

Mediterranean Marine Science

Vol 24, No 2 (2023)

VOL 24, No 2 (2023)



New records of rarely reported species in the Mediterranean Sea (July 2023)

DANIELE GRECH, EMANUELE ASCIUTTO, RIGERS BAKIU, PIETRO BATTAGLIA, CHAIMA BEN-GRIRA, ÖZNUR YAZILAN ÇAMLIK, ROBERTO CAPPUCCINELLI, LEILA CARMONA, SAHAR CHEBAANE, FABIO CROCETTA, ANDREA DESIDERATO, FILIPPO DOMENICHETTI, JAKOV DULČIĆ, PAOLO FASCIGLIONE, BELLA S. GALIL, MOHAMAD YOUNIS GALIYA, RAZY HOFFMAN, JOACHIM LANGENECK, LOVRENC LIPEJ, ENRIC MADRENAS, MICHELA MARTINELLI, MARÍA DEL ROSARIO MARTÍN-HERVÁS, CLAUDIO MASALA, FRANCESCO MASTROTOTARO, BORUT MAVRIC, FEDERICA MONTESANTO, SERENA MUCCIOLO, RANIM MOHAMAD OTHMAN, JUAN SEMPEREVALVERDE, ALEN SOLDI, ANDREA SPINELLI, ERGÜN TAŞKIN, FRANCESCO TIRALONGO, ANDREA TOSO, EGIDIO TRAINITO, DOMEN TRKOV, DYANA VITALE, LORENZO ZACCHETTI

doi: [10.12681/mms.30401](https://doi.org/10.12681/mms.30401)

To cite this article:

GRECH, D., ASCIUTTO, E., BAKIU, R., BATTAGLIA, P., BEN-GRIRA, C., ÇAMLIK, ÖZNUR Y., CAPPUCCINELLI, R., CARMONA, L., CHEBAANE, S., CROCETTA, F., DESIDERATO, A., DOMENICHETTI, F., DULČIĆ, J., FASCIGLIONE,

P., GALIL S. , B., GALIYA, M. Y., HOFFMAN, R., LANGENECK, J., LIPEJ, L., ENRIC MADRENAS, E. M., MARTINELLI, M., MARTÍN-HERVÁS, M. D. R., MASALA, C., MASTROTOTARO, F., MAVRIC, B., MONTESANTO, F., MUCCIOLO, S., OTHMAN, R. M., SEMPEREVALVERDE, J., SOLDI, A., SPINELLI², A., TAŞKIN, E., TIRALONGO, F., OSO, A., TRAINITO, E., TRKOV, D., VITALE, D., & ZACCHETTI, L. (2023). New records of rarely reported species in the Mediterranean Sea (July 2023). *Mediterranean Marine Science*, 24(2), 392–418.
<https://doi.org/10.12681/mms.30401>

New records of rarely reported species in the Mediterranean Sea (July 2023)

Daniele GRECH^{1,2,3}, Emanuele ASCIUTTO⁴, Rigers BAKIU⁵, Pietro BATTAGLIA⁴, Chaima BEN-GRIRA⁶, Öznur Yazılan ÇAMLIK⁷, Roberto CAPPUCCINELLI⁸, Leila CARMONA^{9,10}, Sahar CHEBAANE^{6,11,12}, Fabio CROCETTA¹³, Andrea DESIDERATO¹⁴, Filippo DOMENICHETTI¹⁵, Jakov DULČIĆ¹⁶, Paolo FASCIGLIONE¹⁷, Bella S. GALIL¹⁸, Mohamad Younis GALIYA¹⁹, Razy HOFFMAN¹⁸, Joachim LANGENECK^{2,20}, Lovrenc LIPEJ²¹, Enric MADRENAS²², Michela MARTINELLI¹⁵, María del Rosario MARTÍN-HERVÁS⁹, Claudio MASALA³, Francesco MASTROTOTARO^{20,23}, Borut MAVRIC²¹, Federica MONTESANTO^{20,24}, Serena MUCCIOLO¹⁴, Ranim Mohamad OTHMAN¹⁹, Juan SEMPERE-VALVERDE²⁵, Alen SOLDÓ²⁶, Andrea SPINELLI²⁷, Ergün TAŞKIN⁷, Francesco TIRALONGO^{28,29}, Andrea TOSO^{2,20,30}, Egidio TRAINITO³¹, Domen TRKOV²¹, Dyana VITALE³² and Lorenzo ZACCHETTI¹⁵

¹IMC - International Marine Centre, Loc. Sa Mardini, Torregrande - 09170 Oristano, Italy

²NBFC, National Biodiversity Future Center, Palermo 90133, Italy

³Subacquei per la Scienza, Italy

⁴Stazione Zoologica Anton Dohrn, Sicily Marine Centre, c/o Villa Pace, Contrada Porticatello 29, 98167 Messina, Italy

⁵Department of Aquaculture and Fisheries, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez, Albania

⁶TunSea, 33 rue de l'Irak, la Soukra, Tunisia

⁷Manisa Celal Bayar University, Faculty of Arts and Sciences, Department of Biology, Yunusemre, Manisa 45140, Türkiye

⁸Porto Conte Ricerche s.r.l., Alghero, Italy

⁹Departamento de Biología, Facultad de Ciencias del Mar y Ambientales, Campus de Excelencia Internacional del Mar (CEI-MAR), Universidad de Cádiz, 11510 Puerto Real, Spain

¹⁰Instituto Universitario de Investigación Marina (INMAR), Campus de Excelencia Internacional del Mar (CEI-MAR), Universidad de Cádiz, Av. República Saharaui, s/n, 11510 Puerto Real, Spain

¹¹MARE - Marine and Environmental Sciences Centre/ ARNET - Aquatic Research Network, Regional Agency for the Development of Research, 13 Technology and Innovation (ARDITI), Funchal, Portugal

¹²Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal

¹³Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, Villa Comunale, 80121 Naples, Italy

¹⁴Department of Invertebrate Zoology and Hydrobiology, Faculty of Biology and Environmental Protection, University of Lodz, Banacha 12/16, 90-237 Lodz, Poland

¹⁵National Research Council - Institute of Marine Biological Resources and Biotechnologies (CNR IRBIM), Ancona, 60125, Italy

¹⁶Institute of Oceanography and Fisheries, Šet. I. Meštrovića 63, 21000 Split, Croatia

¹⁷Research Infrastructures for Marine Biological Resources, Stazione Zoologica Anton Dohrn, Villa Comunale, 80121 Naples, Italy

¹⁸The Steinhardt Museum of Natural History, Israel National Center for Biodiversity Studies, Tel Aviv University, Tel Aviv 6997801

¹⁹Department of Zoology, Faculty of Sciences, Tishreen University, Lattakia, Syria

²⁰Consorzio Nazionale Interuniversitario per le Scienze del Mare (CoNISMa), U.L.R. di Lecce, DiSTeBA, Lecce, Italy

²¹Marine Biology Station Piran, National Institute of Biology, Fornače 41, SI- 6330 Piran, Slovenia

²²VIMAR, C/ Rocafort 246, 08029 Barcelona, Spain

²³Department of Bioscience, Biotechnology and Environmental, University of Bari, Via E. Orabona, 4, 70125, Bari, Italy

²⁴University of Nebraska - Lincoln, 3310 Holdrege Street, Lincoln, NE 68583, USA

²⁵Departamento de Zoología, Facultad de Biología, Universidad de Sevilla, Avda Reina Mercedes s/n, 41012, Sevilla, Spain

²⁶Department of Marine Studies, University of Split, Croatia

²⁷Research Department, Fundación Oceanogràfic de la Comunitat Valenciana, Oceanogràfic, Ciudad de las Artes y las Ciencias, 46013, Valencia, Spain

²⁸Department of Biological, Geological and Environmental Sciences, University of Catania, Catania, Italy

²⁹Ente Fauna Marina Mediterranea, Avola (SR), Italy

³⁰Department of Biological and Environmental Sciences and Technologies (DiSTeBA), University of Salento, Lecce, Italy

³¹Department of Integrative Marine Ecology (EMI), Stazione Zoologica Anton Dohrn-National Institute of Marine Biology, Ecology and Biotechnology, Genoa Marine Centre, Villa del Principe, Piazza del Principe 4, 16126 Genoa, Italy

³²Food and Environmental Research Group (SAMA-UV), Research Desertification Centre (CIDE) (CSIC-University of Valencia-GV), Moncada-Naquera Road, Km 4.5, 46113 Moncada, Valencia, Spain

Abstract

This Collective Article presents new information about the occurrence of 23 marine taxa that belong to five Phyla: two Chlorophyta, one Annelida, six Mollusca, three Arthropoda, eleven Chordata (one Ascidiacea, one Elasmobranchii and nine Teleostei) and extending from the Western Mediterranean to the Levantine Sea. All these records were reported from nine countries from the western to the eastern Mediterranean Sea, with a broad biogeographical coverage as follows: **Spain:** first records of the sacoglossans *Cyerce graeca* and *Placida tardyi* for the Alboran Sea and first records of the nudibranch *Marionia gemmii* for the Mediterranean waters of Spain; first records of nudibranch *Algarvia alba* in the Mediterranean Sea. **Italy:** First report of the long-legged crab *Paragalene longicrura*, a further new Mediterranean record of the rare offshore rockfish *Pontinus kuhlii*, first documented record of the spiny butterfly ray *Gymnura altavela* in Sardinia (Tyrrhenian Sea), new record of the red-spotted wrasse *Lappanella fasciata* from the Messina Strait, first documented record of the rarely observed brown moray *Gymnothorax unicolor* in the Ionian coast, first record of the colonial ascidian *Botrylloides israeliensis*, first record of the Morocco dentex *Dentex maroccanus*, first record of mottled shore crab *Pachygrapsus maurus* and of an adult specimen of barracudina *Lestidiops sphyrenoides* in the Adriatic Sea, and further new Mediterranean records of Ross worm *Sabellaria spinulosa* along the same coast. **Tunisia:** second record of smalleye squaretail *Tetragonurus cuvieri* from the African Mediterranean coast. **Slovenia:** first records of the sea slug *Trapania graeffei* and *Melanochlamys wildpretii*, with the last one also representing the northernmost finding of this species. **Croatia:** northernmost record of the endangered twaite shad *Alosa fallax* in the Adriatic coast. **Albania:** first records of the Mediterranean spearfish *Tetrapturus belone*. **Türkiye:** first record from the Aegean coasts for Türkiye of the green macroalgae *Cladophora battersii* and *Valonia aegagropila*. **Israel:** first record of the skeleton shrimp *Caprella acanthifera* in the Southeastern Mediterranean Sea. **Syria:** first record of the Smooth grenadier *Nezumia aequalis* from Syrian marine waters.

Introduction

The Mediterranean Sea is a semi-enclosed basin, typically oligotrophic for the most of its area. The diversity in the marine environment is high and the whole basin is characterized as an important “biodiversity hotspot”, with more than 8,500 macroscopic marine organisms reported (4-18% of species living in the whole marine environment; Bianchi & Morri, 2000) in an area which covers only the 0.82% of the World Ocean (Karydis *et al.*, 2021). This huge density of biodiversity includes many endemic species, as well as species of particular interest (e.g., protected and threatened) as well as non-indigenous species (Zenetos *et al.*, 2022). The increasing human pressure on marine resources in the Mediterranean Sea poses a threat to marine habitats and species: this basin is considered one of the most threatened seas of the world (Fraschetti *et al.*, 2011) and subject to marine heatwaves driving and increasing mass mortalities due to climate change (Garabou *et al.*, 2019; 2022). For these reasons it has been identified among the most threatened biodiversity reservoirs (Coll *et al.*, 2010; Albano *et al.*, 2021).

The Mediterranean Sea also represents one of the most studied basins in the world, with some biological information available since historical times. Nevertheless, the biodiversity inventory, as well as the knowledge on the geographical and bathymetrical distribution of the organisms, and the functioning of its ecosystems are still incomplete (e.g., Coll *et al.*, 2010; Narayanaswamy *et al.*, 2013; Levin *et al.*, 2014; Gerovasileiou *et al.*, 2015; 2022; Bavestrello *et al.*, 2023).

