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KONSTANTINOS TSAGARAKIS, SANDRA AGIUS DARMANIN, SARA A.A. AL MABRUK, ROCCO AURIEMMA, ERNESTO AZZURRO, NICHOLAS BADOUVAS, RIGERS BAKIU, MICHEL BARICHE, PIETRO BATTAGLIA, FEDERICO BETTI, DIEGO BORME, ROBERTO CACCIAMANI, FEDERICO CALI, MARIA CORSINI-FOKA, FABIO CROCETTA, CEM DALYAN, ALAN DEIDUN, MARKOS DIGENIS, FILIPPO DOMENICHETTI, BRANKO DRAGIČEVIĆ, JAKOV DULČIĆ, FURKAN DURUCAN, TAMAR GUY-HAIM, NUR BIKEM KESICI, POLYTIMI LARDI, YIANNIS MANITARAS, NIKOLAS MICHAILIDIS, STEFANO PIRAINO, JAMILA RIZGALLA, APOSTOLOS SIAPATIS, ALEN SOLDO, MARIA GIULIA STIPA, TUBA TERBIYIK KURT, FRANCESCO TIRALONGO, KONSTANTINOS TSIAMIS, ADRIANA VELLA, NOEL VELLA, BRUNO ZAVA, VASILIS GEROVASILEIOU

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Collective Article B

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New records of rare species in the Mediterranean Sea (October 2021)

Konstantinos TSAGARAKIS[1], Sandra AGIUS DARMANIN[2], Sara A. A. AL MABRUK[3, 4], Rocco AURIEMMA[5], Ernesto AZZURRO[6], Nicholas BADOUVAS[1], Rigers BAKIU[7], Michel BARICHE[8], Pietro BATTAGLIA[9], Federico BETTI[10], Diego BORME[5], Roberto CACCIAMANI[6], Federico CALÌ[6, 11], Maria CORSINI-FOKA[12], Fabio CROCETTA[13], Cem DALYAN[14], Alan DEIDUN[15], Markos DIGENIS[16, 17], Filippo DOMENICHETTI[6], Branko DRAGIČEVIĆ[18], Jakov DULČIĆ[18], Furkan DURUCAN[19], Tamar GUY-HAIM[20], Nur Bikem KESICI[14], Polytimi-Ioli LARDI[21], Yiannis MANITARAS[22], Nikolas MICHAILIDIS[22, 23], Stefano PIRAINO[24], Jamila RIZGALLA[25], Apostolos SIAPATIS[1], Alen SOLDO[26], Maria Giulia STIPA[9], Tuba TERBIYIK KURT[27], Francesco TIRALONGO[28], Konstantinos TSIAMIS[21], Adriana VELLA[2], Noel VELLA[2], Bruno ZAVA[29, 30] and Vasilis GEROVASILEIOU[16, 31, 32]

[1] Hellenic Centre for Marine Research (HCMR), Institute of Marine Biological Resources and Inland Waters (IMBRIW), Anavyssos 19013, Attica, Greece
[2] Conservation Biology Research Group, Biology Department, University of Malta, Msida, MSD 2080, Malta
[3] Department of General Nursing Technology, Higher Institute of Science and Technology - Cyrene, Libya
[4] Marine Biology in Libya Society, El Bayda, Libya
[5] National Institute of Oceanography and Applied Geophysics - OGS, Italy
[6] National Research Council - Institute for Marine Biological Resources and Biotechnologies (CNR-IRBIM), Largo Fiera della Pesca, 60125, Ancona, Italy
[7] Department of Aquaculture and Fisheries, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez, Albania
[8] Department of Biology, Faculty of Arts and Sciences, American University of Beirut, P.O. Box 11-0236, Beirut, Lebanon
[9] Stazione Zoologica Anton Dohrn, Sicily Marine Centre, c/o Villa Pace, Contrada Porticatello 29, 98167 Messina, Italy
[10] DISTAV, Genova University, Corso Europa 26, 16132 Genova, Italy
[11] Department of Biological, Geological, and Environmental Sciences (BiGeA), Alma Mater Studiorum - University of Bologna, Bologna, Italy
[12] Hellenic Centre for Marine Research, Institute of Oceanography (IO), Hydrobiological Station of Rhodes, Cos Street, 85100 Rhodes, Greece
[13] Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, Villa Comunale, I-80121 Naples, Italy
[14] Istanbul University, Department of Biology, Division of Hydrobiology, Vezneciler, 34134 Istanbul, Turkey
[15] Department of Geosciences, University of Malta, Msida MSD 2080 Malta
[16] Department of Marine Sciences, University of the Aegean, University Hill, 81100 Mytilene, Greece
[17] Hellenic Centre for Marine Research (HCMR), Institute of Oceanography, 71003 Heraklion, Crete, Greece
[18] Institute of Oceanography and Fisheries, Šetalište Ivana Meštrovića 63, 21000 Split, Croatia
[19] Department of Aquaculture, Isparta University of Applied Sciences, Isparta, 32260, Turkey
[20] Biology Department, National Institute of Oceanography, Israel Oceanographic and Limnological Research (IOLR), Haifa, Israel
[21] Hellenic Centre for Marine Research (HCMR), Institute of Oceanography (IO), Anavyssos 19013, Attica, Greece
[22] Department of Fisheries and Marine Research, 101 Vithleem Str., 1416 Strovolos, Nicosia, Cyprus
[23] Department of Biological Sciences, University of Cyprus, 1 Panepistimiou Str., 2109 Aglantzia, Nicosia, Cyprus
[24] Department of Biological and Environmental Sciences and Technologies (DISTEBA), University of Salento,73100 Lecce, Italy
[25] Department of Aquaculture, Faculty of Agriculture, University of Tripoli, Tripoli, Libya
[26] Department of Marine Studies, University of Split, Croatia
[27] Department of Marine Biology, Faculty of Fisheries, Cukurova University, Adana, Turkey
[28] Department of Biological, Geological and Environmental Sciences, University of Catania, Catania, Italy
[29] Museo Civico di Storia Naturale, via degli Studi 9, 97013 Comiso (RG), Italy
[30] Wilderness studi ambientali, via Cruillas 27, 90146 Palermo, Italy
[31] Hellenic Centre for Marine Research (HCMR), Institute of Marine Biology, Biotechnology and Aquaculture (IMBBC), 71500 Heraklion, Crete, Greece
[32] Department of Environment, Faculty of Environment, Ionian University, 29100 Zakynthos, Greece

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Abstract

This Collective Article presents information about 27 taxa belonging to five Phyla (one Ochrophyta, one Cnidaria, three Arthropoda, two Mollusca and twenty Chordata) and extending from the Western Mediterranean Sea to the Levantine Sea and the Black Sea (Sea of Marmara). The new records were reported from 11 countries as follows: **Algeria**: occurrence of the African striped grunt *Parapristipoma octolineatum*; **Spain**: new records of eight uncommon fish species (*Gadella maraldi*, *Hypleurochilus bananensis*, *Lobotes surinamensis*, *Parapristipoma octolineatum*, *Selene dorsalis*, *Sphoeroides marmoratus*, *Tetragonurus cuvieri*, and *Trachyrincus scabrus*) from the Spanish Mediterranean; **Italy**: new record of the football octopus *Ocythoe tuberculata* from the Southern Tyrrhenian Sea; a rare sighting of a juvenile phase of a moray eel of the genus *Gymnothorax*, tentatively identified as *Gymnothorax* cf. *unicolor* in the Ligurian Sea; first record of adult Facciola's sorcerer *Facciolella oxyrhynchus* in the Adriatic Sea; occurrence of the tope shark *Galeorhinus galeus* in the Northern Adriatic Sea; **Libya**: first confirmed record of the pen shell *Pinna rudis*; first documented record of the palaemonid shrimp *Brachycarpus biunguiculatus*; first record of the fish *Sudis hyalina*; **Malta**: new records of Grant's rockling, *Gaidropsarus granti*; multiple concomitant reports of the rare hydromedusan species *Aequorea forskalea*; **Croatia**: a record of the skipjack tuna *Katsuwonus pelamis* in the Southern Adriatic Sea; **Albania**: new record of the bigeye thresher shark *Alopias superciliosus*; **Greece**: confirmation of the rare brown alga *Sargassum flavifolium* occurrence in the Eastern Mediterranean Sea; first record of the scaleless dragonfish *Bathophilus nigerrimus*; **Turkey**: first occurrence of the calanoid copepod *Pteriacartia josephinae* in the Aegean Sea; first documented record of the Cremona's sea slug *Placida cremoniana* for the easternmost Mediterranean Sea; new record of the yellow-headed goby *Gobius xanthocephalus* in the Sea of Marmara; **Cyprus**: first record of the Liechtenstein's goby *Corcyrogobius liechtensteini*; an individual of the Yellowfin tuna *Thunnus albacares* captured with handline by an artisanal fisher; **Lebanon**: an individual of the Black marlin *Istiompax indica* captured in a gill net.

Introduction

A large fraction of the world's oceans remains unexplored while at the same time climate change and other anthropogenic disturbances (e.g., habitat modification, pollution, human-induced eutrophication, overfishing) affect ecological processes and biodiversity (Canonico *et al.*, 2019). Although these changes take place globally, they are thought to be even more intense in the Mediterranean Sea (Lejeusne *et al.*, 2010, Crise *et al*., 2015), a biodiversity hotspot which is populated, exploited and impacted since ages (Coll *et al*., 2010). In this changing world, documenting georeferenced records of rare species as well as of species of special interest (e.g., protected and threatened) can be of high value to science and management as they may provide early signs of distributional shifts or habitat expansions. Furthermore, they can fill gaps and provide information on the population status, biology, distribution and ecology of species that have been facing population declines, or that have been simply overlooked due to their low abundance, confined distributional range, rare sightings and/or low sampling intensity. Recognizing the fact that many of these records remain unpublished and unexploited, the Collective Article: Series B provides a platform for periodically reporting new records of such species in the Mediterranean Sea and adjacent regions. New records are presented in separate sub-chapters authored by the contributor(s). The sub-chapters are classified geographically following the regions and subregions defined in the Marine Strategy Framework Directive (Directive 2008/56/EC): Western Mediterranean Sea, Central Mediterranean Sea, Adriatic Sea, Eastern Mediterranean Sea and Black Sea (including the Sea of Marmara).

The current Collective Article reports 28 independent records of 27 taxa belonging to five Phyla in the Mediterranean Sea (from the Alboran Sea to the Levantine) and the Black Sea (Sea of Marmara). The locations of the observations are shown in Figure 1, indicated by a number (Location Number; LN) in increasing order from west to east. A summary of each LN mapped in Figure 1, is presented in the associated Table 1, which includes information about the taxon (ordered by Phylum), the basin, the region and the country that it was spotted and indicates the sub-chapter that each finding is presented. The large brown alga *Sargassum flavifolium*, a canopy-forming and habitat-creating keystone species and one of the rarest species of the genus *Sargassum* in the Mediterranean Sea was confirmed for the first time in Greece, and consequently in the Eastern Mediterranean Sea. Multiple concomitant occurrences of the rare hydromedusan species *Aequorea forskalea* were reported in Malta in a short-timed but intense event during spring 2021, which adds to the knowledge on jellyfish blooms. The records also include three molluscs: a new record of the football octopus *Ocythoe tuberculata*, from the Southern Tyrrhenian Sea which is the second largest specimen ever found in the world and the biggest individual found in the Tyrrhenian Sea; the first confirmed presence of the pen shell *Pinna rudis* in two locations from the Libyan coast, despite the fact that it has been scarcely reported from the eastern and central Mediterranean basin; a record of a heterobranch mollusc that lives in shallow waters, the Cremona's sea slug *Placida cremoniana*, which is the first documentation for the easternmost Mediterranean Sea. The palaemonid shrimp *Brachycarpus biunguiculatus*, which hides during the day in caves and crevices, was documented for the first time in Libya, probably not recorded until now due to its nocturnal behaviour. *Pteriacartia josephinae*, a calanoid copepod which strictly inhabits coastal waters, was recorded for the first time in the Aegean Sea (Turkish coasts) extending its previously known distribution which comprised the Western Mediterranean, Ionian, Adriatic and Levantine seas. The

