

Mediterranean Marine Science

Vol 23, No 3 (2022)

VOL 23, No 3 (2022)



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

VASILIKI KOUSTENI, ATHANASIOS ANASTASIADIS*, MICHEL BARICHE, PIETRO BATTAGLIA, ANDREA BONIFAZI, ILIJA ČETKOVIĆ, GIOVANNI CHIMIENTI, MARCO COLOMBO, COSTAS CONSTANTINOU, MARIA CORSINI-FOKA, CEM DALYAN, AIKATERINI DOGRAMMATZI, FILIPPO DOMENICHETTI, RADHOUAN EL ZRELLI, ALFREDO FERNÁNDEZ-ALÍAS, THODOROS E. KAMPOURIS, NUR BBIKEM KESICI, FRITHJOF C. KÜPPER*, LOVRENC LIPEJ, EMANUELE MANCINI, BRUNO MANUNZA, CONCEPCION MARCOS, BORUT MAVRIČ, SINAN MAVRUK, ERHAN MUTLU, YAŞAR ÖZVAROL, EVANGELOS PAPADIMITRIOU*, ANA PEŠIĆ, ANGEL PÉREZ-RUZAFA, ALEXIS PEY, DIMITRIS POURSANIDIS, JAMILA RIZGALLA, ZIAD SAMAHA, MARIA GIULIA STIPA, DOMEN TRKOV, CANAN TÜRELİ, PATRÍCIA VENTURA, LAMIA YACOUBI, LORENZO ZACCHETTI, BRUNO ZAVA

doi: [10.12681/mms.28372](https://doi.org/10.12681/mms.28372)

To cite this article:

KOUSTENI, V., ANASTASIADIS, A., BARICHE, M., BATTAGLIA, P. ., BONIFAZI, A. ., ČETKOVIĆ, I. ., CHIMIENTI, G. ., COLOMBO, M. ., CONSTANTINOU, C. ., MARIA, DALYAN, C. ., DOGRAMMATZI, A., DOMENICHETTI, F., EL ZRELLI, R., FERNÁNDEZ-ALÍAS, A., E. KAMPOURIS, T., KESICI, N. B., C. KÜPPER, F., LIPEJ, L., MANCINI, E.,

MANUNZA, B., MARCOS, C. ., MAVRIČ, B., MAVRUK, S., MUTLU, E. ., ÖZVAROL, Y. ., PAPADIMITRIOU, E., PEŠIĆ, A., PÉREZ-RUZAFÁ, A., PEY, A., POURSANIDIS, D., RIZGALLA, . J., SAMAHA, Z., STIPA, M. G., TRKOV, D., TÜRELİ, C., VENTURA, P., YACOUBI, L., ZACCHETTI, L., & ZAVA, B. . (2022). New records of rare species in the Mediterranean Sea (May 2022). *Mediterranean Marine Science*, 23(3), 417–446. <https://doi.org/10.12681/mms.28372>

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

**Vasiliki KOUSTENI^{1,2}, Athanasios ANASTASIADIS^{*3}, Michel BARICHE⁴, Pietro BATTAGLIA⁵,
Andrea BONIFAZI⁶, Ilija ĆETKOVIĆ⁷, Giovanni CHIMIENTI^{8,9}, Marco COLOMBO¹⁰,
Costas CONSTANTINOU¹¹, Maria CORSINI-FOKA¹², Cem DALYAN¹³, Aikaterini DOGRAMMATZI²,
Filippo DOMENICHETTI¹⁴, Radhouan EL ZRELLI¹⁵, Alfredo FERNÁNDEZ-ALÍAS¹⁶,
Thodoros E. KAMPOURIS¹⁷, Nur Bikem KESICI¹³, Frithjof C. KÜPPER^{*18,19}, Lovrenc LIPEJ²⁰,
Emanuele MANCINI²¹, Bruno MANUNZA¹⁰, Concepción MARCOS¹⁶, Borut MAVRIČ²⁰, Sinan MAVRUK²²,
Erhan MUTLU²³, Yaşar ÖZVAROL²⁴, Evangelos PAPADIMITRIOU^{*17,18}, Ana PEŠIĆ⁷, Angel PÉREZ-RUZAFÁ¹⁶,
Alexis PEY²⁵, Dimitris POURSANIDIS²⁶, Jamila RIZGALLA²⁷, Ziad SAMAHA²⁸, Maria Giulia STIPA⁵,
Domen TRKOV²⁰, Canan TÜRELİ²², Patrícia VENTURA²⁵, Lamia YACOUBI²⁹, Lorenzo ZACCHETTI¹⁴
and Bruno ZAVA^{30,31}**

¹ Fisheries Research Institute, Hellenic Agricultural Organization Dimitra, 64007 Nea Peramos, Kavala, Greece

² Institute of Marine Biological Resources and Inland Waters,

Hellenic Centre for Marine Research, Vouliagmenis ave. 576, Argiroupoli, Greece

³ Department of Animal Production, Fisheries and Aquaculture, University of Patras, 30200 Messolonghi, Greece

⁴ Department of Biology, Faculty of Arts and Sciences, American University of Beirut, PO Box 11-0236 Beirut, Lebanon

⁵ Stazione Zoologica Anton Dohrn, Department of Integrated Marine Ecology, Sicily Marine Centre,
c/o Villa Pace, Contrada Porticattello 29, 98167 Messina, Italy

⁶ Dipartimento di Biologia, Roma Tor Vergata, 00133 Roma, Italy

⁷ University of Montenegro, Institute of Marine Biology, Dobrota bb, P Fah 68, 85330 Kotor, Montenegro

⁸ Department of Biology, University of Bari, Bari, Italy

⁹ CoNISMa, Rome, Italy

¹⁰ Department of Agriculture, University of Sassari, Viale Italia 39, I-07100 Sassari, Italy

¹¹ 13, Iakovou Patatsou str., 2362 Ayios Dometios, Nicosia, Cyprus

¹² Institute of Oceanography, Hellenic Centre for Marine Research, Hydrobiological Station of Rhodes,
Cos Street, 85100 Rhodes, Greece

¹³ Istanbul University, Department of Biology, Division of Hydrobiology, Vezneciler, 34134 Istanbul, Turkey

¹⁴ National Research Council – Institute for Marine Biological Resources and Biotechnologies (CNR-IRBIM),
Largo Fiera della Pesca, 60125 Ancona, Italy

¹⁵ SADEF, 30 Rue de la Station, 68700 Aspach-Le-Bas, France

¹⁶ Department of Ecology and Hydrology and Campus of International Excellence “Mare Nostrum”,
University of Murcia, 30100 Murcia, Spain

¹⁷ Department of Marine Sciences, University of the Aegean, University Hill, 81100 Mytilene, Greece

¹⁸ School of Biological Sciences, University of Aberdeen, Cruickshank Building, St. Machar Drive,
Aberdeen AB24 3UU, Scotland, United Kingdom

¹⁹ Marine Biodiscovery Centre, Department of Chemistry, University of Aberdeen, Aberdeen AB24 3UE, Scotland, United Kingdom

²⁰ Marine Biology Station, National Institute of Biology, Piran, Fornače 41, 6330 Piran, Slovenia

²¹ C.I.R.S.Pe. (Italian Fishery Research and Studies Center), Roma, Italy

²² Çukurova University, Fisheries Faculty, TR01330, Balcali, Adana, Turkey

²³ Akdeniz University, Fisheries Faculty, Main Campus, Antalya, Turkey

²⁴ Akdeniz University, Kemer Faculty of Maritime, Main Campus, Antalya, Turkey

²⁵ Thalassa Marine research & Environmental awareness, 286 F route d'Aspremont 06690 Tourrette-Levens, France

²⁶ terraSolutions marine environment research, Heraklion, Crete, Greece

²⁷ Department of Aquaculture, University of Tripoli, Tripoli, Libya

²⁸ Marine and Coastal Zone Management Programme, International Union for Conservation of Nature,
Regional Office for West Asia, IUCN ROWA, Amman, Jordan

²⁹ University of Carthage, Tunisia

³⁰ Wilderness Studi Ambientali, Via Cruillas, 27, 90146 Palermo, Italy

³¹ Museo Civico di Storia Naturale, via degli Studi 9, 97013 Comiso (Ragusa), Italy

*Authors' paper was retracted on ...March 2023. Appropriate changes have been made in pp. 437-438, Abstract, Introduction, Acknowledgments and References.

