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New records of rare species in the Mediterranean Sea (May 2022)

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New records of rare species in the Mediterranean Sea (May 2022)

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Abstract

This Collective Article presents new information about the occurrence of 20 taxa that belong to six Phyla: one Cnidaria, one Ctenophora, two Annelida, four Mollusca, two Arthropoda, and ten Chordata. These records were reported from ten countries from the western to the eastern Mediterranean Sea as follows: **Spain:** early colonization signs of the Mar Menor lagoon by the cigar jellyfish *Olindias muelleri*; **France:** second record of the sea chub of the genus *Kyphosus* in French Mediterranean waters; **Italy:** first record of the marbled crab *Pachygrapsus maurus* in Sardinian waters; first records of the polychaetes *Malmgrenia polypapillata* and *Levinsenia tribranchiata* in the Tyrrhenian Sea; new record of the deep-sea squid *Ancistrocheirus lesueurii* in the Tyrrhenian Sea; first record of the pignosed arrowtooth eel *Dysomma brevirostre* in the Adriatic Sea; **Tunisia:** first documented record of the blue butterfish *Stromateus fiatola* and new record of the iconic great white shark *Carcharodon carcharias* in the Gulf of Gabes; **Slovenia:** first records of the sea slug *Diaphorodoris alba* and the sharpnose sevengill shark *Heptranchias perlo*; **Montenegro**: new record of the rare tope shark *Galeorhinus galeus*; **Greece:** new records of the rabbitfish *Chimaera monstrosa* and the electric ray *Tetronarce nobiliana*; first published record of the nuribranch *Discodoris rosi*; **Turkey:** first record of the ctenophore *Hormiphora plumosa* at country level; first records of the anomuran decapod *Munida speciosa* and the Mediterranean tripodfish, *Bathypterois mediterraneus* from the Levantine Sea; **Cyprus:** first documented record of the nuribranch *Scyllaea pelagica*; **Lebanon**: first record of the killer whale *Orcinus orca* from the Levantine Sea.

Introduction

Although the Mediterranean Sea represents 0.82% of the surface and 0.32% of the volume of the oceans (Defant, 1961), this marine ecosystem is one of the most significant biodiversity hotspots of the world harbouring between 15,000-20,000 marine species, approximately one quarter of which are endemic (Myers *et al.*, 2000; Bianchi *et al*., 2012). The turbulent geological history of the Mediterranean Sea during the Tertiary along with the dramatic climatic fluctuations of the Quaternary, constitute the primary drivers that have transformed this distinctive province of the Atlantic-Mediterranean biogeographic region into a heterogeneous biogeographically ecosystem with high species richness and high level of endemism (Vogiatzakis *et al*., 2006; Bianchi *et al*., 2012). Nevertheless, the Mediterranean marine ecosystem is experiencing an on-going rapid alteration due to the combined effect of anthropogenic pressure, introduction of invasive alien species, and climate change, and has been classified among the most threatened biodiversity reservoirs (Coll *et al*., 2010; Albano *et al*., 2021). As such, documenting new records of species rarely encountered and/or of special interest is of paramount importance to the scientific community and decision-makers to follow the Mediterranean ecosystem evolution in a continuously changing environment and to support species conservation action plans (Gerovasileiou *et al*., 2020; Tsagarakis *et al*., 2021). The Collective Article, Series B 'New records of rare species in the Mediterranean Sea' offers the means to publish records of rare marine species and information on the spatial distribution of threatened taxa in the Mediterranean Sea and adjacent regions. New records are presented by major geographical zones, from west to east, arranged in corresponding sub-chapters: WMED, Western Mediterranean Sea; ADRI, Adriatic Sea; CMED, Central Mediterranean Sea; EMED, Eastern Mediterranean Sea. The nomenclature proposed by the World Register of Marine Species is followed (WoRMS, 2022).

The present Collective Article presents records of 20 species that belong to six Phyla: one Cnidaria, one Ctenophora, two Annelida, four Mollusca, two Arthropoda, and ten Chordata. The approximate locations of the species occurrence records are illustrated in Figure 1, represented by a number in increasing order from west to east. The list of species and the corresponding information (Phylum, sub-chapter, basin, country, location, and location number on map) are presented in Table 1. The species are recorded from the sea surface to bathyal depths of about 800 m across ten Mediterranean countries at longitudes between 0.79°W and 35.50°E. The majority of the records is reported from the EMED (N = 8), followed by the WMED (N = 6), ADRI (N = 4) and CMED (N = 2).

The westernmost species record comes from the Mar Menor coastal lagoon, located in the region of Murcia in southeastern Spain, where the cigar jellyfish *Olindias muelleri* Haeckel, 1879, a species with scattered records in the Mediterranean Sea dated back to 1824, has been documented by established monitoring stations since 2010, and was more recently confirmed by fishers and an underwater photographer. One sea chub specimen of the genus *Kyphosus*, assigned with uncertainty to *Kyphosus sectatrix* (Linnaeus, 1758), was captured by a spearfisher and recorded for the second time off the French Mediterranean coast. The marbled crab *Pachygrapsus maurus* (H. Lucas, 1846) was recorded for the first time in Sardinian waters, in the Capo Caccia-Isola Piana Marine Protected Area, accounting for its widest population known so far from the north-central Mediterranean Sea. The paraonid polychaete *Levinsenia tribranchiata* Çinar, Dagli & Acik, 2011, previously reported off the Turkish coasts, was reported for the first time in Italian waters (central Tyrrhenian Sea), representing its westernmost occurrence in the Mediterranean basin. The polynoid polychaete *Malmgrenia polypapillata* (Barnich & Fiege, 2001) was reported for the first time from the central Tyrrhenian Sea (Italian waters), representing the second species record at country level. The sharpear enope squid *Ancistrocheirus lesueurii* (d'Orbigny in Férussac & d'Orbigny, 1842), an oceanic cephalopod rarely caught, especially at adult stage, in the Mediterranean, was reported by a recreational fisher in the southern Tyrrhenian Sea. The blue butterfish *Stroma-*

teus fiatola Linnaeus, 1758 was documented for the first time in the Gulf of Gabes, where, according to local fishers' experience, the species used to be common before the 60-70's. A new record of the iconic great white shark *Carcharodon carcharias* (Linnaeus, 1758), characterized as Critically Endangered at Mediterranean scale, comes also from the Gulf of Gabes, represented by a gravid female at the latest stage of gestation, supporting the notion that this area may be used as a potential nursery ground for the species. The onchidorid sea slug *Diaphorodoris alba* Portmann & Sandmeier, 1960 is reported for the first time in Slovenian waters, representing the second record of the species in the Adriatic Sea, and at the same time the northernmost species record in the Mediterranean. The sharpnose sevengill shark *Heptranchias perlo* (Bonnaterre, 1788) was reported for the first time in Slovenian waters, added to the few records of the species that have previously been reported in the Adriatic Sea. The pignosed arrowtooth eel *Dysomma brevirostre* (Facciolà, 1887), with sporadic occurrence records in the entire Mediterranean Sea, was reported for the first time in the Adriatic Sea (Italian waters). The tope shark *Galeorhinus galeus* (Linnaeus, 1758), a species that has become extremely rare across the Mediterranean Sea, where it has been characterized as Vulnerable, is firstly reported from the Montenegrin waters, and specifically near the Bojana River Delta, an area locally known as a hotspot for smooth-hound sharks. The Near Threatened at Mediterranean scale rabbitfish *Chimaera monstrosa* Linnaeus, 1758 is documented in Hellenic waters (Lakonikos Gulf), where sporadic records of the species exist since early 80's. A new record of the electric ray *Tetronarce nobiliana* (Bonaparte, 1835) was reported in Hellenic waters, off the northwestern Crete, expanding our current knowledge about the distribution range of the species. The nuribranch *Discodoris rosi* Ortea 1979 was appropriately documented for the first time in Hellenic waters, representing the first published species record from the eastern Mediterranean Sea and the easternmost species occurrence. The ctenophore *Hormiphora plumosa* M. Sars, 1859, previously documented in the Tyrrhenian and southern Adriatic seas, was reported for the first time in Turkish waters (Levantine). The anomuran decapod *Munida speciosa* von Martens, 1878 and the Mediterranean tripodfish, *Bathypterois mediterraneus* Bauchot, 1962 were recorded for the first time from the northern Levantine basin (southern Turkey), corresponding to the easternmost records of both species in the Mediterranean. The nuribranch *Scyllaea pelagica* Linnaeus, 1758, a species with scattered records in the Mediterranean, was recorded for the first time in Cyprus. Unexpected sightings of the killer whale *Orcinus orca* (Linnaeus, 1758), including at least two individuals and one carcass, were recorded for the first time in Lebanese waters, although the species is known to episodically venture into the Mediterranean basin between the area of the Strait of Gibraltar and the Ionian Sea.

Recent studies have highlighted the significant contribution of citizen science in monitoring and filling distributional data gaps of the marine biota (e.g., Kousteni *et al*., 2021). This notion is further supported herein, considering that one record of *C. carcharias* comes from a post in social media in the frame of a citizen science project, *S. pelagica* individuals were observed during recreational scuba diving activities and the two additional species records of *Kyphosus* sp. and *A. lesueurii* were caught by recreational fishers using a spear and hand-jig line, respectively. In addition to the above four species records reported by citizens, ten species (one ctenophore, one hydrozoan, two polychaetes, two molluscs, one decapod, two fishes, and one mammal) were recorded in the frame of scientific field surveys by using trawlers or Van Veen grab samplers, and during field observations including underwater visual census. Six more species (one decapod, and five fishes), reported herein, were caught by professional fishers by using various fishing gears (e.g., trammel nets, gillnets, longlines, and trawlers), further highlighting the significance of a close collaboration between fishers and scientists (Steins *et al*., 2020). Six taxa individuals and one tissue sample from the *O.*

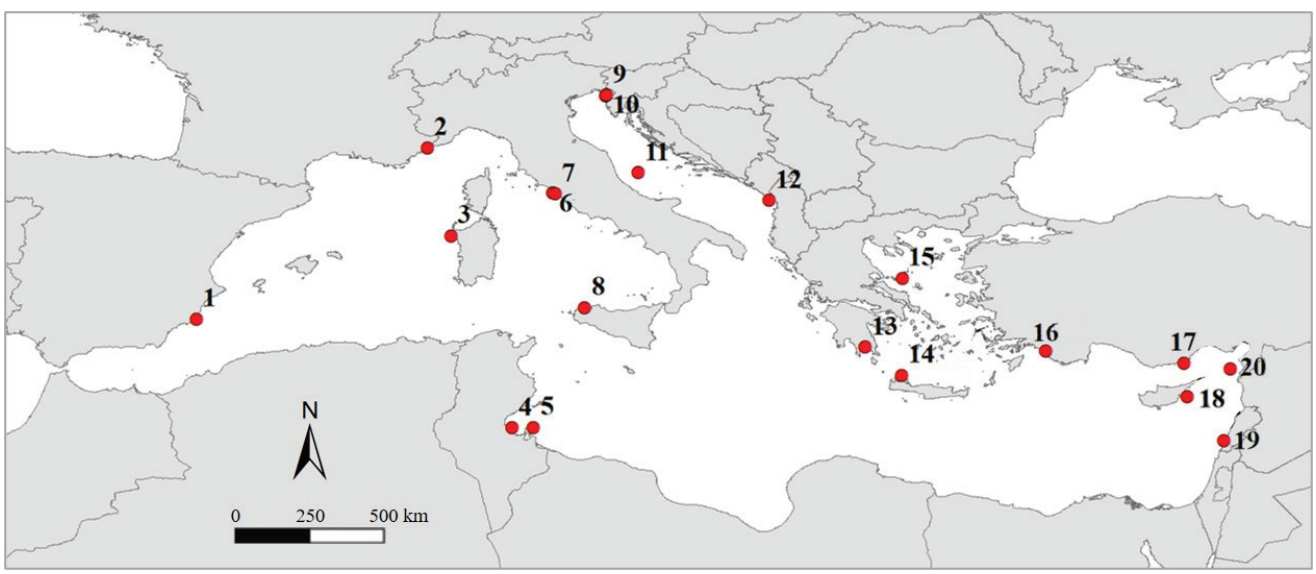

Fig. 1: Approximate locations of species records in the Mediterranean Sea. Location numbers (1-20) correspond with those on Table 1.

Table 1. Information about species records by Phylum, sub-chapter (SC), basin (WMED, Western Mediterranean; CMED, Central Mediterranean; ADRIA, Adriatic Sea, EMED, Eastern Mediterranean), location, country, and location number (LN) as in Figure 1. Point (*) locations represent more than one site in the broader area.