majority of the findings reported here concern fish. An overall rare fish of the family Blenniidae, *Hypleurochilus bananensis*, was reported in the Spanish Mediterranean (Sant Carles de la Ràpita) from a harbour area, as also observed in the past. Seven fish species (*Gadella maraldi*, *Lobotes surinamensis*, *Parapristipoma octolineatum*, *Selene dorsalis*, *Sphoeroides marmoratus*, *Tetragonurus cuvieri*, and *Trachyrincus scabrus*) quite rare in the Mediterranean – but most of them more frequent in the Eastern Atlantic – were recorded in the Spanish Mediterranean, mainly in the Alboran Sea. One of them, the African striped grunt *P. octolineatum*, was also caught in west Algeria. A rare sighting of a juvenile phase of a moray eel of the genus *Gymnothorax*, tentatively identified as *Gymnothorax* cf. *unicolor* was reported from the Ligurian Sea. New records of a rarely encountered deep-water fish species, the Grant's rockling *Gaidropsarus granti*, were added in Malta, increasing its reported occurrences in the central Mediterranean and highlighting the importance of further deep-water research. An immature female specimen of the tope shark *Galeorhinus galeus*, was incidentally caught in the Northern Adriatic Sea, being one of the northernmost documented reports of this species in the Mediterranean. In addition, the first record of an adult Facciola's sorcerer *Facciolella oxyrhynchus* in the Adriatic Sea was reported, a species which was found only as leptocephali in the region. Also in the Adriatic, a skipjack tuna *Katsuwonus pelamis* was caught by shore fishing, constituting the second confirmed record of the species, 80 years after the first. A new record of the bigeye thresher shark *Alopias superciliosus* from the Albanian Adriatic was added to some recent occurrences of the species from the region, suggesting that this species may not be so rare and scarce as previously thought. Two mesopelagic fishes, *Sudis hyalina* and the scaleless dragonfish *Bathophilus nigerrimus*, were reported for the first time for Libya and Greece respectively, highlight the need for further exploration of the mesopelagic zone in the Mediterranean Sea. In two submerged tunnel-shaped caves, the Liechtenstein's goby *Corcyrogobius liechtensteini* was recorded for the first time in Cyprus, expanding eastwards the known distribution of this Mediterranean endemic goby. A photo dating back in 1993 documented the capture of a single individual of the Yellowfin tuna *Thunnus albacares* by an artisanal fisher in Cyprus, being the first record of the species for the entire Mediterranean. An individual of another large pelagic species, the Black marlin *Istiompax indica*, was captured in a gillnet in Lebanon; only one more record of the species, in the Western Mediterranean had been previously documented. Finally, the current Collective Article includes – for the first time in this series – a report from the Marmara Sea; specifically, an established population of *Gobius xanthocephalus* is described, filling the gap in the species' distribution between the Aegean Sea and the Black Sea.

Twelve out of the 28 observations reported here come from citizen science platforms or posts in social media by naturalists, divers, and recreational fishers; such approaches considerably increase the overall sampling intensity, even in a non-systematic way, and prove to be quite effective in documenting the presence of rare species, which are relatively improbable to encounter even in regular scientific surveys. However, given that species identification through photos is often uncertain, a proper validation by scientists is needed to ensure accurate reporting (Follett & Strezov, 2015), as practiced in the relevant sub-sections of the current article. Seven more species (six fishes and a cephalopod) were caught by professional fishers, further highlighting the need for a close collaboration between the fishing and the scientific communities (Steins *et al.*, 2020). The remaining taxa were recorded during scientific surveys using a variety of methods such as bottom and pelagic experimental trawls, zooplankton nets, and visual census (with snorkelling or SCUBA diving), mainly focusing on underexplored habitats and ecosystems (e.g., marine caves and deep-sea ecosystems), and/or taxa that need high expertise to be identified.

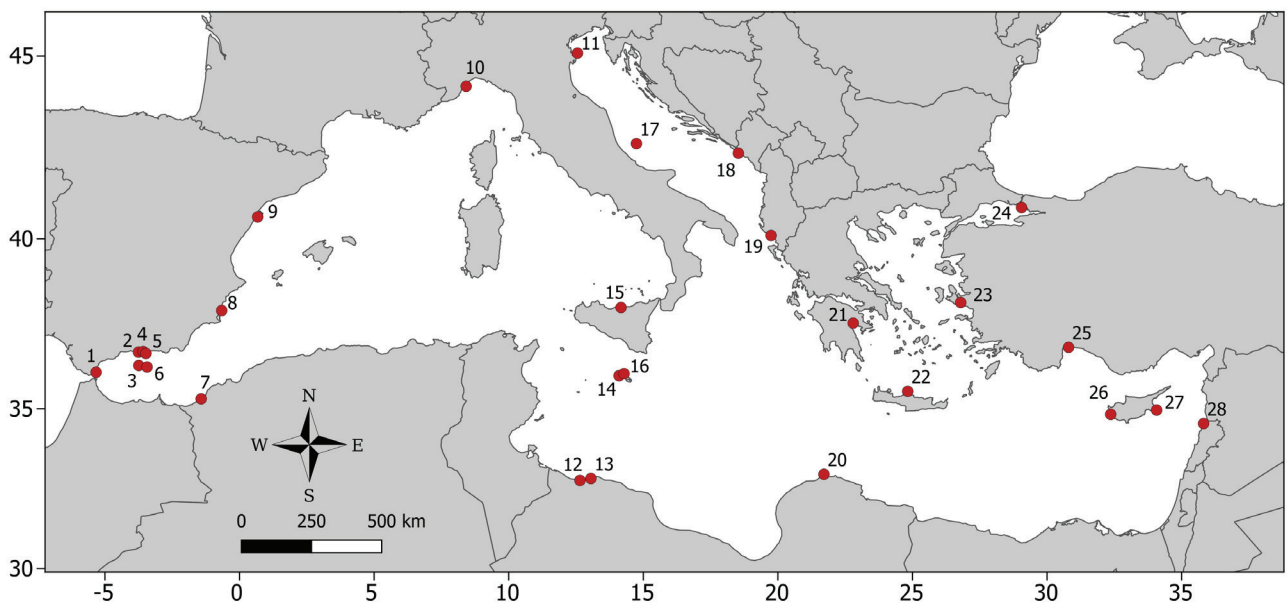

Fig. 1: Location of species records in the Mediterranean Sea.

Table 1. Information about species records by Phylum. Sub-chapters (SC), basin (WMED – West Mediterranean, CMED – Central Mediterranean, ADRIA – Adriatic Sea, EMED – Eastern Mediterranean, BLACK – Black Sea), location, country, and location number as in Figure 1 (LN). [*Point locations represent more than one site in the broader area].

Taxon	SC	Basin	Location	Country	LN
Phylum Ochrophyta					
Sargassum flavifolium	4.1	EMED	Argolikos Gulf	Greece	21
Phylum Cnidaria					
Aequorea forskalea	2.4	CMED	Northern and western coastline of the Maltese archipelago and offshore	Malta	16*
Phylum Mollusca					
Ocythoe tuberculata	1.4	WMED	Tyrrhenian Sea	Italy	15
Pinna rudis	2.1	CMED	El Harsha (west of Tripoli) and Regatta (Tripoli)	Libya	12*
Placida cremoniana	4.4	EMED	Örnekköy, Lara (Antalya)	Turkey	25
Phylum Arthropoda					
Brachycarpus biunguiculatus	2.2	CMED	Regatta bay, Tripoli	Libya	13
Pteriacartia josephinae	4.3	EMED	Coastal waters of Seferihisar	Turkey	23*
Phylum Chordata					
Alopias superciliosus	3.4	ADRIA	Offshore Himara	Albania	19
Bathophilus nigerrimus	4.2	EMED	Cretan Sea	Greece	22*
Corcyrogobius liechtensteini	4.6	EMED	Cape Greco Peninsula	Cyprus	27
Facciolella oxyrhynchus	3.2	ADRIA	Pomo Pits area	Italy	17
Gadella maraldi	1.1	WMED	Alboran Sea	Spain	6
Gaidropsarus granti	2.3	CMED	West from the island of Gozo	Malta	14*
Galeorhinus galeus	3.1	ADRIA	Northern Adriatic Sea	Italy	11
Gobius xanthocephalus	5.1	BLACK	Sea of Marmara, Buyukada and Burgazada Islands	Turkey	24*
Gymnothorax cf. *unicolor*	1.3	WMED	Ligurian Sea, Noli Cape	Italy	10
Hypleurochilus bananensis	1.1	WMED	Sant Carles de la Ràpita	Spain	9
Istiompax indica	4.5	EMED	North of Tripoli	Lebanon	28
Katsuwonus pelamis	3.3	ADRIA	Off Prevlaka	Croatia	18
Lobotes surinamensis	1.1	WMED	Southeast Spanish Mediterranean	Spain	8
Parapristipoma octolineatum	1.1	WMED	Alboran Sea	Spain	4
	1.2	WMED	Béni Saf, Aïn Témouchent, west Algeria	Algeria	7
Selene dorsalis	1.1	WMED	Alboran Sea	Spain	1
Sphoeroides marmoratus	1.1	WMED	Alboran Sea	Spain	2
Sudis hyalina	2.5	CMED	Port of Susa	Libya	20
Tetragonurus cuvieri	1.1	WMED	Alboran Sea	Spain	5
Thunnus albacares	4.5	EMED	Off Potima Bay, Pafos	Cyprus	26
Trachyrincus scabrus	1.1	WMED	Alboran Sea	Spain	3

1. WESTERN MEDITERRANEAN

1.1 New records of uncommon fish species from the Western Mediterranean Sea: The contribution of citizens through the Seawatchers.net platform

Francesco TIRALONGO and Ernesto AZZURRO

In the last years, technological developments have much empowered marine citizen science and increased its recognition among scientific, policy and public fields (Garcia-Soto *et al.*, 2021). This is particularly apparent in the Mediterranean region, where several citizen science initiatives are successfully connecting motivated researchers and local communities towards the early detection of rare and exotic fauna (e.g., Azzurro & Ti-

ralongo, 2020; Tiralongo *et al.*, 2020). Here, based on a series of observations posted by recreational fishers to the Seawatchers platform (https://www.seawatchers.net) between October 2008 4th and December 4th 2020, we report new records of eight uncommon fishes (Fig. 2) from the Western Mediterranean Sea (Spain): *Gadella maraldi* (Risso, 1810), *Hypleurochilus bananensis* (Poll, 1959), *Lobotes surinamensis* (Bloch, 1790), *Parapristipoma octolineatum* (Valenciennes, 1833), *Selene dorsalis* (Gill, 1863), *Sphoeroides marmoratus* (Lowe, 1838), *Tetragonurus cuvieri* Risso, 1810 and *Trachyrincus scabrus* (Rafinesque, 1810). All these records were kept on stand-by until their full validation by the Seawatchers editorial team, which is composed by professional scientists and led by the authors of this note. All the main data for each record are summarized in Table 2. Remarks: *H. bananensis*, an overall rare fish of the family Blenniidae, was again reported from a harbour area (Sant Carles de la Ràpita), corroborating the preference of this species for areas with high anthropogenic impact (Tiralongo *et al.*, 2016). All the other species (cosmopolitan or known for the Mediterranean and the Eastern Atlantic) were uncommon, and especially the records of *P. octolineatum*, *S. marmoratus* and *S. dorsalis* (all species of east Atlantic origin) were rarely reported for the Mediterranean Sea, probably due to their relative rarity and lack of importance for Mediterranean fisheries. We also provide a rare *in situ* photo of *T. cuvieri* taken at a depth of 10 m, that is unusual for this species which usually inhabits deeper waters.

By the end of 2020 there were 2.7 billion Facebook and 262 million Twitter users around the world (Garcia-Soto *et al.*, 2021) and this increasing connection of people through social networks and web platforms such as Seawatchers.net is offering unprecedented opportunities to investigate marine biodiversity, especially in its most overlooked aspects.

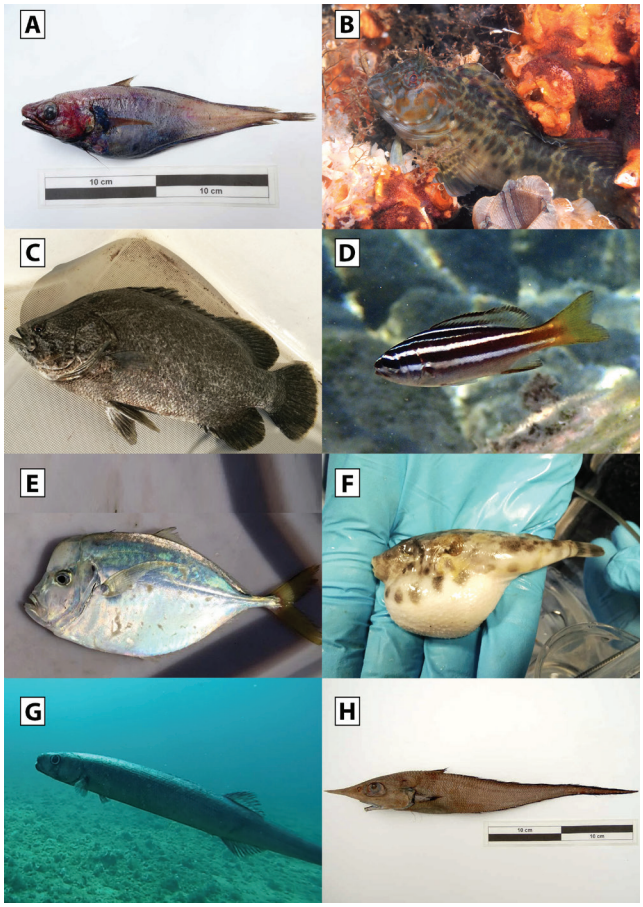

Fig. 2: The specimens collected/observed from the Western Mediterranean Sea through the "Seawatchers" platform: *Gadella maraldi* (A), *Hypleurochilus bananensis* (B), *Lobotes surinamensis* (C), *Parapristipoma octolineatum* (D), *Selene dorsalis* (E), *Sphoeroides marmoratus* (F), *Tetragonurus cuvieri* (G) and *Trachyrincus scabrus* (H).