Published online: 2 May 2022

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 butterflyfish *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 sharpnose 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 butterflyfish *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* (Bonaterre, 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* (Facciola, 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.*

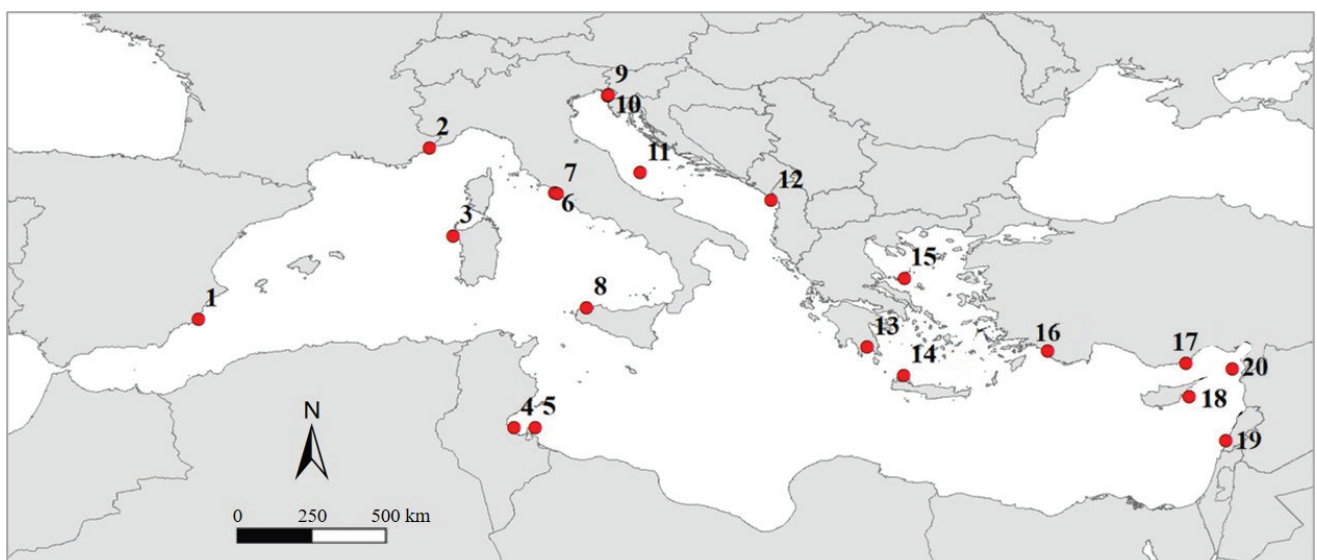


Fig. 1: Approximate locations of species records in the Mediterranean Sea. Location numbers (1-20) correspond with those on Table 1.

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

Olindias muelleri Haeckel, 1879 is a nightly active hydrozoan whose hemispherical umbrella can reach eight centimetres in diameter. The medusa phase has four red-

dish 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

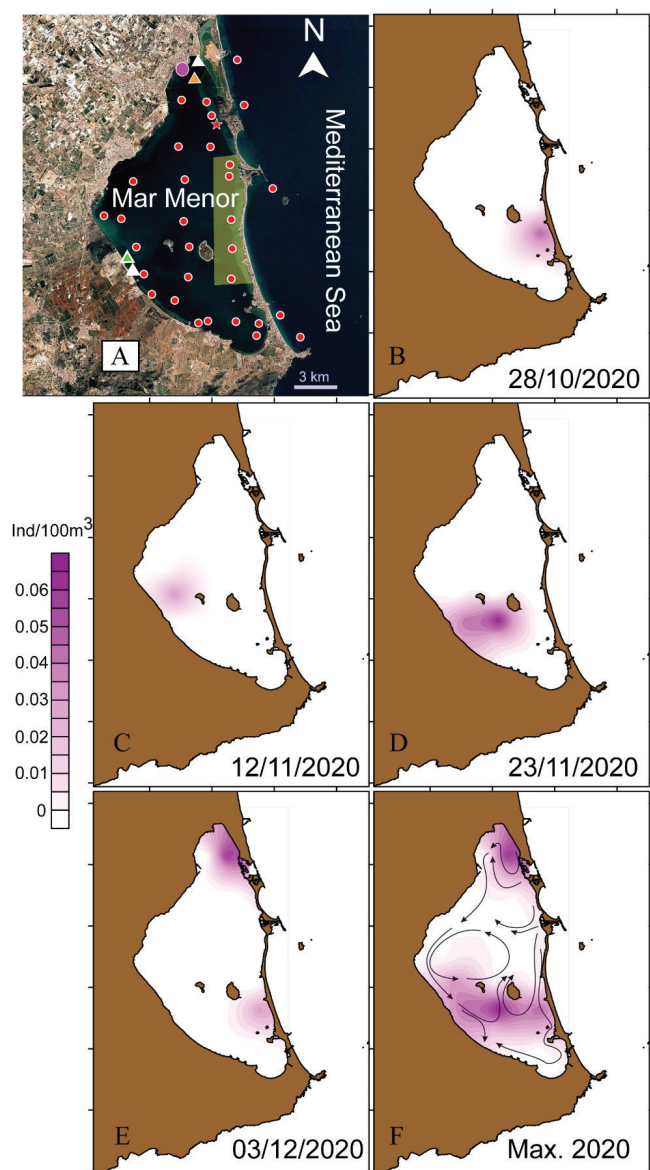


Fig. 2: Monitoring system stations, register of observations and abundances (individuals/100m³) of *O. muelleri* in the Mar Menor. (A) red circles correspond to the sampling stations; red star indicates the first observation (6 July 2010); triangles indicate the observations reported by Javier Murcia: 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: 37.709439°N, 0.787627°W.

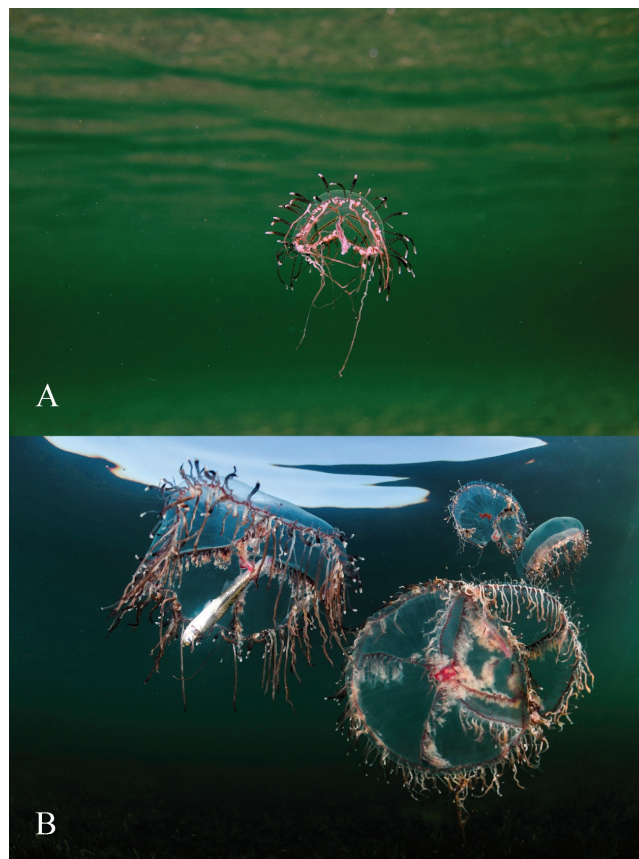


Fig. 3: *Olindias muelleri* detected in the Mar Menor: (A) first register, 6 July 2010 (Photo credit: Angel Pérez-Ruzafa); (B) aggregation of individuals with one of them preying on *Atherina boyeri* (Photo credit: Javier Murcia).

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 count-

ing 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 pereopod (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 pereopod. (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. tribran-*

chiata 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 neurochaetae (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.

