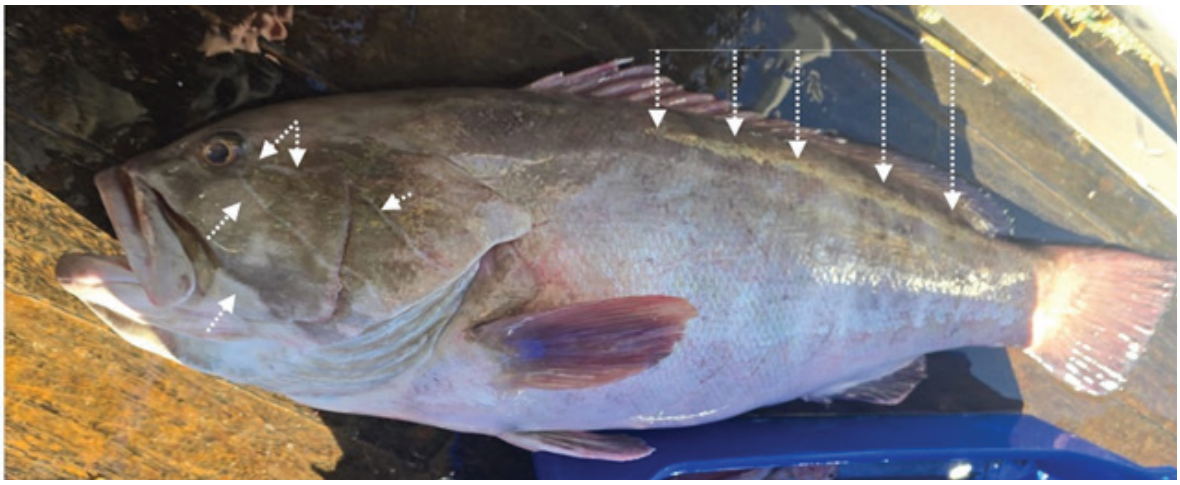

Fig. 17: White grouper, *Epinephelus aeneus* (W = 9 Kg) caught on 8 January 2025, off Ancona, Western Central Adriatic Sea. Arrow point to the distinguish characters of the species: the oblique whitish lines running across preoperculum and operculum, and the dark bars on the body. Photo credits: Gianluca Caselli.

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