Table 2. Main data for each of the eight recorded fish species from Spain (Western Mediterranean Sea).

Species	Date	Depth	Coordinates	Fig.
Gadella maraldi	1st April 2014	~500 m	36.2609°N; 3.4346W	2A
Hypleurochilus bananensis	13rd September 2018	2 m	40.6218°N; 0.6743E	2B
Lobotes surinamensis	28th May 2017	15 m	37.9330°N; 0.6619W	2C
Parapristipoma octolineatum	4th October 2008	1 m	36.7230°N; 3.5807W	2D
Selene dorsalis	23rd August 2015	3 m	36.1028°N; 5.3294W	2E
Sphoeroides marmoratus	4th December 2020	5 m	36.7054°N; 3.7537W	2F
Tetragonurus cuvieri	25th July 2018	10 m	36.6674°N; 3.4786W	2G
Trachyrincus scabrus	14th May 2010	~550 m	36.3067°N; 3.7419W	2H

1.2 Occurrence of *Parapristipoma octolineatum* (Valenciennes, 1833) in the Algerian waters

Sara A.A. AL MABRUK, Bruno ZAVA and Maria CORSINI-FOKA

The distribution of *Parapristipoma octolineatum* (Valenciennes, 1833) (Haemulidae) comprehends the Eastern Atlantic, from Angola to the south of Spain and Portugal, including Cape Verde, Madeira, Canary Islands, and the Western Mediterranean; recently, in the Atlantic, it has been reported up to the Bay of Biscay and the Galician waters (Casamajor, 2016; Báez *et al.*, 2019). For the Mediterranean basin, Bauchot (1987) reports the occurrence of the species along the coasts of Morocco and Algeria, in the Gibraltar Strait and the south and east coasts of Spain, while it is not listed among the Mediterranean ichthyofauna of eastern Spain in Báez *et al.* (2019). In Algeria, the species is considered extremely rare (Dieuzeide *et al.*, 1955; Djabali *et al.*, 1993).

The ecology and biology of the African striped grunt *P. octolineatum* are poorly known; it is mainly gregarious, over rocky or sandy bottoms, but sometimes isolated specimens can be observed (Casamajor, 2016). It dwells from the shoreline up to 50-60 m depth, feeds on crustaceans and molluscs and has a common Standard Length (SL) of 20-30 cm (Casamajor, 2016). Taken occasionally throughout its range, but apparently not abundant, it is caught with trammel nets, bottom trawls and handlines, and marketed mostly fresh (Bauchot, 1987).

On the 21st October 2020, an Algerian spear fisher submitted photos of an unknown fish specimen he had just caught to the Facebook social media citizen science platform for Libyan waters called "Marine Biology in Libya" (https://www.facebook.com/MarineBiologyinlibya). The specimen, 24.8 cm in SL, was fished off Béni Saf, Aïn Témouchent, west Algeria (approximate coordinates 35.3014° N, 1. 4250° W) at 15 m depth on rocky bottom.

Fig. 3: The specimen of *Parapristipoma octolineatum* from Algerian waters (SL = 24.8 cm). Photo credit: Sofiane Ebin Al Shareef.

The specimen was identified from photos following Bauchot (1987). The colour of the freshly caught sample was brown dorsally and argentous ventrally, crossed longitudinally by four whitish characteristic stripes, and the fins were dark reddish-brown (Fig. 3). After capture, the fish was unfortunately consumed.

1.3 On the occurrence and morphology of a juvenile *Gymnothorax* moray in the Ligurian Sea

Federico BETTI

Moray eels belonging to the genus *Gymnothorax* (Anguilliformes: Muraenidae) are poorly represented in the Mediterranean Sea, as only two species have been reported so far: the brown moray *Gymnothorax unicolor* (Dela-

Fig. 4: Underwater images of the recorded juvenile moray specimen. a lateral view; b curling behaviour; c frontal view; d detail of the head with morphological features. The second supraorbital pore is visible only from frontal view.

roche, 1809), occasionally recorded in the western basin and in the Aegean Sea (Louisy, 2015; Spinelli & Castriota, 2017; Tiralongo *et al.*, 2020), and the alien *Gymnothorax reticularis* Bloch, 1795, reported once along Israelian coasts (Stern & Goren, 2013). On the 12th of January 2021, during a scientific SCUBA diving activity along Noli Cape (Western Ligurian Sea; 44.19918° N, 8.41996° E), a ~6 cm long moray eel was found and photographed at 6 m depth, curled among cobbles on a sandy seafloor, in an area known for its high biodiversity. The number and position of sensorial head pores, as well as the absence of tubular secondary nostrils (that can be absent in small *Muraena helena* Linnaeus, 1758 as well), were typical of the genus *Gymnothorax* (Bertolini *et al.*, 1931-1956; Bini, 1970). The specimen was dark reddish to dark brown in colour, with the tip of the snout completely white, and a yellowish, thin line on the margin of the fins (Fig. 4). The overall colouration partially matched the only description available so far in the literature of a juvenile *G. unicolor* which was collected in 1900 in Posillipo (Gulf of Naples), then fixed and subsequently described (Bertolini *et al.*, 1931-1956). It was 43 mm long, brown in colour, with a white thin line along the fins margin, and white snout. The different colour of the margin of the fins (white in the fixed specimen, yellowish in the present one) might be tentatively attributed to an intraspecific variability or a loss of colour in the preserved individual. In conclusion, this record represents a rare sighting of a juvenile phase of a moray eel of the genus *Gymnothorax*, tentatively identified as *Gymnothorax* cf. *unicolor*. This species, rarely observed in the Italian seas (mainly along northern Sicily and Sicily Channel), has been recorded only twice in the Ligurian Sea (Spinelli & Castriota, 2017); the present record might confirm the presence and the reproduction of *G. unicolor* in the area.

1.4 New record of the football octopus *Ocythoe tuberculata* Rafinesque 1814, from the Southern Tyrrhenian Sea (Italy)

Pietro BATTAGLIA and Maria Giulia STIPA

Ocythoe tuberculata is the only member of the family Ocythoidae, belonging to the superfamily Argonautoidea. It is a pelagic octopus occurring in temperate waters of all oceans of both hemispheres, including the Mediterranean Sea (Jereb *et al.*, 2014). As other argonautoids, this species is characterized by a marked sexual dimorphism, with

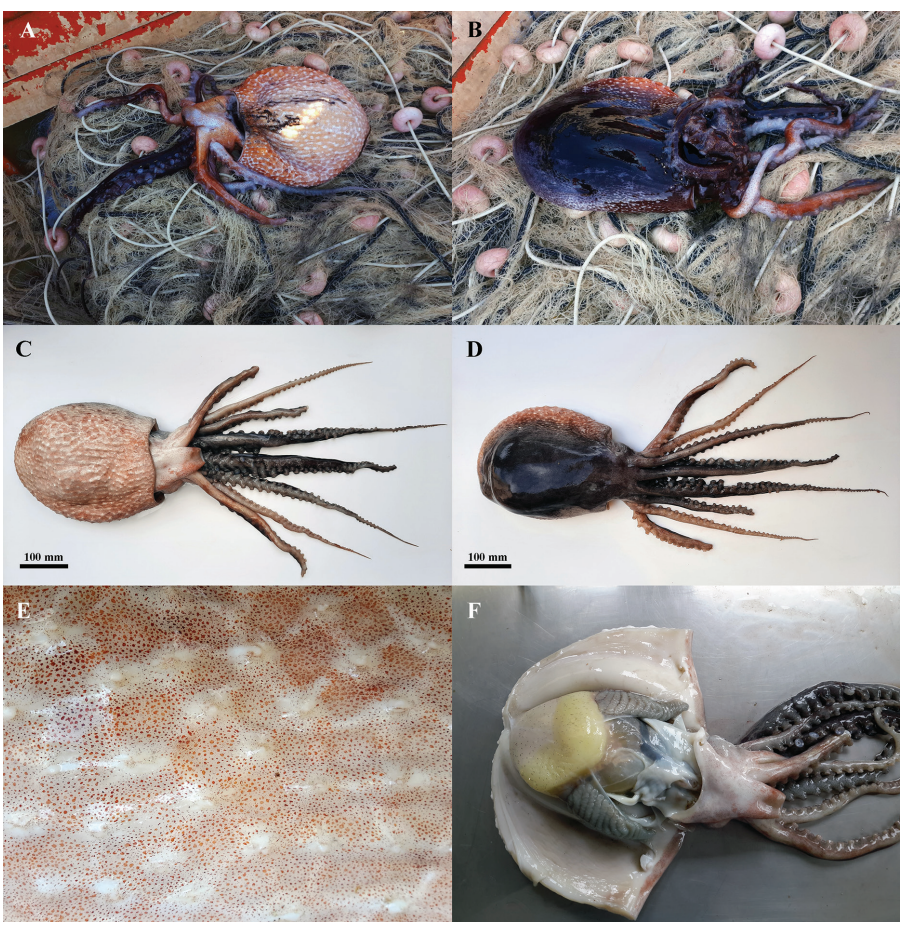

Fig. 5: *Ocythoe tuberculata* caught by trammel net in the Southern Tyrrhenian Sea (A: ventral view; B: dorsal view). The same specimen photographed and measured in laboratory (C: ventral view; D: dorsal view). E: Skin ridges and tubercles on the ventral mantle. F: Analysis and dissection of the specimen.

large females and dwarf males. Females have a large head with a ventral mantle adorned with a reticular sculpture due to the presence of skin ridges and cartilaginous tubercles. Two cephalic water pores are present at the base of the ventral arms. Arms are of different size, with the first and fourth longer than second and third ones. Moreover, a swimbladder is present in the mantle cavity and has an important role in the buoyancy control (Packard & Wurtz, 1994). *O. tuberculata* is considered a rare pelagic octopus and several traits of its biology and ecology are poorly investigated. Indeed, this cephalopod is sporadically caught by different fishing gears or found stranded on the shore (Corsini & Lefkaditou, 1994; Salman & Akalin, 2012), although it also occurs in the stomach contents of large pelagic predators (Romeo *et al.*, 2012).

A large female specimen of *O. tuberculata* (Fig. 5) was caught by an artisanal fisher using a trammel net on a sandy bottom of 5-10 m depth in the Southern Tyrrhenian Sea (38.021°N, 14.174°E) on 29 March 2021. In laboratory, this individual was photographed (Fig. 5C-D), identified (according to the taxonomic features reported by Jereb *et al.*, 2014), weighed and measured to the nearest 1 mm. Its total and mantle lengths (ML) were 888 and 318 mm, respectively, whereas the total weight was 4,835 g. Other morphometric data are shown in Table 3. This is the second largest specimen ever found in the world so far, after the individual measuring 335 mm ML and weighing 5,060 g, reported by Salman & Akalin (2012) in the Aegean Sea, and therefore it is the biggest individual found in the Tyrrhenian Sea. Overall, the other specimens found in Mediterranean waters during the last 60 years had an average ML of about 225 mm and average total weight of 2,030 g. The ovary contained eggs having different maturity stages, but not fully mature oocytes were found, although a portion of this organ contained remains of eggs in a regression status, indicating a recent spawning event. Moreover, we did not find any male hectocotylus in the mantle cavity. The stomach was empty. Although some records of this species are sporadically reported, it is important to collect more morphometric data as well as information useful to improve the current knowledge on the biology and ecology of this poorly known cephalopod.

Table 3. Morphometric data of *Ocythoe tuberculata* caught in the Southern Tyrrhenian Sea on 29 March 2021.

Measurements	***mm***
Total Length	888
Dorsal Mantle Length	318
Ventral Mantle Length	270
Mantle Width	240
Head Length	55
Head Width	124
Eye diameter	44
Funnel Length	111
Right arm I	680
Right arm II	300*
Right arm III	475
Right arm IV	240**
Left arm I	466
Left arm II	553
Left arm III	454
Left arm IV	378**
Lower hood Length	16.3
Upper hood Length	22.0
Other information	
Body Weight	4835 g
Ovary Weight	732 g
Gill Weight	87 g
Stomach Weight	44.3 g
Sex	F
Number of hectocotyli inside the mantle cavity	0

*broken; **broken and regenerated

2. CENTRAL MEDITERRANEAN

2.1 First confirmed record of the pen shell *Pinna rudis* (Linnaeus, 1758) in Libyan waters

Jamila RIZGALLA

The pen shell *Pinna rudis* (Linnaeus, 1758) has a wide distribution including the Atlantic Ocean and the Mediterranean Sea but has been scarcely reported from the eastern and central Mediterranean basin (Gvozdenović *et al.*, 2019). In contrast to the critically endangered *Pinna nobilis* (Linnaeus, 1758) (Kersting *et al.*, 2019), only recorded from the eastern part of Libya (Marrocco *et al.*, 2019), *P. rudis* records from Libya remain unconfirmed despite the presence of viable populations in the neighbouring Tunisia (Gvozdenović *et al.*, 2019).