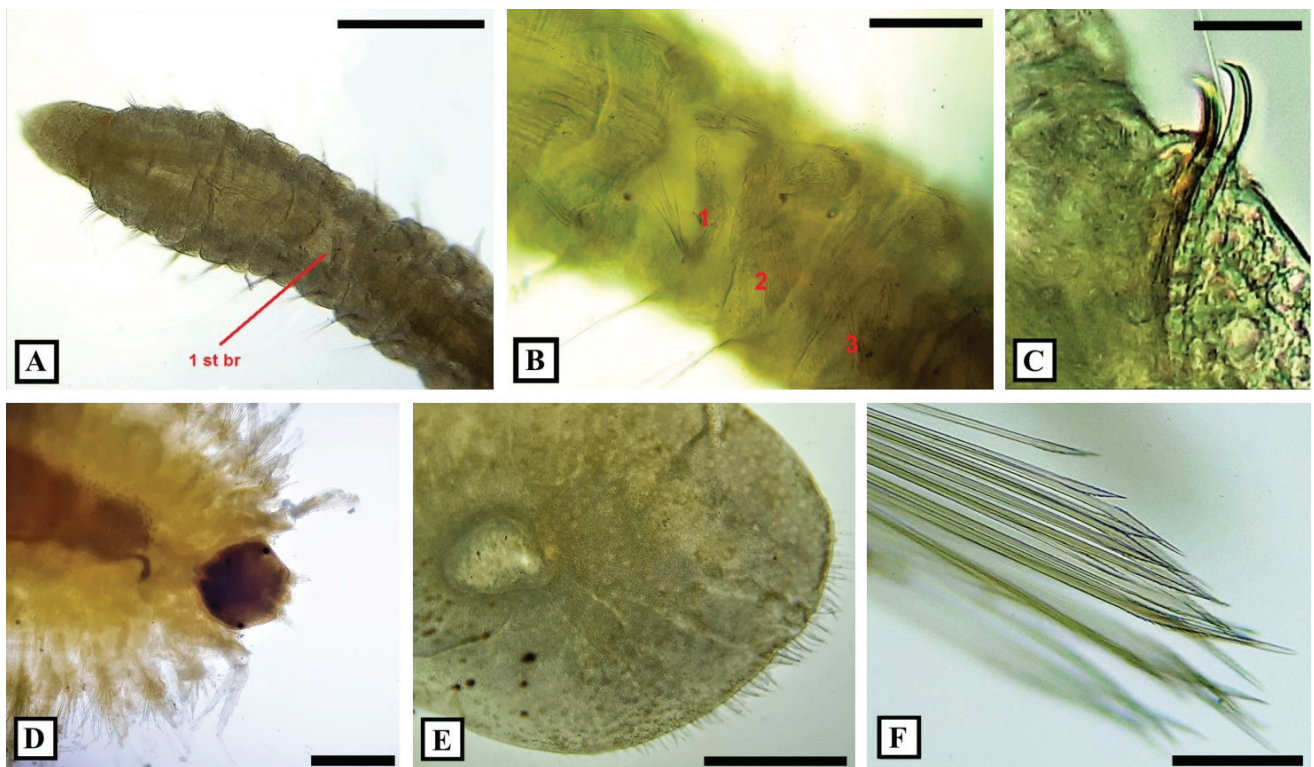


Fig. 6: *Levinsenia tribranchiata*: (A) anterior end, dorsal view; (B) branchiae, three pairs; (C) modified neurochaetae. *Malmgrenia polypapillata*: (D) anterior end, dorsal view; (E) detail of the lateral margin of the elytron; (F) unidentate neurochaetae. Scale bars: 200 µm for A; 100 µm for B and 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 butterflyfish *Stromateus fiatola* Linnaeus, 1758 in the Gulf of Gabes (South-East Tunisia)

Radhouan EL ZRELLI and Lamia YACOUBI

Among the butterflyfishes (Stromateidae) occurring in the Mediterranean Sea, the blue butterflyfish *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 butterflyfishes 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 butterflyfish 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 butterflyfish 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 butterflyfish in the Mediterranean Sea, in particular along the Tunisian coasts.

The occurrence 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 occurrence 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 butterflyfish (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 posterior 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.

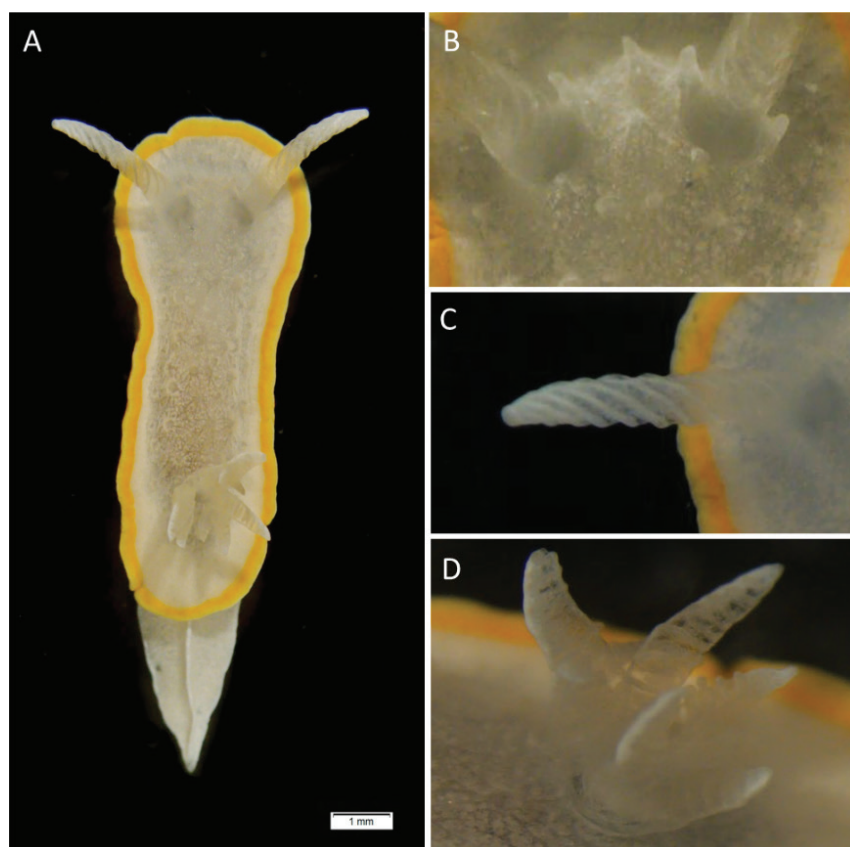


Fig. 10: *Diaphorodoris alba* observed on bottom sediment in Slovenian waters. Characteristics of the species are: (A) white mantle with a continuous yellow line on the margin extending below the mantle; (B) conical tubercles (papillae) on the mantle; (C) lamellate rhinophores; (D) seven branched gills 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 sharpnose sevengill shark was caught by trammel net in Slovenian coastal waters 0.5 nmi off Strunjan (Gulf of Trieste, northern Adriatic; 45.54000°N, 13.60158°E) (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, Synphobranchidae) in the Adriatic Sea

Filippo DOMENICHETTI and Lorenzo ZACCHETTI

The pignosed arrowtooth eel *Dysomma brevirostre* (Facciola, 1887) belongs to the family Synphobranchidae (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).

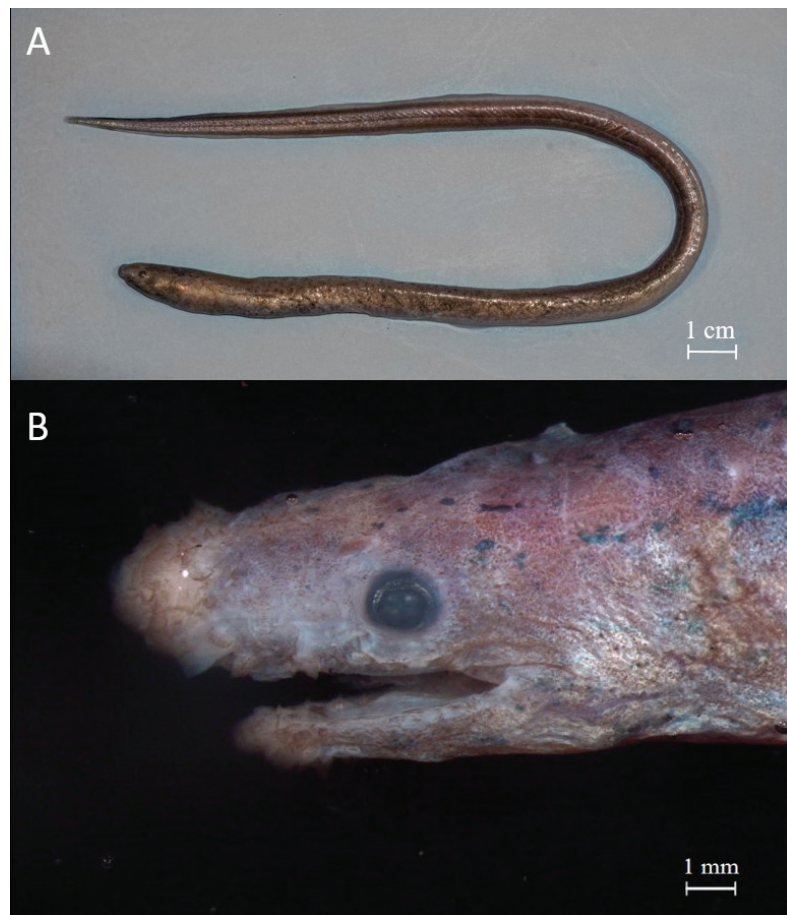


Fig. 12: Specimen of *Dysomma brevirostre* caught in the Pomo Pits area (central Adriatic Sea): (A) whole body; (B) profile view of head. Photo credit: L. Zacchetti.

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

Ilija ČETKOVIĆ 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 circum-global 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.