Scientific name	SC	Basin	Location	Country	LN
Phylum **CNIDARIA**					
Olindias muelleri	1.1	WMED	Mar Menor lagoon	Spain	1*
Phylum **CTENOPHORA**					
Hormiphora plumosa	4.5	EMED	Fethiye Bay, Levantine	Turkey	16
Phylum **ANNELIDA**					
Levinsenia tribranchiata	1.4	WMED	Civitavecchia, Tyrrhenian Sea	Italy	6
Malmgrenia polypapillata	1.4	WMED	Civitavecchia, Tyrrhenian Sea	Italy	7
Phylum **MOLLUSCA**					
Ancistrocheirus lesueurii	1.5	WMED	Gulf of Castellammare, Tyrrhenian Sea	Italy	8
Diaphorodoris alba	3.1	ADR	Gulf of Trieste, Adriatic Sea	Slovenia	9
Discodoris rosi	4.3	EMED	Alonissos Island, Aegean Sea	Greece	15
Scyllaea pelagica	4.7	EMED	Pernera Beach, Ayia Napa, Levantine	Cyprus	18
Phylum **ARTHROPODA**					
Munida speciosa	4.6	EMED	Mersin, Levantine	Turkey	17
Pachygrapsus maurus	1.3	WMED	Alghero, Sardinia	Italy	3*
Phylum **CHORDATA**					
Bathypterois mediterraneus	4.9	EMED	Iskenderun Bay, Levantine	Turkey	20*
Carcharodon carcharias	2.2	CMED	Djerba, Gulf of Gabes	Tunisia	5
Chimaera monstrosa	4.1	EMED	Lakonikos Gulf, southeastern Peloponese	Greece	13
Dysomma brevirostre	3.3	ADR	Pomo Pits area, Adriatic Sea	Italy	11
Galeorhinus galeus	3.4	ADR	Bojana River Delta, Adriatic Sea	Montenegro	12
Heptranchias perlo	3.2	ADR	Strunjan, Gulf of Trieste, Adriatic Sea	Slovenia	10
Kyphosus sp.	1.2	WMED	Villefranche-sur-Mer, Saint-Jean-Cap-Ferrat	France	2
Orcinus orca	4.8	EMED	Beirut, Sarafand, Levantine	Lebanon	19*
Stromateus fiatola	2.1	CMED	Zarrat, Gulf of Gabes	Tunisia	4
Tetronarce nobiliana	4.2	EMED	Chania, Cretan Sea	Greece	14

orca carcass were deposited in zoological collections of museums, universities or institutes. Overall, the current Collective Article contributes significantly to our current knowledge about the known distribution range of 20 taxa, including eight species that are reported for the first time at country level.

1. WESTERN MEDITERRANEAN SEA

1.1 Early colonization stages of the Mar Menor coastal lagoon by the Hydrozoan *Olindias muelleri* Haeckel, 1879

Alfredo FERNÁNDEZ-ALÍAS, Concepción MARCOS and Angel PÉREZ-RUZAFA

Olindias muelleri Haeckel, 1879 is a nightly active hydrozoan whose hemispherical umbrella can reach eight centimetres in diameter. The medusa phase has four reddish main radial canals arranged in a cross, along which the white scalloped gonads extend. The latter expand to the lips of the umbrella centered manubrium, elongated and ending in a narrow mouth. The number of primary and secondary tentacles can reach 60 and 120, respectively (Ziemski & Sittler, 2020). The first record of *O. muelleri* in the Mediterranean Sea dates back to 1824 in the west coast of Italy and, since then, even if the species records cover a wide area in the Mediterranean, they are very scarce and distant both in time and space (see Aytan *et al*., 2019 for a review of historical records).

In the Mar Menor coastal lagoon, a monitoring system controlling the ongoing eutrophication process, the ichthyoplankton community and the outburst of jellyfish populations has been carried out in different periods since 1997 (Pérez-Ruzafa *et al*., 2019). In this ecosystem, the anthropogenic pressure has led to a smoothening of salinity and temperature conditions, more recently changing the conditions from oligotrophic to eutrophic, and thus facilitating the colonization by species that modify the lagoon's ecology (Pérez-Ruzafa *et al*., 2002). Herein, we report the early stages of the Mar Menor colonization by

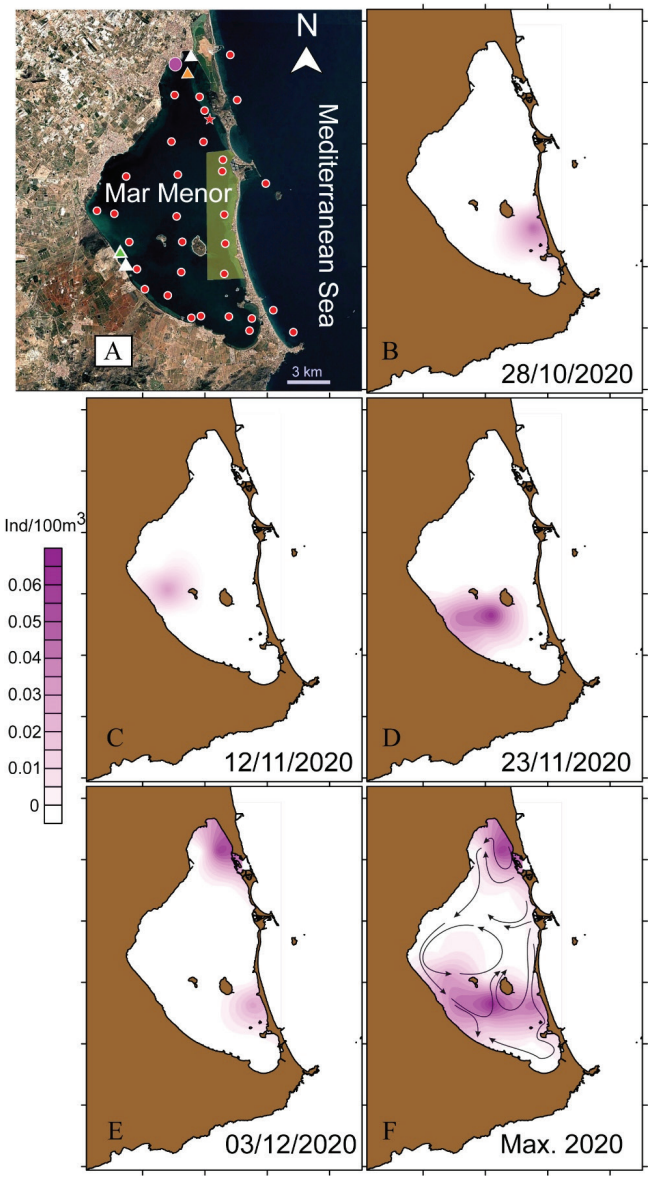

Fig. 2: Monitoring system stations, register of observations and abundances (individuals/100m^3) of *O. muelleri* in the Mar Menor. (A) red circles correspond to the sampling stations; red star indicates the first observation (6 July 2010); triangles indicate the observations reported by Javier Murcia: green (1 individual, 6 February 2014), white (>8 individuals each, 16 and 17 November 2020), orange (>5 individuals, 23 November 2020); pink circle indicates the last observation (1 carcass, 15 December 2020); yellow shaded area indicates the shrimp fishing area; (B-E) *O. muelleri* distribution recorded in the censuses; (F) maximum abundance of *O. muelleri* recorded through censuses in 2020 and Mar Menor water currents. Coordinates: 37.709439ºN, 0.787627ºW.

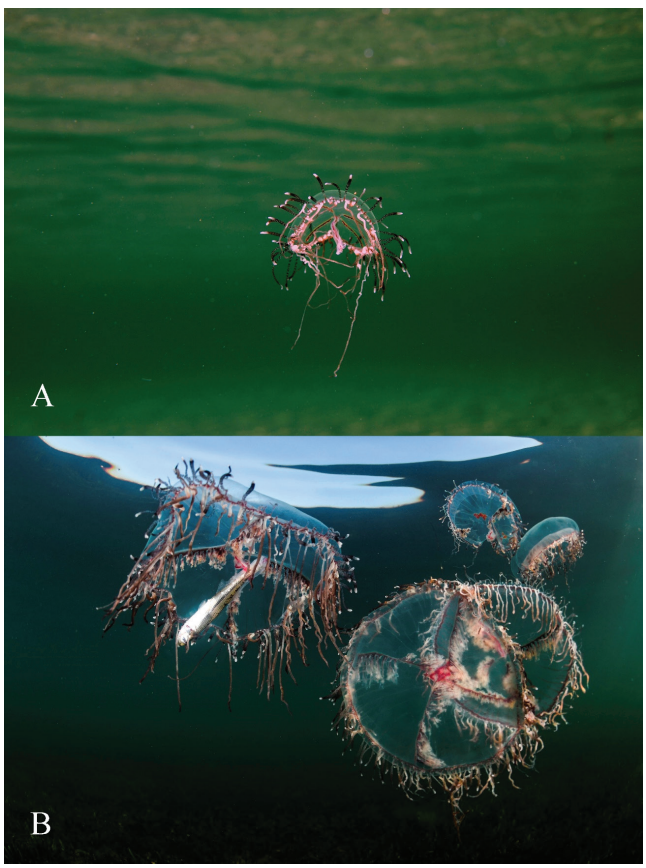

Fig. 3: *Olindias muelleri* detected in the Mar Menor: (A) first register, 6 July 2010 (Photo credit: Angel Pérez-Ruzafa); (B) aggregation of individuals with one of them preying on *Atherina boyeri* (Photo credit: Javier Murcia).

O. muelleri (Fig. 2). Given the nocturnal habits of the species we presumed that our diurnal censuses might have underestimated its abundance, and thus we have complemented the observations with fishermen's declarations and by interviewing an underwater photographer specialized in the Mar Menor. We made the first observation of *O. muelleri* in 2010, near one of the communication channels between the lagoon and the Mediterranean Sea, and a second one in 2014. In September 2020, the fishermen reported that their catch was negatively affected by the presence of *O. muelleri* in the fishing gears, which killed the shrimp *Penaeus kerathurus* (Forskål, 1775) collected by the nets and diminished its market value (Salas, 2020). Since then, we have made 13 observations of adult specimens and one of a dead carcass. In the same period, the underwater photographer reported aggregations from 5 to 50 individuals, in a single dive, and provided a photograph of *O. muelleri* preying upon *Atherina boyeri* Risso, 1810, a species with commercial value (Fig. 3). An additional problem, which is likely to appear with the species establishment, is its interference with the swimmers given that it is a small-sized 'wasp-like' stinger that can easily pass through the protection nets installed in the swim areas.

1.2 A new record of the genus *Kyphosus* along the French Mediterranean coast

Alexis PEY and Patrícia VENTURA

Sea chubs of the genus *Kyphosus* are relatively common herbivorous species with a circumglobal distribution from subtropical to temperate areas (Knudsen & Clements, 2016). On 13th June 2021, a specimen of the genus *Kyphosus* was captured by a spearfisher in the eastern part of the bay of Villefranche-sur-Mer (Saint-Jean-Cap-Ferrat, France, 43.6952°N, 7.3241°E), between 3-4 m depth, an area covered by *Posidonia oceanica* meadows (Fig. 4). The recorded temperature was 23°C. This specimen was found alone, had a calm behaviour and did not flee in the presence of the spearfisher.

The analysis of the stomach content was realised after thawing the specimen. The stomach was full and its content in a low state of digestion. It was possible to identify photophilic algae, characteristic of the Mediterranean rocky infralittoral habitats. *Dictyota* was by far the most represented and abundant algae group, with the presence of two species, *Dictyota fasciola* (Roth) J.V. Lamouroux, 1809 and *D. dichotoma* (Hudson) J.V. Lamouroux, 1809. We also observed the presence of *Padina pavonica* (Linnaeus) Thivy, 1960 and *Acetabularia acetabulum* (Linnaeus) P.C. Silva, 1952. It should be noted that although healthy meadows of *Posidonia oceanica* (Linnaeus) Delile, 1813 and belts of *Ericaria amentacea* (C. Agardh) Molinary & Guiry, 2020 and *Cystoseira compressa* (Esper) Gerloff & Nizamuddin, 1975 characterise the site, where this specimen was captured, no fragments of these algae were identified in the stomach content of the specimen.

The main morphometric and meristic characteristics of the specimen are summarized in Table 2. The meristic characteristics (anal fin soft rays and gill rakers on the lower lobe of first gill arch) suggest that this specimen could be identified as *Kyphosus sectatrix* (Linnaeus, 1758) (Carpenter, 2002). However, the taxonomy of the genus *Kyphosus* has been problematic, and even though

Fig. 4: The specimen of *Kyphosus* sp. caught in the bay of Villefranche-sur-Mer (Saint-Jean-Cap-Ferrat, France). Photo credit: R. Saule.

Table 2. Morphometric and meristic data and respective body proportions as percentage of total length (TL), standard length (SL) and head length (HL) of *Kyphosus* sp. caught off the French Mediterranean coast.

Morphometric measurements	**mm**	**%TL**	**%SL**	**%HL**
Total length	485			
Fork length	431			
Standard length	385			
Dorsal fin length	205	42.3	53.2	
Pectoral fin length	70	14.4	18.2	
Pelvic fin length	62	12.8	16.1	
Anal fin length	94	19.4	24.4	
Pre-dorsal length	144	29.7	37.4	
Pre-pectoral length	87	17.9	22.6	
Pre-pelvic length	133	27.4	34.5	
Pre-anal length	264	54.4	68.6	
Body depth	185	38.1	48.1	
Body width	60	12.4	15.6	
Caudal peduncle height	36	7.4	9.4	
Head length	94			
Eye diameter	18			19.1
Inter-orbital distance	48			51.1
Pre-orbital length	33			35.1
Post-orbital length	51			54.3
Meristic characters	**Number**			
Dorsal fin rays	X + 13			
Pectoral fin rays	18			
Anal fin rays	III + 11			
Caudal fin rays	18			
Pored scales in lateral line	54			
Scales above lateral line	11			
Scales below lateral line	17			
Gill-rakers on first arch	6 + 17			
Weight	**g**			
Total - Eviscerated	2045 - 1765			

Knudsen & Clements (2013) addressed this confusion by analysing morphometric and meristic characters as well as by performing phylogenetic analysis, species identification requires further genetic analysis (Mannino *et al*., 2015).