On the 18th November 2014 a recreational fisher shared on his social media page images of his catch. Two *P. rudis* (approximately 25-30 cm long) were visible in the shared image, alongside images of the associated decapod *Pontonia pinnophylax* (Otto, 1821), which has been reportedly found in *P. rudis* (Fig. 6A and D). The two *P. rudis* individuals were found close to each other in shallow waters, lodged between rocks and seaweed in El Harsha (west of Tripoli) (32.794389°N, 12.648250°E). Permission was sought and obtained to use both imag-

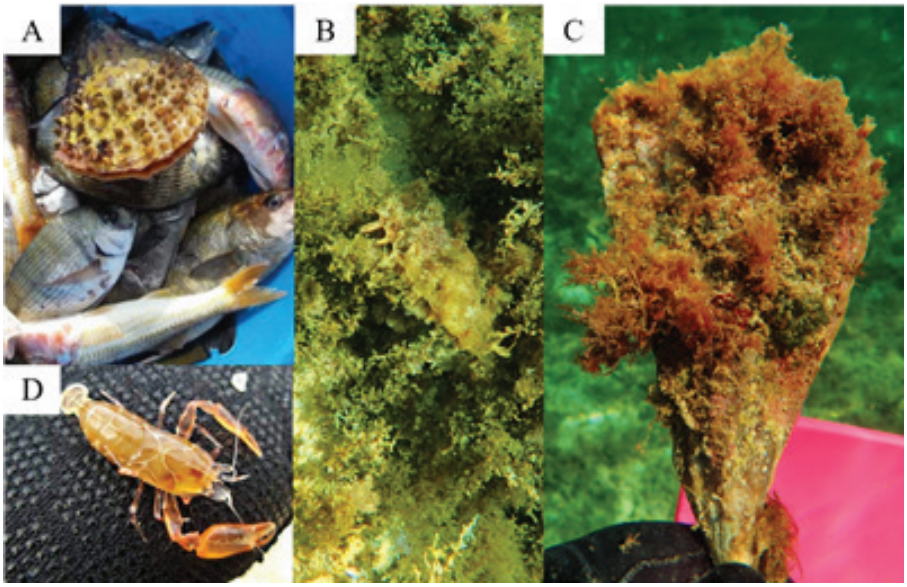

Fig. 6: *Pinna rudis* (A) top view of the bivalve in the image shared on social media. (B-C) One individual found during field survey in Regatta (Tripoli). (D) The symbiotic decapod *Pontonia pinnophylax*. Photo credits: (A, D) Adel Alanabi; (B, C) Jamila Rizgalla.

es and information. Furthermore, one individual of *P. rudis* (24 cm long) was found on the 29th July 2021, at 2-2.5 m depth between rocky substrate in Regatta (Tripoli) (32.854167°N, 13.054722°E; Fig. 6B-C) during snorkelling surveys spanning from 2018 to date. The individual was photographed *in situ*.

The finding of *Pinna rudis* in two locations almost 40 km apart strongly points towards a possible wider distribution in Libyan waters that has simply remained undetected so far. Interestingly, the association of the decapod *P. pinnophylax* with *P. rudis*, previously observed by Barreiros *et al.* (2016), is an association rarely reported; the decapod has been primarily observed in association with *P. nobilis* (Richardson *et al.*, 1997). Further studies are necessary to assess the distribution and abundance of both Pinnidae species in Libyan waters, for assessing their populations viability.

2.2 First documented record of the palaemonid shrimp *Brachycarpus biunguiculatus* (H. Lucas, 1846) from Libya

Jamila RIZGALLA

While the circumtropical palaemonid shrimp *Brachycarpus biunguiculatus* (H. Lucas, 1846) is widely distributed in the Mediterranean basin, its records are sporadic (Spinelli *et al.*, 2017; Kampouris *et al.*, 2018). It is a

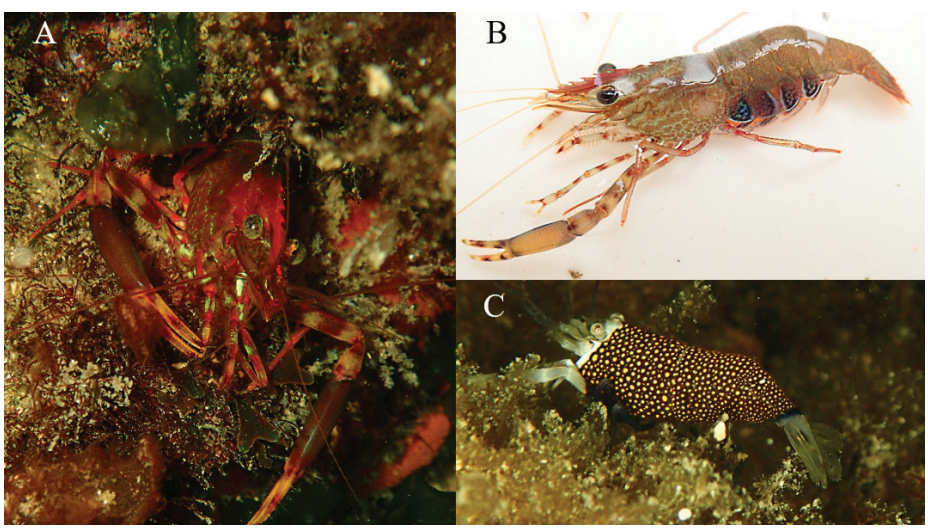

Fig. 7: *Brachycarpus biunguiculatus* found within a rock fissure (A); (B) gravid female (total length = 5 cm; carapace length = 12 mm) (missing right claw), with a cluster of reddish eggs, 0.5 mm in diameter. (C) *Gnathophyllum elegans*. Photo credit: Jamila Rizgalla.

cryptic animal, mostly nocturnal, hiding during the day in caves and crevices (Corredor, 1978; Kampouris *et al.*, 2018). This behaviour could explain its absence from reports on crustaceans in Libyan waters (e.g., Abushaala *et al.*, 2014). In the present study *B. biunguiculatus* is recorded in the western part of Libya.

Two *B. biunguiculatus* specimens were found on 30 June 2021, at 0.5-1 m depth, in a crevasse along rocky formations (Fig. 7A-B), during snorkelling surveys carried out between May-November 2018-to date to assess marine biodiversity in a natural bay called Regatta in Tripoli (for description see Rizgalla *et al.*, 2018) (32.854167°N, 13.054722°E). The specimens were photographed *in situ*, and one individual was sampled fixed in 86% ethanol, and placed in the author's private collection. The identification was based on Okuno & Osawa (1994). The species were found along with the bumblebee shrimp *Gnathophyllum elegans* (Risso, 1816) (Fig. 7C) and *Lysmata seticaudata* (Risso, 1816).

2.3 Grant's rockling, *Gaidropsarus granti* (Regan 1903) (Gadiformes: Gaidropsaridae) in the Central Mediterranean, with new records from Malta

Adriana VELLA, Noel VELLA and Sandra AGIUS DARMANIN

Gaidropsarus granti (Regan, 1903) is a rarely encountered deep-water fish species that was firstly described from the Atlantic Ocean and is often associated with deep coral communities (Bello, 2018). In the Mediterranean Sea it was first recorded in 1989-1990 (Orsi Relini & Relini, 2013), followed by a few other records in the region (Bello, 2018 and references within).

On the 5th May 2021 a local small-scale fisher caught a 298 mm long specimen (Fig. 8) west from the island of Gozo, Malta (coordinates: 36.00°N, 14.10°E), within the Maltese Fisheries Management Zone at a depth of around 290 m using bottom longlines. According to the fisher on the same day he also found another Grant's rockling in the mouth of a European conger, *Conger conger* (Linnaeus, 1758). After capture, the fisher communicated with the authors who identified the specimen following Orsi Relini & Relini (2013). The specimen had asymmetric brown- and cream-coloured reticulations over the head and the dorso-lateral area with a cream-coloured belly. The tail and tail peduncle had brown spots, with smaller sparse brown spots on the lower lateral area. The meristic counts were as follows: second dorsal fin = 59, pectoral fins = 21 and anal fin = 48 rays.

A tissue sample was genetically analysed for the partial 12S rRNA, 16S rRNA and cytochrome oxidase subunit I gene (COI) following Vella *et al.* (2016). The sequences were deposited in GenBank under accession numbers MZ574570 (12S), MZ574571 (16S) and MZ574564 (COI). Genetics validated species identity with the COI data showing a 100% match to KY370533 and KY250239, and 99.9% to KY250238, all representing *G. granti* collected from Spain, Mediterranean Sea (Barros-García *et al.*, 2017). BOLD search placed the specimen within BOLD:ABA2794 which belongs to the species. A 100% match for the 16S with KC980946 and a 100% match for the 12S with KC980975 both representing the same specimen of *G. granti* collected from the Azores (Francisco *et al.*, 2014). This study adds to the little genetic data currently available for this poorly studied species.

Records of *G. granti* in the central Mediterranean have been on the increase, highlighting the importance of further deep-water research to better understand the biology of this species and its interspecific interactions within the little-known deep-water communities in the region.

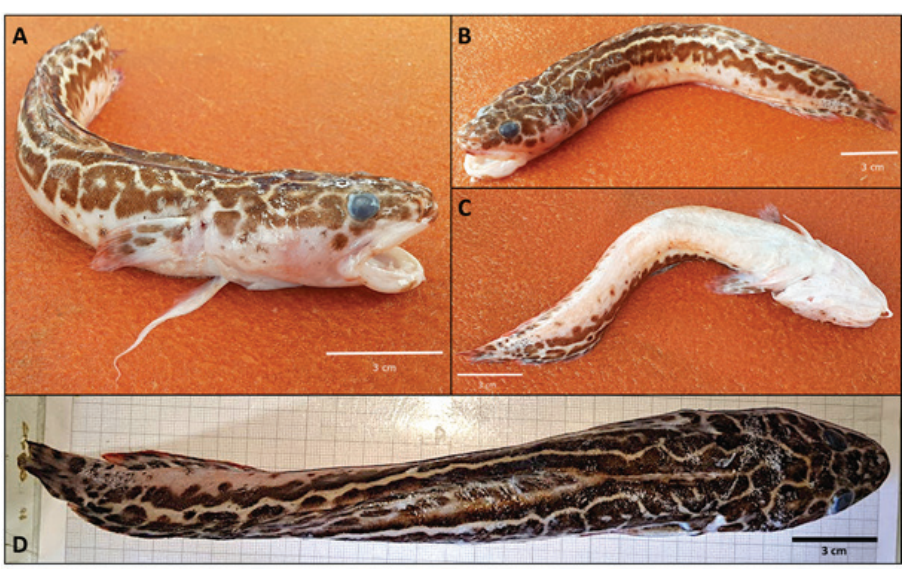

Fig. 8: Photos of the analysed *Gaidropsarus granti* from Malta. A and B - right and left lateral views respectively; C - ventral view; D - dorsal view (scale bars 3 cm).

2.4 Multiple concomitant reports of the rare hydromedusan species *Aequorea forskalea* Péron & Lesueur, 1810 in Maltese waters

Alan DEIDUN and Stefano PIRAINO

The hydrozoan genus *Aequorea* has 24 valid species in the world, with four or five of them occurring in the Mediterranean Sea: two natives, *A. forskalea* and *A. pensilis*, and two non-indigenous species, namely *A. conica* and *A. macrodactyla* (Boero & Bouillon, 1993; Gravili *et al.*, 2013, Mizrahi *et al.*, 2015). An additional *Aequorea* species was purportedly recorded in 2011 from Turkish waters as *A. globosa* (Turan *et al.*, 2011), but it should more probably be referred to as *A. australis*, a common species in the Red Sea.

Aequorea forskalea Péron & Lesueur, 1810 has been reported from all over the world, from the Atlantic, the Indo-Pacific region, and throughout the Mediterranean Basin, especially in the Adriatic Sea (Boero & Bouillon, 1993). The species can be considered as native but inherently rare (in space and time) within the Mediterranean region. The case of Maltese waters is paradigmatic of such rarity, with a total of just 20 reports for the species having been received over the 2010-2020 period by the *Spot the Jellyfish* citizen science campaign operated by the University of Malta.