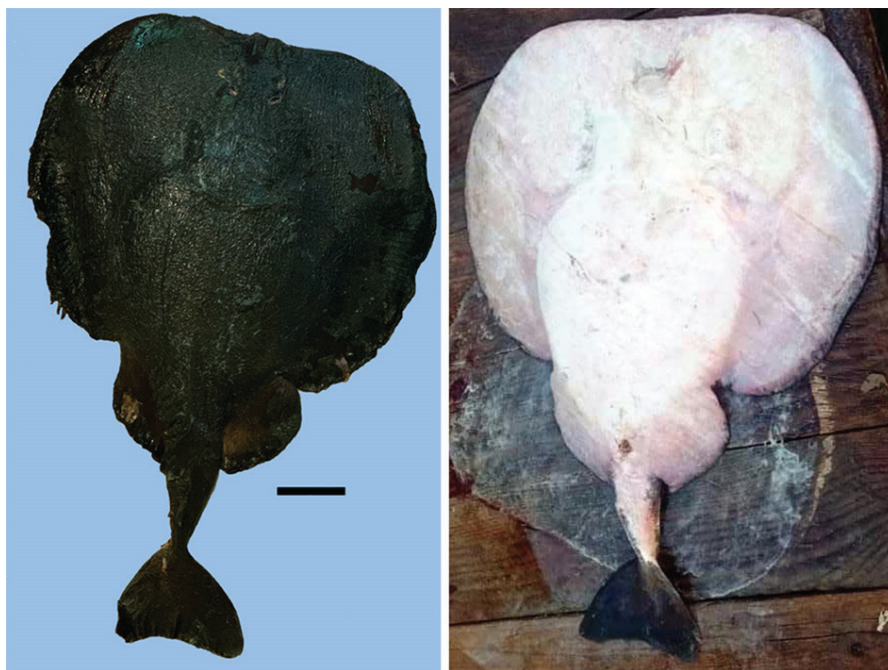


Fig. 15: Dorsal and ventral view of a female *Tetronarce nobiliana* caught off northwestern Crete (Greece), eastern Mediterranean. Scale bar: 10 cm. Photo credit: R. Figuccia.

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 tubercles 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.

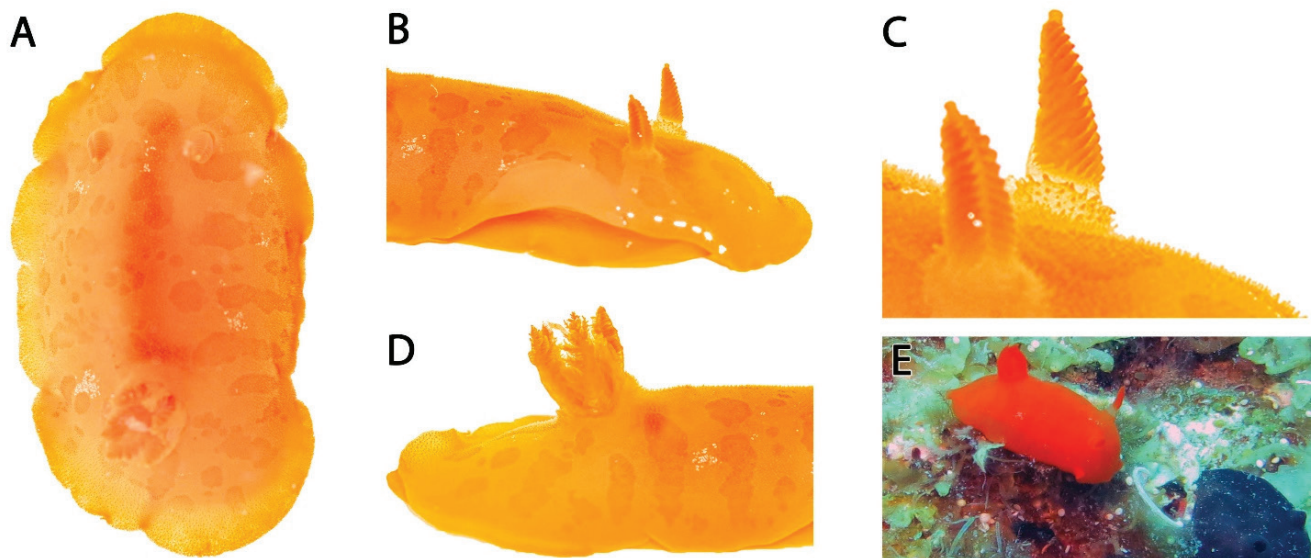


Fig. 16: *Discodoris rosi* observed off Alonnisos Island (Aegean Sea): (A) dorsal view; (B) lateral view with details of the white areas; (C) detail of the rhinophores and the tubercles; (D) posterior, lateral view of the body, with gills; (E) specimen on photophilous algae.

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

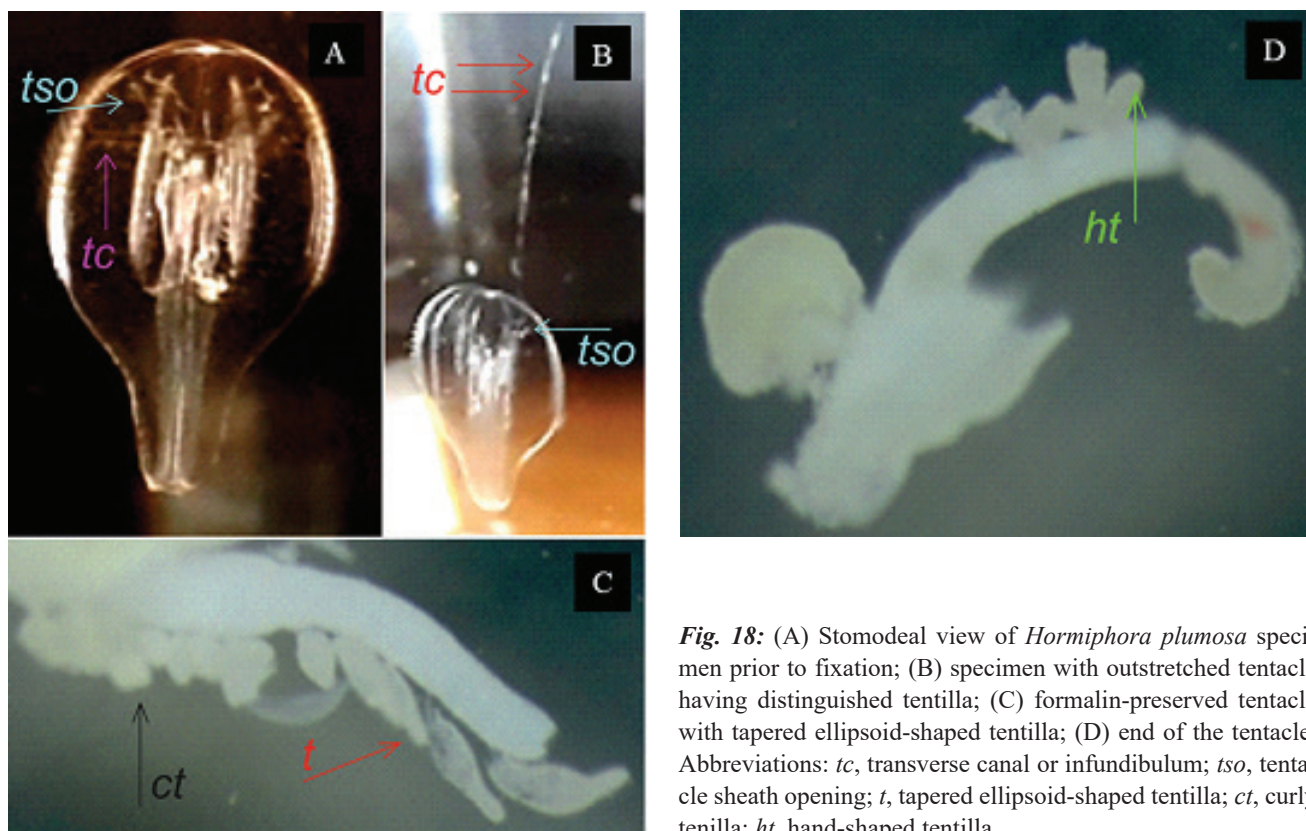


Fig. 18: (A) Stomodeal view of *Hormiphora plumosa* specimen prior to fixation; (B) specimen with outstretched tentacle having distinguished tentilla; (C) formalin-preserved tentacle with tapered ellipsoid-shaped tentilla; (D) end of the tentacle. Abbreviations: *tc*, transverse canal or infundibulum;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

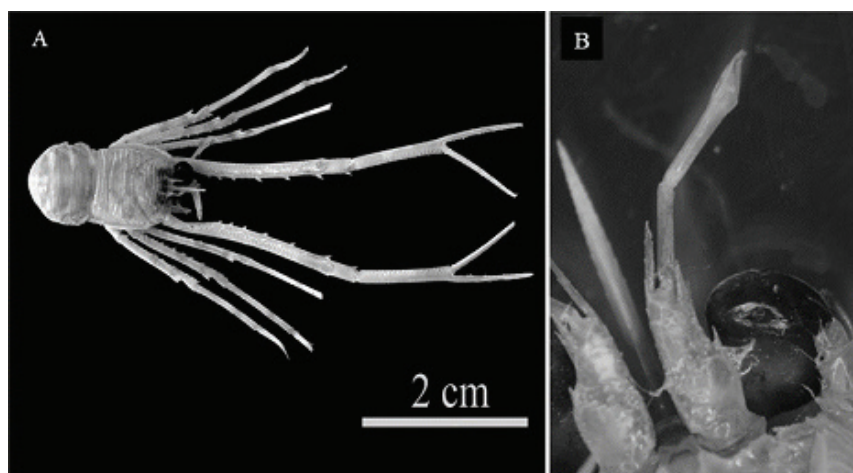


Fig. 19: (A) *Munida speciosa* specimen from Taşucu, Turkey; (B) ventral view of cephalic region. Photographs were taken from 10% formalin fixed specimens.