In the Mediterranean Sea, the first record of sea chubs dates back to 1847 off the coast of Trieste, northern Adriatic Sea. Since then, other Mediterranean occurrences have been recorded, and so far, only two species have been identified, *K. sectatrix* and *K. vaigiensis* (Quoy & Gaimard, 1825). The only observation off the French Mediterranean coast is from 2006 and concerns *K. sectatrix* according to Francour & Mouine (2008). The specimen, similar in size to our observation, was caught more than 70 km away in Saint-Tropez (southern France). More data at species level could provide valuable information to better understand the potential establishment of the species in the Mediterranean Sea.

1.3 A newly discovered population of *Pachygrapsus maurus* (H. Lucas, 1846) in Italy

Marco COLOMBO and Bruno MANUNZA

The grapsid genus *Pachygrapsus* Randall, 1840 (Malacostraca: Decapoda: Grapsidae) includes three species in the Mediterranean Sea: *P. marmoratus* (J.C. Fabricius, 1787), *P. maurus* (H. Lucas, 1846), and *P. transversus* (Gibbes, 1850) (Crocetta *et al.*, 2011; Giacobbe *et al.*, 2018). Although these taxa share syntopically the same rocky habitat from upper subtidal to supratidal, they strongly differ in their distribution. In fact, while *P. marmoratus* is known to be widespread along the entire basin since centuries, *P. maurus* and *P. transversus* showed, until recently, an almost disjoint distribution, as being widely known from the western and eastern coasts, but lacking recent (≤1923) records from its central part (Crocetta *et al.*, 2011; Giacobbe *et al.*, 2018). In fact, both *P. maurus* and *P. transversus* were reported from scattered localities of the central Mediterranean also in the last two decades, although often in small abundance (Vaccaro & Pipitone, 2005; Zaouali *et al.*, 2008; Crocetta *et al.*, 2011; Lipej *et al.*, 2017; Giacobbe *et al.*, 2018), which led Giacobbe *et al.* (2018) to speculate about the present known distribution of the two species in the Mediterranean Sea.

We hereby first report the recent sighting of *P. maurus* in the Capo Caccia-Isola Piana Marine Protected Area (MPA) (Alghero, Sardinia, Italy, north-central Mediterranean Sea; 40.619680°N, 8.143847°E). Crabs were initially identified in August 2021 during the underwater inspection of the intertidal zone for photographic purposes, based on their distinctive colouration, which is different from the one usually observed in *P. marmoratus*. Then 5 random specimens were sampled and identified by counting the teeth on the lateral margin of carapace, in addition to the exorbital tooth, and evaluating the posterior border of the meropodite in the fifth pereiopod (Fig. 5A-B), thus confirming the visual identification, and then immediately released. In the subsequent weeks, field surveys were made during daytime with the help of light torches in different localities of the coastline to verify the wide distribution of the species in the MPA. *Pachygrapsus maurus* was abundant in every suitable habitat along almost all the coasts from Punta Cristallo (40.625892°N, 8.146641°E) to Cala Inferno (40.578493°N, 8.153918°E), although it showed preference for holes and crevices in *Lithophyllum* trottoirs at the base of rocky cliffs (Fig. 5C), even inside semi-submerged caves.

The present record constitutes the first sighting of *P. maurus* in Sardinian waters and accounts for the widest population known so far from the north-central Mediterranean Sea. Nevertheless, we cannot exclude the fact that the species is more widespread on the island, as it may have gone easily overlooked due to its ecological demands and elusiveness, as it tends to immediately hide among calcareous algae when approached. Alternatively, *P. maurus* may have colonized the MPA only recently, as the area of sighting is exposed to the main north-western winds, which bring loads of floating material during storms (e.g., logs, branches, plastic waste). Both hypotheses are in agreement with the suggestions by Crocetta *et al.* (2011) and Giacobbe *et al.* (2018). Further studies, including population genetic studies, are required to shed light on the ecology and origin of the Sardinian specimens.

Fig. 5: *Pachygrapsus maurus* from the Capo Caccia-Isola Piana MPA (Italy). Diagnostic characters of the species: (A) carapace spines; (B) absence of apical spines on the posterior border of the meropodite of the fifth pereiopod. (C) Specimen photographed in a hole of a *Lithophyllum* "trottoir".

1.4 First records of *Malmgrenia polypapillata* (Polychaeta, Polynoidae) and *Levinsenia tribranchiata* (Polychaeta, Paraonidae) in the Tyrrhenian Sea (Italy)

Andrea BONIFAZI and Emanuele MANCINI

To date, seven Polychaeta species of the genus *Levinsenia* Mesnil, 1897 and five of the genus *Malmgrenia* McIntosh, 1874 have been reported from the Italian waters (Castelli *et al*., 2008; Langeneck *et al*., 2019). *Levinsenia tribranchiata* Çinar, Dagli & Acik, 2011 is a small paraonid species mainly characterized by the presence of three pairs of branchiae, strongly curved unidentate modified neurochaetae starting from chaetiger 12-13 and finger shaped notopodial lobes in the postbranchial region (Çinar *et al*., 2011; Erdogan-Dereli & Çinar, 2021) (Fig. 6A-C). *Malmgrenia polypapillata* (Barnich & Fiege, 2001) is mainly characterized by the presence of long notochaetae with entire tips, unidentate neurochaetae, conical supra-acicular process and long papillated elytra (Fig. 6D-F). *Levinsenia tribranchiata* was previously reported from the Sea of Marmara, and the Aegean and Levantine coasts of Turkey, and to date this species has not been reported from other areas of the Mediterranean basin (Çinar *et al*., 2011; 2014a; Erdogan-Dereli & Çinar, 2021). In the Mediterranean Sea, *M. polypapillata* was reported off the coasts of France, in the southern Adriatic Sea (Italian coasts) (Barnich & Fiege, 2001) and Turkey (Çinar *et al*., 2014a). On 25th November 2020, 12 specimens of *M. polypapillata* and 5 specimens of *L. tribranchiata* were collected on soft substrata in the coastal waters off Civitavecchia (Latium, Central Tyrrhenian Sea, Italy). The samples were collected by using an 18 L Van Veen grab. *Levinsenia tribranchiata* was collected on mud at 42 m depth (42.12498°N, 11.71437°E), *Malmgrenia polypapillata* was found on sandy substrata close to a *Posidonia oceanica* meadow at 13 m depth (42.08202°N, 11.79789°E). The morphology of *L. tribranchiata* is close to *Levinsenia flava* (Strelzov, 1973) and *Levinsenia demiri* Çinar, Dagli & Acik, 2011, but differs from these species at some morphological features: the first appearance of the modified neurochetae (on chaetigers 12-13 in *L. tribranchiata* vs. on chaetiger 15 in *L. flava* and on chaetigers 14-15 in *L. demiri*), the shapes and the number of the branchiae (3 pairs in *L. tribranchiata* vs. 3-5 pairs in *L. flava* and 5 pairs in *L. demiri*), and the shape of notopodial lobes (Çinar *et al*., 2011). *Malmgrenia polypapillata* can be clearly distinguished from other *Malmgrenia* species in the Mediterranean Sea by the presence of unidentate chaetae in neuropodia and the densely papillated elytra (Barnich & Fiege, 2001). The present records increase the knowledge on the distribution of these species in the Mediterranean Sea and represent the first report of *L. tribranchiata* in the Italian waters.

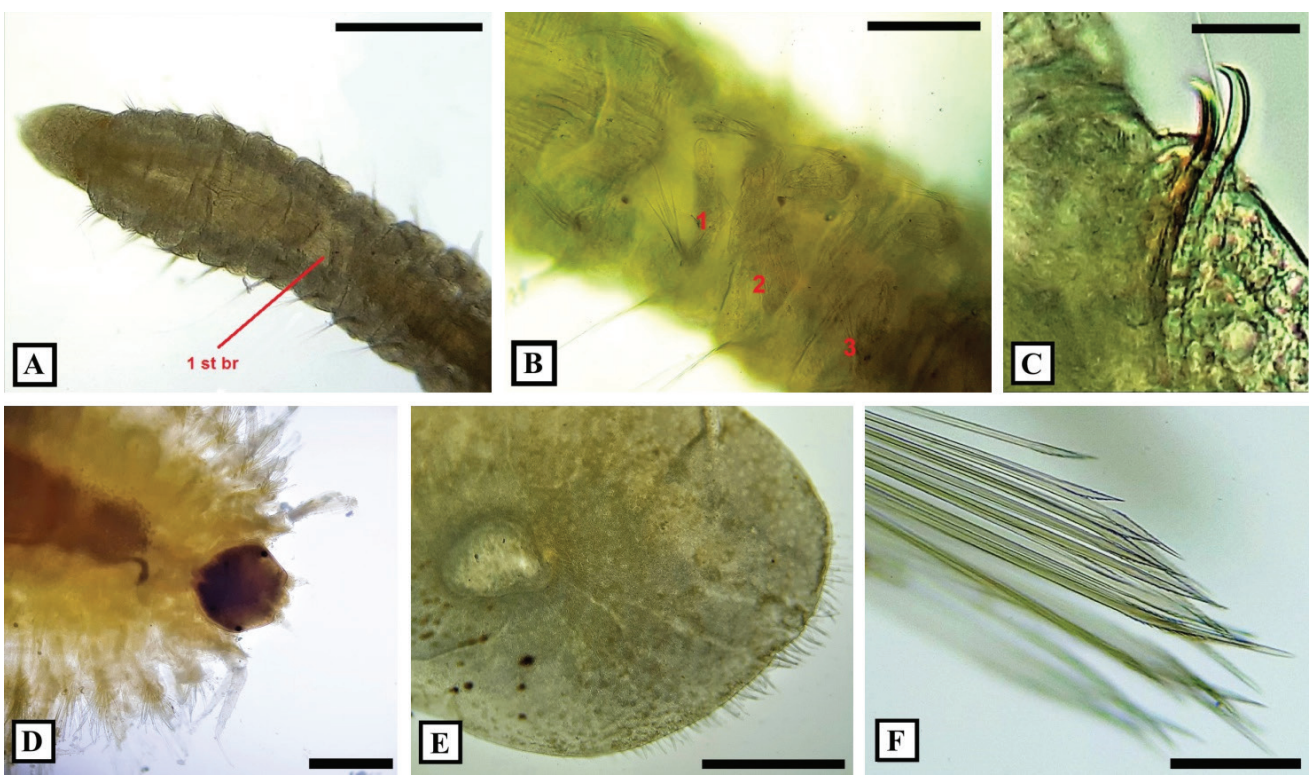

Fig. 6: *Levinsenia tribranchiata*: (A) anterior end, dorsal view; (B) branchiae, three pairs; (C) modified neurochaetae. *Malmgrenia polypapillata*: (D) anterior end, dorsal view; (E) detail of the lateral margin of the elytron; (F) unidentate neurochaetae. Scale bars: 200 µm for A; 100 µm for B and F; 30 µm for C; 500 µm for D and E.

1.5 New record of the deep-sea cephalopod *Ancistrocheirus lesueurii* (d'Orbigny in Férussac & d'Orbigny, 1842) from the southern Tyrrhenian Sea (Italy)

Pietro BATTAGLIA and Maria Giulia STIPA

Ancistrocheirus lesueurii (d'Orbigny in Férussac & d'Orbigny, 1842) is a deep-sea buoyant squid and the only member of the family Ancistrocheridae occurring worldwide in tropical and temperate waters, including the Mediterranean Sea (Jereb & Roper, 2010). However, some authors suggest that more than one species of the genus *Ancistrocheirus* may exist based on marked differences observed in paralarvae from different oceans (Jereb & Roper, 2010). For this reason, it is important to collect more individuals of this rare species to retrieve new morphometric, biological and genetic data. To date, most information comes from studies carried out in Atlantic waters that investigate the age and growth, and the reproductive aspects of the species (e.g., Hoving & Lipinski, 2015). According to this information, *A. lesueurii* exhibits sexual dimorphism with adult females attaining a mantle length up to 3.5 times more compared to adult males. In the Mediterranean, the catch of adult specimens is rarely reported and mainly obtained by bottom trawl, during daylight at 500-580 m depth (D'Onghia *et al*., 1997), but additional information on its occurrence can be obtained by stomach contents of large pelagic predators (Romeo *et al.,* 2012).

Fig. 7: (A) *Ancistrocheirus lesueurii* caught in the southern Tyrrhenian Sea; (B) hooks on the tentacles; (C) hooks on the arms; (D) photophore on the ventral mantle; (E) *Anisakis* spp. larvae found adhered to the external wall of the stomach.