During the last week of March and the first week of April 2021, a short-lived but intense occurrence of this species was recorded from nearshore waters of the Maltese archipelago, with the reports being submitted to the *Spot the Jellyfish* campaign (www.ioikids.net/jellyfish) by a variety of SCUBA and skin divers, boat owners as well as beach-goers. The reports received were validated by examining accompanying photo or video evidence, and unsubstantiated reports were discarded (Fig. 9, Table 4). *Aequorea forskalea* is identified through the characteristic closely-spaced radial canals spanning the entire circumference of the umbrella.

An analysis of the attributes of these reports indicates that live individuals of the species were encountered exclusively in the upper few meters of the water column and, except for one offshore record, within shallow embayments along the northern and western coastline of the Maltese archipelago. Observed individuals exhibited a bell diameter which fell within the 11-15 cm diameter range. The spring timing of the *A. forskalea* records reported upon within this study is consistent with the timing of previous occurrence events by the same species within Maltese waters, with all pre-2021 records of the species being made over the late February-early May period, with just three exceptions (sightings made in July-August). The species was always observed as single individuals or in few numbers, except for one record, which referred to a maximum of ten individuals. The fact that a single offshore record of the species was submitted corroborates the hypothesis that *A. forskalea* – a meroplanktonic species – can mostly occur in the surface waters close to shore to move at a greater depth offshore, taking advantage of onshore currents to avoid oceanic dispersal and secure larval settlement on the shelf (Sparks *et al.*, 2005).

Fig. 9: Selection of *Aequorea forskalea* photos submitted to the *Spot the Jellyfish* citizen science campaign over the March-April 2021 period. A = report no. 4; B = report no. 9; C = report no. 1; D = report no. 5; E = report no. 6; F = report no. 13 (Table 4). Photo credits: Patrick Schembri, Francesca Vincenti, Antonio Impliantini, Morgane Duffy, Glorianne Sciberras and Conrad Neil Attard.

Table 4. Summary of the *Aequorea forskalea* records submitted to the *Spot the Jellyfish* campaign during the March-April 2021 occurrence event. M = Malta; G = Gozo; C = Comino.

Report reference	Date	Locality	Island	Coordinates		Number of individuals observed	Photo/Video	Live/beached individual
1	27.03.21	Cirkewwa	M	35.988°N	14.327°E	2	Photo	Live
2	27.03.21	Ghajn Tuffieha	M	35.928°N	14.343°E	1	Photo	Live
3	27.03.21	Golden Bay	M	35.933°N	14.343°E	2	Video	Live
4	27.03.21	Cirkewwa	M	35.988°N	14.327°E	2	Photo	Live
5	28.03.21	Ghadira	M	35.970°N	14.350°E	1	Photo	Live
6	28.03.21	Cirkewwa	M	35.988°N	14.327°E	3	Photo	Live
7	28.03.21	Xwejni Bay	G	36.078°N	14.247°E	1	Photo	Beached
8	28.03.21	Cirkewwa	M	35.988°N	14.327°E	2	Video	Live
9	29.03.21	Little Armier	M	35.989°N	14.359°E	2	Video	Live
10	30.03.21	Marsalforn	G	36.071°N	14.260°E	2	Photo	Live
11	30.03.21	Blue Lagoon	C	36.014°N	14.324°E	1	Photo	Live
12	31.03.21	Paradise Bay	M	35.982°N	14.332°E	2	Video	Live
13	31.03.21	Ghar Lapsi	M	35.826°N	14.423°E	1	Photo	Live
14	01.04.21	Offshore	M	35.901°N	14.278°E	1	Photo	Live
15	03.04.21	Ghajn Tuffieha	M	35.928°N	14.343°E	2	Photo	Beached
16	03.04.21	Ramla l-Hamra	G	36.061°N	14.285°E	5-10	Photo	Beached

2.5 First record of *Sudis hyalina* Rafinesque, 1810 in Libyan waters

Sara A. A. AL MABRUK and Bruno ZAVA

The barracudina *Sudis hyalina* Rafinesque, 1810 (Actinopterygii, Paralepididae) is a rarely captured Atlanto-Mediterranean mesopelagic-to-bathypelagic fish, inhabiting depths from 300 to 1500 m, or shallower waters for juveniles. It reaches a maximum length of 100 cm, with usual length from 25 to 40 cm (Bauchot, 1987; Golani *et al.*, 2006).

On the 16th March 2021 a fisher informed directly one of the authors (SAM) about the capture of an unknown fish, providing photos. The specimen was identified as *S. hyalina* from the available photos, following Bauchot (1987). It showed a long pectoral fin, large teeth on lower jaw and it was silvery with pink shadows (Fig. 10). The fish was caught with a longline, off the port of Susa, north-eastern Libya (coordinates 32.98524°N, 21.71217°E), at 325 m depth, over rocky substrate. The approximate total length, measured on board by the fisher, was 40 cm.

The species is recorded almost all along the Mediterranean. Considering the marine regions contiguous to Libya, *S. hyalina* is known from the Strait of Sicily to the west (Bauchot, 1987; Relini & Lanteri, 2010) and it has been recently reported from the Egyptian waters to the east (Farrag, 2016). Up to date, the species has not been listed among the marine ichthyofauna of Libya (cf. Elbaraasi *et al.*, 2019). The first finding of *S. hyalina* in the waters of the country described here fills a gap on the geographical distribution of the species in the southern waters of the Mediterranean Sea.

Fig. 10: *Sudis hyalina* caught in Libyan waters. Photo credit: Waled Abdelsalam (Susa).

3. ADRIATIC SEA

3.1 Occurrence of the tope shark *Galeorhinus galeus* (Linnaeus, 1758) in the Northern Adriatic Sea

Diego BORME and Rocco AURIEMMA

The tope shark (or school shark) *Galeorhinus galeus* (Linnaeus, 1758) is a medium-sized shark, up to 2 m long, distributed world-wide in temperate waters: Northeastern Atlantic, Southwestern Atlantic, off South Africa, Mediterranean Sea, and Pacific Ocean (Compagno *et al.*, 2005). *Galeorhinus galeus* is a benthopelagic oceanodromous species found usually at depths between 20 and 470 m (Fisher *et al.*, 1987). It occurs in small schools, which show highly migratory attitude, especially at higher latitudes. Bony fish and squids are the most common preys of the species, with other benthic organisms occurring in its diet. The maturity is reached at 120-170 cm in males and at 130-185 cm in females (Fisher *et al.*, 1987). This species was important for fisheries, especially off Uruguay, Argentina, California, and Southern Australia, but now its populations are showing rapid decline due to overfishing and is listed as critically endangered at global scale by the IUCN Red List of Threatened Species (Walker *et al.*, 2020).

In the Mediterranean Sea *G. galeus* is considered a rare species, mainly occurring in the western areas (Bini, 1967). It is usually caught by gillnets, longlines, and occasionally by trawling nets. In this area, it is sold as "smooth-hound" (*Mustelus* spp.) or "blue shark" (*Prionace glauca*), making the recording of this species almost completely neglected. In the Adriatic, considering 2575 trawling tows during scientific fishing cruises, a total of 18 individuals of *G. galeus* were caught in Hvar (1948-49) and Županović (1957-58) expeditions, while no specimens were recorded during Jukić (1963-71), GRUND (National Group on Demersal resources assessment) (1994-95) and MEDITS (International bottom Trawl Survey in the Mediterranean) (1994-2005) scientific surveys (in Ferretti *et al.*, 2013). During 50 interviews with fishers from the Northern Adriatic, with a total of 1905 years of fishing experience (mean 38.1 ± 13.9), only 16 of them remember at least one catch of this species and consider it very rare (authors' unpublished data). Due to its rarity, there is a significant lack of knowledge about the biology and behaviour of this species in the Adriatic Sea.

On the 20th October 2020, an immature female specimen of *G. galeus*, 86 cm long and weighing 2.93 kg (Fig. 11), was incidentally caught by bottom-set gillnets in the Northern Adriatic Sea, 5.5 nautical miles offshore the river Po delta (45.075° N, 12.555° E), at 25 m of depth. The main diagnostic features of the species were recognized based on Bini (1967). This is one of the northernmost documented reports of this species in the Mediterranean Sea. The northernmost documented specimen was a juvenile female caught off Grado (not specified position) in November 1934 and is currently preserved at the Natural History Museum of Trieste (Italy).

Fig. 11: Dorsal view of the whole body (A), mouth and teeth (B), and view of the caudal fin (C) of a female *Galeorhinus galeus* specimen caught in the Northern Adriatic Sea on the 20th October 2020. Photo credit: Diego Borme.

3.2 First record of adult *Facciolella oxyrhynchus* (Actinopterygii, Anguilliformes, Nettastomatidae) in the Adriatic Sea

Filippo DOMENICHETTI, Roberto CACCIAMANI and Federico CALÌ

Facciola's sorcerer *(Facciolella oxyrhynchus)* belongs to Nettastomatidae family and its distribution area includes the Mediterranean Sea and the Eastern Atlantic Ocean, from Portugal to Angola (Saldanha, 1984). It is mainly found up to 730 m but occurs also in the shallower zone of the continental shelf (Bellotti, 1883).

This paper reports the first occurrence of adult *Facciolella oxyrhynchus* in the Adriatic Sea (Fig. 12A), since up until this record, only leptocephali have been found (Anibaldi *et al.*, 2016). The specimen was caught during a yearly survey performed by CNR-IRBIM on 15 October 2019 in the Pomo Pit area (42.654333° N, 14.74535° E), using an otter trawl equipped with an experimental net, at the depth of 173 m. The specimen was morphologically identified using Golani *et al.* (2008) as a reference, it was fixed in 4% formalin solution and stored in our fish collection. It has a slender, scaleless body, sub-cylindrical in the anterior part, becoming compressed behind anus and tapering in the caudal region. The fish measures 472 mm in total length (TL) and 33.3 gr in body weight. The head is elongated, 9.5% in TL; snout long and flat, with a conical fleshy extension at the tip (Fig. 12B). The mouth is wide, extending to the posterior margin of the eye; upper jaw (17.5 mm) is longer than lower (15.2 mm). Bands of teeth are present in both jaws; small and conical in outer rows, longer and pointed in inner rows. Vomer tooth patch is long and wide, originating behind lower jaw and terminating in front of the eye. Anterior nostril is at the tip of the snout while posterior is in the front of the eye. Dorsal fin originates just behind slit and it is confluent with anal and caudal fin; pectoral and pelvic fins are absent. The body colour is light-grey; a large number of small grey-black chromatophores are equally distributed along the body, getting larger and black in the caudal region; the tip of the caudal fin is black. Eyes show silver iris with black pupil.

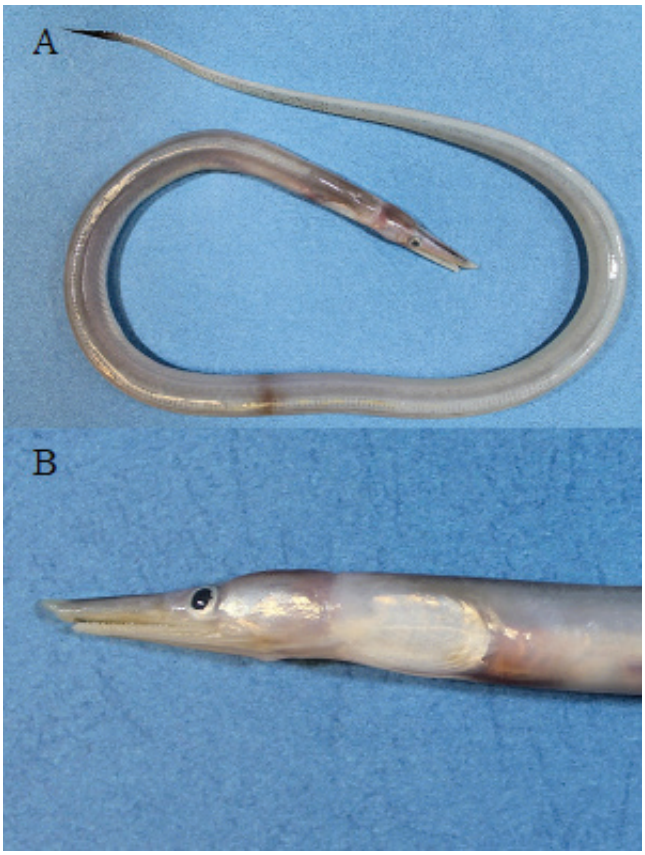

Fig. 12: The specimen of *Facciolella oxyrhynchus* caught in Pomo Pit (Adriatic Sea). A: whole body; B: head of the same specimen. Photo credit: Filippo Domenichetti.

Among nettastomatid eels, mainly *Nettastoma melanurum* and *F. oxyrhynchus* have been found in the Mediterranean Sea (Battaglia, 2013) with still few records of *Saurenchelys cancrivora* larvae (Papaconstantinou, 2014). The current specimen can be distinguished from *N. melanurum* by the fleshy extension at the tip of the snout, its lighter colour, the slit-like posterior nostril and a narrow ridge between the eyes (Golani *et al.*, 2008).