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 spec-

imens 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.

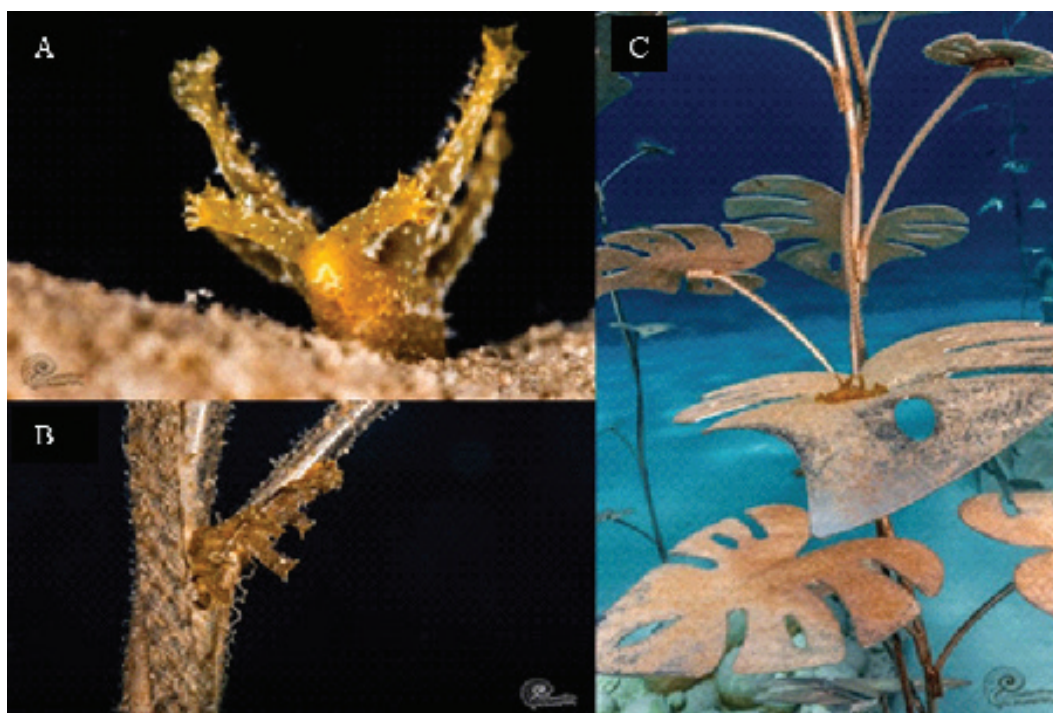


Fig. 20: (A, B) Two out of the seven individuals of *S. pelagica* from MUSAN, Cyprus; (C) the leaf like stainless-steel surfaces of the sculpture, where all individuals were observed and photographed, MUSAN, Cyprus.

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 Snaefell-snes 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?

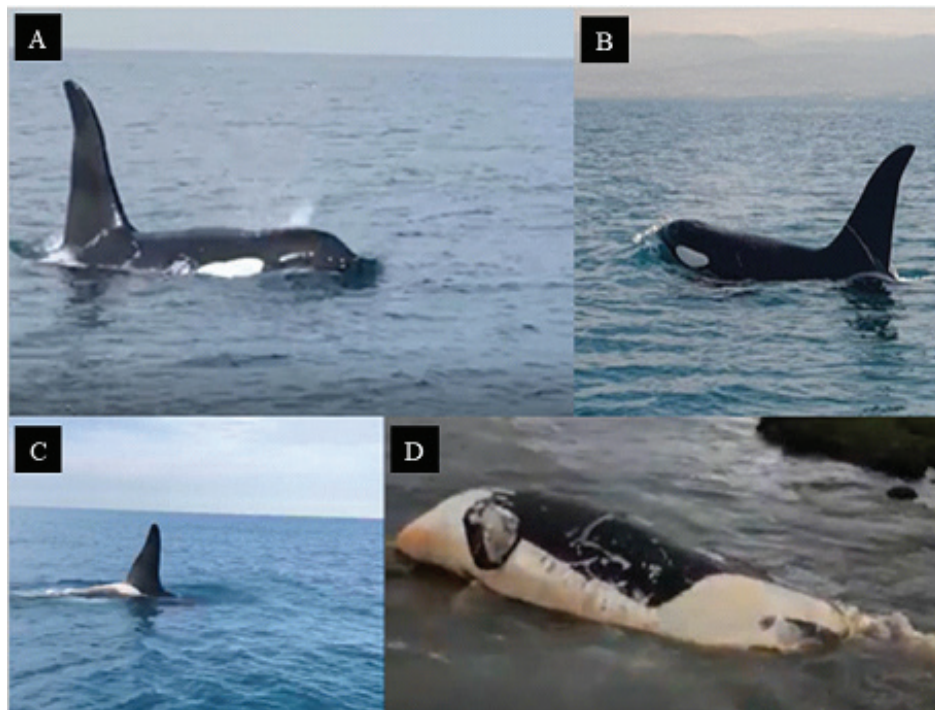


Fig. 21: Selected photographs of killer whales *Orcinus orca* recorded off Beirut: (A-C) individuals sighted in February 2020; (D) carcass sighted on 10th February 2020.

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 hermaph-

roditic 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.

Acknowledgements

Vasiliki Kousteni would like to thank all the reviewers for their time and valuable contribution to the review process for the preparation of this Collective Article, and Vasilis Gerovasileiou for the fruitful collaboration and timely support during the editing process. The work of Alfredo Fernández-Alías, Concepción Marcos and Angel Pérez-Ruzafa was partially funded by different agreements with Regional Government of the Community of the Region de Murcia (Spain). Alfredo Fernández-Alías was supported by 21449/FPI/20, Fundación Séneca. Región de Murcia (Spain). The same authors express their gratitude to Javier Murcia, an underwater photographer, for the information provided, and to all the researchers participating in the 25 years of the monitor-

ing system. Alexis Pey and Patrícia Ventura would like to thank Mme. Jacqueline Gautier-Debernardi, manager of the Marine Protected Areas of Monaco and Mr. David Gamba, president of the Monegasque Sport Fishing Federation, for their reactivity. The same authors also thank Rémi Saule, the spearfisher, for having quickly preserved the specimen and provided all relevant observations and photos. Marco Colombo and Bruno Manunza are grateful to Alberto Ruiu and the Capo Caccia-Isola Piana MPA for supporting their underwater research. Bruno Manunza was funded by Fondo di Ateneo per la Ricerca (FAR) 2020. Pietro Battaglia and Maria Giulia Stipa would like to thank the recreational fisherman Alfio Coppola who provided the specimen of *Ancistrocheirus lesueurii* for

this study. Radhouan El Zrelli and Lamia Yacoubi thank Yu-Jia Lin for helping in the identification of *Stromateus fiatola*, and Lotfi Rabaoui for checking and editing the English text of this contribution. The study of Jamila Rizgalla was carried out as part of the citizen science and field survey project “snowball” (<https://www.researchgate.net/project/Project-snowball-Investigating-the-marine-fauna-in-Libyan-waters>). Jamila Rizgalla wishes to thank Cherif Chiheb for giving her the permission to use the images and information related to the *C. carcharias* record, Patrick Jambura and Alessandro De Maddalena for confirming the species identification, and the two reviewers for their thoughtful comments and corrections. Filippo Domenichetti and Lorenzo Zacchetti would like to acknowledge the crew of the R/V “Dallaporta” for their professional skills in conducting the fishing surveys. Their research was conducted in the frame of ScamPo surveys that aimed to evaluate the effects of management measures implemented in the Pomo pits area supported by the Direzione Generale della Pesca Marittima e dell’Acquacoltura of the Italian Ministry of Agricultural, Food and Forestry Policies. Ilija Četković and Ana Pešić are thankful to Ivo Knežević who reported the catch, and the Interreg-IPA CBC Italy-Albania-Montenegro BLUE LAND project, which supported the field visit to the area of the catch. Vasiliki Kousteni and Aikaterini Dogramatzi deeply thank the anonymous fisher for the immediate notification upon the chimaera’s capture. Bruno Zava and Maria Corsini-Foka warmly thank Roberto Figuccia, the Captain of the bottom trawler “Luciano Giacalone”, Mazara del Vallo (Italy), for promptly providing data, photos and the specimen of *Tetronarce nobiliana* herein reported. The study of Dimitris Poursanidis and Giovanni Chimienti was supported by the project “Coral Gardens of Spodares Archipelagos”, funded by THALASSA foundation and by the Italian Ministry of Education, University and Research (PON 2014-2020, grant AIM 1807508-1, Linea 1). The study of Erhan Mutlu and Yaşar Özvarol was carried out within the framework of the project “Acoustical determination of biomass quantities and monitoring of distribution of *Posidonia oceanica* meadows on the Turkish entire coast in the Eastern Mediterranean” (grant no: 117Y133), funded by the Scientific and Technological Research Council of Turkey (TUBITAK). Erhan Mutlu and Yaşar Özvarol thank Lombard Fabien (Sorbonne Université, France) and Cornelia Jaspers (DTU Aqua, Denmark) for their suggestions and providing them with identification drawings of the species, as well as the anonymous reviewers for their constructive help, corrections and comments. The same authors also thank the crew of the R/V “Akdeniz Su”. Canan Türeli and Sinan Mavruk would like to express their appreciation to the fisher Sedat Ortaç for delivering samples. Ziad Samaha and Michel Bariche would like to thank Ms. Fadia Jomaa and Mr. Mostapha Harbi for information and pictures about the orca, as well as Ms. Marie-Thérèse Mruszczok from Orca Guardians for identifying the orca as a member of an Icelandic pod. The work of Ziad Samaha and Michel Bariche was partly funded by a University Research Board Grant from the American University

of Beirut (Lebanon). The study of Cem Dalyan and Nur Bikem Kesici was financially supported by the Research Fund of Istanbul University (Project number: 4378).