Here we examined a female *Ancistrocheirus lesueurii* (Fig. 7A), caught by a recreational fisher using a hand-jig line, in the southern Tyrrhenian Sea (Gulf of Castellammare; 38.1025°N, 12.8414°E) on 12th September 2021. Similarly to the individual reported by Bello *et al.* (1993), the catch was recorded during night in the water column at about 60 m depth, indicating possible vertical movements of this species. The specimen was frozen at -20°C and later photographed, identified according to the taxonomic features reported by Jereb & Roper (2010) and Vecchione & Young (2016), measured to the nearest 0.1 mm and weighed to the nearest 0.1 gram. Morphometric data are given in Table 3. Its dorsal mantle length and total weight were 295.0 mm and 600.5 g, respectively. The specimen had conical mantle with broad rhomboidal fins, hooks on both manus of tentacles (Fig. 7B) and arms (Fig. 7C), photophores on tentacles, ventral surface of fins, mantle (Fig. 7D), funnel, head and ventral arms, but it was impossible to count them because the skin was quite damaged. The stomach of this individual contained remains of the following prey items: *Pasiphaea sp.*, *Stomias boa* and *Sardina pilchardus*. Moreover, three Anisakis spp. larvae were found adhered to the external wall of the stomach (Fig. 7E). Different stages of maturity were observed in oocytes, but not fully mature ones were present in the ovary, confirming an asynchronous ovulation pattern for the species (Hoving & Lipinski, 2015). These data contribute to improve the current knowledge on this poorly known deep-sea squid.

Table 3. Morphometric data of *Ancistrocheirus lesueurii* caught in the southern Tyrrhenian Sea on 12th September 2021.

Morphometric measurements	mm
Total length with tentacles (TL_1)	1010.0
Total length without tentacles (TL_2)	650.3
Dorsal mantle length (DML)	295.0
Ventral mantle length (VML)	292.2
Mantle width (MW)	80.3
Head length (HL)	120.1
Head width (HW)	81.2
Fin length (FL)	188.3
Fin width (FW)	82.5
Distance between fin tips	206.5
Funnel width (FuW)	31.3
Funnel length (FuL)	54.8
Maximum arm length (AL)	222.0
Tentacle length (TeL)	630.4
Lower rostral length (LRL)	7.1

2. CENTRAL MEDITERRANEAN SEA

2.1 Occurrence of the blue butterfish *Stromateus fiatola* Linnaeus, 1758 in the Gulf of Gabes (South-East Tunisia)

Radhouan EL ZRELLI and Lamia YACOUBI

Among the butterfishes (Stromateidae) occurring in the Mediterranean Sea, the blue butterfish *Stromateus fiatola* Linnaeus, 1758 is considered one of the less common species. Its spatial distribution is limited to the eastern Atlantic coast (mainly in the Bay of Biscay where it is considered rare), the Mediterranean Sea (Haedrich, 1986), and southwards to the Cape of Good Hope (South Africa). It is a benthopelagic species, which lives in depths between 10-70 m and can reach a maximum length of 50 cm (Haedrich, 1986). Blue butterfishes are mainly encountered in continental shelves and feed on a variety of small fishes, zooplankton, and medusae (Haedrich, 1986).

In the Mediterranean Sea, *S. fiatola* was rarely recorded in the Adriatic Sea, in both Croatian and Italian coasts (Tiralongo *et al.*, 2020), as well as in Lebanon (Bariche & Fricke, 2020). To our knowledge, no documented records of the blue butterfish are available from the other Mediterranean regions, in particular from North African coasts. In this paper, we report the first documented record of *S. fiatola* in the Gulf of Gabes (south-eastern Tunisia). On 14th November 2021, two blue butterfish specimens (Fig. 8) were caught by a local fisher from Zarat (33.894072°N, 10.292975°E; central Gulf of Gabes). The two specimens, caught using trammel nets at a depth of 18 m, measured 21.1 and 22.5 cm of total length.

The present observation of *S. fiatola* in Tunisian waters represents the first documented record of the species at country level. According to local old fishermen, *S. fiatola* used to be frequent in the Gulf of Gabes before the 60-70's, but it has not been observed in the region since many decades. Similar to this observation, most of *S. fiatola* records along the Lebanese coasts were made in the 60-70's (Bariche & Fricke, 2020). It is also worth noting that the only old reference having reported the occurrence of this species in the north-western coasts of Africa was made by Le Gall (1993) who also stated its presence in southern Spanish coasts. This proves the rarity of the blue butterfish in the Mediterranean Sea, in particular along the Tunisian coasts.

The occurence of *S. fiatola* in the Gulf of Gabes and its recent repetitive records in the Adriatic Sea may be one of the consequences of climate change and global warming. The increase in the Mediterranean seawater temperature is likely to enhance the appearance of thermophilic species, such as *S. fiatola*, thus leading to significant changes in the structure and composition of the marine biota. The occurence of *S. fiatola* in the Gulf of Gabes indicates that this region is likely to provide trophic resources for this species. In spite of the anthropogenic pressure on the marine ecosystem of the Gulf of Gabes, this region is known to host rich benthic and pelagic biodiversity that may attract the blue butterfish (El Zrelli *et al.*, 2020). Further documented records of the species in the Mediterranean Sea will enable us to better describe its distribution in this region and provide more information about its ecology.

Fig. 8: Two specimens of *Stromateus fiatola* collected from Zarat, in the central area of Gabes Gulf (south-eastern Tunisia).

2.2 Citizen science record of the critically endangered great white shark off Tunisian coast

Jamila RIZGALLA

The great white shark *Carcharodon carcharias* (L., 1758) is reportedly one of the largest marine predators worldwide that reaches a maximum length of at least six meters (Ebert *et al*., 2013). It is a cosmopolitan species that occurs throughout the Mediterranean Sea, although in very low numbers (Soldo *et al.*, 2016). It is most abundant in the western part of this basin, where it is often incidentally caught by commercial and artisanal fisheries (Moro *et al.,* 2019). Regionally, *C. carcharias* is characterised as a critically endangered species (Soldo *et al*., 2016).

On 4th February 2022, a gravid female great white shark (~5 m in total length and ~1000 kg in total weight) (Fig. 9) was incidentally caught off Djerba (Tunisia) (Gulf of Gabes; 33.910889°N, 11.041083°E) at 12-15 m depth. The animal was found dead and entangled in ropes used to fix octopus traps. Both the mother and the eight embryos (~1.2 m each) were sold at the local fish market. Images of the landed animal and the embryos were posted on a social media platform by a citizen, Mr. Cherif Chiheb. The species was verified by examining the photographic material and identifying main morphological features as described in Ebert *et al.* (2013): stout, spindle-shaped body; snout moderately long, bluntly conical; large, erect first dorsal fin with concave posterial margin; small second dorsal fin; lunate caudal fin; large, flat, triangular, serrated teeth; long gill slits; eyes moderately large and black; sharp colour change from greyish dorsally to white ventrally; black axillary marking often present in pectoral fins.

Several potential nurseries for the great white shark have been proposed in the Mediterranean Sea (Moro *et al*., 2019) including the Gulf of Gabes (southern Tunisia, central Mediterranean) (Saïdi *et al.,* 2005). This view is further supported by the present record of a gravid female at the latest stage of gestation in Tunisian waters.

According to the General Fisheries Commission for the Mediterranean Sea (GFCM), the white sharks caught during fishing operations should be immediately released, without inflicting harm. Further, they should not be retained on board, transferred, landed or sold (Recommendation GFCM/42/2018/2). Nevertheless, the great white shark is often incidentally caught by commercial fisheries (Soldo *et al.,* 2016). The white shark recorded herein was landed and sold despite the GFCM recommendation. A wide awareness campaign is highly recommended to further inform fishermen and public towards these regulations to safeguard this iconic shark species in the region.

Fig. 9: Female *Carcharodon carcharias* landed in Djerba (Tunisia) on 4th February 2022: (A) view of whole specimen; (B) view of head focusing on the black eyes and jaws with triangular, serrated teeth; (C) four out of the eight embryos (indicated with white arrows) retrieved from the gravid female. Photo credit: Cherif Chiheb.

3. ADRIATIC SEA

3.1 First record of the sea slug *Diaphorodoris alba* Portmann & Sandmeier, 1960 in Slovenia

Domen TRKOV and Lovrenc LIPEJ

Diaphorodoris alba Portmann & Sandmeier, 1960 is an oval shaped onchidorid sea slug that reaches a total length of about 12 mm (Furfaro *et al.*, 2016). The mantle is white and covered with conical tubercles (papillae). Rhinophores are lamellated, while up to seven gills are branched and arranged in a rosette surrounding the anal papilla. The metapodium is crenulated, it extends beyond the mantle and has a distinct keel. Previously, the species was considered as *D. luteocincta var. alba,* a colour morph of *D. luteocincta*. Recently, Furfaro *et al*. (2016) in a genetic study showed that *D. alba* is a valid species, while *D. luteocincta var. reticulata* is the synonym of *D. luteocincta*. *Diaphorodoris alba* is distinguished by the absence of the reddish colour pattern on the dorsal mantle and by a continuous yellow line on the margin extending below the mantle. The species can also be distinguished based on the morphology of the radula, as *D. alba* has fewer denticles on the first lateral teeth than *D. luteocincta* (Furfaro *et al.*, 2016). Little is known about the ecology of the species. Given that these two species were previously considered as one, published records on the distribution and ecology of *D. alba* often refer to the related species *D. luteocincta*. According to available data, *D. alba* occurs along the Atlantic coast of Europe, from northern to southwestern England and Wales, and in the northwestern Mediterranean (GBIF, 2021). The species is known to occur from the shallow infralittoral to 37 m depth, where it inhabits rocky substrates with sciaphilic algae and turf vegetation (Lombardo & Marletta, 2020; Canessa *et al*., 2021). *Diaphorodoris alba* feeds on highly calcified bryozoans of the genera *Smittina* Norman, 1903, *Cellepora* Linnaeus, 1767, and *Crisia* Lamouroux, 1812 (Furfaro & Mariottini, 2016).

On 12th July 2021, a specimen of *D. alba* (Fig. 10) was collected during the daytime (11:00-12:00) between Fiesa and Pacug (45.526611°N, 13.585472°E) in the Slovenian part of the Gulf of Trieste. The specimen was found at a depth of 9.6 m on a sedimentary bottom consisting of gravel and coarse sand covered with organic detritus. It was located in close proximity to a rocky precoralligenous reefs. The specimen measured 11.3 mm in total length.

This is the first record of *D. alba* in Slovenian waters and the second for the Adriatic Sea, where the species was confirmed only in the western part (GBIF, 2021). It also represents the northernmost record of the species in the entire Mediterranean Sea.

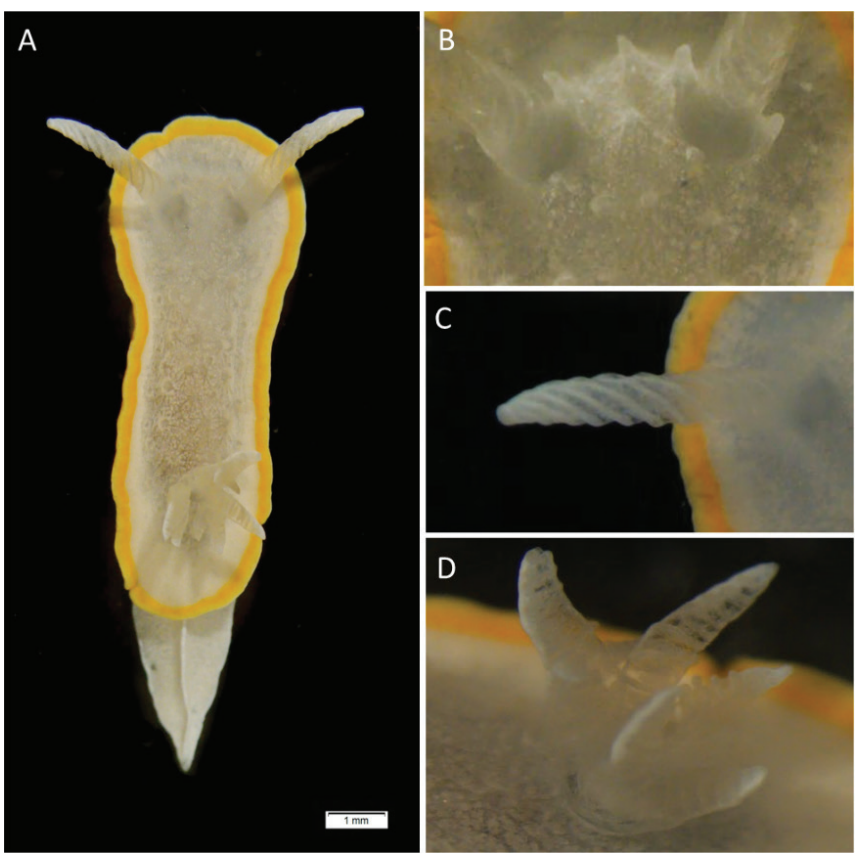

Fig. 10: *Diaphorodoris alba* observed on bottom sediment in Slovenian waters. Characteristics of the species are: (A) white mantle with a continuous yellow line on the margin extending below the mantle; (B) conical tubercles (papillae) on the mantle; (C) lamellate rhinophores; (D) seven branched gills surrounding the anal papilla.

3.2 First confirmed record of *Heptranchias perlo* in Slovenia

Lovrenc LIPEJ and Borut MAVRIČ

The sharpnose sevengill shark, *Heptranchias perlo* (Bonnaterre, 1788) is a medium-sized shark with a wide geographic distribution, inhabiting tropical and temperate seas (Compagno, 1984). It is a bottom-dwelling predator of deep-waters, continental regions, islands and high slopes at depths from 27 to 720 m (Compagno, 1984). One sharponse sevengill shark was caught by trammel net in Slovenian coastal waters 0.5 nmi off Strunjan (Gulf of Trieste, northern Adriatic; 45.54000ºN, 13.60158ºE) (Fig. 11A). It was captured on sedimentary bottom at 20 m depth. The specimen was delivered to the Marine Biology Station of the National Institute of Biology in Piran where it was examined, weighed to the nearest gram and measured to the nearest millimetre.