3.3 On the record of *Katsuwonus pelamis* (Scombridae) in the Eastern Adriatic Sea

Branko DRAGIČEVIĆ and Jakov DULČIĆ

The Skipjack tuna *Katsuwonus pelamis* (Linnaeus, 1758) is a cosmopolitan species that inhabits tropical and warm-temperate waters, including the Mediterranean Sea, but is not found in the Black Sea. It is a highly migratory species inhabiting depths between 0 and 260 m (Collette & Nauen, 1983). Recent occurrences in the Mediterranean, where it is considered uncommon, are reported from the central Tyrrhenian Sea and Southern Aegean Sea (Tiralongo *et al.*, 2019; Santin *et al.*, 2021). In the Eastern Adriatic Sea, this species has been documented only once when two specimens were collected in the vicinity of Trogir, Croatia in 1940 (Šoljan, 1948). One of these specimens is deposited in the Museum of Natural History in Zagreb (Šoljan, 1948). Recent ichthyological literature treats this species as rare, but sporadically caught in the Adriatic Sea, however, no confirmed records after 1940 have been reported (Dulčić & Kovačić, 2020).

On the 3rd of November 2020, one specimen of *K. pelamis* (Fig. 13) was caught by shore casting in the Southern Adriatic (Croatian coast, off Prevlaka; 42.3921°N, 18.5333°E) by a recreational fisher. The specimen was 66 cm long (TL) and weighed 5.4 kg. According to the

Fig. 13: The specimen of *Katsuwonus pelamis* caught in Prevlaka (Southern Adriatic, Croatia) on 3rd of November 2020. Photo credit: Denis Marković.

fisher, the caught specimen was part of a larger school, presumably of the same species, which passed by the coast during the fishing activity. Several photos of the caught specimen were sent to the authors of this paper for identification (Fig. 13). The specimen was identified following Collette & Nauen (1983). The most conspicuous features were purplish-blue, almost metallic, colour dorsally and silvery-white ventrally with 4 to 5 longitudinal dark bands. This is the second confirmed record of this rare species in the Adriatic Sea.

3.4 New record of the bigeye thresher shark *Alopias superciliosus* in the Albanian waters

Alen SOLDO and Rigers BAKIU

The bigeye thresher shark *Alopias superciliosus* Lowe, 1841 is a highly migratory species distributed in tropical and temperate waters. It has an exceptionally low annual rate of population increase compared to its congeners and as all thresher sharks (*Alopias* spp.) are inferred to be highly susceptible to overfishing; on the basis of their life history characteristics and low productivity, it is listed as Endangered in the Mediterranean in the IUCN Red List (Walls & Soldo, 2016). The bigeye thresher shark is considered a rare species throughout the Mediterranean, as its presence has been poorly documented. However, some recent studies suggest that this species might not be so rare and scarce but probably misidentified and reported as the common thresher *A. vulpinus* (Kleitou *et al.*, 2017). Previous records from adjacent waters include a single record off Montenegro (Tsiamis *et al.*, 2015), which was considered as the first record of this species for the Adriatic (Kovačić *et al.*, 2020) and a recent record from Albanian waters (Stamouli *et al.*, 2017).

The authors of this paper received from a fisher the photos of a specimen caught on 26th March 2019 (Fig. 14). The specimen was landed in Vlora, Albania, but it was caught by a pelagic trawl at depth of 30 m offshore from Himare (40.0970° N, 19.7475° E), which is in close vicinity to the previous record reported by Stamouli *et al.* (2017). The female specimen was easily identified due to its well-known distinctive characteristics such as relatively big eyes and the existence of prominent lateral grooves that start between and just behind the eyes. It was landed dead on a boat and was then measured: total length (TL) and weight (W) were reported as 320 cm and 120 kg, respectively.

Fig. 14: *Alopias superciliosus* specimen captured off Himare, Albania. Photo credit: Sherif Durmishaj.

4. EASTERN MEDITERRANEAN

4.1 Confirmation of the rare brown alga *Sargassum flavifolium* occurrence in the Eastern Mediterranean Sea

Konstantinos TSIAMIS and Polytimi-Ioli LARDI

The large brown alga *Sargassum flavifolium* Kützing (Sargassaceae, Phaeophyceae) is one of the rarest species of the genus *Sargassum* C. Agardh in the Mediterranean Sea (Cormaci *et al.*, 2012). According to Aouissi *et al.* (2018) its presence in the basin is vague. The only record of this species from the eastern basin is that by Tsekos *et al.* (1982) from Greece. Such a record, however, requires confirmation because it lacks description. Tsiamis *et al.* (2013) did not include the species in the related checklist of marine brown algae of Greece stating that "its occurrence in Greece needs to be confirmed".

In the present study, the occurrence of *Sargassum flavifolium* is confirmed for the first time in Greece, and consequently in the Eastern Mediterranean Sea. Several thalli of the species were observed at 0.5 m depth on a rocky shore of Argolikos Gulf, Aegean Sea (37.563141°N, 22.798464°E) in June 2019. Associated flora included *Ellisolandia elongata* (Ellis & Solander) K. Hind & G.W. Saunders, *Jania rubens* (Linnaeus) J.V. Lamouroux and *Dictyota* sp.. Herbarium voucher is deposited in the herbarium base of the Hellenic Centre for Marine Research (Athens).

Thallus 15 cm in height (Fig. 15), fixed to the substratum by a small basal disc; primary and secondary branches cylindrical and smooth; leaves (foliaceous branches) lanceolate, up to 25 mm long and 3-5 mm wide, unbranched, with a midrib and marginal acute teeth; leaf gas vesicles (aerocysts) present, located at the base of the leaves, spherical, 2-4 mm in diameter, with a short pedicel 1-2 mm long; fertile receptacles without a pedicel, rather pinnately branched and slightly compressed (Fig. 16), thickset, short, up to 4 mm long, muriculate and warty, and frequently bifurcate at the extremity; several receptacles can show either an air vesicle or a small leaf, inserted between fertile parts.

Our specimen is close to *Sargassum* sp. described from Algeria by Aouissi *et al.* (2018). In our specimen, however, fertile receptacles are rather pinnately branched (as in Kutzing's 1849 protologue of the species) and not branched in all directions (as in the specimens of Aouissi *et al.*, 2018). On the other hand, the receptacles of our specimen are muriculate and not smooth, which is in agreement with *Sargassum* sp. of Aouissi *et al.* (2018). We agree with the latter authors that several taxonomic characters of the genus *Sargassum* are elusive and can be overlapping among the species, and thus genetic tools would be helpful. The need to re-investigate the type material of *S. flavifolium* and of the other Mediterranean taxa belonging to the genus *Sargassum* can be useful as well.

Sargassum flavifolium is a canopy-forming and habitat-creating keystone species. As all *Sargassum* species, it is highly sensitive to natural and human disturbance. It should be mentioned that the species is listed in Annex II (List of Endangered and Threatened Species) of the Protocol of the Barcelona Convention concerning Specially Protected Areas and Biological Diversity in the Mediterranean (UNEP-PAM-RAC/SPA, 2012).

Fig. 15: *Sargassum flavifolium*, herbarium specimen; scale bar = 1 cm.

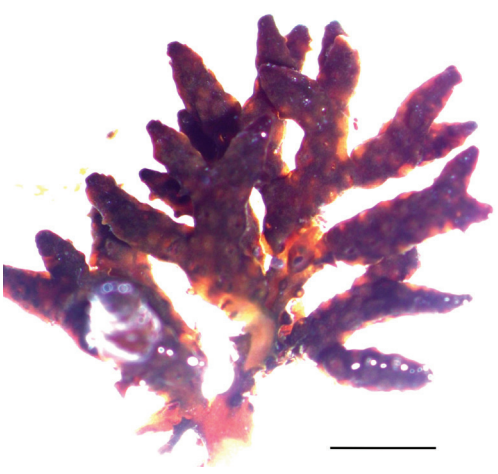

Fig. 16: *Sargassum flavifolium*, fertile receptacles; scale bar = 1 mm.

4.2 First record of *Bathophilus nigerrimus* Giglioli, 1882 in the Greek Seas

Konstantinos TSAGARAKIS, Apostolos SIAPATIS and Nicholas BADOUVAS

The scaleless dragonfish *Bathophilus nigerrimus* Giglioli, 1882, is a mesopelagic fish belonging to the family Stomiidae (Subfamily Melanostomiinae), distributed along the Atlantic Ocean and the Mediterranean Sea. However, records of the species in the Mediterranean are scarce; *Bathophilus nigerrimus* has been documented in the western (e.g., Balearic Islands: Olivar *et al.*, 2012) and central Mediterranean basin (e.g., Strait of Messina: Battaglia *et al.*, 2020), while in the Eastern Mediterranean, its presence has been confirmed in the Eastern Aegean Sea (Gökova Bay: Bilecenoğlu *et al.*, 2014) and the Levantine Sea (e.g., Golani & Levy, 2005). A substantiated record of the species has been absent so far in Greek waters, possibly due to the shortage of dedicated sampling in the mesopelagic ecosystems in which the species inhabits.

Nowadays, the ecology, behaviour and habitat preferences of the species are not well known. Regarding the Mediterranean, in the Balearic Islands, *B. nigerrimus* has been reported as a non-vertical migrator encountered in the Deep Scattering Layer (DSL) at a depth range around 400 m depth during both day and night (Olivar *et al.*, 2012), while in south Sardinian waters, the species has been caught at 1000 m depth by bottom trawling (Follesa *et al.*, 2011).

In the present study, the presence of *B. nigerrimus* is reported for the first time in the Cretan Sea (Eastern Mediterranean, Greece). Four specimens were caught during a mesopelagic fish survey onboard the R/V PHILIA (December 2019). The largest specimen (TL=60 mm, Fig. 17A) was caught with a pelagic trawl (35.530°N, 24.825°E) towed in a DSL around 700 m depth; bottom depth during hauling varied from 735 to 780 m. Two specimens (with TL= 47 and 35 mm) were caught also with a pelagic trawl (35.491°N, 25.009°E) towed in a DSL at 500-540 m depth with bottom depth varying between 527 and 633 m. The fourth and smallest specimen (TL=33 mm, Fig. 17B) was caught with a Methot frame (35.495°N, 25.008°E) towed in a DSL around 400-500 m depth, while the bottom depth was approximately 545 m. All specimens of this species could be distinguished from other congeners occurring in the area of Central Atlantic and the Mediterranean by the number of pectoral fin rays, which exceeded 15 (Sutton *et al.*, 2020). Morphometric and meristic characteristics were available only for the smallest individual (Table 5).

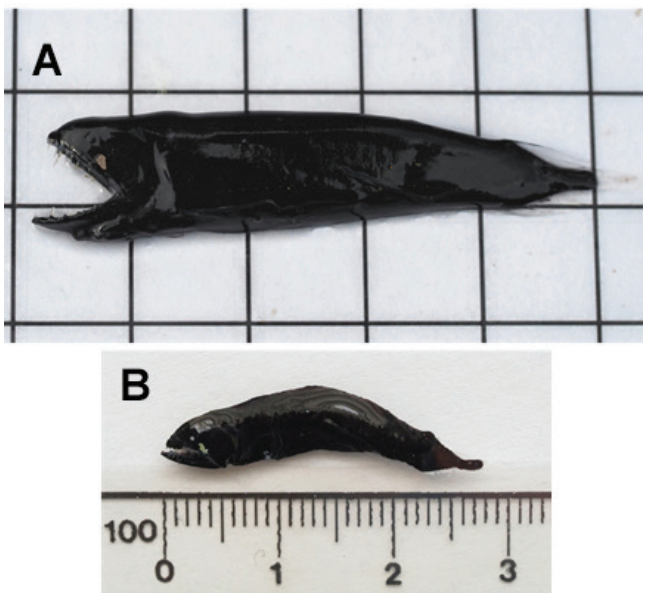

Fig. 17: Two of the four specimens (A: TL=60 mm; B: TL=33 mm) of *Bathophilus nigerrimus* caught in the Cretan Sea. Grid size is 1 cm.

The confirmed bathymetric distribution of the species in the Cretan Sea (400-700 m) is within the depth range already reported from other areas of the Mediterranean Sea. It is worth noting that *B. nigerrimus* was absent in more than 35 hauls performed in the twilight zone during surveys in other Greek Seas (namely the Gulf of Corinth, Saronikos and North Euboean Gulfs and the North Aegean Sea). More effort is needed to explore the presence of *B. nigerrimus* and possibly of other mesopelagic species in further regions of the Eastern Mediterranean Sea to improve our understanding of those ecosystems.

Table 5. Morphometric measurements (±0.5 mm for length) and meristic characteristics of the juvenile specimen of *Bathophilus nigerrimus*. The precise number of pectoral and pelvic fin rays could not be determined as some of these soft rays were destroyed during hauling.