References

- Albano, P.G., Steger, J., Bošnjak, M., Dunne, B., Guifarro, Z. *et al.*, 2021. Native biodiversity collapse in the eastern Mediterranean. *Proceedings of the Royal Society B: Biological Sciences*, 288, 20202469.
- Aytan, Ü., Aksu, İ., Bektaş, Y., 2019. Recent occurrence of *Olindias muelleri* Haeckel, 1879 (Cnidaria, Hydrozoa, Limnomedusae, Olindiidae) in the Aegean Sea. *Plankton & Benthos Research*, 14 (1), 22-28.
- Bakir, A.K., Katağan, T., Aker, H.V., Özcan, T., Sezgin, M. *et al.*, 2014. The marine arthropods of Turkey. *Turkish Journal of Zoology*, 38 (6), 765-831.
- Bakiu, R., Soldo, A., 2021. Shark capture by commercial fisheries in Albania. *Journal of Applied Ichthyology*, 37 (4), 607-610.
- Ballesteros, M., Madrenas E., Pontes M., 2021. *Discodoris rosi* in OPK-Opisthobranchius. <https://opisthobranchius.info/en/NtYgy> (Accessed 10 September 2021).
- Bariche, M., Fricke, R., 2020. The marine ichthyofauna of Lebanon: an annotated checklist, history, biogeography, and conservation status. *Zootaxa*, 4775 (1), 001-157.
- Barnich, R., Fiege, D., 2001. The Mediterranean species of *Malmgreniella* Hartman, 1967 (Polychaeta: Polynoidae: Polynoinae), including the description of a new species. *Journal of Natural History*, 35 (8), 1119-1142.
- Batistić, M., Jasprica, N., Carić M., Lučić, D., 2007. Annual cycle of the gelatinous invertebrate zooplankton of the eastern South Adriatic coast (NE Mediterranean). *Journal of Plankton Research*, 29 (8), 671-686.
- Bello, G., Potoschi, A., Berdar, A., 1993. Adult of *Ancistrocheirus lesueurii* caught in the straits of Messina (Cephalopoda: Ancistrocheiridae). *Bollettino Malacologico*, 29 (9-12), 259-266.
- Bianchi, C.N., Morri, C., Chiantore, M., Montefalcone, M., Parravicini, V. *et al.*, 2012. Mediterranean Sea biodiversity between the legacy from the past and a future of change. p. 1-55. In: *Life in the Mediterranean Sea: A Look at Habitat Changes*. Stambler, N. (Ed). Nova Science, New York, NY, USA, 2012.
- Canessa, M., Bavestrello, G., Cattaneo-Vietti, R., Furfaro, G., Doneddu, M. *et al.*, 2021. Rocky substrate affects benthic heterobranch assemblages and prey/predator relationships. *Estuarine, Coastal and Shelf Science*, 261, 107568.
- Carpenter, K.E., 2002. Kyphosidae: sea chubs. p. 1684-1687. In: *The living marine resources of the western central Atlantic. Volume 3: Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. Carpenter, K.E. (Ed). FAO Species Identification Guide for Fishery Purposes, Rome.
- Carpentieri, P., Nastasi, A., Sessa, M., Srouf, A., 2021. *Incidental catch of vulnerable species in Mediterranean and Black Sea fisheries – A review*. General Fisheries Commission for the Mediterranean, Studies and Reviews No 101. FAO, Rome.
- Castelli, A., Bianchi, C.N., Cantone, G., Çinar, M.E., Gambi, M.C. *et al.*, 2008. Annelida Polychaeta. *Biologia Marina Mediterranea*, 15 (Suppl 1), 323-373.

- Catarino, D., Stanković, D., Menezes, G., Stefanni, S., 2017. Insights into the genetic structure of the rabbitfish *Chimaera monstrosa* (Holocephali) across the Atlantic-Mediterranean transition zone. *Journal of Fish Biology*, 91, 1109-1122.
- Çinar, M.E., Dagli, E., Açık, S., 2011. Annelids (Polychaeta and Oligochaeta) from the Sea of Marmara, with descriptions of five new species. *Journal of Natural History*, 45 (33-34), 2105-2143.
- Çinar, M.E., Dağlı, E., Kurt-Şahin, G., 2014a. Checklist of Annelida from the coasts of Turkey. *Turkish Journal of Zoology*, 38 (6), 734-764.
- Çinar, M.E., Yokeş, M.B., Açık, Ş., Bakır, A.K., 2014b. Checklist of Cnidaria and Ctenophora from the coasts of Turkey. *Turkish Journal of Zoology*, 38, 677-697.
- Coll, M., Piroddi, C., Steenbeek, J., Kaschner, K., Ben Rais Lasram, F. *et al.*, 2010. The biodiversity of the Mediterranean Sea: estimates, patterns, and threats. *PloS ONE*, 5, e11842.
- Compagno, L.J.V., 1984. *FAO Species Catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Part 1 - Hexanchiformes to Lamniformes*. FAO Fisheries Synopsis, 125 (4/1), FAO, Rome, 249 pp.
- Compagno, L.J.V., Dando, D., Fowler, S., 2005. *Sharks of the world*. Princeton field guides. Harper Collins Publishing Ltd., London, 368 pp.
- Crocetta, F., Mifsud, S., Paolini, P., Piscopo, J., Schembri, P.J., 2011. New records of the genus *Pachygrapsus* (Crustacea: Decapoda) from the central Mediterranean Sea with a review of its Mediterranean zoogeography. *Mediterranean Marine Science*, 12 (1), 75-93.
- Crocetta, F., Zibrowius, H., Bitar, G., Templado, J., Oliveiro, M., 2013. Biogeographical homogeneity in the eastern Mediterranean Sea - I: the opisthobranchs (Mollusca: Gastropoda) from Lebanon. *Mediterranean Marine Science*, 14 (2), 403-408.
- de Carvalho, M.R., Last, P.R., Séret, B., 2016. Torpedo Rays, Family Torpedinidae. p. 184-203. In: *Rays of the World*. Last, P.R., White W.T., de Carvalho M.R., Séret B., Stehmann M.F.W., Naylor G.J.P. (Eds). CSIRO Press, Canberra.
- Defant, A., 1961. *Physical Oceanography, Vol. 1*. Pergamon Press, New York, xvi + 729 pp.
- D'Onghia, G., Maiorano, P., Tursi, A., 1997. Morphometric and biological data on *Ancistrocheirus lesueurii* (Orbigny, 1842) from the middle-eastern Mediterranean Sea. *Scientia Marina*, 61 (3), 389-396.
- Ebert, D.A., Dando, M., 2020. *Field Guide to Sharks, Rays & Chimaeras of Europe and the Mediterranean*. Princeton University Press, United Kingdom, 385 pp.
- Ebert, D.A., Fowler, S.L., Compagno, L.J.V., 2013. *Sharks of the World: A Fully Illustrated Guide*. Wild Nature Press, Plymouth, 528 pp.
- El Zrelli, R., Rabaoui, L., Roa-Ureta, R.H., Gallai, N., Castet, S. *et al.*, 2020. Economic impact of human-induced shrinkage of *Posidonia oceanica* meadows on coastal fisheries in the Gabes Gulf (Tunisia, Southern Mediterranean Sea). *Marine Pollution Bulletin*, 155, 111124.
- Erdoğan-Dereli, D., Çinar, M.E., 2021. *Levinsonia* species (Annelida: Polychaeta: Paraonidae) from the Sea of Marmara with descriptions of two new species. *Zootaxa*, 4908 (2), 151-180.
- Farrag, M., Ahmed, H., Toutou, M., Eissawi, M., 2019. Marine Mammals on the Egyptian Mediterranean Coast "Records and Vulnerability". *International Journal of Ecotoxicology and Ecobiology*, 4 (1), 8-16.
- Fishelson, L., Galil, B.S., 2001. Gonad Structure and Reproductive Cycle in the Deep-Sea Hermaphrodite Tripodfish, *Bathypterois mediterraneus* (Chlorophthalmidae, Teleostei). *Copeia*, 1 (2), 556-560.
- Francour, P., Mouine, N., 2008. First record of *Kyphosus sec-tator* (Kyphosidae) along the French Mediterranean coast. *Journal of the Marine Biological Association of the United Kingdom*, 85, 1535-1537.
- Fransen, C.H.J.M., 2014. Anomurans. p. 235-248. In: *The living marine resources of the Eastern Central Atlantic: Volume 1: Introduction, crustaceans, chitons and cephalopods*. Carpenter, K.E., De-Angelis, N. (Eds). FAO Species Identification Guide for Fishery Purposes, Rome.
- Fricke, R., Eschmeyer, W.N., van der Laan R., 2022. *Eschmeyer's catalog of fishes: genera, species, references*. <https://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. (Accessed 2 March 2022).
- Furfaro, G., Mariottini, P., 2016. Check-list of the Nudibranchs (Mollusca Gastropoda) from the biodiversity hot spot "Scoglio del Corallo" (Argentario promontory, Tuscany). *Biodiversity Journal*, 7, 67-78.
- Furfaro, G., Picton, B., Martynov, A., Mariottini, P., 2016. *Diaphorodoris alba* Portmann & Sandmeier, 1960 is a valid species: molecular and morphological comparison with *D. luteocincta* (M. Sars, 1870) (Gastropoda: Nudibranchia). *Zootaxa*, 4193 (2), 304-316.
- GBIF, 2021. *Diaphorodoris alba* Portmann & Sandmeier, 1960 in GBIF Backbone Taxonomy-Checklist dataset. <https://doi.org/10.15468/39omei> (Accessed 7 January 2022).
- Gerovasileiou, V., Akyol, O., Al-Hosne, Z., Alshikh Rasheed, R., Ataç, E. *et al.*, 2020. New records of rare species in the Mediterranean Sea (May 2020). *Mediterranean Marine Science*, 21 (2), 340-359.
- Giacobbe, S., Lo Piccolo, M., Crocetta, F., 2018. *Pachygrapsus maurus* and *Pachygrapsus transversus* (Crustacea: Decapoda) in the central Mediterranean: new colonizers or overlooked species? *Biologia*, 73 (6), 609-614.
- Haedrich, R.L., 1986. Stromateidae p. 1192-1193. In: *Fishes of the North-eastern Atlantic and the Mediterranean*. Whitehead, P.J.P., Bauchot, M.L., Hureau, J.C., Nielsen J., Tortonese E. (Eds). UNESCO, Paris.
- Hoving, H.J.T., Lipinski, M.R., 2015. Observations on age and reproduction of the oceanic squid *Ancistrocheirus lesueurii* (d'Orbigny, 1842) (Cephalopoda: Ancistrocheiridae). *Journal of Natural History*, 49 (21-24), 1319-1325.
- Jereb, P., Roper, C.F., 2010. *Cephalopods of the world: an annotated and illustrated catalogue of cephalopod species known to date. Myopsid and oegopsid squids*. FAO Species Catalogue for Fishery Purposes. No. 4, Vol. 2. FAO, Rome.
- Jukić-Peladić, S., Vrgoč, N., Šifner, S., Piccinetti, C., Piccinetti-Manfrin, *et al.*, 2001. Long-term changes in demersal resources of the Adriatic Sea: Comparison between trawl surveys carried out in 1948 and 1998. *Fisheries Resources*, 53, 95-104.
- Kaya, M., 1993. Ege Denizi Derin Deniz Balıkları Üzerine Bir Araştırma. *Turkish Journal of Zoology*, 17, 411-426.