Verified georeferenced occurrence records for marine native or introduced species accompanied by relevant meta-data (e.g., depth, habitat, and functional traits) are fundamental for researchers and decision-makers in order to identify knowledge gaps, map and model distributions of species, predict distribution shifts range under future scenarios, evaluate the invasive potential of non-native

species and, ultimately, to design maritime planning, management, restoration and conservation initiatives and adopt appropriate measures for species and hosting habitats (Douvere & Ehler, 2011; Schaefer & Barale, 2011; Gerovasileiou *et al.*, 2019; Katsanevakis *et al.*, 2020; Tamburello *et al.*, 2022).

Although the Mediterranean Sea has been studied extensively, the knowledge of presence, distribution and ecological status of several taxa and their populations is still incomplete (Fraschetti *et al.*, 2011). Especially for rare or overlooked taxa, such data is often lacking or not updated from biodiversity information systems, such as WoRMS (World Register of Marine Species), OBIS (Ocean Biogeographic Information System) and GBIF (Global Biodiversity Information Facility). The absence of an international, Mediterranean or national collections biorepository is hindered by the paucity of fundings (thus personnel) that hamper the digitization, sharing and thus streamlining the consultation of collections. The publication in peer-reviewed journals (e.g., as short notes) becomes more and more difficult with the exception for large collaborative initiatives on native or allochthonous biodiversity (e.g., Servello *et al.*, 2019; Katsanevakis *et al.*, 2020; Ragkousis *et al.*, 2023).

Considering the importance of archiving these unpublished records of species found in the Mediterranean Sea, *Mediterranean Marine Science* journal publishes a collective article, twice a year, with new records of rare and rarely reported marine species in the Mediterranean Sea and/or information on the spatial distribution of already known species of particular interest (Gerovasileiou *et al.*, 2020; Bo *et al.*, 2020; Santin *et al.*, 2021; Tsagarakis *et al.*, 2021; Kousteni *et al.*, 2022; Montesanto *et al.*, 2022). All submissions to the Collective Article are peer-reviewed by at least one reviewer and the editor. The contributors are co-authors in this collective article, their names appearing in alphabetical order. Contributing authors appear as co-authors and are also cited at the be-

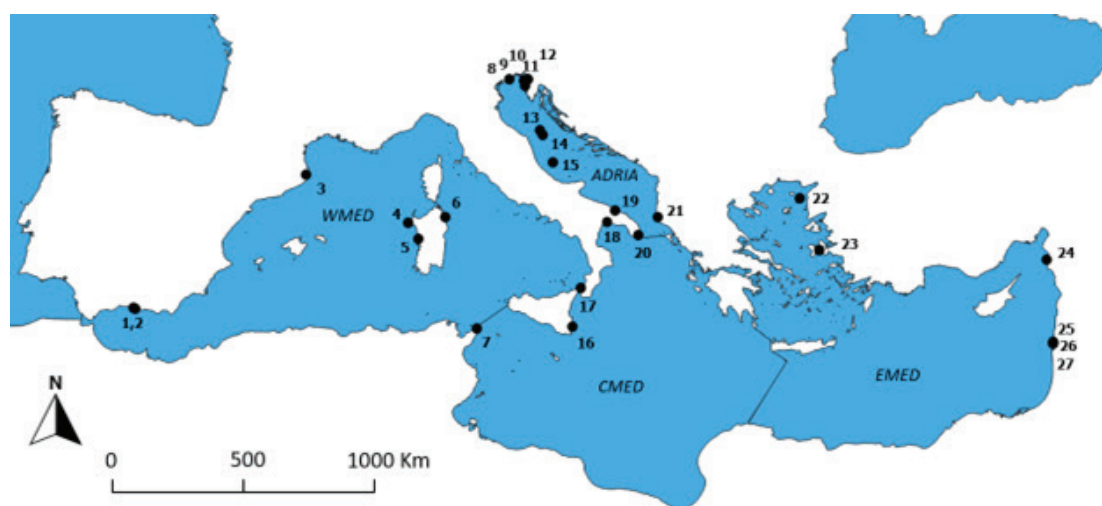


Fig. 1: Approximate locations of species records in the Mediterranean Sea presented in “New records of rarely reported species in the Mediterranean Sea (July 2023)”. Location numbers (1-27) correspond with those on Table 1 (WMED - Western Mediterranean Sea, CMED - Central Mediterranean Sea, ADRIA - Adriatic Sea, and EMED - Eastern Mediterranean Sea).

ginning of the sub-section corresponding to their records.

In this article, new records are provided for 23 species belonging to five Phyla: two Chlorophyta, one Annelida, six Mollusca, three Arthropoda, eleven Chordata (one Ascidiacea, one Elasmobranchii and nine Teleostei) and extending from the Alboran to the Levantine Sea (Figure 1; Table 1), from the sea surface (stranded individuals or collected from a depth of about 1 m) to a depth of 176 m. Taxonomy follows the World Register of Marine Species (WoRMS Editorial Board, 2023). Records are presented by major geographical zone of the Mediterranean Sea, from west to east, arranged in corresponding sub-chapters. The approximate location of species occurrence records is illustrated in Figure 1 and the corresponding information (i.e., Phylum, sub-chapter, basin, location, country, and location number on map) is presented in Table 1 and Supplementary Data S1 Table 1 (shapefile).

In the Alboran Sea, the nudibranch *Marionia gemmii* was reported in the Natural Park of Acanilados de Marro-Cerro Gordo, representing the first record for Mediterranean Spain, while the sacoglossans *Cyerce graeca* and *Placida tardyi* were recorded for the first time in the Alboran Sea at Berengueles Bay, Granada, in an area proposed as a Special Area of Conservation. In addition, the records of the nudibranch *Algarvia alba* in Costa Brava represent the first records in the Mediterranean Sea. A further new Mediterranean record of the rare offshore rockfish *Pontinus kuhlii* was reported from Sardinia (Western Mediterranean Sea), where the species is known only from a few records. Presence and abundance of this species in the Mediterranean Sea could be underestimated due to several factors, such as misidentification with other closely related species, difficulty of sampling and a general lack of reports from amateurs. In the same area, two new records were reported: *Gymnura altavela* in Santa Caterina di Pittinuri and *Paragalene longicrura* in Tavolara - Punta Coda Cavallo Marine Protected Area. The spiny butterfly ray *Gymnura altavela* was first documented and video reported (Supplementary Data S2 Video 1) for the island, probably an underestimated spe-

cies that was less rare in the past and currently in warmer regions of the Mediterranean Sea. The *exuvia* of the long-legged crab *Paragalene longicrura* was recorded for the first time for this island (Tyrrhenian Sea). This species is represented only by 12 records from Italy and a total of 85 specimens known to date (Iveša *et al.*, 2020).

A record of Smalleye squaretail *Tetragonurus cuvieri* was reported for the second time for the African Mediterranean coast (Ayas *et al.*, 2022) in Houria, Tunisia. The adult specimen of a brown moray *Gymnothorax unicolor* was first documented in Fontane Bianche (Siracusa, Ionian coast) although in this area eggs of this species had already been found (Ahlstrom *et al.*, 1962), representing the first record for Ionian Sea and reaffirming its occurrence in Italian waters. The red-spotted wrasse *Lappanella fasciata* was recorded as a fresh stranded individual on the shore from the Strait of Messina. Morphometric and meristic data of the specimen were recorded, calculating for the first time the relationship between total and standard length, moreover, offering detailed measurements that until now were only available in the Mediterranean populations for few specimens from the Aegean Sea (Keskin *et al.*, 2014). The colonial ascidian *Botrylloides israeliensis* was reported for the first time in the Italian coasts in the Gulf of Taranto: this species was previously described only along the Mediterranean coasts of Israel, but it is likely that its presence has been overlooked on Mediterranean coasts, as it often happens with ascidian species (e.g., Mastrototaro & Montesanto, 2022).

The records of Ross worm *Sabellaria spinulosa* in Caorle and at Torre Canne beach represent further records documenting this species along the Italian Adriatic coast. The sea slugs *Melanochlamys wildpretii* in Fornače (Piran) is the first record from Slovenia, representing also the northernmost finding of this species ever. The species was recorded in a shellfish larval collector, in the framework of *Pinna nobilis* LIFE project and alien species research monitoring. The record of the endangered twaite shad *Alosa fallax* in Tar cove (River Mirna estuary, Croatia) represents the northernmost report from the Adriatic

coast. According to this record, as well as the wide temperature tolerance, it can be expected that records of this species could be more frequent in the northern Adriatic (western coast of the Istrian Peninsula), especially where there is freshwater inflow and appropriate protection measures. The sea slug *Trapania graeffei* record in Port of Koper accounts for the first finding in Slovenia and the third in the Adriatic, where it is apparently confined to the Gulf of Trieste (Doneddu *et al.*, 2020). The mottled shore crab *Pachygrapsus maurus*, an adult specimen of barracudina *Lestidiops sphyrenoides* represents both first records in the Adriatic Sea, collected respectively in the gas platforms Elettra and Bonaccia, and Pomo Pits area. The *P. maurus* record could represent a research gap or new arrival in a colder sector of the Mediterranean Sea. The occurrence of *Lestidiops sphyrenoides* in the Adriatic Sea was previously based only on two postlarval specimens (Kovačić *et al.*, 2020). The morocco dentex *Dentex maroccanus* in Tricase Porto, represents the first record for the Italian Adriatic Sea, at the southern limit with Ionian Sea, suggesting the hypothesis that this uncommon species is a recent newcomer to this area (Micaroni *et al.*, 2022). The supposed range expansion is potentially related to the ongoing warming scenario occurring in the Mediterranean Sea. The Mediterranean spearfish *Tetrapturus belone* was recorded for the first time in Albanian waters in Bay of Vlora. It is considered as very rare species in the Adriatic (Dulčić & Soldo, 2004) and thus, bearing in mind a lack of focused fisheries surveys, it is clear why this species was not recorded in the Albanian sea so far.

The two Chlorophyta macroalgae *Cladophora batter-sii* and *Valonia aegagropila* were reported for first time from the Aegean coasts for Türkiye, respectively in the coast of Çeşme and the coast of Gökçeada Island. The record of Smooth grenadier *Nezumia aequalis* represents a new species from Syrian waters and contributes to the knowledge on biodiversity of fish fauna of this country. The skeleton shrimp *Caprella acanthifera* was first reported in the Southeastern Mediterranean Sea, in three different locations of Israel coast. Considering the high frequency of previous investigations of the rocky subtidal along the northern Israel coast, this species is likely a recent arrival, as it had not been previously recorded in the area.

All these records were reported from nine countries from the western to the eastern Mediterranean Sea, with a broad biogeographical coverage. The most represented country in this Collective Article is Italy with ten records from Western Mediterranean (3), Adriatic (4) and Ionian Sea (3), followed by Spain (4), Slovenia (2), Türkiye (2), Albania (1), Croatia (1), Israel (1), Syria (1) and Tunisia (1). As for many countries, despite a lack of a national system of museum of natural history, Italy confirms the long tradition of biodiversity studies that hopefully will be implemented in the framework of the recently proposed National Biodiversity Future Center (NBFC) planned within the National Plan of Recovery and Resilience (PNRR) (Andreone *et al.*, 2022). This initiative will have great potential to offer a unique occasion to

boost the establishment of a national institution dedicated to biodiversity, taxonomy, and conservation (Ferrari, 2022). In eight cases specimens recorded were deposited in institutional and/or private zoological collections under a reference code including Genbank accession number. The reported species were recorded and documented using a wide variety of methods and information sources. Three of the fishes recorded were caught by professional or recreational fishers, using various types of fishing gear (e.g., gillnets, longlines, and spearfishing) or were media recorded (video) in their natural habitat, so completely without any impact on the specimens (*Gymnura altavela* and *Gymnothorax unicolor*). At least ten records (one of them dating back to 2019, that would have remained unknown to the scientific community without the occurrence of the 2022 citizen science initiative) resulted from the interactions between scientists and recreational divers or diving clubs, video makers or fishers, highlighting the importance of communication between scientific community and all the sea users, as well as citizens' involvement (Tiralongo *et al.*, 2020) and Ocean Literacy (Koulouri *et al.*, 2022) for accurately concur to update the occurrence and abundance of marine life and set the baselines for future assessments.

In addition, for 13 cases species were recorded, directly or indirectly, in the framework of research monitoring programs, emphasizing as ever the importance of continuous local research based on typical sampling designs and protocols (e.g., floristic inventories, artificial collectors, scrape sampling, underwater transects).