Measurements	**mm**
Total length (TL)	33 mm
Standard length	29 mm
Head length	7 mm
Eye diameter	1.5 mm
Lower jaw length	6 mm
Pre-anal length	23.5 mm
Pectoral fin length	6 mm
Pelvic fin length	8 mm
Maximum height	5.5 mm
Head height (at eye position)	4 mm
Weight	0.230 g
Meristic characters	
Dorsal fin rays	11
Anal fin rays	9
Pectoral fin rays	>20
Pelvic fin rays	>20

4.3 The first occurrence of the copepod *Pteriacartia josephinae* (Crisafi, 1974) in the Aegean Sea

Tuba TERBIYIK KURT and Tamar GUY-HAIM

The pelagic copepod *Pteriacartia josephinae* (Crisafi, 1974) is a calanoid species belonging to the Acartiidae family and is endemic to the Mediterranean Sea (Belmonte, 1998; Razouls *et al.*, 2005-2021). This species strictly inhabits coastal waters and confined environments (Belmonte & Potenza, 2001). It was first described in 1974 in samples from Castellon and Milazzo ports in Italy (Crisafi, 1974). In the following years, *P. josephinae* was found in the Western Mediterranean, Ionian, Adriatic and Levantine seas (Razouls *et al.*, 2005-2021). To date, this species has not been observed in the Aegean Sea. *Pteriacartia josephinae* has a fragmented distributional pattern and was found only in 4.13% of the sampled areas in the Mediterranean Sea (Belmonte & Potenza, 2001). This study reports on the finding of both female and male *P. josephinae* specimens around the coastal waters of Seferihisar (Aegean Sea, Turkey). Its presence was recorded in zooplankton samples collected on the 13th June 2020 at two shallow stations (approximately 9-10 m; 38.1666° N, 26.7933° E; and 38.1597° N, 26.8112° E), with abundances of 10.5 and 15.7 ind. m^{-3}, respectively.

A detailed description of *P. josephinae* was given by Crisafi (1974) and Belmonte (1998). Crisafi pointed at the similarity of both female *P. josephinae* and *Paracartia latisetosa*. *Pteriacartia josephinae* (Fig. 18A) has two distinctive genital pores (Fig. 18B), gelatinous apron (Fig. 18B) and a very reduced P5 (Fig. 18C), similar to *P. latisetosa* (Belmonte, 1998). However, the morphology of the female genital segment in *P. josephinae* is unique and clearly separates it from other Acartiidae species. The genital segment of *P. josephinae* is asymmetrical, having a fin or wing-like pointed protrusion on the right (Fig. 18B). In addition, no setae on furcal rami are enlarged (Fig. 18B). In the males of *P. josephinae* (Fig. 18D), A1 geniculate does not have the swelling that is found in *Paracartia* (Fig. 18E), and a finger-like bulge is present on the distal half of the subterminal joint of the right branch of P5 (Fig. 18F) (Belmonte, 1998).

It is very difficult to infer the dispersal pathway(s) of *P. josephinae*. One possible hypothesis for why this species has not been found earlier in the Aegean Sea is its rarity in the Mediterranean Sea (Belmonte & Potenza, 2001). However, its presence has not been reported from nearby areas for a long time, and thus alternative explanations for its late discovery in the Aegean Sea should be raised, such as the combined introduction by ballast waters and spread by natural currents. This species was found in the Cilician Basin (Levantine Sea) (Uysal *et al.*, 2002) and could be carried by the branches of the Asia Minor current penetrating from the Levantine Sea in the South Aegean Sea (Pancucci-Papadopoulou *et al.*, 1992). Additionally, the study area is located between Kuşadası and Çeşme international ports. Therefore, there is a possibility that *P. josephinae* may have arrived with ballast waters of cruise ships, large tankers and bulk cargo carriers.

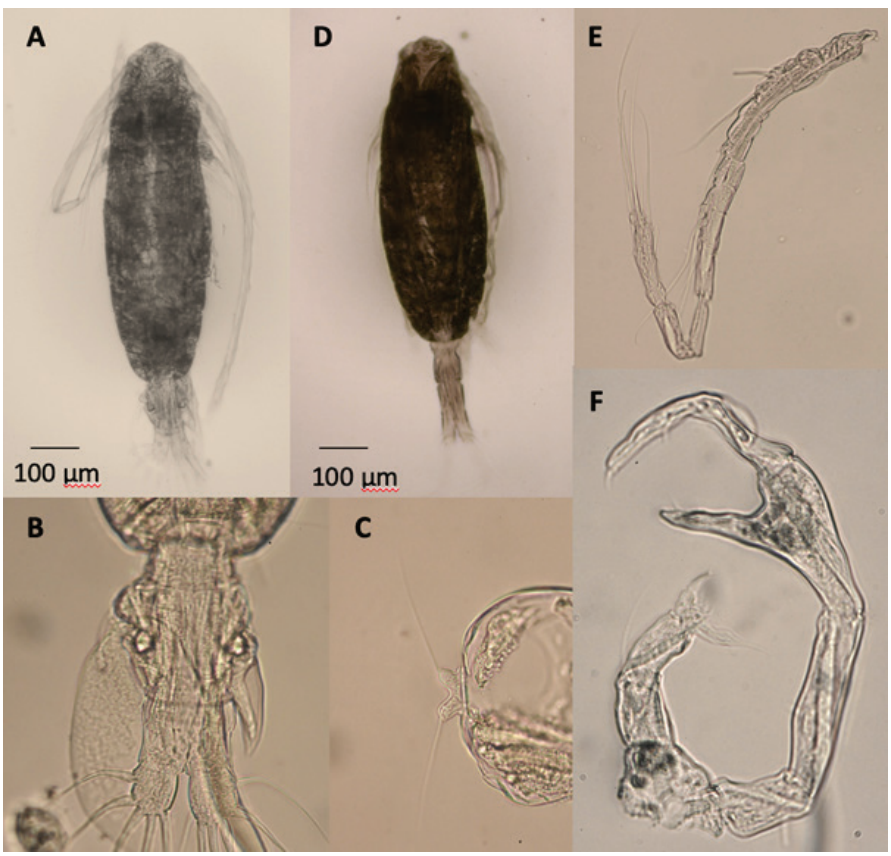

Fig. 18: *Pteriacartia josephinae* (Crisafi, 1974), A: female, B: female urosome, C: female P5, D: male, E: male A2, F: male P5.

4.4 *Placida cremoniana* (Trinchese, 1892) in the Eastern Mediterranean

Furkan DURUCAN and Fabio CROCETTA

The Cremona's sea slug *Placida cremoniana* (Trinchese, 1892) (Gastropoda: Heterobranchia: Sacoglossa) is a heterobranch mollusc of the family Limapontiidae Gray, 1847 that lives in shallow waters among various photophilic algae and is characterized by head, rhinophores, and upper third of cerata purple-black, whereas the remaining part of the body is yellow-orange (Mc Carthy *et al.*, 2017). Originally described from the Gulf of Naples (Italy, Mediterranean Sea), this taxon is known from several localities of the Mediterranean Sea, including the Adriatic Sea, and the Eastern Atlantic (Mytilineou *et al.*, 2016). Past literature records from other worldwide localities were considered incorrect by Mc Carthy *et al.* (2017), who recently disentangled the *P. cremoniana* species complex and described three species new to science.

During recent sampling activities held on the 24th December 2020 in Örnekköy, Lara (Antalya, Turkey) (36.847273°N, 30.800485°E), a single ~5 mm specimen of the *P. cremoniana* species complex (Fig. 19) was found at 0.5 m depth in a tidal pool characterized by a coarse-sand substrate and an algae carpet of *Corallina elongata* J. Ellis & Solander. The specimen was subsequently brought to laboratory, photographed with the aid of a stereomicroscope, and finally transferred in 96% ethanol for preservation in the personal collection of the first author (F.D., Antalya). It was identified as *P. cremoniana* based on the diagnostic colour pattern differences highlighted by McCarthy *et al.* (2017), and in particular by the black head with posterior white stripes from base to tip of the rhinophores (visible here in dorsal and lateral view), the two yellow-orange patches containing the eyespots (visible in lateral view), and by the yellow-orange line on the head that connects the yellow-orange eye patches to the dorsum (visible in lateral view).

Despite its peculiar and distinctive colouration, which should make it easy to spot during field activities, reliable records from the Eastern Mediterranean are so far lacking, and in particular the species has also never been reported from Turkey (e.g., Öztürk *et al.*, 2014; Mytilineou *et al.*, 2016; Crocetta *et al.*, 2015, 2020, among others). Therefore, this is the first documented record of this species for the easternmost Mediterranean Sea, and it considerably extends the known distribution range of the species.

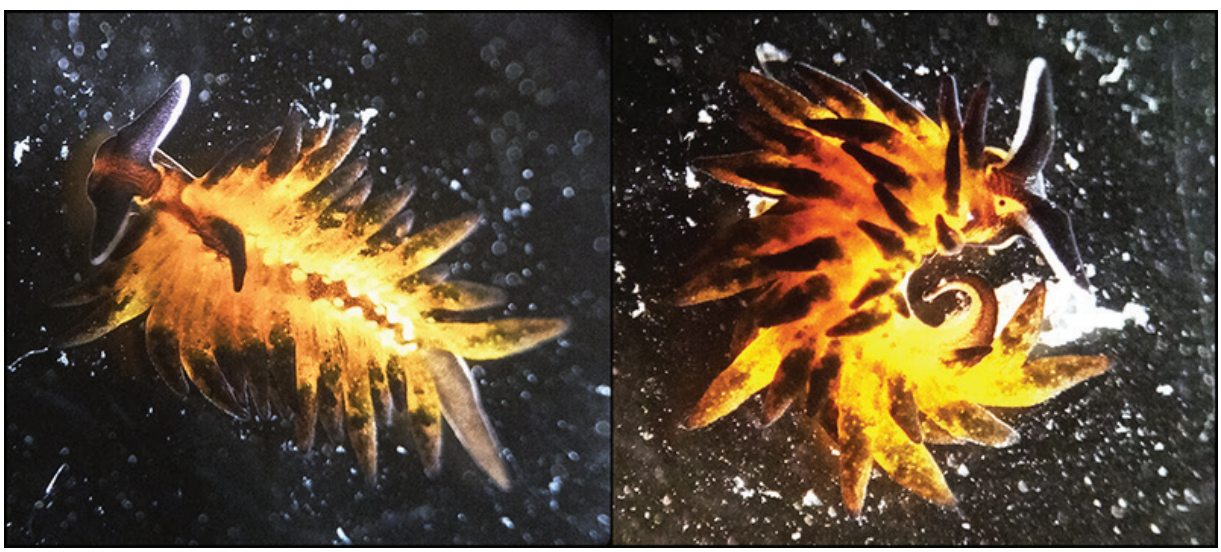

Fig. 19: *Placida cremoniana* from Örnekköy, Lara (Turkey): dorsal and lateral view.

4.5 Unusual records of a Yellowfin tuna and a Black marlin in the Eastern Mediterranean Sea

Nikolas MICHAILIDIS, Yiannis MANITARAS and Michel BARICHE

The Yellowfin tuna is a highly migratory pelagic and oceanic species found worldwide in tropical and subtropical seas but absent from the Mediterranean Sea (Collette & Graves, 2019). A single individual of the Yellowfin tuna *Thunnus albacares* (Bonnaterre, 1788) was captured by an artisanal fisher off Potima Bay, Pafos, Cyprus (34.8333°N, 32.3666°E), in October 1993. One of the authors (NM) met with the fisher and scanned old photos hanging on a wall. According to the fisher, the fish was spotted swimming alone in the area for several days. It was caught after several attempts on a handline baited with a mackerel. Its fork length (FL) was estimated to be 185 cm long and its weight was approximately 110 kg.

Besides morphometric and meristic characters, *T. albacares* can be recognized by the relatively long second dorsal (D2) and anal (A) fins, more elongate in large spec-

imens, which can reach to more than 20% of the FL. The pectoral fins (P) are also moderately long, usually reaching beyond the D2 fin origin but not beyond the end of its base. The species also has a metallic dark blue dorsal side, changing from yellow to silver on the ventral side; the ventral side is frequently crossed by about 20 broken, nearly vertical lines; D2, A, and all finlets are bright yellow in colour (Collette & Graves, 2019). The specimen from Cyprus shows the following combination of characteristics: long and yellow-edged D2 and A, P moderately long, broken lines on the ventral side and bright yellow finlets (Fig. 20). The Yellowfin tuna differs from the two congeneric species present in the Mediterranean Sea by the following characteristics: both the Atlantic Bluefin tuna *Thunnus thynnus* (Linnaeus, 1758) and the Albacore *Thunnus alalunga* (Bonnaterre, 1788) have significantly shorter D2 and A fins, which are never elongate even in large specimens, and a belly without broken lines. The P fins are significantly shorter in *T. thynnus*, never reaching the inter-space between the dorsal fins (D1, D2), and significantly larger in *T. alalunga*, reaching the dorsal finlets. *Thunnus thynnus* has a reddish brown D2 with the A and finlets dusky yellow, whereas *T. alaunga* has light yellow D2 and A with dark finlets. Finally, the latter species presents a white posterior margin in the caudal fin, which is not present in any of the other two species.