- Kleitou, P., Giovos, I., Wolf, W., Crocetta, F., 2019. On the importance of citizen-science: the first record of *Goniobranchus obsoletus* (Rüppell and Leuckart, 1830) from Cyprus (Mollusca: Gastropoda: Nudibranchia). *BioInvasions Records*, 8 (2), 252-257.
- Klinowska, M., 1985. Cetacean live stranding sites relate to geomagnetic topography. *Aquatic Mammals*, (1), 27-32.
- Knudsen, S.W., Clements, C.D., 2013. Revision of the fish family Kyphosidae (Teleostei: Perciformes). *Zootaxa*, 3751, 1-101.
- Knudsen, S.W., Clements, C.D., 2016. World-wide species distributions in the family Kyphosidae (Teleostei: Perciformes). *Molecular Phylogenetics and Evolution*, 101, 252-266.
- Kousteni, V., Christidis, G. I., 2019. Historical records and new occurrence of the rare serpent eel *Ophisurus serpens* (Linnaeus, 1758) in the Mediterranean Sea. *Regional Studies in Marine Science*, 25, 1-4.
- Kousteni, V., Mazzoleni, S., Vasileiadou, K., Rovatsos, M., 2021. Complete Mitochondrial DNA Genome of Nine Species of Sharks and Rays and Their Phylogenetic Placement among Modern Elasmobranchs. *Genes*, 12 (3), 324.
- Kousteni, V., Tsiamis, K., Gervasini, E., Zenetos, A., Karachle, P.K., Cardoso, A.C. (2021). Citizen scientists contributing to marine alien species detection: the case of alien fish and molluscs in the European marine waters. *Ecosphere*, e03875.
- Kremers, D., Célrier, A., Schaal, B., Campagna, S., Trabalon, M. *et al.*, 2016. Sensory Perception in Cetaceans: Part I-Current Knowledge about Dolphin Senses as a Representative Species. *Frontiers in Ecology and Evolution*, (4), 1-49.
- Langeneck, J., Barbieri, M., Maltagliati, F., Castelli, A., 2019. Molecular phylogeny of Paraonidae (Annelida). *Molecular Phylogenetics and Evolution*, 136, 1-13.
- Last, P.R., Stevens, J.D., 2009. *Sharks and rays of Australia*. CSIRO Publishing, Collingwood, Victoria, 644 pp.
- Le Gall, J., 1933. *Stromateus fiatola* Linné 1758. In: CIESM Historic Records of Marine Fauna. <https://www.ciesm.org/online/archives/medfauna/STROMATEUSFIATOLA.pdf>
- Lipej, L., Acevedo, I., Akel, E.H.K., Anastasopoulou, A., Angelidis, A. *et al.*, 2017. New Mediterranean Biodiversity Records (March 2017). *Mediterranean Marine Science*, 18 (1), 179-201.
- Lipej, L., De Maddalena, A., Soldo, A., 2004. *Sharks of the Adriatic Sea*. University of Primorska, Koper, 253 pp.
- Lombardo, A., Marletta G., 2020. The biodiversity of the marine Heterobranchia fauna along the central-eastern coast of Sicily, Ionian Sea. *Biodiversity Journal*, 11 (4), 861-870.
- Madin, L.P., 1991. *Distribution and taxonomy of zooplankton in the Alboran Sea and adjacent western Mediterranean: a literature survey and field guide*. Woods Hole Oceanographic Institution, Technical Report, WHOI-91-26, USA, 153 pp.
- Mannino, A.M., Balistreri, P., Iacofano, D., Galil B.S., Lo Brutto, S., 2015. An additional record of *Kyphosus vaigiensis* (Quoy & Gaimard, 1825) (Osteichthyes, Kyphosidae) from Sicily clarifies the confused situation of the Mediterranean kyphosids. *Zootaxa*, 3963, 045-054.
- Mayer, A.G., 1912. *Ctenophores of the Atlantic Coast of North America*. Carnegie Institute, Washington, 58 pp.
- Mizzan, L., 1996. I Leptocardi, Ciclostomi e Selaci delle collezioni del Museo Civico di Storia Naturale di Venezia - 1) Leptocardia, Agnatha, Gnathostomata - Chondrichthyes (esclusi Rajiformes). *Bollettino del Museo Civico di Storia Naturale di Venezia*, 45, 123-137.
- MolluscaBase, 2021. *Discodoris rosi* Ortea, 1979. <https://molluscabase.org/aphia.php?p=taxdetails&id=139572> (Accessed 1 July 2021).
- Moro, S., Jona-Lasinio, G., Block, B., Micheli, F., De Leo, G. *et al.*, 2020. Abundance and distribution of the white shark in the Mediterranean Sea. *Fish and Fisheries*, 21, 338-349.
- Mulas, A., Bellodi, A., Carbonara, P., Cau, A., Marongiu, M.F. *et al.*, 2021. Bio-ecological features update on eleven rare cartilaginous fish in the Central-Western Mediterranean Sea as a contribution for their conservation. *Life*, 11, 871.
- Myers, N., Mittermeier, R.A., Mittermeier, C.G., Da Fonseca, G.A., Kent, J., 2000. Biodiversity hotspots for conservation priorities. *Nature*, 403, 853-858.
- Notarbartolo di Sciara, G., 2002. Cetacean species occurring in the Mediterranean and Black Seas. In: *Cetaceans of the Mediterranean and Black Seas: state of knowledge and conservation strategies*. Notarbartolo di Sciara G. (Ed.). A report to the ACCOBAMS Secretariat, Monaco, Section 3, 17 p.
- Ortea, J., 1979. Deux nouveaux Doridiens (Mollusca, Nudibranchiata) de la côte nord d'Espagne. *Bulletin du Muséum National d'Histoire Naturelle*, 4 (1), section A, no3, 575-583.
- Ortea, J., Moro, L., Bacallado, J.J., Caballer M., 2014. Nuevas especies y primeras citas de babosas marinas (Mollusca: Opisthobranchia) en las islas Canarias y en otros archipiélagos de la Macaronesia. *Viera y Clavay*, 42, 47-77.
- Papaconstantinou, C., 2014. *Fauna Graeciae. An updated checklist of the fishes in the Hellenic Seas*. Monographs on Marine Sciences, 7. HCMR, Athens, 340 pp.
- Pérez-Ruzafa, A., Gilabert, J., Gutiérrez, J.M., Fernández, A.I., Marcos, C. *et al.*, 2002. Evidence of a planktonic food web response to changes in nutrient input dynamics in the Mar Menor coastal lagoon, Spain. *Hydrobiologia*, 475/476, 359-379.
- Pérez-Ruzafa, A., Campillo, S., Fernández-Palacios, J.M., García-Lacunza, A., García-Oliva, M. *et al.*, 2019. Long-term dynamic in nutrients, chlorophyll a, and water quality parameters in a coastal lagoon during a process of eutrophication for decades, a sudden break and a relatively rapid recovery. *Frontiers in Marine Science*, 6, 1-23.
- Pola, M., Camacho-García, Y.E., Golsiner, T.M., 2012. Molecular data illuminate cryptic nudibranch species: the evolution of the Scyllaeidae (Nudibranchia: Dendronotina) with a revision of Notobryon. *Zoological Journal of the Linnean Society*, 165, 311-336.
- Porcu, C., Follesa, M.C., Grazioli, E. Deiana, A.M., Cau, A., 2010. Reproductive biology of a bathyal hermaphrodite fish, *Bathypterois mediterraneus* (Osteichthyes: Ipnopidae) from the south-eastern Sardinian Sea (central-western Mediterranean). *Journal of the Marine Biological Association of the United Kingdom*, 90 (4), 719-728.
- Poulain, P.-M., Bussani, A., Gerin, R., Jungwirth, R., Mauri, E. *et al.*, 2013. Mediterranean surface currents measured with drifters: From basin to subinertial scales. *Oceanography*, 26 (1), 38-47.
- Poursanidis, D., Koutsoubas, D., Issaris, J., Gerovasileiou, V., Zenetos, A., 2009. New records on the opisthobranch fauna of the Greek seas. *Marine Biodiversity Records*, 2, e74.
- Quignard, J.P., Tomasini, J.A., 2000. Mediterranean fish biodiversity. *Biologia Marina Mediterranea*, 7 (3), 1-66.
- Rodríguez-Flores, P.C., Machordom, A., Abelló, P., Cues-