This article provides additional sightings of protected, threatened or data deficient species, including the Critically Endangered at Mediterranean level (Walls *et al.*, 2016) elasmobranch *Gymnura altavela* which is also listed in Annex II of the SPA/BD Protocol; *Alosa fallax*, Endangered species (EN) in the Red List of freshwater fish and sea fishes of the Republic of Croatia and the Data Deficient species *Pontinus kuhlii* (IUCN Red List Status). To conclude, the above records have increased our knowledge of the regional biodiversity in several Mediterranean areas and the ecological habits of several species (e.g., occurrence, habitats ad morphometry) and they have also considerably expanded the known distribution range of species, including two species of sea slug that were recorded for the first time at Mediterranean scale (*Algarvia alba* and *Marionia gemmii*) and five species at country level (Albania: *Tetrapturus belone*, Italy: *Botryllodes israeliensis*, Slovenia: *Trapania graeffei*, *Melanochlamys wildpretii*, Syria: *Nezumia aequalis*), especially in understudied areas (Lamine *et al.*, 2018; Micaroni *et al.*, 2018; Grech *et al.*, 2020; Fortič *et al.*, 2023). However, this contribution also confirms the trend of data paucity from southern coast of the Mediterranean Sea respect to other areas, as previously reported (Garrabou *et al.*, 2019; Gerovasileiou & Bianchi, 2021; Montesanto *et al.*, 2022), an aspect that hampers knowledge and conservation measures, as well as species distribution modelling (Fabbriizzi *et al.*, 2023) and considerations for maritime spatial planning purposes.

Table 1. Species records metadata by Phylum, Sub-chapters (SC), basin (WMED - Western Mediterranean Sea, CMED - Central Mediterranean Sea, ADRIA - Adriatic Sea, and EMED - Eastern Mediterranean Sea), Location, Ecoregion sensu Spalding *et al.* (2007), and Location Number (LN) as in Figure 1.

Taxon	Species	SC	Basin	Location	Country	Ecoregion	LN
Phylum Chlorophyta	<i>Cladophora battersii</i> C.Hoek	4.1	EMED	İzmir	Türkiye	Aegean Sea	23
	<i>Valonia aegagropila</i> C.Agardh	4.1	EMED	Gökçeada Island	Türkiye	Aegean Sea	22
Phylum Annelida	<i>Sabellaria spinulosa</i> (Leuckart 1849)	3.1	ADRIA	Caorle and at Torre Canne beach	Italy	Adriatic Sea	8,19
Phylum Mollusca	<i>Algarvia alba</i> García-Gómez & Cervera, 1989	1.2	WMED	L'Escala Costa Brava	Spain	Western Mediterranean	3
	<i>Cyerce graeca</i> T. E. Thompson, 1988	1.1	WMED	Berengueles Bay, Granada	Spain	Alboran Sea	2
	<i>Marionia gemmii</i> Almón, Pérez & Caballer, 2018	1.1	WMED	Natural Park of Acantilados de Marro-Cerro Gordo	Spain	Alboran Sea	1
	<i>Melanochlamys wildpretii</i> Ortea, Bacallado & Moro, 2003	3.2	ADRIA	Fornače, Piran; Sečovelje	Slovenia	Adriatic Sea	9,10
	<i>Placida tardyi</i> (Trinchese, 1874)	1.1	WMED	Berengueles Bay, Granada	Spain	Alboran Sea	2
	<i>Trapania graeffei</i> (Bergh, 1880)	3.4	ADRIA	Gulf of Trieste; Port of Koper	Slovenia	Adriatic Sea	12
	<i>Caprella acanthifera</i> Leach, 1814	4.3	EMED	Coast of Israel	Israel	Levantine Sea	25, 26,27
Phylum Arthropoda	<i>Pachygrapsus maurus</i> (H. Lucas, 1846)	3.5	ADRIA	Adriatic Sea; Elettra & Bonaccia gas platform	Italy	Adriatic Sea	13, 14
	<i>Paragalene longicrura</i> (Nardo, 1869)	1.5	WMED	Sardinia; Tavolara Punta Coda Cavallo MPA	Italy	Western Mediterranean	6
	<i>Alosa fallax</i> (Lacepède, 1803)	3.3	ADRIA	North Adriatic Sea; Tar cove (River Mirna estuary)	Croatia	Adriatic Sea	11
Phylum Chordata	<i>Botrylloides israeliensis</i> (Brunetti, 2009)	2.4	CMED	Gulf of Taranto	Italy	Ionian Sea	18
	<i>Dentex maroccanus</i> Valenciennes, 1830	3.7	ADRIA	Tricase Porto	Italy	Adriatic Sea	20
	<i>Gymnothorax unicolor</i> (Delaroche, 1809)	2.2	CMED	Ionian Sea; Fontane Bianche (Siracusa)	Italy	Ionian Sea	16
	<i>Gymnura altavela</i> (Linnaeus, 1758)	1.4	WMED	Sardinia, Santa Caterina di Pittinuri	Italy	Western Mediterranean	5
	<i>Lappanella fasciata</i> (Cocco, 1833)	2.3	CMED	Strait of Messina	Italy	Ionian Sea	17
	<i>Lestidiops sphyrenoides</i> (Risso, 1820)	3.6	ADRIA	Adriatic Sea, Pomo Pits area	Italy	Adriatic Sea	15
	<i>Nezumia aequalis</i> (Günther, 1878)	4.2	EMED	Ras Albasit	Syria	Levantine Sea	24
	<i>Pontinus kuhlii</i> (Bowdich, 1825)	1.3	WMED	Sardinia, off Alghero coast	Italy	Western Mediterranean	4
	<i>Tetragonurus cuvieri</i> Risso, 1810	2.1	CMED	Houria, Tunisia	Tunisia	Tunisian Plateau/ Gulf of Sidra	7
	<i>Tetrapturus belone</i> Rafinesque, 1810	3.8	ADRIA	Albanian waters, Bay of Vlora	Albania	Ionian Sea	21

1. WESTERN MEDITERRANEAN

1.1 Records of *Cyerce graeca* T. E. Thompson, 1988, *Marionia gemmii* Almón, Pérez & Caballer, 2018 and *Placida tardyi* (Trinchese, 1874) in the Alboran Sea

Juan SEMPERE-VALVERDE and María del Rosario MARTÍN-HERVÁS

On December 7th, 2022, a juvenile of the gastropod genus *Cyerce* (4 mm) was found at 8 m depth on a specimen of *Holothuria* (*Panningothuria*) *forskali* Delle Chiaje, 1823 in Berengueles Bay, Granada, SE Spain (36.721152°N, -3.728084°E). This area has been proposed as a Special Area of Conservation (SAC Acantilados y Fondos Marinos Punta de la Mona). This specimen was photographed (Fig. 2A), collected and identified as *Cyerce graeca* T. E. Thompson, 1988 based on both external morphology and molecular data. DNA from foot tissue was extracted from the specimen preserved in 96% ethanol using the DNeasy Blood and Tissue Kit of Qiagen (Qiagen, Valencia, CA, USA; 09/2001) following the manufacturer protocol. A 658-bp-long fragment of cytochrome c oxidase subunit I (COI) was amplified from the juvenile (Genbank accession number: OQ921992) by PCR using Folmer primers (LCO1490/HCO2198) and the same protocol as in Martín-Hervás *et al.* (2020). A second individual of *C. graeca* (10 mm) was identified *in situ* and photographed in the same area on January

3rd, 2023, at 11 m depth on a pre-coralligenous habitat (Fig. 2B). In this same bay, a specimen of *Placida tardyi* (Trinchese, 1874) (15 mm) was also found at 8 m depth on an *Holothuria* (*Platyperona*) *sanctori* Delle Chiaje, 1823 on November 7th, 2022, which was also identified *in situ* and photographed (Fig. 2C). Finally, an individual of *Marionia gemmii* Almón, Pérez & Caballer, 2018 (10 cm) was found, identified *in situ* and photographed at 8 m depth during nighttime on November 11th, 2022, on a colony of the gorgonian *Leptogorgia sarmentosa* (Esper, 1791) in the Natural Park of Acantilados de Maro-Cerro Gordo, SE Spain (36.737611°N, 3.778139°W) (Fig 2D). All the specimens were found during nighttime and constitute the first records of the sacoglossans *C. graeca* and *P. tardyi* for the Alboran Sea, and the first record of the nudibranch *M. gemmii* for Mediterranean Spain (Ballesteros *et al.*, 2023).

Cyerce graeca is an extremely rare observation due to its small size (11 mm) and cryptic capabilities. It has been found on hard substrates, algal growths and under stones,

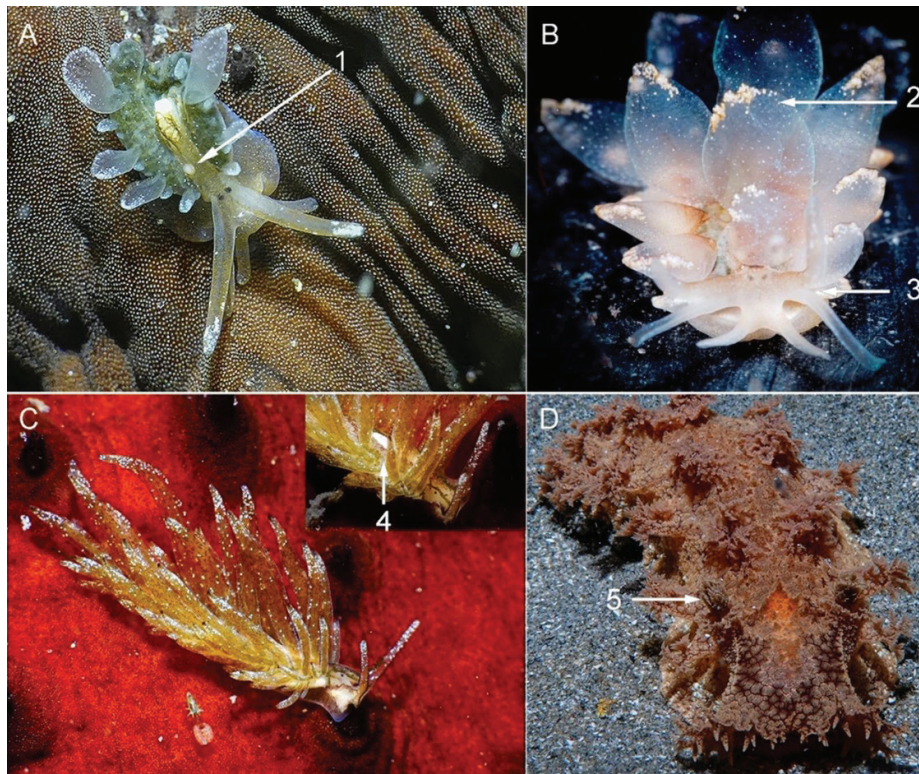


Fig. 2: Specimens photographed in Granada (SE Spain), from November 2022 to January 2023. A: juvenile of *Cyerce graeca*, showing a raised whitish anal papilla (1); B: *Cyerce graeca*, with remarks on the rounded cerata with concentration of white points and digitations along their margins (2) and bifurcated rinophores (3); C: *Placida tardyi*, with detail on the opaque white pericardial area (4); D: frontal view of *Marionia gemmii*, with rinophores regularly scalloped with warts and tripinnate dense filaments around the tip (5). More pictures of these specimens can be found at <http://www.litoraldegranada.ugr.es>. Photo credit: A, C and D: Luis Sánchez-Tocino @litoraldegranada; B: Francisco Sedano @sedano_uwphoto.

from the surface to 30 m deep (Ballesteros *et al.*, 2023). It has an elongated body, transparent to beige with a darker dorsum which may have a greenish coloration by the digestive gland (Fig. 2.1). The cerata are rounded, globular and semi-transparent with white dots concentrated along ceratal margins (Fig. 2.2) (Salvador *et al.*, 2022). The pericardium ranging from white to pale yellow, raised, irregularly shaped. The anal papilla is white, anterior and to the right of pericardium. The head, oral tentacles and rhinophores are white to pale yellow in ground color. The latter are bifurcated (Fig. 2.3) and may be speckled with white dots most concentrated at tips (Fig. 2A). This species is differentiated from other Mediterranean *Cyerce* species by its rounded parapodial margin and digitated cerata tips.

Placida tardyi can reach 15 mm and is found on algae

and seagrass meadows, where it blends with the environment because of its coloration. This species has an elongated body with wide and short oral palps and moderately elongated rhinophores. It has a green-yellowish translucent color with white dots concentrated in the subapical area of the rhinophores and cerata and a characteristic opaque white pericardial area (Fig 2.4) (see Cervera *et al.*, 1988).