The specimen was identified as *H. perlo* on the basis of seven pairs of gill slits and a small single dorsal fin (Fig. 11A-B). Other features included slender and fusiform body, long pelvic fins with very long trailing edge, long upper lobe of the caudal fin, first pair of gill slits longer than the others, pointed head, rather large and fluorescent blue eyes, and comb-like teeth in the lower jaw with second cusp distinctly longer than others (Fig. 11C). The specimen measured 728 mm in total length (TL) and weighed 1010 g. It was an immature female, which was evident also from the black tips of the dorsal fin and the upper lobe of the caudal fin, a feature characteristic for immature specimens (Last & Stevens, 2009).

Up to date, only few records of *H. perlo* have been reported in the Adriatic Sea (Lipej *et al.,* 2004). A specimen of about 80 cm TL captured before 1900, is kept in the Trieste Natural History Museum (Lipej *et al.,* 2004). The Venetian Museum of Natural History is housing a female of 135 cm TL caught in 1926 in an unspecified area of the Adriatic and a second specimen of 108 cm TL with unknown sex and capture data (Mizzan*,* 2004). Additional Adriatic records include two specimens caught in the framework of the Hvar expedition in 1948 (Jukić-Peladić *et al.,* 2001), while the most recent record comes from Albanian waters (Bakiu & Soldo, 2021). The present report presents the first record of *H. perlo* in Slovenian territorial waters.

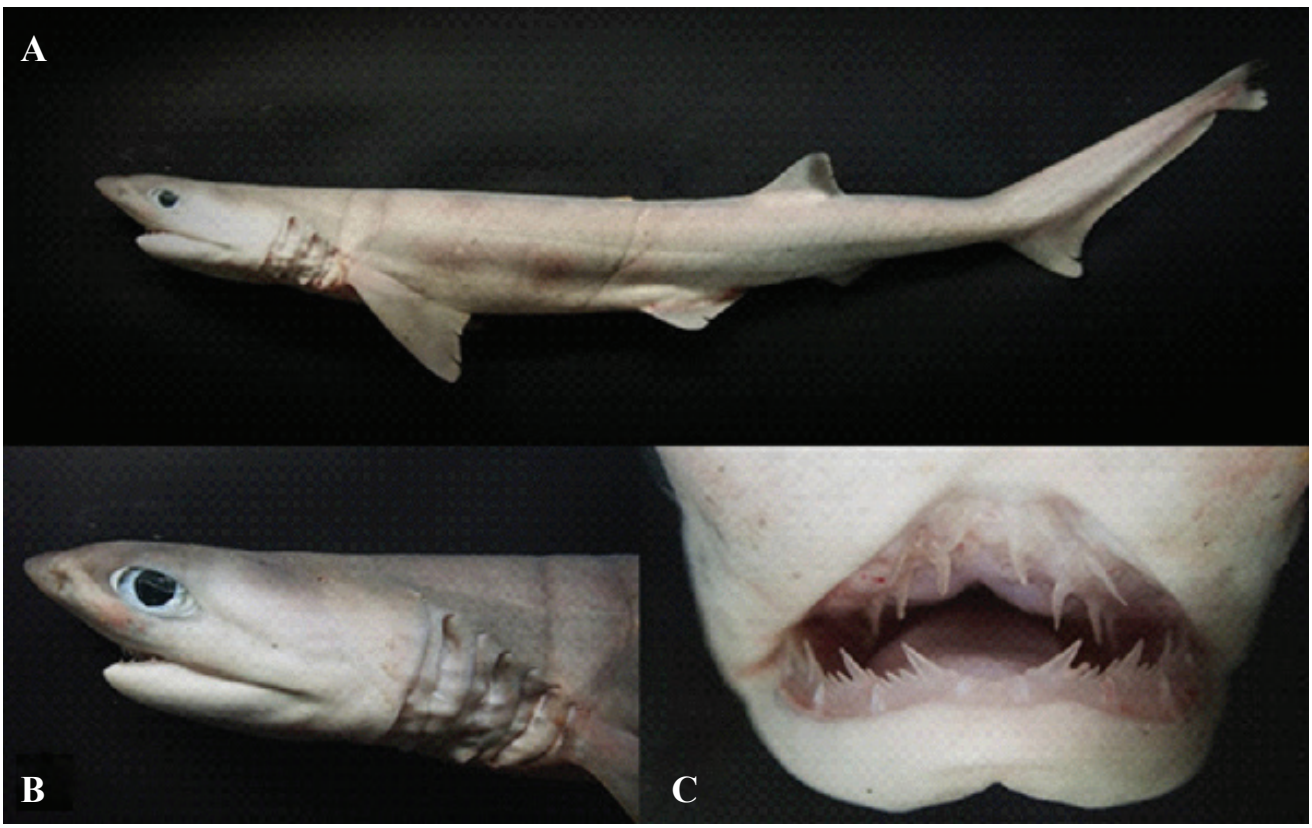

Fig. 11: Immature female *H. perlo* captured off Slovenia on 21st December 2021: (A) whole specimen; (B) side view of head with seven gill slits and large eye; (C) comb-like teeth in upper and lower jaw. Photo credit: B. Mavrič.

3.3 First record of the pignosed arrowtooth eel *Dysomma brevirostre* (Actinopterygii, Anguilliformes, Synaphobranchidae) in the Adriatic Sea

Filippo DOMENICHETTI and Lorenzo ZACCHETTI

The pignosed arrowtooth eel *Dysomma brevirostre* (Facciolà, 1887) belongs to the family Synaphobranchidae (Anguilliformes) consisted of 12 genera and 51 species (Fricke *et al.,* 2022). The species has previously been recorded in the northeastern Atlantic (off Portugal and Madeira Islands), in the southeastern Atlantic (off Cabinda, Congo and Gabon), in the western Atlantic (off Miami), in the central Pacific (off Hawaii) and from the western to the eastern Mediterranean Sea (Sion *et al*., 2008 and references therein).

Herein, we report the first record of *D. brevirostre* in the central Adriatic Sea (Fig. 12A). The specimen was caught on 20th November 2021 in the Pomo Pits area (42.8344° N, 14.7293° E) at 234 m depth, during a yearly experimental survey performed by CNR-IRBIM by using a bottom otter trawl. The specimen was stored on board in a freezer at -20°C until it was morphologically identified according to Smith (2002). Its main characteristics included an elongated body brown in colour with black chromatophores dorsally, a bulbous snout decorated by a number of papillae (Fig. 12B), gill openings ventrally located, no pectoral and ventral fins, and a dorsal fin merged with the anal and caudal. The specimen was female, weighed 27.5 g and measured 250 mm in total length. The head length was 13 mm and the upper jaw length was greater than the lower jaw length (6 and 4.9 mm, respectively). Inside the mouth, two rows of small lateral teeth not projecting outside were observed, while one row of 3 more robust teeth was observed centrally. The specimen was preserved in 4% formalin solution and stored in our collection (CNR-IRBIM Cat. No.: 01 *D. brevirostre* 11/2021).

Dysomma brevirostre shows a wide distribution range, from tropical and subtropical areas to the Mediterranean Sea. The species has been recorded, although sporadically, within the entire Mediterranean Sea (Sion *et al*., 2008), similarly to other anguilliform species (e.g., Kousteni & Christidis, 2019). *D. brevirostre* is characterised by leptocephalic pelagic larvae, whose high dispersal potential has probably contributed greatly to the range expansion of the species (Stefanescu *et al*., 1990). Nevertheless, its presence may be underestimated due to its extremely elongated body that makes it difficult to capture and its low commercial value that makes fishers discard it back into the sea, as also assumed for other eels (Kousteni & Christidis, 2019).

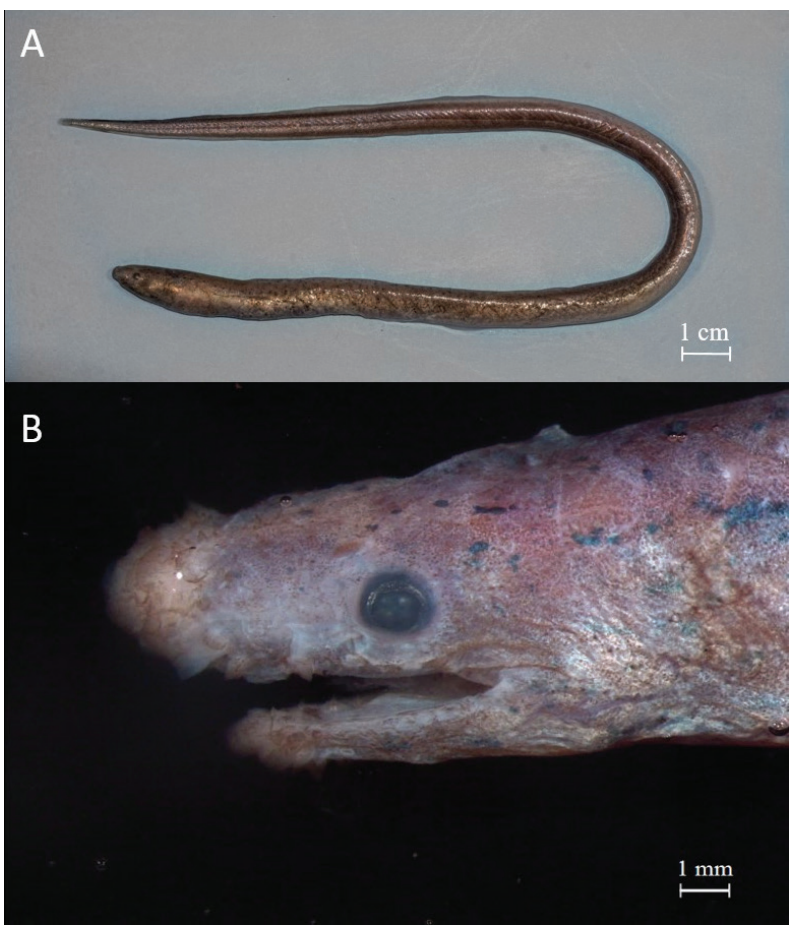

Fig. 12: Specimen of *Dysomma brevirostre* caught in the Pomo Pits area (central Adriatic Sea): (A) whole body; (B) profile view of head. Photo credit: L. Zacchetti.

3.4 New record of the rare tope shark *Galeorhinus galeus* (Linnaeus, 1758) in the southeastern Adriatic Sea (Montenegro)

Ilija ĆETKOVIĆ and Ana PEŠIĆ

The tope shark *Galeorhinus galeus* (Linnaeus, 1758), also known as school shark, is a slender-bodied unspotted houndshark with the following main diagnostic characters: snout long, large mouth and arched with small blade-like teeth, second dorsal fin markedly smaller than first, caudal fin upper lobe extremely long, and caudal fin lower lobe very long at all life stages (Ebert & Dando, 2020). It is a highly migratory species with a world-wide distribution in temperate waters (Compagno *et al*., 2005). Its diet is mainly composed of bony fishes, cephalopods and crustaceans. The tope shark is viviparous, with females usually giving birth to 20-35 pups after a 12-month gestation period. The species reaches a maximum age of 45-60 years (Ebert & Dando, 2020). *G. galeus* is characterized as Critically Endangered (CR) globally based on the International Union for Conservation of Nature (IUCN) Red List (Walker *et al*., 2020). According to Serena *et al*. (2020) the species has become extremely rare across the entire Mediterranean Sea, while its cousins from the genus *Mustelus*, particularly the smooth-hound shark *Mustelus mustelus* (Linnaeus, 1758) and the black-spotted smooth-hound shark *Mustelus punctulatus* Risso, 1827, are abundant in the Adriatic Sea only. The most recent occurrence of *G. galeus* in the Adriatic Sea is reported in its northern part, where an immature female was recorded in October 2020 (Tsagarakis *et al*., 2021).

On 3rd of March 2021, an immature female specimen (Fig. 13) was caught by gillnet targeting smooth-hound sharks near the Bojana River Delta, off the southern Montenegrin coast (coordinates: 41.860067°N, 19.312291°E), at a depth of about 20 m. The area is locally known as a hotspot for smooth-hound sharks and gillnets with large mesh-size are often used targeting these species. The total length of the specimen was 863 mm and its total weight was 2850 g. Detailed morphometric measurements are given in Table 4. The specimen was processed in the Institute of Marine Biology in Kotor, Montenegro, then preserved in 70% ethanol and donated to the University of Montenegro - Faculty of Natural Sciences and Mathematics for student exams, however, without assigning it a catalogue number.

Table 4. Morphometric measurements of *Galeorhinus galeus* recorded near the Bojana River Delta in Montenegro.