- ta, J.A., Macpherson, E., 2019. Species delimitation and multi-locus species tree solve an old taxonomic problem for European squat lobsters of the genus *Munida* Leach, 1820. *Marine Biodiversity*, 49, 751-1773.
- Romeo, T., Battaglia, P., Pedà, C., Perzia, P., Consoli, P. *et al.*, 2012. Pelagic cephalopods of the central Mediterranean Sea determined by the analysis of the stomach content of large fish predators. *Helgoland Marine Research*, 66 (3), 295-306.
- Rudman, W.B., 2002. *Discodoris rosi* Ortea, 1979 in *Sea Slug Forum*. Available from <https://www.seaslugforum.net/factsheet/discrosi> (Accessed 2 March 2022).
- Saïdi, B., Bradaï, M.N., Bouain, A., Guelorget, O., Capapé, C., 2005. Capture of a pregnant female white shark, *Carcharodon carcharias* (Lamnidae) in the Gulf of Gabès (southern Tunisia, central Mediterranean) with comments on oophagy in sharks. *Cybium*, 29 (3), 303-307.
- Salas, A., 2020. *El langostino del Mar Menor se hace de rogar*, *La Verdad*, September 25th <https://www.laverdad.es/murcia/sanpedro/langostino-menor-rogar-20200925004432-ntvo.html> (Accessed 31 July 2021).
- Serena, F., Abella, A.J., Bargnesi, F., Barone, M., Colloca, F. *et al.*, 2020. Species diversity, taxonomy and distribution of Chondrichthyes in the Mediterranean and Black Sea. *The European Zoological Journal*, 87 (1), 497-536.
- Sion, L., Battista, D., Mastrototaro, F., Carlucci, R., 2008. New findings of pignosed arrowtooth eel *Dysomma brevirostre* (Synphobranchidae) in the Western Ionian Sea (Mediterranean Sea). *Cybium* 32, 189-190.
- Smith D.G., 2002. Synphobranchidae. Cutthroat eels. p. 719-723. In: *FAO species identification guide for fishery purposes. The living marine resources of the Western Central Atlantic. Vol. 2: Bony fishes. Part 1 (Acipenseridae to Grammatidae)*. Carpenter K.E. (Ed.). Department of Biological Sciences, Old Dominion University, Norfolk, Virginia.
- Soldo, A., Bradaï, M.N., Walls, R.H.L., 2016. *Carcharodon carcharias*. *The IUCN Red List of Threatened Species* 2016. <https://www.iucnredlist.org/species/3855/16527829> (Accessed 2 March 2022).
- Stefanescu, C., Lloris, D., Rucabado, J., 1990. Primeras citas de *Cataetys laticeps* (Osteichthyes, Bythitidae) y *Dysomma brevirostre*, (Osteichthyes, Synphobranchidae) en el Mar Catalan (Mediterraneo Iberico). *Arxius de Miscel·lània Zoològica*, 14, 135-143.
- Steins, N.A., Kraan, M.L., van der Reijden, K.J., Quirijns F.J., Broekhoven, W. *et al.*, 2020. Integrating collaborative research in marine science: Recommendations from an evaluation of evolving science-industry partnerships in Dutch demersal fisheries. *Fish and Fisheries*, 21, 146-161.
- Sulak, K.J., 1977. The Systematics and Biology of *Bathypterois* Pisces, Chlorophthalmidae with a Revised Classification of Benthic Myctophiform Fishes. *Galathea Report*, 14, 49-108.
- Tiralongo, F., Crocetta, F., Riginella, E., Oscar Lillo, A., Tondo, E. *et al.*, 2020. Snapshot of rare, exotic and overlooked fish species in the Italian seas: A citizen science survey. *Journal of Sea Research*, 164, 101930.
- Tsagarakis, K., Darmanin, S. A., Al Mabruk, S. A., Auriemma, R., Azzurro, E. *et al.*, 2021. New records of rare species in the Mediterranean Sea (October 2021). *Mediterranean Marine Science*, 22 (3), 627-652.
- Vaccaro, A.M., Pipitone, C., 2005. First record of *Pachygrapsus transversus* (Gibbes, 1850) (Brachyura, Grapsidae) in Italian waters. *Crustaceana*, 78 (6), 677-683.
- Vecchione, M., Young R.E., 2016. *Ancistrocheiridae* Pfeffer 1912. *Ancistrocheirus lesueurii* (Orbigny 1842). *Ancistrocheirus* Gray 1849 in *The Tree of Life Web Project*. https://tolweb.org/Ancistrocheirus_lesueurii/19632/2016.11.16 (Accessed 2 March 2022).
- Vogiatzakis, I.N., Mannion, A.M., Griffiths, G.H. 2006. Mediterranean ecosystems: Problems and tools for conservation. *Progress in Physical Geography*, 30, 175-200.
- Walker, M.M., Kirschvink, J.L., Ahmed, G., Diction, A.E., 1992. Evidence that fin whales respond to the geomagnetic field during migration. *Journal of Experimental Biology*, 171, 67-78.
- Walker, T.I., Rigby, C.L., Pacoureau, N., Ellis, J., Kulka, D.W. *et al.*, 2020. *Galeorhinus galeus*. *The IUCN Red List of Threatened Species* 2020: e.T39352A2907336. (Downloaded on 03 November 2021).
- WoRMS, 2022. *World Register of Marine Species*. <https://www.marinespecies.org> (Accessed 12 January 2022).
- Zaouali, J., Ben Souissi, J., Galil, B.S., d'Udekem d'Acoz, C., Ben Abdallah, A., 2008. Grapsoid crabs (Crustacea: Decapoda: Brachyura) new to the Sirte Basin, southern Mediterranean Sea - the roles of vessel traffic and climate change. *Marine Biodiversity Records*, 1, e73.
- Zenetos, A., Mačić, V., Jaklin, A., Lipej, L., Poursanidis, D. *et al.*, 2016. Adriatic 'opisthobranchs' (Gastropoda, Heterobranchia): shedding light on biodiversity issues. *Marine Ecology*, 37, 1239-1255.
- Ziemski, F., Sittler, A.P., 2020. *Olinidias muelleri* Haeckel, 1879 in *DORIS*. <https://doris.ffessm.fr/ref/specie/784> (Accessed 31 July 2021).