Marionia gemmii is up to 200 mm and is thought to feed exclusively on *L. sarmentosa* (Ballesteros *et al.*, 2023). *Marionia gemmii* is cream to brown colored, with diffused warts, scattered white and purple spots and a characteristic orange dorsal midline (Trainito *et al.*, 2021). Rhinophores are regularly scalloped with warts and their tips are often hidden by tripinnate dense filaments (Fig. 2.5).

1.2 First record of *Algarvia alba* García-Gómez & Cervera, 1989 (Gastropoda: Heterobranchia) in the Mediterranean Sea

Enric MADRENAS and Leila CARMONA

The aeolid nudibranch species *Algarvia alba* García-Gómez & Cervera, 1989 is the only species of its genus. It was first described from Sagres (Portugal) more than 30 years ago (García-Gómez & Cervera 1989), and since then it has been only reported in Getaria (Gipuzkoa, North Spain) (Silva *et al.*, 2016).

Recently, one specimen of *Algarvia alba* (6 mm long) was photographed and collected in L'Escala (Costa Brava, north-western Mediterranean Spain, 42.114139°N, 3.167472°E) (Fig. 3). This specimen completely matched

with its original description (García-Gómez & Cervera, 1989), being an unmistakable species due to its white body colour, one coloured patch on each side of the head and partially orange rhinophores. This specimen was found on a stone at a depth of about 15 m in a clearly phytophilous environment and was surrounded by red algae. The water temperature was 13.5°C.

Besides being a new report of a rare species, this is the first time that *A. alba* is recorded in the Mediterranean Sea, suggesting a broader distribution of this species.

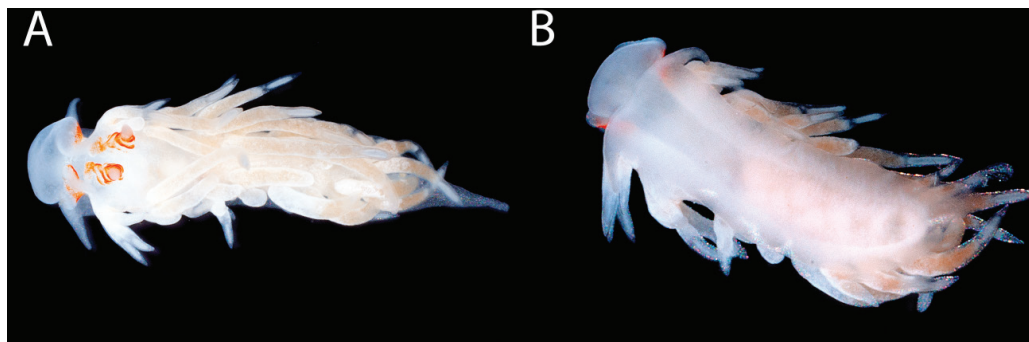


Fig. 3: Dorsal (A) and ventral (B) views of *Algarvia alba* (6 mm) in the laboratory.

1.3 New Mediterranean record of the rare Offshore rockfish, *Pontinus kuhlii* (Bowdich, 1825)

Francesco TIRALONGO and Roberto CAPPUCCINELLI

In the Mediterranean Sea, the only known species of the genus *Pontinus* Poey, 1860 is *Pontinus kuhlii* (Bowdich, 1825). It is a benthic fish found on hard bottoms at depths ranging between 100 and 450 meters. This species is widely distributed in the eastern Atlantic, from Portugal, Madeira and Azores to Mauritania and Cape Verde Island, with records extending to South Africa (Pais *et al.*, 2005). Biological and ecological data

on this fish are scarce, especially in the Mediterranean Sea, where the species is known from a few records only. The first Mediterranean record of the species is attributed to Sauvage (1878), who described it as a new species (*Sebastes bibroni*) and subsequently considered by Doderlein (1891) as a variety of *Helicolenus dactylopterus* (Delaroche, 1809). However, the species was recorded in a few western and central Mediterranean Sea locations

(Pais *et al.*, 2005; Castriota & Deidun, 2014 and references therein).

Here we report a new record of this rare fish in the Mediterranean Sea. An adult specimen of 31 cm in total length and with a weight of 329 g was captured by an amateur fisher through the use of fishing line deployed from a boat on October 30th 2022, SW off Alghero coast (Sardinia – 40.65758° N, 7.99385° E) at a depth of 136 m (Fig. 4). The fish was unfortunately consumed in a “fish soup” a few days later together with others. The species was identified through the high-quality photo provided by the same fisher. The fish was photographed in lateral view and this allowed us to observe important diagnostic characters such as the meristics of the dorsal fin (XII + 10) and its morphology, and the general colour pattern of the body (a red coral background with yellow irregular spots) (Pais *et al.*, 2005; Castriota & Deidun, 2014). In particular, the head was characterized by the presence of a large and irregular yellow spot on cheeks, and a smaller area of the same colour around the eyes. The body was speckled by irregular spots: yellow in colour and more spaced in the ventral area, brownish and close together in the dorsal area.

It is interesting to note that, in 2004, a specimen of *P. kuhlii* was caught in the same area and from the same seabed typology in Sardinia (Pais *et al.*, 2005). Hence, further investigations in this area could help to understand the effective presence and abundance of the species, whose presence and abundance in the Mediterranean Sea could be underestimated due to several factors, such as misidentification with other closely related species, difficulty of sampling and a general lack of reports from amateurs. In this context, citizen science is an effective tool for monitoring the presence of the species over time.

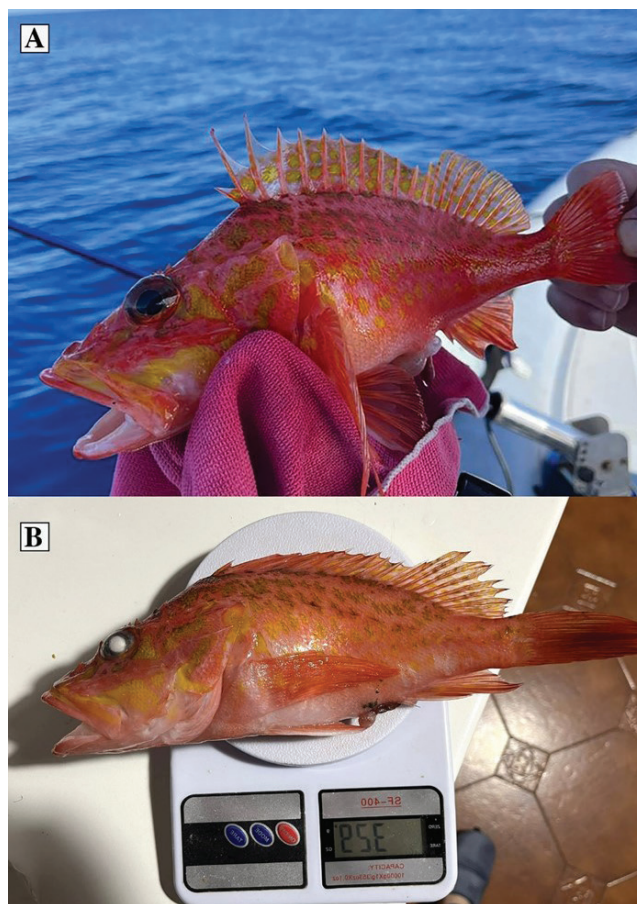


Fig. 4: Specimen of *Pontinus kuhlii* caught off Alghero coast (Sardinia) on October 30th 2022. A: the fish just caught; B: the fish after defrosting (figure horizontally rotated).

Indeed, this record reached us through the AlienFish citizen science project (Tiralongo *et al.*, 2020).

1.4 Documented record of the rare threatened elasmobranch *Gymnura altavela* off West Sardinian coast by a citizen science initiative

Daniele GRECH and Claudio MASALA

Known since 1616, when it was described and denominated by neapolitan naturalist Fabio Colonna as ‘*Pastinaca marina altera pteryplateja altavela*’, the spiny butterfly ray *Gymnura altavela* (Linnaeus, 1758) is the only member of the family Gymnuridae which occurs in the Mediterranean Sea, thus easily identifiable. Its geographical distribution includes the Black Sea, and both the eastern (from Portugal to Angola including Madeira

and Canary Islands) and western Atlantic (New England to Argentina) Ocean (Froese & Pauly, 2023). According to the scientific literature, *G. altavela* is less rare in the warmer regions of the Mediterranean Sea, especially in Sicily and along the North African coast where the species is rarely caught by bottom trawl fisheries and occasionally commercialized (Carpentieri *et al.*, 2021 and references therein).

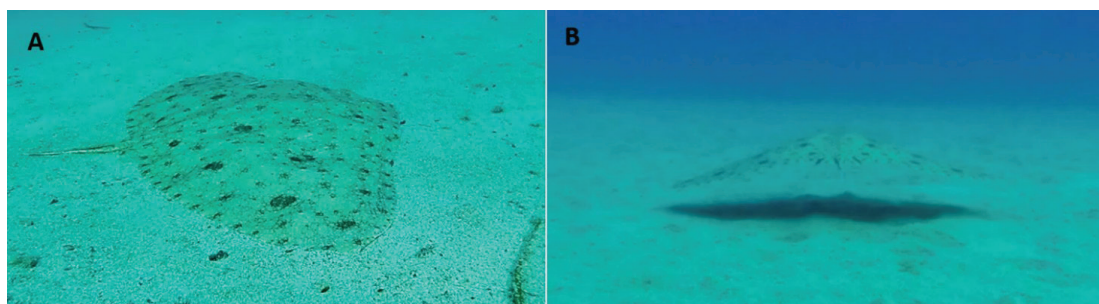


Fig. 5: Underwater photo of *Gymnura altavela* specimen, A. Lateral view, B. Back view.

On 27 July 2019 a *G. altavela* specimen was recorded off S. Caterina di Pittinuri Cape (40.104126° N, 8.485193° E, WGS84), on sandy bottom at 7 m depth (Fig. 5). Estimated measures were about 100 cm total length and 150 cm disc width, per about 20 kg inferred weight, the sex could not be identified (Supplementary Data S2 Video 1). Video and images of the species were shared during a citizen science media initiative “*Meraviglie sotto il mare della Sardegna*” in the framework of *Subacquei per la scienza* group.

Gymnura altavela is a large skate species considered Critically Endangered at the Mediterranean level (Walls

et al., 2016) and a Mediterranean elasmobranch species listed in Annex II of the SPA/BD Protocol. The species has also historically occurred along Tunisian coasts, where individuals at all maturity stages were observed but only one occurrence was recorded in the Italian waters (Mancusi *et al.*, 2020).

The contribution of citizen scientist involved in this initiative allowed to increase data on the occurrence of this species providing an effective contribution on the conservation of this species, in an area where broad biodiversity inventories are still overlooked (Grech *et al.*, 2020).

1.5 First report of *Paragalene longicrura* (Nardo, 1869) in Sardinia (Tyrrhenian Sea)

Egidio TRAINITO and Francesco TIRALONGO

Paragalene longicrura (Nardo, 1869) (Decapoda: Brachyura: Progeronidae) is a characteristic crab with a hexagonal carapace and long and thick legs, recently redescribed by Castro & Ng (2008). Despite its distribution extends from the Atlantic (Canary Islands and Madeira) to the Adriatic and the eastern Mediterranean, it is a rarely reported species, with 85 specimens known to date (Iveša *et al.*, 2020). Of these, only 12 were reported from Italy, including its first record from the Ionian Sea (Stern *et al.*, 2019).

During a monitoring activity, held on 19th October 2022 within the Tavolara Punta Coda Cavallo MPA, an *exuvia* of a male specimen of *P. longicrura* (carapace length x width: 34 x 46 mm: Fig. 6) was found by one of us (E.T.) at 44 m depth on detritic bottom surrounding a granite relief hosting large erect sponges and gorgonians (40.887931°N, 9.693519°E). In the nearby “tafone” (a shallow hollow partially enclosed through the preservation of a visor, particularly common on granite formations, where probably the crab sheltered) the species *Centrostephanus longispinus* (Philippi, 1845) and *Phycis phycis* (Linnaeus, 1766) were detected during this survey and *Homarus gammarus* (Linnaeus, 1758) and *Epinephelus marginatus* (Lowe, 1834) in a previous monitoring. The *exuvia* has been collected and photographed by the observer and is now dry preserved in the collection



Fig. 6: Dorsal view of the exuvia of *Paragalene longicrura* found in the Tavolara Punta Coda Cavallo MPA (white line = 1 cm).

of the Tavolara Punta Coda Cavallo MPA.