Morphometric measurements	mm	%TL
Total length (TL)	863	100
Fork length (FL)	761	88.18
Precaudal-fin length (PCL)	680	78.80
Pre-second dorsal-fin length (PD2)	568	65.82
Pre-first dorsal-fin length (PD1)	271	31.40
Head length (HDL)	193	22.36
Prebranchial length (PG1)	152	17.61
Prespiracular length (PSP)	101	11.70
Preorbital length (POB)	67	7.77
Prepectoral-fin length (PP1)	179	20.74
Prepelvic-fin length (PP2)	444	51.45
Snout-vent length (SVL)	462	53.53
Preanal-fin length (PAL)	572	66.28
Interdorsal space (IDS)	229	26.54
Dorsal caudal-fin space (DCS)	79	9.15
Pectoral-fin pelvic-fin space (PPS)	226	26.19
Pelvic-fin anal-fin space (PAS)	107	12.40
Anal-fin caudal-fin space (ACS)	75	8.69
Pelvic-fin caudal-fin space (PCA)	215	24.91
Vent caudal-fin length (VCL)	289	33.46
Prenarial length (PRN)	47	5.45
Preoral length (POR)	66	7.65
Eye length (EYL)	22	2.55

Continued

Table 4 continued

Morphometric measurements	mm	%TL
Eye height (EYH)	19	2.20
Subocular pocket depth (SOD)	7	0.81
Intergill length (ING)	42	4.87
First gill slit height (GS1)	29	3.36
Second gill slit height (GS2)	29	3.36
Third gill slit height (GS3)	29	3.36
Fourth gill slit height (GS4)	28	3.24
Fifth gill slit height (GS5)	26	3.01
Pectoral-fin length (P1L)	82	9.50
Pectoral-fin anterior margin (P1A)	115	13.33
Pectoral-fin radial length (P1R)	91	10.55
Pectoral-fin base (P1B)	47	5.45
Pectoral-fin inner margin (P1I)	43	4.98
Pectoral-fin posterior margin (P1P)	93	10.78
Pectoral-fin height (P1H)	105	12.17
First dorsal-fin length (D1L)	97	11.24
First dorsal-fin anterior margin (D1A)	76	8.81
First dorsal-fin base (D1B)	70	8.11
First dorsal-fin height (D1H)	57	6.61
First dorsal-fin inner margin (D1I)	29	3.36
First dorsal-fin posterior margin (D1P)	62	7.18
Second dorsal-fin length (D2L)	59	6.84
Second dorsal-fin anterior margin (D2A)	38	4.40
Second dorsal-fin base (D2B)	42	4.87
Second dorsal-fin height (D2H)	29	3.36
Second dorsal-fin inner margin (D2I)	23	2.67
Second dorsal-fin posterior margin (D2P)	35	4.06
Pelvic-fin length (P2L)	61	7.07
Pelvic-fin anterior margin (P2A)	41	4.75
Pelvic-fin base (P2B)	42	4.87
Pelvic-fin height (P2H)	27	3.13
Pelvic-fin inner margin length (P2I)	21	2.43
Pelvic-fin posterior margin length (P2P)	44	5.10
Anal-fin length (ANL)	57	6.61
Anal-fin anterior margin (ANA)	36	4.17
Anal-fin base (ANB)	37	4.29
Anal-fin height (ANH)	23	2.67
Anal-fin inner margin (ANI)	22	2.55
Anal-fin posterior margin (ANP)	30	3.48
Dorsal caudal-fin margin (CDM)	185	21.44
Preventral caudal-fin margin (CPV)	93	10.78
Upper postventral caudal-fin margin (CPU)	55	6.37
Lower postventral caudal-fin margin (CPL)	45	5.21
Caudal-fin fork width (CFW)	52	6.03
Caudal-fin fork length (CFL)	69	8.00

Continued

Table 4 continued

Morphometric measurements	mm	%TL
Subterminal caudal-fin margin (CST)	36	4.17
Subterminal caudal-fin width (CSW)	25	2.90
Terminal caudal-fin margin (CTR)	82	9.50
Terminal caudal-fin lobe (CTL)	85	9.85
Head height (HDH)	66	7.65
Trunk height (TRH)	73	8.46
Abdomen height (ABH)	101	11.70
Tail length (TAH)	69	7.96
Caudal-fin peduncle height (CPH)	31	3.59
Head width (HDW)	103	11.94
Trunk width (TRW)	100	11.59
Abdomen width (ABW)	83	9.62
Tail width (TAW)	63	7.30
Caudal-fin peduncle width (CPW)	22	2.55
Second dorsal-fin insertion anal-fin insertion (DAI)	14	1.62
Second dorsal-fin origin anal-fin origin (DAO)	5	0.58
First dorsal-fin midpoint pectoral-fin insertion (DPI)	98	11.36
First dorsal-fin midpoint pelvic-fin origin (DPO)	122	14.14
Pelvic-fin midpoint first dorsal-fin insertion (PDI)	93	10.78
Pelvic-fin midpoint second dorsal-fin origin (PDO)	120	13.91
Mouth length (MOL)	31	3.59
Mouth width (MOW)	66	7.65
Upper labial-furrow length (ULA)	17	1.97
Lower labial-furrow length (LLA)	11	1.28
Nostril width (NOW)	12	1.39
Internarial space (INW)	32	3.71
Anterior nasal-flap length (ANF)	6	0.70
Interorbital space (INO)	65	7.53
Spiracle length (SPL)	7	0.81
Eye spiracle space (ESL)	11	1.28
Girth (GIR)	270	31.29

Fig. 13: Immature female *Galeorhinus galeus* recorded near the Bojana River Delta in Montenegro.

4. EASTERN MEDITERRANEAN SEA

4.1 First record of the Near Threatened rabbitfish *Chimaera monstrosa* Linnaeus, 1758 (Holocephali: Chimaeriformes) in Lakonikos Gulf, Greece

Vasiliki KOUSTENI and Aikaterini DOGRAMMATZI

The Class Holocephali includes the order Chimaeriformes with about 50 species of chimaeras, also known as ghostfishes or ratfishes, the closest relatives to elasmobranchs (Kousteni *et al*., 2021 and references therein). Probably two species of chimaeras occur in the Mediterranean Sea, the rabbitfish *Chimaera monstrosa* Linnaeus, 1758 and the large-eyed rabbitfish *Hydrolagus mirabilis* (Collett, 1904) (Serena *et al*., 2020), which can be easily distinguished by the presence or absence of the anal fin (Ebert & Dando, 2020). *Chimaera monstrosa* is mostly found along the upper continental slope from 300 to 500 m depth, reaching 1663 m depth also. It mainly feeds on benthic invertebrates and fishes, and like other chimaeras, it reproduces with oviparity with females laying egg-cases of about 170 mm long (Catarino *et al*., 2017 and references therein). According to the IUCN Red List, *C. monstrosa* is considered as Near Threatened in the Mediterranean Sea owing to its intrinsic life-history traits, the increasing deep-sea fishing pressure, and the probable high rate of mortality during discards. Thus, special attention should be given in any historical or future records of this vulnerable species.

On 1st February 2017, a female rabbitfish was caught incidentally by commercial longliner in central Lakonikos Gulf, southeastern Peloponnese, at 512 m depth (Fig. 14). The geographical position of the capture was: 36.7261°N, 22.6901°E. The specimen weighed 1060 g and reached 782 mm in total length. The main diagnostic features of the species were recognized and included: head large and stout; slender-body strongly mottled with distinct longitudinal stripes extending onto fins; eyes large with silvery iris; first dorsal fin high and triangular; first dorsal fin spine longer than fin height; second dorsal fin margin long and relatively straight; anal fin short and low, well separated from the caudal fin; very long whip-like tail (Ebert & Dando, 2020). In Hellenic waters, *C. monstrosa* has been recorded since 1881 with sporadic records in the Aegean and Ionian seas (Papaconstantinou, 2014 and references therein). To the best of our knowledge this is the first record of *C. monstrosa* in Lakonikos Gulf, Greece.

Fig. 14: Female *Chimaera monstrosa* caught incidentally by longliner in Lakonikos Gulf (southeastern Peloponnese).

4.2 Occurrence of *Tetronarce nobiliana* (Bonaparte, 1835) (Elasmobranchii, Torpedinidae) in the waters off Crete, Mediterranean Sea

Bruno ZAVA and Maria CORSINI-FOKA

The electric ray *Tetronarce nobiliana* (Bonaparte, 1835), also known as great torpedo ray, is a circumglobal species that occurs in the entire Mediterranean Sea, with a wide bathymetric distribution from shallow waters to at least 925 m depth (de Carvalho *et al*., 2016). This piscivorous chondrichthyan has a low or null commercial value. It is captured as by-catch and usually discarded back into the sea (de Carvalho *et al*., 2016; Mulas *et al*., 2021). It is mainly caught by bottom trawlers and purse seiners (Carpentieri *et al*., 2021 and references therein).

On 1st September 2021 an individual *T. nobiliana* was caught by a commercial bottom trawler about 13 nm off Chania, northwestern Crete (Greece) (GFCM: GSA 23) (35.74225°N, 23.96746°E) at 700-750 m depth. The specimen was female with total length (TL) 93.2 cm, disc length 52.5 cm, disc width 63.1 cm (67.7% TL) and total weight 17.8 kg. The margins of spiracles were smooth and the colour was uniformly black-violet dorsally and whitish ventrally (Fig. 15). The values of total length and weight approached the maximum values reported for females collected in Sardinian waters (Mulas *et al*., 2021). The specimen is deposited in the Museo Civico di Storia Naturale di Comiso (Ragusa, Italy) with the catalogue number MSNC 4856.

The great torpedo ray is considered rare in the Mediterranean basin (Serena *et al*., 2020; Mulas *et al*., 2021). Already known from the Hellenic waters, through scattered records or catches (Papaconstantinou, 2014 and references therein), the present note contributes to current knowledge about the distribution of *T. nobiliana* in the south Aegean waters of Greece. As mentioned above, when caught, electric rays are usually discarded at sea, resulting in very little data on catches of this species, thus its populations may be more abundant than expected.

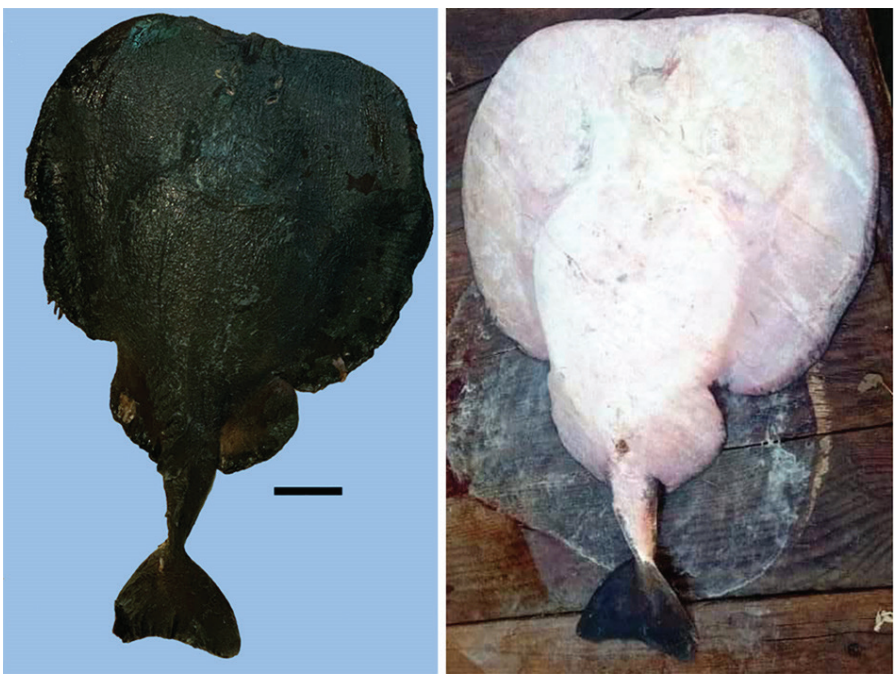

Fig. 15: Dorsal and ventral view of a female *Tetronarce nobiliana* caught off northwestern Crete (Greece), eastern Mediterranean. Scale bar: 10 cm. Photo credit: R. Figuccia.

4.3 First record of *Discodoris rosi* Ortea, 1979 from the Greek territorial waters

Dimitris POURSANIDIS and Giovanni CHIMIENTI

The orange doris *Discodoris rosi* Ortea, 1979 is a nudibranch species reported in the western Mediterranean Sea and in some areas of the eastern Atlantic (Rudman, 2002; Ortea *et al*., 2014; Ballesteros *et al*., 2021; MolluscaBase, 2021). This discodoridid is usually found on coastal areas up to about 15 m depth, under stones or among algae, as well as feeding on the sponge *Clathria* (*Microciona*) *gradalis* Topsent, 1925 (Ballesteros *et al*., 2021). Morphological elements for the identification of the species include the thin white lines marking circular, oval or elongated areas along with the small caryophyllic tubercules that are well spaced and with slightly protruding spicules. The white lines might be more or less apparent or they can define darker areas in the bright coloured body. In June 2021, in the frame of the project "Coral Gardens of Spodares Archipelagos", one specimen of *D. rosi* was observed at 7 m depth off Alonissos Island (National Marine Park of Alonissos and Northern Sporades,

Aegean Sea; 39.135089°N, 23.985917°E), on a seabed characterized by photophilic algae and massive sponges. Underwater, *in-vivo* photographs of the specimen were taken in its natural habitat as well as using a white background. Then the specimen was collected, preserved in 96% ethanol and deposited in the collection of the Natural History Museum of Crete (voucher code: NHMC52.12).