The Black marlin (Istiophoridae) is a pelagic oceanodromous fish species from the Indo-Pacific, but also regularly reported in the Southeastern Atlantic (Froese & Pauly, 2021). A single specimen of Black marlin had been reported, as *Makaira indica* (Cuvier, 1832), from the Ligurian Sea three decades ago (Orsi-Relini & Costa, 1987) and an earlier unsubstantiated record of a large billfish captured in the Ionian Sea could have also been a Black marlin record (Bini, 1968).

On 23 January 2021, a Black marlin *Istiompax indica* (Cuvier, 1832) was netted from the north of Tripoli, Lebanon (approximate coordinates: 34.5500°N, 35.8166°E). The specimen was found entangled in a gill net, set close to the surface and over a deep bottom (700-1000 m depth). Its lower jaw FL was estimated to be 300 cm, weighing about 285 kg (Fig. 21). A sample tissue was stored at the marine collection of the American University of Beirut (AUBM ST 1004). The cytochrome oxidase I (COI) mitochondrial gene was sequenced and matched those for *I. indica* available on GenBank using BLAST. The sequence was then deposited in the Barcode of Life Data system (BOLD), accession number BSII001-21.

This species can be easily recognised by the height of anterior lobe of D1 which is lower than its body depth, body not compressed laterally, highly elevated nape, and its P being rigid and cannot be folded back against the sides of the body. Both the Atlantic sailfish *Istiophorus albicans* (Latreille, 1804) and the Indo-Pacific sailfish *I. platypterus* (Shaw, 1792) differ by having a sail-like D1 higher than their body depth. Unlike *I. indica*, the P of the Blue marlin *Makaira nigricans*, Lacepède, 1802 and the Indo-Pacific blue marlin *Makaira mazara* (Jordan & Snyder, 1901) can be folded back against the sides of their bodies (Collette & Graves, 2019). Two billfishes are native to the Mediterranean Sea and present in Lebanese waters (Bariche & Fricke, 2020). These are the confamilial Mediterranean spearfish *Tetrapturus belone* Rafinesque 1810 and the Swordfish *Xiphias gladius* Linnaeus 1758. The Mediterranean spearfish differs from the Black marlin by the height of the anterior lobe of D1, being slightly greater than its body depth and slightly higher than the posterior part of the fin, as well as having the body well compressed laterally, the nape slightly elevated and the bill less than 18% of the body length. The Swordfish, *Xiphias gladius* Linnaeus 1758, also differs from the Black marlin by the absence of P, a short-based D1 which is well separated from D2, as well as the absence of scales or teeth on the body and jaws, respectively. Other billfishes have also been reported occasionally in the Mediterranean Sea and were considered vagrants (Tinti *et al.*, 2020; Di Natale, 2021).

To our knowledge, this is the first record of a Yellowfin tuna and the second record of a Black marlin for the entire Mediterranean Sea. The presence of the two large fishes in the easternmost part of the Mediterranean Sea is unexpected and confusing as to how they reached this region. It is not easy to conclude whether they arrived through the Suez Canal or the Strait of Gibraltar, and both pathways are theoretically possible. The earlier occurrence of the Black marlin in the central Mediterranean suggests an arrival from the Atlantic while the record from Lebanon might be explained by an arrival from the Red Sea through the Suez Canal.

Fig. 20: Yellowfin tuna *Thunnus albacares* recorded from Potima Bay, Pafos, Cyprus.

Fig. 21: Black marlin *Istiompax indica* recorded from north of Tripoli, Lebanon.

4.6 First record of *Corcyrogobius liechtensteini* (Kolombatović, 1891) in Cyprus

Markos DIGENIS and Vasilis GEROVASILEIOU

Liechtenstein's goby *Corcyrogobius liechtensteini* (Kolombatović, 1891) is a Mediterranean endemic species, reported from the Balearic Islands, the Sardinian Sea, the Tyrrhenian Sea, the Siculo-Tunisian Strait, the Adriatic Sea, the Ionian Sea, and the Aegean Sea (Ahnelt *et al.*, 1994; Ragkousis *et al.*, 2021). This cryptobenthic species is usually found in marine caves, crevices, hollows, cavities, among boulders and cobbles in multilayered bottoms, below biogenic structures (e.g., rhodophyte thickets and erect bryozoans), or even inside sponge cavities (Herler *et al.*, 1999; Kovačić *et al.*, 2012; Gerovasileiou *et al.*, 2015). Due to its highly cryptic habit, records of the species are fragmented, and its distribution range remains unknown (Kovačić *et al.*, 2012).

In August 2021, three *C. liechtensteini* individuals were observed and photographed during a SCUBA survey in two submerged tunnel-shaped caves, at 6-9 m depth, in Cape Greco Peninsula, Cyprus (Fig. 22). One individual was recorded in a tunnel, 9 m deep and 30 m long, while two more individuals were found at a nearby tunnel, 6 m deep and 15 m long (approximate coordinates: 34.9625° N, 34.0729° E). All three specimens were observed on the rocky walls and ceiling of the semidark sections, which were dominated by various sponges, polychaetes, bryozoans, and brachiopods (Fig. 22).

The recorded gobies were juveniles, approximately 1.5-2 cm in length, had an orangish-brown body with 10-15 transverse narrow bluish bars, and pale bars which extended downwards from the eye over cheek and preopercle (Fig. 22), which restricts the identification among Mediterranean Gobiidae to *C. liechtensteini* and *Odondebuenia balearica* (Pellegrin & Fage, 1907). The pale mottled nape poorly shaping pale transversal bends in front of the first dorsal fin and the lack of whitish spot at the dorsal edge of the opercle or white middorsal longitudinal stripe at nape, all match *C. liechtensteini*, distinguishing the observed specimens from *O. balearica* (Ahnelt *et al.*, 1994; Ragkousis *et al.*, 2021). To our knowledge this constitutes the sixth published record of *C. liechtensteini* from the Eastern Mediterranean Sea, the closest report being from Crete (Ragkousis *et al.*, 2021 and references therein), and represents the first record from Cyprus and the easternmost finding of this Mediterranean endemic goby.

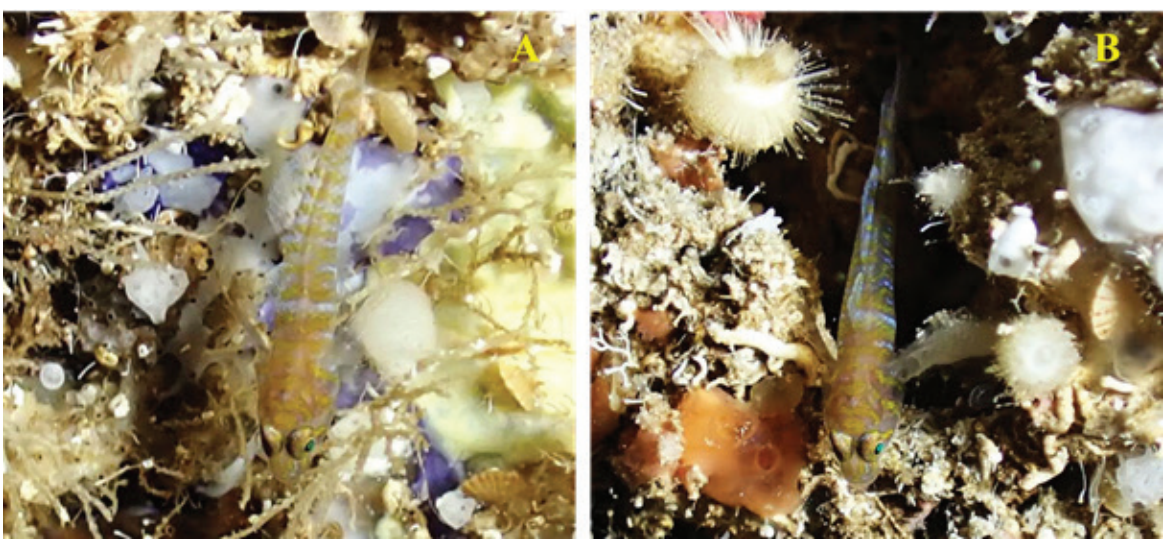

Fig. 22: *Corcyrogobius liechtensteini* individual photographed at different locations (A, B) on the wall of a tunnel-shaped cave in Cyprus, dominated by sessile invertebrates. Photo credit: Markos Digenis.

5. BLACK SEA

5.1 New record of *Gobius xanthocephalus* Heymer & Zander, 1992 in the Sea of Marmara

Cem DALYAN and Nur Bikem KESICI

The yellow-headed goby, *Gobius xanthocephalus* Heymer & Zander, 1992, has long been misidentified as *Gobius auratus* Risso, 1810 until Heymer & Zander (1992) clarified this issue. The distribution range of the species expanded from the Western Mediterranean Sea to the Eastern Atlantic Ocean (Wirtz & Herrera, 1995; Almeida & Arruda, 1998) and the Black Sea (Vasil'eva & Bogorodskii, 2004). However, in the Turkish waters

as well as the Eastern Mediterranean, *G. xanthocephalus* was not known until 2011. The first record of the species was presented as photographic evidence by Gökalp (2011) from the coasts of the North Aegean Sea.

On 16th September 2019, 112 individuals of *G. xanthocephalus* were observed and some of them were photographed (Fig. 23) during a 65 min long SCUBA dive at a depth range of 4-23 m along the coasts of the Buyukada Island, Sea of Marmara (Turkey). In addition, On 13th October 2019, four specimens were obtained with plastic bags during SCUBA dives at 5-7 m depth, from the coasts of the Burgazada Island (40.886°N; 29.055°E), Sea of Marmara. The specimens were observed and collected from the underside of rocks (20 cm to 1 m diameter) and from nests of the bivalve *Limaria hians* (Gmelin, 1791). The samples are stored in the Istanbul University Science Faculty, Hydrobiology Museum (code IUSHM 2019-1413).

The diagnosis is based on a minimum combination of characters that positively identify *G. xanthocephalus* among the members of the Gobiidae family present in the Mediterranean: body with longitudinal rows of dots or small dashes; the bodies of fresh specimens mostly pale yellow with bright yellow heads (Fig. 23A) or at least head yellow if body whitish (Fig. 23B); the fixed specimens do not have blotches among their lateral midlines; pelvic disc emarginated less than 1/3. The total length range of the four specimens examined was 33-50 mm (27-43 mm SL). Important meristics of the species were counted as follows: D1 VI; D2 I/14-15; A I/13-14; C 14-15 branched rays; P 19-20; V I/5+5/I and LL 44-47. Cheek naked. Predorsal area with small cycloid scales. Caudal fin rounded. The head canal system is fully developed with anterior and posterior oculoscapular canal and preopercular canal, with pores σ, λ, κ, ω, α, β, ρ, $\rho 1$, $\rho 2$, and γ, δ, ε respectively. Suborbital row *3* reaching row *d*. Row *6i* extends to below level of row *d*.

This work reports on an established population of *G. xanthocephalus* in the Sea of Marmara, filling the gap in the species distribution between the Aegean Sea and the Black Sea.

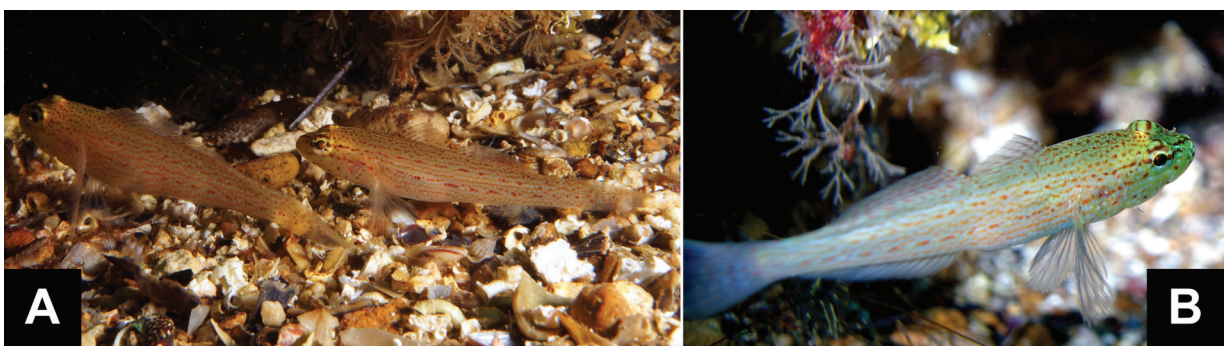

Fig. 23: The observed specimens of the *G. xanthocephalus* (A) photo credit: Meltem Kartal Taşdelen and (B) photo credit: Soner Işın.

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