The present finding clearly suggest that *P. longicrura* lived in the nearby, and that further specimens may be present in the area. Moreover, it represents the first report for Sardinia, filling a gap between the previous records in the eastern Tyrrhenian Sea (Kossmann, 1878) and the Balearic Archipelago (Gili & Macpherson, 1987).

2. CENTRAL MEDITERRANEAN

2.1 New record of Smalleye squaretail *Tetragonurus cuvieri* Risso, 1810 from Tunisian waters

Sahar CHEBAANE and Chaima BEN-GRIRA

On the 1st of February 2023, *Tetragonurus cuvieri* Risso, 1810, was captured with gillnets (the name in Tunisian is “alghazal”) by a local fisher in Houria, Tunisia, 0.80 nautical miles from the harbour entrance, at 15 metres depth (37.026794° N, 11.061666° E). The specimen (Fig. 7) was delivered to researchers of the citizen science

network TunSea (<https://www.facebook.com/Tunsea.2>), who made morphometric and weight measurements (Table 2). The sample was kept in formalin 10% in the National Institute of Marine Sciences and Technologies Museum, Tunisia (code: 23-1-1-4).

The captured fish displayed characteristic features

Table 2. Morphometric measurements of *Tetragonurus cuvieri* captured in Tunisia.

Measurements (cm)	
Total length (LT)	41.57
At fork length (LF)	39.49
Standard length (LS)	38.4
Cephalic length (Lcep)	6.17
Length pre-orbital (Pror)	2.1
Diameter orbital (Dor)	1.09
Post-orbital length (Lpo)	3.09
Maxillary length (Lmax)	2.22
Length pre-pectoral (Lppc)	7.68
Pectoral Height (Hpc)	12.1
Length pre-anal (Lpan)	19.78
Anal Height (Han)	0.6
Peduncle Height (Hpdc)	0.73
Weight (g)	
Total weight	175

of the species, such as a stout lower jaw with fan-like teeth, small pointed teeth on the upper jaw, and a diamond-shaped mouth when viewed from the front. The species has a long, slender body with small, spirally arranged scales and a rectangular caudal peduncle with two lateral keels (Ayas *et al.*, 2022). Adults are uniformly dark brown to black, while juveniles display a greyish upper body and whitish lower body, which may be an adaptation to their habitat (Ayas *et al.*, 2022).

Tetragonurus cuvieri, namely smalleye squaretail, has been rarely found in the Mediterranean Sea (Ayas *et al.*, 2022). This species was not previously observed in Tunisia until it was captured by trawling in 2003 at a depth of 200 m in the northern region of Tunisia. This is the second record of this rare species in Tunisian waters and the African Mediterranean coast (Bradai *et al.*, 2004; Carnevale *et al.*, 2021; Ayas *et al.*, 2022).



Fig. 7: The captured specimen (41.57 mm, TL) *Tetragonurus cuvieri* in Houria, Tunisia.

2.2 First documented record of rarely observed brown moray *Gymnothorax unicolor* (Muraenidae) in the Ionian coast of Italy

Andrea SPINELLI and Dyana VITALE

The brown moray *Gymnothorax unicolor* (Delaroche, 1809) is a Mediterranean fish belonging to the family Muraenidae. This moray eel inhabits crevices and holes, on rocky bottoms between 10 and 80 m deep (Didier Laurent *et al.*, 2014; Spinelli & Castriota, 2017). In the central Mediterranean, the species was occasionally recorded in low abundances in the Italian seas, from the southern Tyrrhenian Sea, Sicily Channel, to the Ligurian and Adriatic

Sea (Spinelli & Castriota, 2017; Tiralongo *et al.*, 2020). In the western and eastern basins, the species has been apparently rarely observed, as summarized by Tsagarakis *et al.* (2021). In the Atlantic, *G. unicolor* has been also reported from eastern part, at Cape Verde, the Canary Islands, Madeira, the Azores, Morocco, and southern Portugal (Didier Laurent *et al.*, 2014). Its biology is poorly investigated, it is a solitary nocturnal species, preying

on crustaceans, gastropods and cephalopods, sometimes sharing the crevices with the Mediterranean moray (*Muraena helena*). On 13th August 2022, one specimen of *G. unicolor* was observed during a SCUBA dive at Fontane Bianche (Siracusa), eastern coast of Sicily, Ionian Sea, Italy (36.953808° N, 15.216292° E) inside a crevice on rocky bottom at a depth of 18 m (Fig. 8A). The surface water temperature was 21° C. In the same moment, the cleft of the rock was shared simultaneously by Mediterranean moray (*M. helena*) (Fig. 8B). The observed specimen was recorded by one of the authors (AS) who shot a short video clip (publicly accessible on YouTube: <https://youtu.be/SNVGkpGiZQM>).

The short snout and high dark head, separated from the brown body by an ochre band reaching about the level of the gill opening, agree with the description of *G. unicolor* reported in Didier Laurent *et al.* (2014) differing from other confamilial species. The present documented finding of *G. unicolor* in eastern Sicilian waters represents the presumed first record of an adult specimen in the Ionian coast of Italy, although in this area eggs of this species had already been found (Ahlstrom *et al.*, 1962), reaffirming its occurrence in Italian waters.

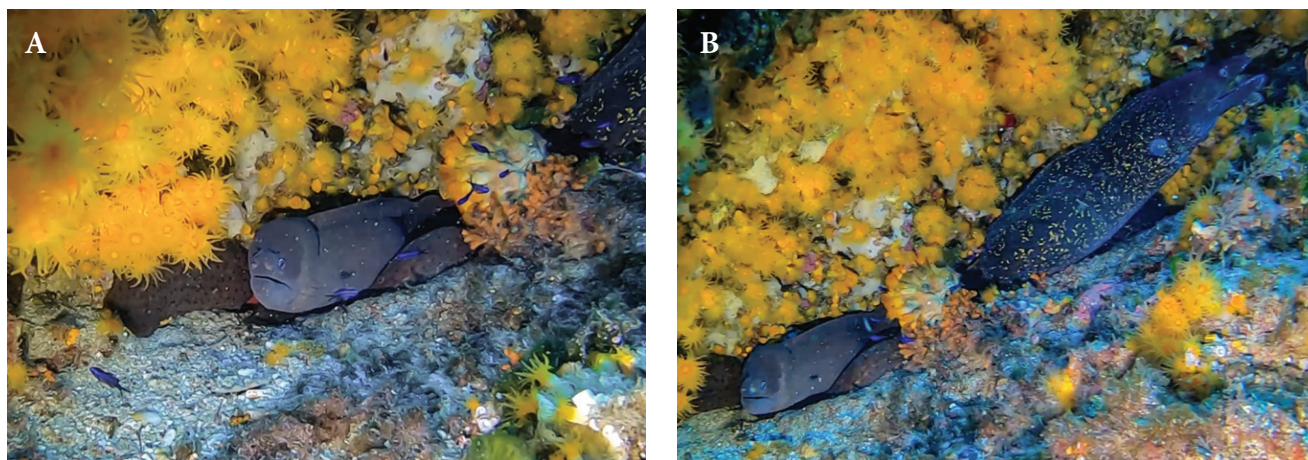


Fig. 8: A) Specimen of *Gymnothorax unicolor* at Fontane Bianche, Siracusa (Italy) on 13 August 2022. B) Specimens of *Gymnothorax unicolor* and *Muraena helena* sharing the same crevice at Fontane Bianche, Siracusa (Italy) on 13 August 2022.

2.3 New record of *Lappanella fasciata* (Cocco, 1833), from the Strait of Messina (Italy)

Emanuele ASCIUTTO and Pietro BATTAGLIA

Lappanella fasciata is small-sized wrasse (Labridae), reaching a maximum length of 158 mm (González *et al.*, 2014) and distributed in the Mediterranean Sea and the eastern Atlantic (Azores, Canary Islands, Madeira Island, Moroccan coast). It has an elongated body, covered with large scales and a pointed snout, with four stout teeth on the anterior part of each jaw. The colour pattern is reddish to orange/pink, paler on the belly, with three dark dots on the caudal peduncle, dorsal fin and caudal fin, respectively. Bathymetric distribution of *L. fasciata* reaches a maximum depth of 398 m (Gomes-Pereira, 2017). This fish lives in coralligenous assemblages (Keskin *et al.*, 2014) and in association with black corals (Bo *et al.*, 2011), large hydrozoans (Gomes-Pereira *et al.*, 2017), gorgonians (Sartoretto *et al.*, 1997). These cnidarians constitute Essential Fish Habitats (EFH) for *L. fasciata*, which is sensitive to environmental and anthropogenic impacts on these vulnerable ecosystems. Although, *L. fasciata* is sometimes observed during ROV surveys or while SCUBA diving, the collection of individuals of this species is an uncommon event and very few biometric data and biological information are currently available. Thus, it is crucial to collect more information about morphometric, meristic, and biological data to fill the gap of knowledge on the ecology and biology of this fish. Here, we report a rare record of a fresh stranded individual (January 22,

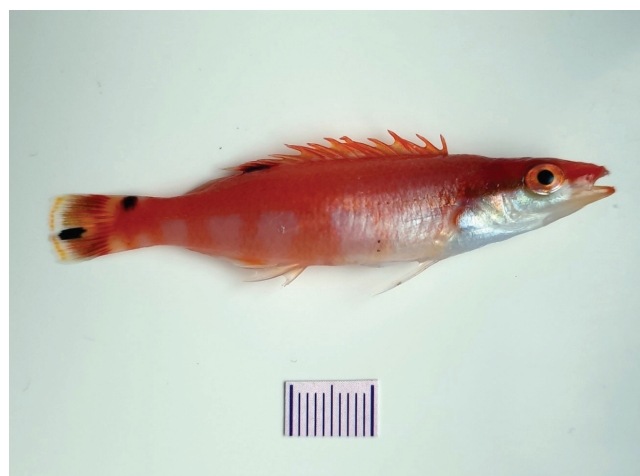


Fig. 9: *Lappanella fasciata* collected in the Strait of Messina on 22nd January 2023.

2023; Fig. 9), found along the coast of the Strait of Messina (38.264658° N, 15.651060° E). It was photographed, weighed, and measured. Total length (TL) and standard length (SL) were 69.4 mm and 59.0 mm respectively, while it weighted 5 g. Morphometric and meristic data are reported in Table 3. Until now, detailed morphometric measurements were only available for two specimens caught in the Aegean Sea (Keskin *et al.*, 2014). Fur-

Table 3. Morphometric and meristic data of a specimen of *Lappanella fasciata* stranded on the shore of the Strait of Messina.

Measurements and Proportions	mm
Total length (TL)	69.4
Standard length	59.0
Caudal length	10.4
Head length (HL)	17.4
Operculum – tail distance	48.6
Preorbital length	5.8
Eye – operculum distance	7.0
Horizontal eye diameter	4.6
Vertical eye diameter	3.9
Predorsal length	18.4
Prepectoral length	17.4
Preal anal length	37.7
Preventral length	20.4
Pectoral fin length	9.0
Pelvic fin length	9.5
Base dorsal fin	30.0
Base anal fin	13.1
Upper jaw length	3.5
Lower jaw length	5.6
Maximum trunk height after the operculum	13.2
Minimum trunk height at caudal peduncle	5.6
Maximum height at anus	12.8
Meristic data	
Dorsal fin rays	XVI + 11
Anal fin rays	III + 10
Pectoral fin rays	14
Pelvic fin rays	I + 5
Caudal fin rays	18

thermore, few data on TL and SL of seven individuals from Cape Verde Islands were provided by González *et al.* (2014). We used these data to calculate for the first time the relationship between total and standard length: $TL=0.866SL-1.642$ ($R^2=0.995$). The comparison of mer-

istic data with Keskin *et al.* (2014) showed similar counts for anal fin rays, but differs for dorsal ones (i.e., XVI+11 in our specimen vs XVIII+8 and XVIII+10 in Aegean ones). More data are needed to understand whether this difference reflects the existence of different populations.