The macroscopic characters of the specimen (Fig. 16) supported the specific attribution according to Ortea (1979), without the need of dissection or further analysis. To our knowledge, this constitutes the first published record of *D. rosi* from the eastern Mediterranean Sea, the closest report being from the Adriatic Sea (Ballesteros *et al*., 2021 and references therein). It also represents the first record from Greece and the easternmost finding of this species.

One Aegean record of the species is reported on the iNaturalist platform, i.e., an online network that provides access to citizen-science observations of animal and plant species. Although the main macroscopic characters are not all clearly visible (https://www.inaturalist.org/observations/30777173), this observation seems to support the presence of the species in the Aegean Sea and more records are expected in the near future.

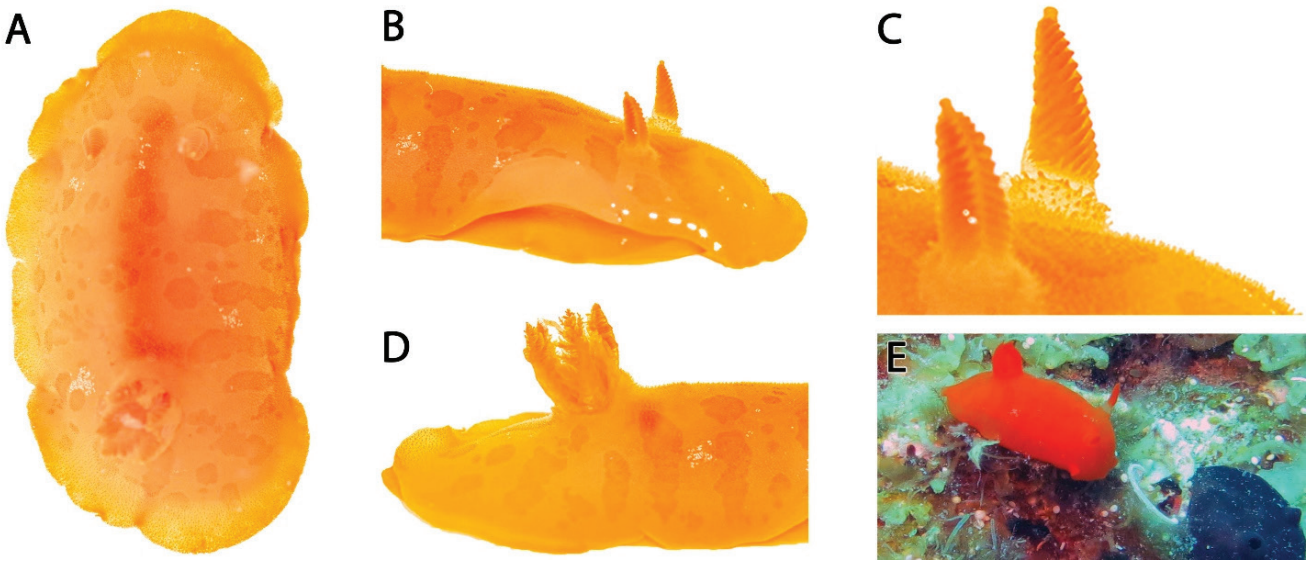

Fig. 16: *Discodoris rosi* observed off Alonnisos Island (Aegean Sea): (A) dorsal view; (B) lateral view with details of the white areas; (C) detail of the rhinophores and the tubercules; (D) posterior, lateral view of the body, with gills; (E) specimen on photophilous algae.

4.4 First record of the goblin shark *Mitsukurina owstoni* Jordan, 1898 (Lamniformes: Mitsukurinidae) in the Mediterranean Sea

Athanasios ANASTASIADIS, Evangelos PAPADIMITRIOU and Frithjof C. KÜPPER

Note: This contribution was retracted by the authors following a comment (DOI: https://doi.org/10.12681/mms.31742) and a reply to the comment, which was also retracted. For more information see retraction note: DOI: https://doi.org/10.12681/mms.34033

4.5 First record of *Hormiphora plumosa* (Ctenophora: Pleurobrachiidae) from the Turkish coast of the Mediterranean Sea

Erhan MUTLU and Yaşar ÖZVAROL

Up to now, no member of the order Cydippida (Ctenophora) has been reported from the Turkish coast of the Mediterranean Sea, although a species from this order, *Pleurobrachia pileus* (O. F. Müller, 1776), is common in northern Turkish waters (Çinar *et al*., 2014b). A specimen of the order Cydippida was captured during SCUBA diving at a depth of 1 m in Fethiye Bay (36.59002°N, 29.02471°E), on 18th January 2019, during a winter

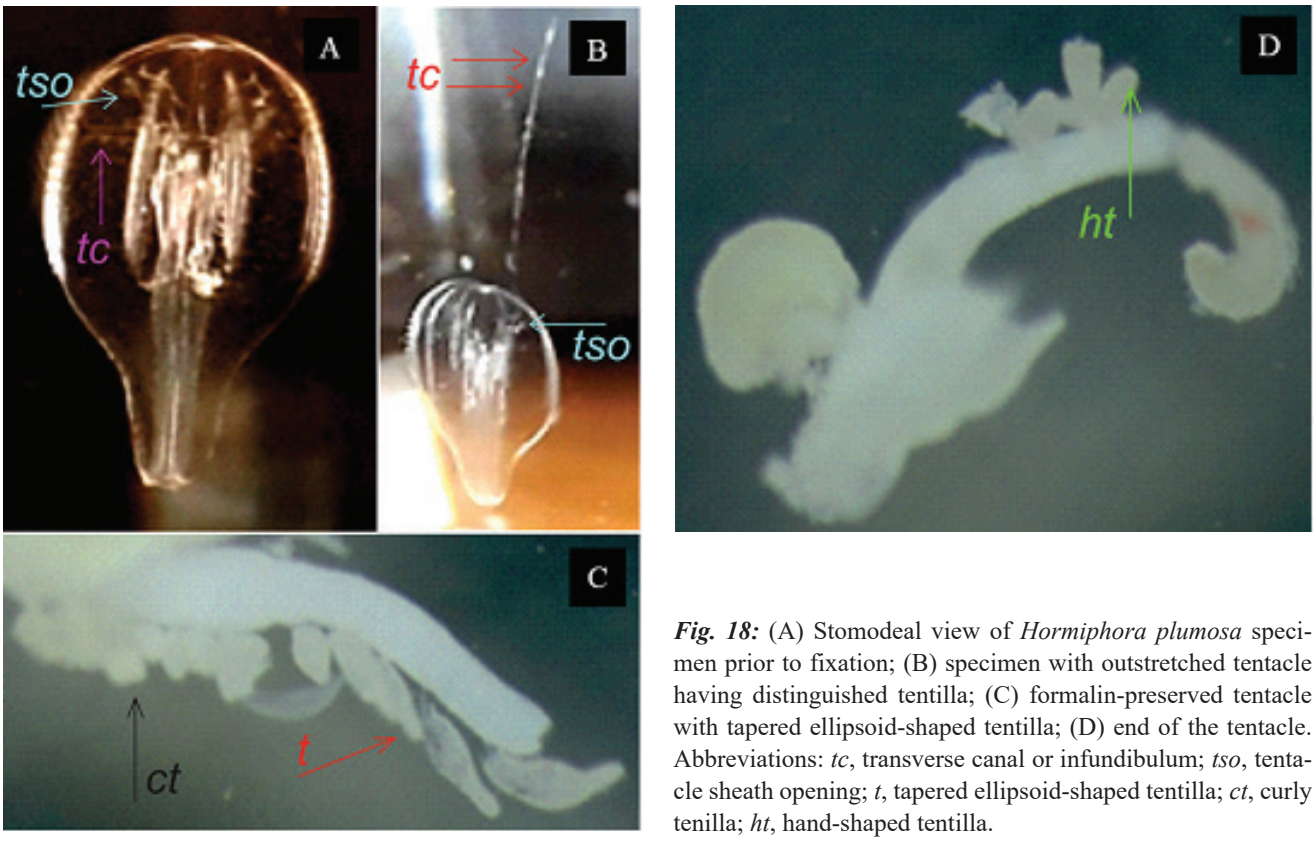

Fig. 18: (A) Stomodeal view of *Hormiphora plumosa* specimen prior to fixation; (B) specimen with outstretched tentacle having distinguished tentilla; (C) formalin-preserved tentacle with tapered ellipsoid-shaped tentilla; (D) end of the tentacle. Abbreviations: *tc*, transverse canal or infundibulum; *tso*, tentacle sheath opening; *t*, tapered ellipsoid-shaped tentilla; *ct*, curly tenilla; *ht*, hand-shaped tentilla.

cruise of a research project. Sea surface temperature was 17.1°C, salinity measured 38.8 psu and dissolved oxygen concentration was 9.56 mg/L. Previous Mediterranean occurrences of *Hormiphora plumosa* were reported from the Tyrrhenian Sea (Madin, 1991) and recently from the southern Adriatic Sea (Batistić *et al*., 2007). The specimen was identified as *Hormiphora plumosa* M. Sars, 1859 based on Mayer (1912) and Madin (1991). The specimen had a pear or bulb-shaped body, 0.5 cm wide (Fig. 18A). The outstretched tentacle was three times longer than body width (Fig. 18B). Diagnosis: similar sensory tracts from sense organ to rows of combs as descriptively drawn by Mayer (1912), transverse canal or infundibulum (*tc*) perpendicular to body, tentacle sheath opening (*tso*) located close to aboral pole (Fig. 18A-B), tentacle base extending to gastrovascular cavity, tentacle having ciliate suchlike tentilla and tapered ellipsoid-shaped tentilla (*t*), with simple and hand-shaped tentilla (*ht*) at some intervals (Fig. 18C), meridonial canal extending to middle of pharynx, tip of tentacle having furcated hand-shaped (*ht*) and curly (*ct*) tenilla (Fig. 18C-D). All diagnostic features differed from those of *Pleurobrachia pileus*, which has an oval body with tentacle without hand-shaped tentilla (Madin, 1991).

In the Mediterranean Sea, one branch of the Atlantic current (Atlantic-Ionian Stream) enters the eastern basin via the Mid-Ionian Jet, linked with the southern Adriatic current (Poulain *et al.*, 2013). Therefore, it is possible that *H. plumosa* could have entered eastern Mediterranean by the Atlantic currents through western Mediterranean.

4.6 First record of *Munida speciosa* von Martens, 1878 from the Levant Basin

Canan TÜRELİ and Sinan MAVRUK

Munida speciosa von Martens, 1878 is an anomuran decapod of the family Munididae Ahyong, Baba, Macpherson & Poore, 2010, widely distributed in the eastern part of south and central Atlantic and in the Mediterranean Sea (WoRMS, 2022). Within the Mediterranean Sea, the species is known from the western basin as well as the Adriatic and Aegean seas in the central-eastern part (Bakır *et al*., 2014; Rodríguez-Flores *et al*., 2019), whereas there is no record from the entire Levant Basin. On 5th September 2021, 10 specimens of *M. speciosa* were caught by a bottom trawler at about 150 m depth off Taşucu (Mersin, Turkey), approximately at the following coordinates: 36.15°N, 33.88°E (Fig. 19). The species identification of the samples was performed based on three specimens with the following morphological characteristics: the total carapace length (TCL) of one female and two males were 14.14 mm, 18.35 mm, 15.40 mm, respectively; colour of the body and appendages orange to red; distal margin of the last two abdominal segments greyish; postero-lateral thoracic sternites without granules; transverse ciliated lines on the carapace highly developed; absence of spines on cardiac or protogastic regions of the carapace; anterior branchial region with 1-2 spines on both sides; eyes large; cornea dilated; P1 fingers as long as or slightly longer than palm; inner margin of the first legs with white spines; antennal article 1 mesially expanded to epistomic ridge; first part of antennule with 2 developed spines; distomesial spine clearly distinctly, longer than distolateral, and two lateral spines, distal longer than proximal; length of abdominal somites at least with spines along anterior ridge of somites 2 and 3 (rarely absent on somite 3) (Fransen, 2014; Rodríguez-Flores *et al.*, 2019). The specimens were kept in 10% buffered formalin and borax solution in the collection of Fisheries Faculty of Çukurova University with the following collection codes: CUMS001-21, CUMS002-21 and CUMS003-21. Although multiple specimens were caught in the Levant Basin, there is not enough evidence to support a self-sustaining population in the area, since all the specimens were obtained in a single trawling. Therefore, the possible establishment of *M. speciosa* in the Levant Basin should be investigated in future studies.

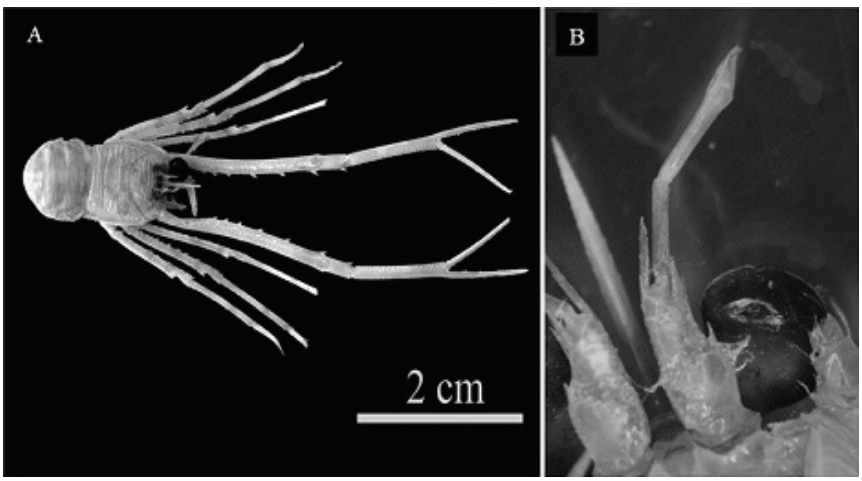

Fig. 19: (A) *Munida speciosa* specimen from Taşucu, Turkey; (B) ventral view of cephalic region. Photographs were taken from 10% formalin fixed specimens.

4.7 First record of *Scyllaea pelagica* Linnaeus, 1758 (Nudibranchia, Scyllaeidae) from Cyprus

Thodoros E. KAMPOURIS and Costas CONSTANTINOU

The family Scyllaeidae Alder & Hancock, 1855 accounts for a single species in the Atlantic Ocean-Mediterranean Sea, namely *Scyllaea pelagica* Linnaeus, 1758 (Pola *et al.*, 2012). In the Mediterranean Sea, this taxon is generally considered as a rare species and is only known by few scattered records (e.g., Poursanidis *et al.*, 2009; Zenetos *et al.*, 2016).

During recreational SCUBA diving activities held between 25th and 26th August 2021, seven individuals of *S. pelagica* were observed and photographed from 5 to 7 m depth at the newly established Museum of Underwater Sculpture Ayia Napa (MUSAN, http://www.musan.com.cy/en/home), at Pernera Beach, Cyprus (34.98361111°N, 33.98333333°E, approximately) (Fig. 20A-B). All specimens were found crawling over the stainless-steel surfaces of the sculptures installed underwater (Fig. 20C), in agreement with the typical behaviour of the species, which is usually living on floating objects. Most of the sculptures were covered with thin algal layers.

The current study reports the first record of *S. pelagica* from Cyprus. However, such a record is not at all unexpected, as the molluscan diversity in the Levantine Sea is generally underestimated, and this also holds true for Cypriot waters (Crocetta *et al.*, 2013; Kleitou *et al.*, 2019). Further studies are therefore still necessary to increase the knowledge of the local marine biota to a level comparable to other areas of the Mediterranean Sea.

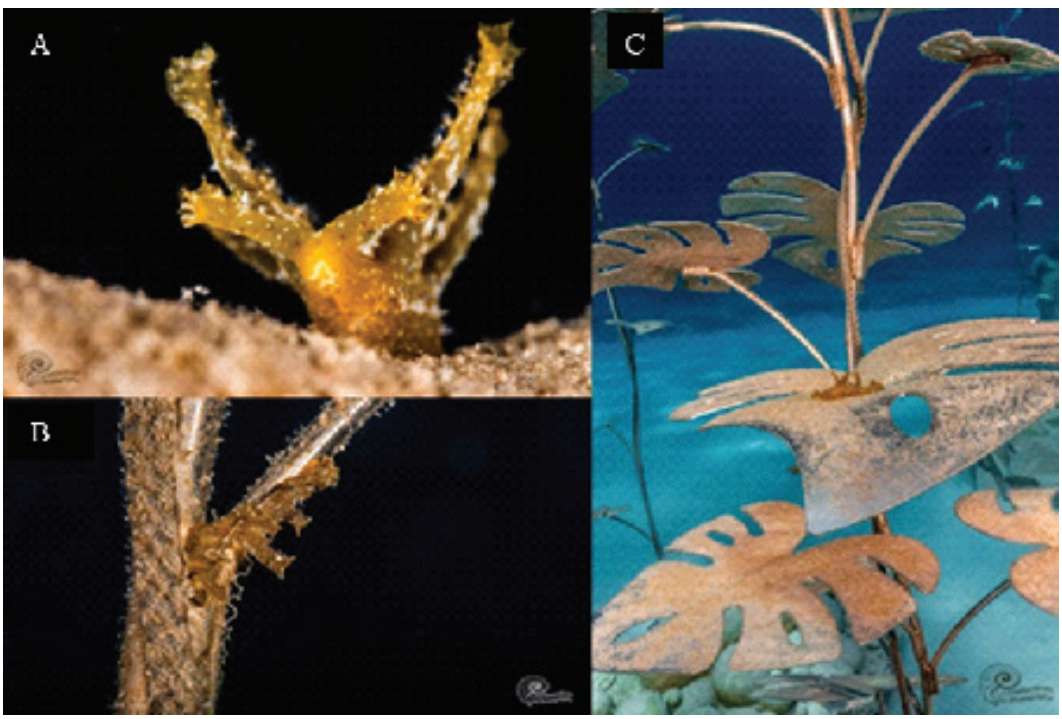

Fig. 20: (A, B) Two out of the seven individuals of *S. pelagica* from MUSAN, Cyprus; (C) the leaf like stainless-steel surfaces of the sculpture, where all individuals were observed and photographed, MUSAN, Cyprus.

4.8 Unexpected killer whales in the eastern Mediterranean Sea

Ziad SAMAHA and Michel BARICHE

A killer whale *Orcinus orca* (Linnaeus, 1758) was seen alive off the coast of Lebanon (Fig. 21A-C). The orca was first sighted on 3rd February 2020 in Cypriot waters and few hours later off Beirut (33.80°N, 35.40°E). Sightings of one individual orca occurred a dozen of times for about 17 days in the vicinity of Beirut, sometimes very close (< 300 m) to the shore. It was assumed that the same individual was seen on and off, and low-resolution pictures and videos of this event were shared extensively in the social media. Few high-quality images allowed the recognition of a male, known as Riptide (SN113), member of a small pod of four individuals known from around the Snaefellsnes Peninsula, West Iceland (orcaguardians.org). Furthermore, on 10th February 2020, a decaying orca was observed in Sarafand, south of Beirut (33.45°N, 35.27°E). The carcass was in an advanced stage of putrefaction and was lacking the dorsal fin and flukes (Fig. 21D). Its accurate identification was not possible but experts excluded SN113, because of a different eye patch (orcaguardians.org). DNA extraction failed and a sample tissue was kept at the American University of Beirut (AUBM-OT0041).

Orcas sometimes venture in the north-western Med-

iterranean, between Gibraltar and the Ionian Sea (Notarbartolo di Sciara, 2002). None of the eastern Mediterranean countries has a substantiated record of any individual (e.g., Farrag *et al*., 2019). The Icelandic pod was first spotted, with an additional calf, in Italy (Genoa) in December 2019 and, afterwards, one individual had supposedly reached Beirut on 3rd February 2020. The carcass found on 10th February 2020 did not belong to Riptide (SN113) and new videos of a living individual, appeared the following week (19-20th February), despite the bad sea conditions that prevailed in February. This information leads to the conclusion that the multiple sightings of orcas for over two weeks off the Lebanese coast included more than one individual, which means that, at least 2-3 individuals from the pod had probably reached separately the coast and then vanished in the area.

Magnetoreception is considered to play an important role in marine mammals' movements (e.g., Walker *et al*., 1992; Kremers *et al*., 2016) and anomalies in coastal geomagnetic fields were also correlated with stranding locations (Klinowska, 1985). One possible explanation of their presence in Lebanese waters is that the pod of orcas may have been disoriented by some unknown factor(s) while looking for the way out of the Mediterranean Sea. This disorientation made the orcas head in the opposite direction, towards the east. Beirut corresponds to almost the same latitude as the Strait of Gibraltar (33.88°N vs 35.97°N), with only 200 km difference towards the south. What made the pod stay for two full weeks wandering in the same area, between Beirut and Sarafand, instead of moving towards other countries in the Levant remains unknown. Is it a coincidence that they were on the exact opposite side of the Mediterranean? Were they searching for the gate to the Atlantic Ocean?

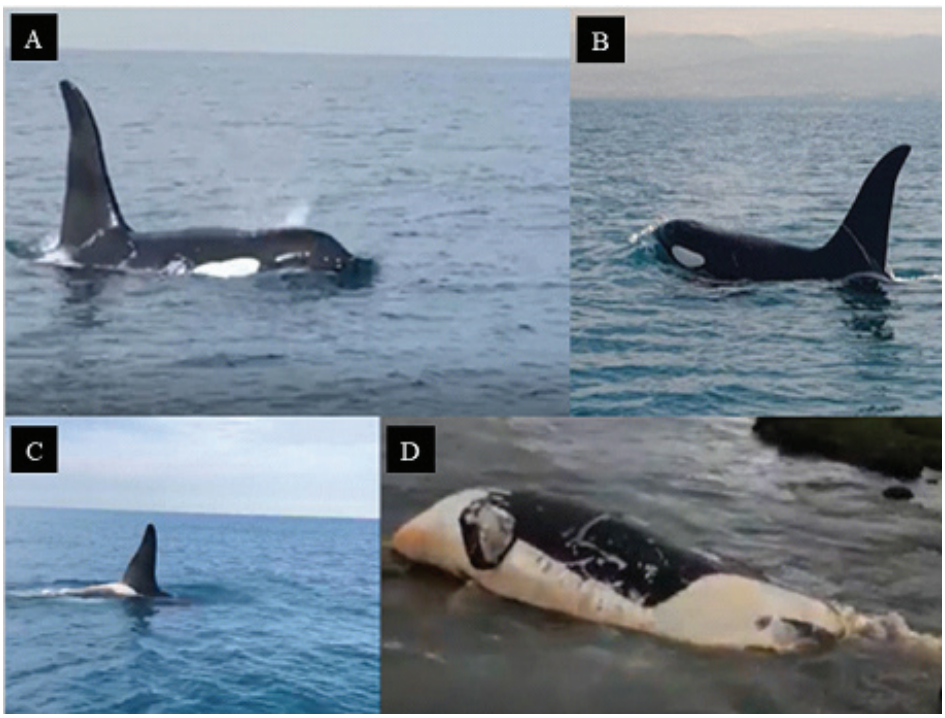

Fig. 21: Selected photographs of killer whales *Orcinus orca* recorded off Beirut: (A-C) individuals sighted in February 2020; (D) carcass sighted on 10th February 2020.

4.9 First record of the Mediterranean tripodfish *Bathypterois mediterraneus* Bauchot, 1962 from the northern Levantine Sea

Cem DALYAN and Nur Bikem KESICI

The genus *Bathypterois* Günther, 1878 comprises benthic species adapted to live in the deep-sea ecosystem and are circumglobally distributed in temperate and tropical seas. From the depth of 250 m down to 6000 m, *Bathypterois* spp. form an important component of the benthic ichthyofauna (Sulak, 1977). The Mediterranean tripodfish, *Bathypterois mediterraneus* Bauchot, 1962 is a bathydemersal species, endemic to the Mediterranean (Quignard & Tomasini, 2000), and it is distributed both in the western and the eastern basin (Porcu *et al*., 2010). The reproductive biology of the Mediterranean tripodfish has been an object of interest, with the simultaneous hermaphroditic gonad and reproductive cycle well demonstrated by Fishelson & Galil (2001) and Porcu *et al*. (2010).

Three specimens of *B. mediterraneus* were caught during trawling surveys conducted in the Iskenderun Bay in 2010. The first sampling was conducted on 6th February 2010 (35.9616°N, 35.6433°E; 35.9766°N, 35.5°E) at a distance of approximately 16-22 nmi from the coast, between 695-732 m depth. Two specimens of *B. mediterraneus* were collected during this trawl route. One additional specimen of *B. mediterraneus* was collected in a trawl conducted on 25th May 2010 (35.9533°N, 35.5916°E; 35.9766°N, 35.5016°E), at a distance of ap-

Table 5. Morphometric measurements (in cm) and meristic characteristics of *B. mediterraneus* (*elongated fin ray).

Morphometric measurements	Specimen 1	Specimen 2	Specimen 3
Total length	11.9	13.0	13.1
Standard length	9.5	10.5	10.7
Head length	2.3	2.5	2.5
Eye diameter	0.1	0.1	0.1
Pre-anal length	6.0	6.5	7.0
Pectoral fin length	7.0	9.5	8.5
Pelvic fin length	2.4	2.8	3.1
Maximum body height	1.5	1.6	1.7
Head height	1.0	1.1	1.0
Meristic characters			
Dorsal fin rays	15	15	15
Anal fin rays	8	9	9
Pectoral fin rays	1* + 9	1* + 9	1* + 9
Pelvic fin rays	8	8	8
Scales in lateral line	55	56	56

proximately 19.5-22 nmi from the coast, between 768-777 m depth (Fig. 22). All samples were stored in the Istanbul University Science Faculty, Hydrobiology Museum (IUSHM 2021-1466 and 2021-1467). All specimens had the following characters which are in accordance with Sulak (1977): elongated and sub-cylindrical body, small head, jaws extending back far behind vertical of eye, snout depressed, eyes small, adipose fin present midway between dorsal and caudal fins. Caudal fin and paired fins with elongate specialized rays are indicative of the genus *Bathypterois*. Moreover, *B. mediterraneus* is identified by the presence of subcaudal notch and eight rayed pelvic fins (Table 5).

Herein, we report the second record of *B. mediterraneus* in Turkish waters after Kaya (1993), and the first record from the northern Levantine Sea. Contributions to the list of deep-sea species are considered valuable. Such contributions help us understand the biological structure of the deep-sea environment and assess possible threats to the ecosystem.

Fig. 22: One of the obtained specimens of *B. mediterraneus* (TL = 13.1 mm) from the northern Levantine Sea.

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