2.4 First record of the colonial ascidian *Botrylloides israeliensis* (Brunetti, 2009) along Italian coasts

Federica MONTESANTO and Francesco MASTROTOTARO

Botrylloides israeliensis (Brunetti, 2009) was first recorded and described along the Mediterranean coasts of Israel, hence the name “*israeliensis*”. Brunetti (2009) reports that *B. israeliensis* may represent a lessepsian species, however this hypothesis has not been confirmed yet and so far, *B. israeliensis* has not been recorded in other regions worldwide (Mastrototaro & Montesanto, personal dataset). Here we report the second documented observation of the species. Colonies of *B. israeliensis* were collected along Italian coasts from aquaculture facilities within the Gulf of Taranto (40.431391°N, 17.239823°E), a semi-enclosed basin located in the north-western Ionian

Sea, in February 2022. About 20 colonies were preserved in a 4% formalin solution after narcotization with menthol crystals for morphological analysis.

The encrusting colonies (about 2 mm thick) appear transparent or brownish in colour, with particles of sand embedded (Fig. 10A). The transparent zooids are arranged in meandering systems, with a wide atrial aperture and masses of pigmented blood cells placed in the ventral part of the branchial transversal vessel (orange spots) (Fig. 10B). The branchial sac has about 10 rows of stigmata, with the second one dorsally incomplete (Fig. 10C). The oral siphon shows 8 large tentacles, with no

Blood cell masses at their base (Fig. 10D). The brownish stomach is characterized by 9 thin folds with no cardiac swellings, sometimes the ninth is not present (Fig. 10E-F). The intestine is long, and the smooth anus opens at the level of the 6-7th rows of stigmata (Fig. 10B-F), while the typhlosolis is enlarged in the pyloric caecum, which ends with a wide club-shaped tip (Fig. 10F-G).

Remarks: This species can be clearly identified by the peculiar arrangement of the haematic masses of pigmented blood cells that are placed in the ventral part of the branchial transversal vessels, the absence of pigmented cells at the base of the oral tentacles, the presence of a club-shaped pyloric caecum, and the absence of cardi-

ac swellings in the stomach folds (Brunetti, 2009). It is important to note that the colonies collected in Taranto show a branchial sac with about 10 rows of stigmata with the second-row dorsally incomplete, while the original description reports 8 rows of stigmata with the 2nd one dorsally complete (thus, the zooids described in Brunetti, 2009 have all rows complete). *Botrylloides israeliensis* was only reported from Israeli coasts thus far but is likely that its presence has been overlooked on Mediterranean coasts, as it often happens with ascidian species (e.g., Mastrototaro *et al.*, 2019; 2020a, b; Mastrototaro & Montesanto, 2022) indeed, its transparent-brownish colonies are difficult to detect.

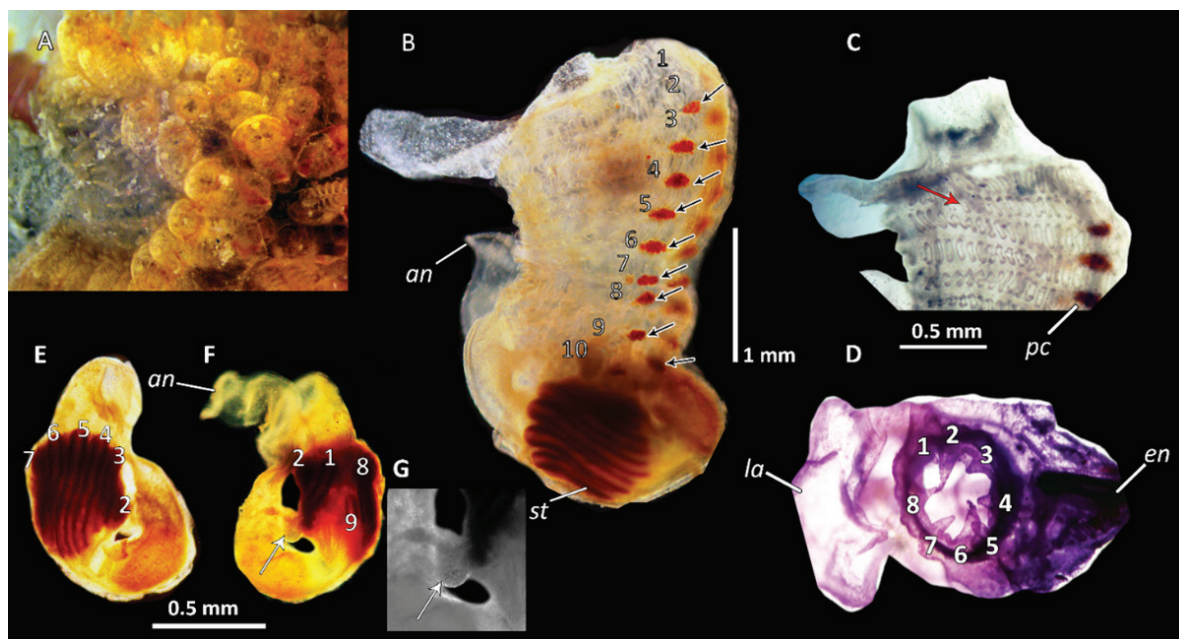


Fig. 10: *Botrylloides israeliensis*. A. Transparent-brown colony sampled within the Gulf of Taranto (Ionian Sea, Italy). B. Zooid with 10 rows of stigmata, a brownish stomach (*st*) and masses of haematic pigmented cells at the level of the transversal vessels (black arrows point out the orange spots corresponding to the haematic pigmented cells), the anus (*an*) opening at the level of the 6-7th row of stigmata. C. Magnification of the upper part of the branchial sac with haematic pigmented cells (*pc*) and the second row of stigmata dorsally incomplete (red arrow). D. Magnification of the 8 large oral tentacles, atrial languet (*la*) and the endostyle (*en*). E- F. Globular stomach with about 9 thin folds. F. Parietal side of the stomach showing the large tip of the pyloric caecum (arrow). G. Magnification of the large tip of the pyloric caecum (arrow).

3. ADRIATIC SEA

3.1 Broadening the occurrence of *Sabellaria spinulosa* (Annelida) in Mediterranean Sea: new records along the Adriatic coast

Serena MUCCILO and Andrea DESIDERATO

Sabellarids are gregarious annelid polychaetes occurring in mesolittoral/upper infralittoral temperate habitats, building biogenic structures of different shape, often coalescing into reefs. Of the two species present in the Mediterranean Sea, *Sabellaria alveolata* (Linnaeus, 1767) and *Sabellaria spinulosa* (Leuckart 1849), the first is known for building large banks; however, there are increasing records of large bioconstructions also for the latter (Gravina *et al.*, 2017). Data about *S. spinulosa*

are scattered along the Italian and Croatian coasts (Mikac, 2015; Lisco *et al.*, 2021, Sanfilippo *et al.*, 2022). In public databases, *S. spinulosa* is reported in the Aegean Sea (Greece), Egypt, and the Gulf of Trieste (Italy; OBIS, 2023). In August 2022 two different new populations of *S. spinulosa* were found along the Italian Adriatic coast, in Caorle (45.576722° N, 12.836983° E) and at Torre Canne beach (40.826227° N, 17.486474° E) (Fig. 11A). Samples of bioconstruction were collected using a putty

knife. The northern population was found on distal parts of the groynes, between 1.5 and 3 m depth, forming large banks up to 30 cm of height. Contrarily, the population from Torre Canne beach was more discontinuous and shallow (1 and 1.5 m depth), forming scattered crusts (20x20x10-15 cm) growing usually in ravines of natural rocks. Specimens and pieces of the reefs were fixed in 96% ethanol, in the laboratory total DNA was extracted from two specimens per population (the animals are stored in the collection of the institution of the authors and available upon request), and the cytochrome oxidase subunit 1 (CO1) barcode amplified according to Lobo *et al.* (2013). Sequences were deposited in BOLD (www.boldsystems.org) and are available in the dataset

DS-SSADR (doi: <http://dx.doi.org/10.5883/DS-SSADR>) together with the other public sequences used in this study as references. The sequences were aligned with public records and a neighbour joining tree using K2P distances with 1000 bootstrap support was generated in MEGA 11 (www.megasoftware.net). The specimens from this study matched those already available from Sicily, but not with the Atlantic populations, supporting the existence of a species complex (~ 10% K2P distance, Fig. 11B). While the population of Caorle seems stable given the size of the bioconstructions, a proper assessment is necessary for the one at Torre Canne beach, considering also the elevated number of bathers during the summer in the area.

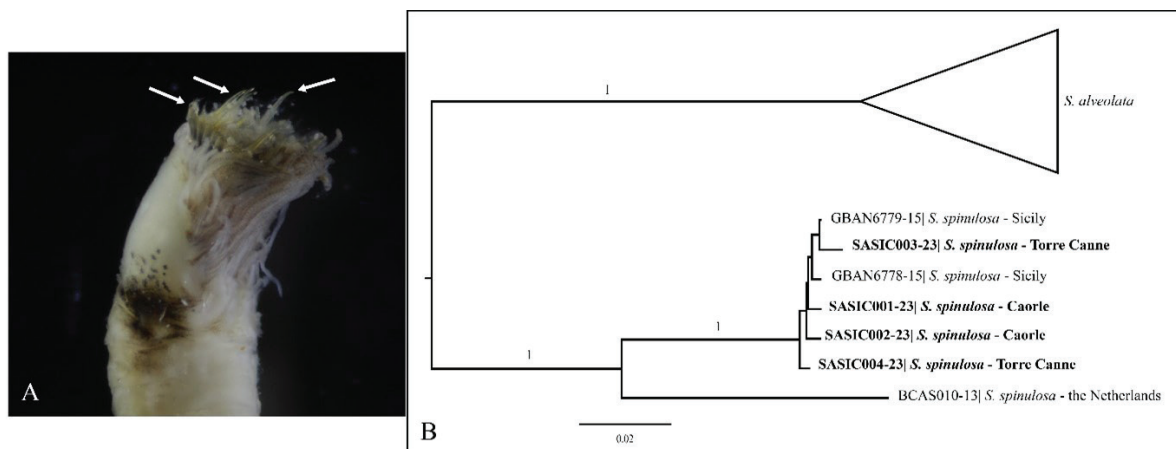


Fig. 11: A) Detail of the head of *Sabellaria spinulosa* from Torre Canne (accession number: SASIC003-23) with the distinctive arrangement of the paleae of the opercular crown (arrows); B) Neighbour joining tree of the cytochrome oxidase subunit 1 (CO1) of *Sabellaria* species from Europe. Numbers on the branches reporting the bootstrap support for the node. In bold, individuals from this study.

3.2 First record of *Melanochlamys wildpretii* Ortea, Bacallado & Moro, 2003 from Slovenia

Borut MAVRIČ and Domen TRKOV

Melanochlamys wildpretii Ortea, Bacallado & Moro, 2003 is a poorly known species of headshield seaslug (Cephalaspidea: Aglajidae) living in shallow waters (up to 15 m depth) in seagrass meadows and muddy bottoms (Ortea *et al.*, 2003; Trainito & Doneddu, 2014). It is char-

acterized by a cylindrical-elongated body with a head rounded at the anterior edge and a cephalic shield that extends over about three-fifths of the total body length. The ground colour of the body is orange-brown with green shading, while a white pigment is scattered on the body

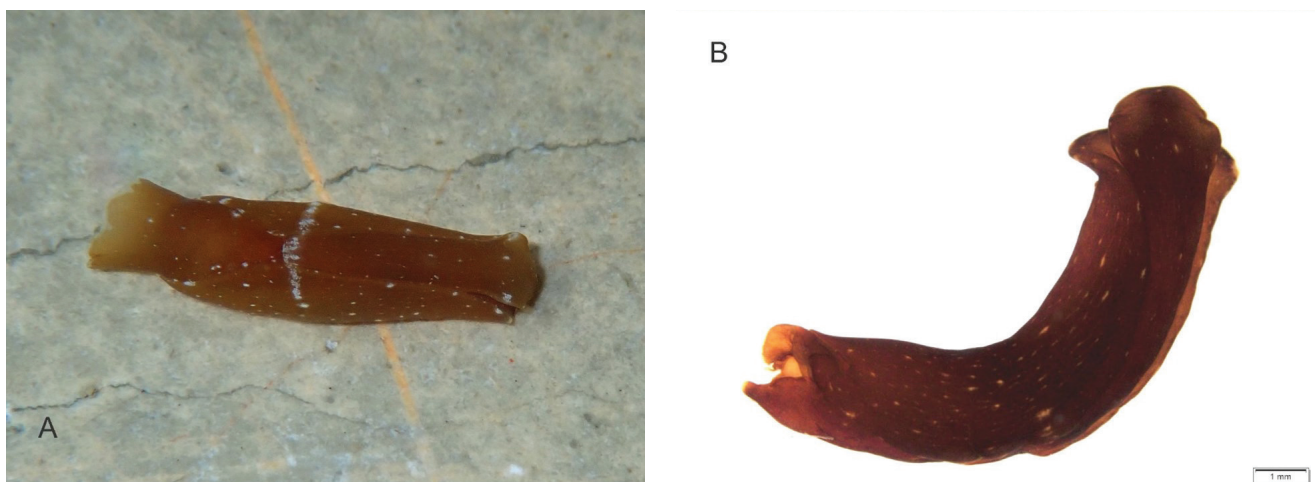


Fig. 12: Specimens of *Melanochlamys wildpretii* from Slovenia. Photo credit: D. Trkov (A), B. Mavrič (B).

forming very thin and short longitudinal lines concentrated on the head, the posterior end of cephalic shield, the edge of the foot, the parapodia, and the posterior margin. In the middle of the body, larger white spots form a transverse band (Ortea *et al.*, 2003; Trainito & Doneddu, 2014).

This species was originally described from the Canary Islands in the Atlantic Ocean (Ortea *et al.*, 2003). However, the first record of the species dates from 1998, from a photograph taken by Arthur J. Telle on the island of Grand Canaria in 1998 and published on Seaslugforum.net. Since that description, all records of the species have been from the Mediterranean Sea (Ballesteros *et al.*, 2016 and references therein). In the Adriatic Sea, the species was previously known only from Split (Croatia

(Zenetos *et al.*, 2016; Prkić *et al.*, 2018). Overall, records are sparse, probably due in part to its small size and habit of burrowing. In late 2022, two live specimens of *M. wildpretii* were found in Slovenian waters for the first time. The first specimen (12 mm: Fig. 12A) was found on 11 November 2022 during the survey of shellfish larvae collectors in Fornače, Piran (45.517517° N, 13.567903° E), at a depth of 3-4 m above the sandy muddy bottom. The second specimen (11 mm: Fig. 12B) was found on 12 December 2022 in the fouling samples scraped from the mussel farm in Sečovlje (45.488919° N, 13.585075° E) at 1 m depth. Both specimens are consistent with the external characteristics reported by Ortea *et al.* (2003), and thus represent the first records for Slovenia and the northernmost finds of this species ever.

3.3 Unusual record of rare and endangered twaite shad *Alosa fallax* (Lacepède, 1803) in the northeast Adriatic Sea (Croatian coast)

Jakov DULČIĆ

Twaite shad *Alosa fallax* (Lacepède, 1803) is an anadromous fish of the family Clupeidae. It is distributed in the Northeast Atlantic, from southern and western Iceland to northern Morocco, including the North Sea, Baltic Sea and also the Mediterranean and Black Seas. The genus *Alosa* is represented by two species in the Adriatic Sea: *Alosa alosa* (Linnaeus, 1758) and *Alosa fallax* (Lacepède, 1803). *Alosa fallax* is generally rare but it is more common in rivers and lakes, especially in the southern Adriatic (Mrakovčić *et al.*, 2006; Dulčić & Kovačić, 2020). It is considered rare in the eastern Adriatic (Dulčić & Kovačić, 2020) and there is limited biological and ecological data on this species from this area in scientific literature. It is included as Endangered species (EN) in the Red List of freshwater fish and sea fishes of the Republic of Croatia (Mrakovčić *et al.*, 2006; Jardas *et al.*, 2008).

Four specimens of twaite shad (Fig. 13) were collected on 15 January 2022 in Tar cove (River Mirna estuary, Croatia) (45.319025° N, 13.607161° E) during experimental catch with specially constructed beach seines (called 'ciparice' or 'mullet nets') with mesh diameter of 22 mm.

Alosa fallax individuals ranged from 29.2 to 40.5 cm in total length (TL), while their weight ranged from 172 to 504 g (TL=40.5 cm, W= 504 g; TL=38.2 cm, W= 502 g; TL=32.2 cm, W= 294 g; TL= 29.6 cm, W= 172 g) (Fig. 13). Specimens were identified according to morphological features: body somewhat compressed, moderately deep with depth at pectoral fin less than head length, upper jaw notched, lower jaw fitting into it; no teeth on palatine and vomer; gillrakers fairly short and stout, shorter than gill filaments; usually a series of 4-8 black blotches behind gill opening, but sometimes a single blotch. All caught individuals were adults since total length at maturity is between 30 to 40 cm (Muus & Nielsen, 1999).

This is the northernmost record of this species in the northeastern Adriatic coast of Croatia confirming the



Fig. 13: Specimens of *Alosa fallax* caught on 15 January 2022 in Tar cove (River Mirna estuary, Croatian coast).

species' presence in the area. Previous studies indicated *A. fallax* is a coastal fish forming aggregations near the estuaries of the most important watersheds in the central and northern Adriatic (the rivers Po, Adige and Brenta), and off the coastline between Pesaro and Ancona (central Adriatic, Italian coast) (La Mesa *et al.*, 2015). It could be found, also in the same areas, accumulated around gas platforms (Fabi *et al.*, 2004).

The temperature in the sampling area was 10°C at 0 m depth and 12°C at 5 m. *Alosa fallax* was found to exhibit a wide thermal tolerance (6–27°C) with preference for temperature around 23°C (La Mesa *et al.*, 2015). According to this record, as well as the wide temperature tolerance, it can be expected that records of this species could be more frequent in the northern Adriatic (western coast of the Istrian Peninsula), especially where there is freshwater inflow and appropriate protection measures. Considering the fact that so far there are no records of this species in the Mirna River (Mrakovčić *et al.*, 2006), it is possible to assume that the origin of these individuals is from Italian waters (i.e., from the basin of the Po River).

3.4 First record of *Trapania graeffei* (Bergh, 1880) from Slovenia

Borut MAVRIČ and Lovrenc LIPEJ

Trapania Pruvot-Fol, 1931 is a monophyletic heterobranch genus of the family Goniodorididae Adams & Adams, 1854. Species of this genus have similar external morphology and internal features, and are characterised by a reduced mantle margin, with a single pair of curved extra-rhinophoral and extra-branchial appendages, lamellate rhinophores, three tripinnate gill branches attached in a semicircle around the anus, and a radular formula $N \times 1.0.1$. (Paz-Sedano *et al.*, 2022). The genus contains so far about 50 species, of which at least five [*Trapania maculata* Haefelfinger, 1960, *T. lineata* Haefelfinger, 1960, *T. graeffei* (Bergh, 1880), *T. orteai* García-Gómez & Cervera, 1989, and *T. tartanella* (Ihering, 1886)] live in the Mediterranean Sea (Paz-Sedano *et al.*, 2022). Three of them [*T. maculata*, *T. lineata*, and *T. graeffei* – previously reported as *T. fusca* (Lafont, 1874)] were also recorded in the Adriatic Sea, with the two former species censused in Slovenia as well (Zenetos *et al.*, 2016; Lipej *et al.*, 2018).

A specimen of *T. graeffei* (Fig. 14) was found on 10th October 2022 while analysing fouling community of ARMS (Autonomous Reef Monitoring Structure). The ARMS was set at 3.5 m depth amongst pillars of the second pier of the Port of Koper (45.564853° N, 13.743919° E), in the Gulf of Trieste, as part of a national project monitoring non-indigenous species. The specimen measured approximately 8 mm in length and showed the typical external morphological characteristics of genus *Trapania* (as mentioned above). Its transparent whitish-pinkish body with irregular brownish blotches (showing a laterally symmetrical pattern) clearly separated it



Fig. 14: *Trapania graeffei* from the Port of Koper (Slovenia), photographed under stereomicroscope (Photo credit: B. Mavrič).

from the two species recorded so far in Slovenia (Zenetos *et al.*, 2016; Lipej *et al.*, 2018) and well matched Bergh's description of *Trapania graeffei*. Although this taxon had often been treated as a synonym of *T. fusca*, Doneddu *et al.* (2020) re-established it as a valid species. Based on the latter study, it is endemic to the Mediterranean Sea and was only found along the French Mediterranean coast, the Italian Tyrrhenian coast, in Malta, and in the Gulf of Trieste (Italian coastline). The specimen reported here therefore accounts for the first finding in Slovenia and the third in the Adriatic, where it is apparently confined to the Gulf of Trieste (Doneddu *et al.*, 2020).

3.5 *Pachygrapsus maurus* in the Adriatic Sea: research gap or new arrival?

Paolo FASCIGLIONE and Fabio CROCETTA

The genus *Pachygrapsus* Randall, 1840 (Malacost-raca: Decapoda: Grapsidae) includes three species in the Mediterranean Sea. These are *P. marmoratus* (J.C. Fabricius, 1787), a common species living at tide level and widespread all over the Mediterranean Sea, and *P. maurus* (H. Lucas, 1846) and *P. transversus* (Gibbes, 1850), that somehow share the same habitat of the former species, but until recently had an almost disjoint distribution, with sporadic records mostly held from both the western and the eastern parts of the basin (d'Udekem d'Acoz, 1999). Since the last decades, these species are also being sporadically recorded in the central Mediterranean Sea, thus filling a wide gap in their known distribution. Whether this is a result of a renewed interest in crab biodiversity, or of a recent spreading due to climate changes or due to a facilitation by a whatever human-mediated vector, it is still an open question (Crocetta *et al.*, 2011; Giacobbe *et al.*, 2018; Kousteni *et al.*, 2022). However, both species still apparently failed to colonize the Adriatic Sea.

During recent (11–24/04/2022) fieldwork carried out



Fig. 15: Dorsal view of a *Pachygrapsus maurus* (♀, 11.98×11.25 mm) from the ELETTRA 003 gas platform (Adriatic Sea). Specimen photographed after ethanol-preservation.

by one of us (P.F.), the brachyuran fauna living within the communities fouling selected gas platforms of the central Adriatic Sea was qualitatively investigated through hand-scraping. The scraped material was sorted onboard and fixed in 99.9% ethanol for subsequent identifica-

tion. Measurements were carried out with an electronic caliper to the nearest millimeter (reported as carapace width \times length). Among several common species [e.g., *P. marmoratus*, *Eriphia verrucosa* (Forskål, 1775), *Pilumnus hirtellus* (Linnaeus, 1761), *Pilumnus villosissimus* (Rafinesque, 1814), and *Lysmata seticaudata* (Risso, 1816)], three specimen each of *P. maurus* were found in scrapings held at tide level at the ELETTRA 003 gas platform (43.764413°N, 14.215197°E) (♀, 11.98 \times 11.25 mm, Fig. 15; ♀, 10.35 \times 9.34 mm; ♀, 10.09 \times 8.82 mm) and at the BONACCIA NW gas platform (43.599803°N, 14.335723°E) (♂, 8.35 \times 7.52 mm; ♀, 7.56 \times 7.02 mm; ♂, 6.96 \times 6.33 mm). All specimens perfectly agree with diagnostic characters reported in previous publications, namely one tooth on lateral margin of carapace behind exorbital tooth and absence of distal spines on ventral

margin of meropodite of fifth pereopod (Crocetta *et al.*, 2011; Giacobbe *et al.*, 2018; Kousteni *et al.*, 2022). No specimens were found in the other investigated platforms, namely BRENDA PROD (44.116443°N, 13.044925°E), FAUZIA (44.056355°N, 13.554058°E), and EMMA W (42.808505°N, 14.379206°E). The sorted material is preserved in the private collection of the last author (F.C., Naples, Italy).

As for previous records, it is difficult to establish with certainties how these specimens arrived in the Adriatic Sea. However, whereas recent records only filled somehow an expected gap, the present sighting first establish the presence of *P. maurus* in the colder sector of the Mediterranean. Under the current climate change scenario, it is thus not unlikely that also *P. transversus* will soon follow it.

3.6 First record of an adult specimen of Barracudina, *Lestidiops sphyrenoides* (Actinopterygii, Aulopiformes, Paralepididae) in the Adriatic Sea

Lorenzo ZACCHETTI, Filippo DOMENICHETTI and Michela MARTINELLI

The barracudina, family Paralepididae, consists of 13 genera and roughly 59 species (Post, 1990). They are widespread around the planet, mostly living in deep pelagic seas along the outer continental shelf and slopes, some species appear to be benthopelagic. They feed mainly on small fish and crustaceans, and the reproduction takes place in temperate and tropical waters, except for the Antarctic species (Whitehead *et al.*, 1984). They are distinguished by having a long, thin body, a posterior anal fin, an elongated snout, and fang-like teeth. *Lestidiops* genus has 18 species, 4 of which are present in the Mediterranean Sea. This paper reports the first occurrence of an adult specimen of *Lestidiops sphyrenoides* (Risso, 1820) in the Adriatic Sea (Fig. 16A). Until now, there have been discussions about the presence of

this species in the area because its presence was based on the finding of two postlarval specimens (Kovačić *et al.*, 2020). Within Italian's waters some individuals were already discovered in the straits of Sicily and Messina (Battaglia *et al.*, 2015). This new record confirms the presence of this species in the Adriatic Sea. The specimen was caught on April 19, 2021, at a depth of 176 meters (42.6550° N, 14.7448° E), during a biyearly trawl survey carried out by CNR-IRBIM through an experimental net in the Pomo Pits area (Central Adriatic Sea). In this area other rare species have been already caught as reported in Kousteni *et al.* (2022). The sample was stored in sea water in a freezer at -20°C until it was morphologically identified according to Dulčić & Kovačić (2020) and Whitehead's (1984). The specimen was a male, weighed

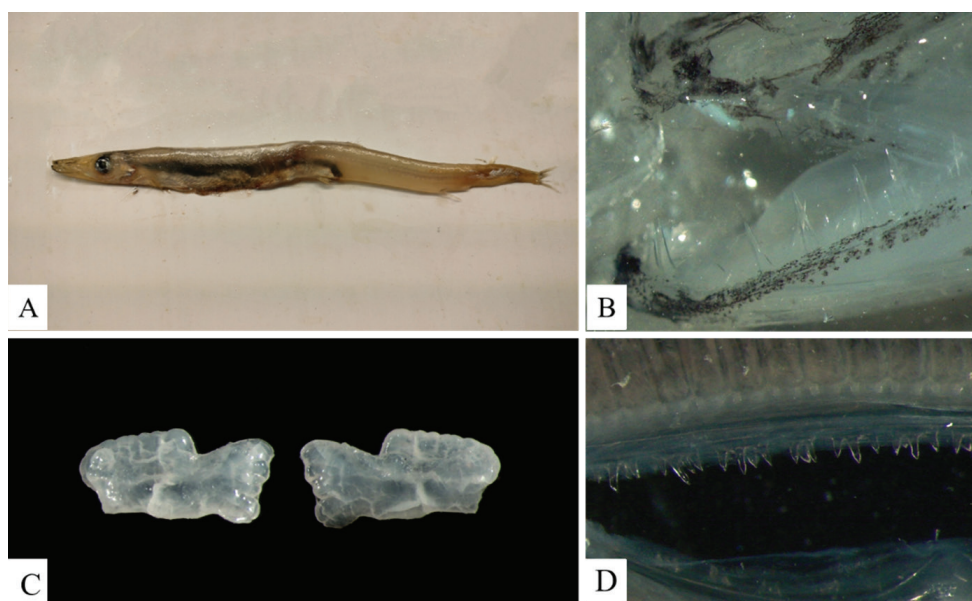


Fig. 16: *Lestidiops sphyrenoides* specimen collected in the Pomo Pits area (central Adriatic): (A) whole body; (B) detail of the teeth characterizing the lower jaw; (C) otolith from both sides; (D) branchial on the first arch, Photo credit: Lorenzo Zacchetti.

21.5 g and measured with a stereoscope 177 mm in total length (TL, Fig. 16A). The body was naked except for the lateral line scales, yellow-brown with silvery color on the sides and with some dorsal pigment cells. Pectoral fins had 11 rays, while the short dorsal, positioned a little behind the middle of the body, had 9 rays with a second small adipose dorsal fin near the tail. Anal fin was far back on body and another adipose fin in front as far as anus. The upper jaw was shorter than the lower jaw, the head measured 31 mm with a ratio equal to 5.7 times the TL. Inside the mouth were observed two rows of teeth

that cross each other with the larger outer ones. At the end of the upper jaw were observed three more robust teeth (Fig. 16B). Otoliths were extracted and analyzed by comparing them with the description given by Battaglia *et al.* (2015, Fig. 16C) for the Strait of Messina. Branchial on the first arch were composed of groups of 3 and 4 spines (Fig. 16D). The total number of vertebrae was 89. The specimen was preserved in 4% formalin solution and stored in the CNR-IRBIM collection (Cat. No.: 01 *L. sphyrenoides* 04/2021).

3.7 A new thermophile joins the Adriatic fish bandwagon: *Dentex maroccanus*

Andrea TOSO and Joachim LANGENECK

The Morocco dentex, *Dentex maroccanus* Valenciennes, 1830, belonging to the family Sparidae, is a small demersal fish inhabiting different types of bottoms between 20 and 500 m depth (Gul *et al.*, 2014). This species, originally described along the coast of Morocco, occurs along the Atlantic coast from France to the Gulf of Guinea, and in the Mediterranean Sea. In this basin, the Morocco dentex was found along the North African coast, in the Aegean Sea, in the Levantine Sea, and has been recently reported in the sea of Marmara; in addition, single specimens have been recorded for the north-western Mediterranean (Gul *et al.*, 2014; Bilecenoglu & Yokes, 2022; Froese & Pauly, 2023). In Italy this species was reported in the southern part of the Tyrrhenian Sea, in the Sicilian Strait and in the Strait of Messina (Relini & Lanteri, 2010). The adult phase for female and male is reached starting from 13.0 cm and 15.8 cm (total length) respectively, with spawning occurring between June and September (Gul *et al.*, 2014).

In the framework of the BONSEA project “Promo-

tion of good marine environmental status and sustainable fishing along the coast between Otranto and Capo di Leuca (Southern Italy, Adriatic Sea)” 20 experimental hauls have been made with the trammel net between 20 and 100 m depth in summer 2022. On the 30th June 2022 one specimen of *Dentex maroccanus* (Fig. 17) was caught close to the locality of Tricase Porto, in the transition area between the North-Eastern Ionian Sea and the Southern Adriatic Sea (39.8796° N, 18.4211 °E), at 86 m depth on a muddy bottom. The specimen was an immature female with developing gonads (stage 2), the stomach was empty. The specimen was identified according to Bauchot & Hureau (1986); in particular, the combination between the number of gillrakers on the first branchial arch (7-9 in the upper arch, 9-12 in the lower arch) and the number of scales along the lateral line (46-51) is diagnostic for this species. The main biometric and meristic parameters of the sampled specimen are summarized in Table 4. It was fixed in 4% buffered formalin and preserved in 70% ethanol in the Marine Biology Museum “Pietro Parenzan”

Table 4. Biometric and meristic measurements of the specimen of *D. maroccanus* caught off Tricase.

Biometric parameters	
Standard length (SL)	14.4 cm
Opercular head length	5.0 cm
Orbital diameter	1.6 cm
Interorbital distance	1.5 cm
Postorbital distance	1.3 cm
Pectoral fin length	5.0 cm
Greatest depth	5.5 cm
Meristic parameters	
Dorsal fin rays	XII + 9
Anal fin rays	III + 8
Pectoral fin rays	15
Ventral fin rays	I + 5
Caudal fin dorsal rays	9
Caudal fin ventral rays	8
Scales on lateral line	48
Gillrakers on the first branchial arch	8 + 11

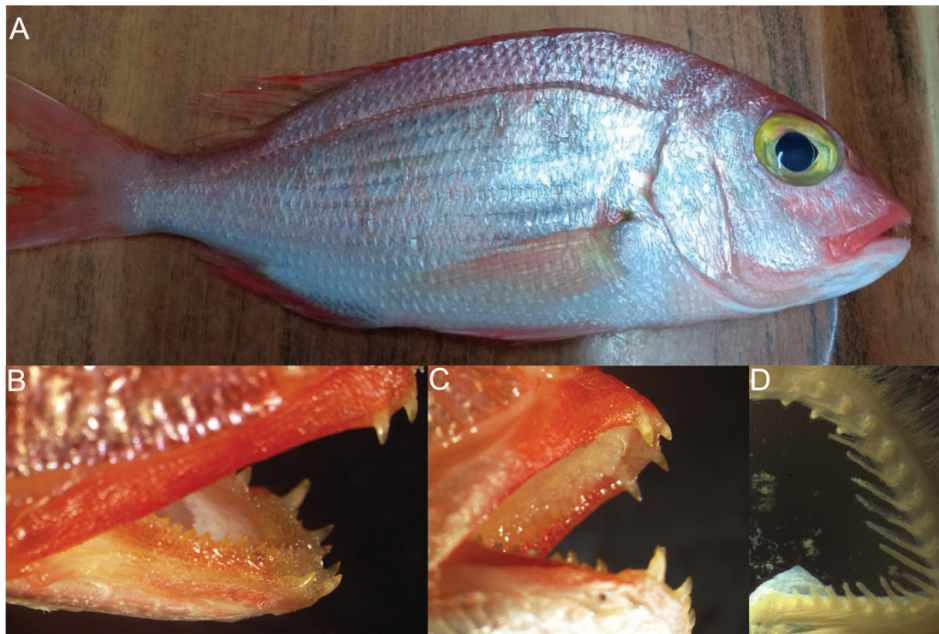


Fig. 17: *Dentex maroccanus* caught off Tricase, Adriatic Sea. A. The entire fish. B. Lower jaw: C. Upper jaw. D. First branchial arch.

of Porto Cesareo. A recent checklist of the marine fauna from the same locality does not include *D. maroccanus*, suggesting the hypothesis that this uncommon species is a recent newcomer to the Italian Ionian Sea (Micaroni *et al.*, 2022). However, the general appearance of this species is not very distinctive, and the possibility that it has been misidentified with other, more frequent Sparidae species cannot be completely ruled out. Nonetheless,

this record expands the distribution of this species along the Italian coast in the Adriatic Sea. This range expansion might originate by an established source population of *D. maroccanus* in the Aegean Sea and is potentially related to the ongoing warming scenario that is altering the biota composition of the different regions of the Mediterranean Sea.

3.8 *Tetrapturus belone* Rafinesque, 1810, a new fish species in the Albanian waters

Alen SOLDI and Rigers BAKIU

The recent list of fish recorded in the Albanian sea contains 262 fish species, representing 106 fish families (Soldo & Bakiu, 2021). Considering that the whole Albanian sea is a part of the Adriatic, the number of recorded Albanian fishes is considerably lower than the total number of Adriatic species as Kovačić *et al.* (2020), using the evidence approach, listed 444 species. Soldo & Bakiu (2021) concluded that although such a high difference may be explained by different geographical and geomorphological factors it is more likely a result of a lack of focused fish surveys in Albania. Moreover, many deep-water and offshore pelagic species are missing from the Albanian list. Thus, Soldo & Bakiu (2021) also concluded that their list can be easily updated with new species from future surveys focusing more on some particular habitats which are not traditional fishing grounds.

A specimen of Mediterranean spearfish *Tetrapturus belone* Rafinesque, 1810 was caught by a spearfisher in Bay of Vlora (40.421516 ° N, 19.369915 ° E) on 19th November 2022 and landed in Radhime where it was measured (Fig. 18). The total length of the specimen was 170 cm and the weight 30 kg. Diagnosis for identification among confamiliar Mediterranean species (Nakamura,



Fig. 18: *Tetrapturus belone* specimen caught in the Bay of Vlora (Photo credit: Sherif Durmishaj).

1986): First dorsal fin not sail-like; nape almost straight and only gently sloping up to dorsal fin origin; pectoral fin short. *Tetrapturus belone* is considered as very rare species in the Adriatic (Dulčić & Soldo, 2004) thus, bear-

ing in mind a lack of focused fisheries surveys, it is clear why this species was not recorded in the Albanian sea so far.

4. EASTERN MEDITERRANEAN

4.1 New records of two green algal species from the Aegean coasts of Türkiye: *Cladophora battersii* C.Hoek and *Valonia aegagropila* C.Agardh

Öznur Yazılan ÇAMLIK and Ergün TAŞKIN

A total of 527 marine macroalgal taxa at specific and infraspecific levels (131 brown algae, 294 red algae, 102 green algae) has been reported from the Aegean coasts of Türkiye, 32 of which belong to order Cladophorales (Taşkın & Çakır, 2022). In the present study, two green algal species, *Cladophora battersii* C.Hoek and *Valonia aegagropila* C.Agardh, are reported for the first time from the Aegean coasts for Türkiye. Sampling took place at two different locations, Gökçeada and Çeşme in April and June 2022. The algal material was collected by snorkeling and SCUBA diving, and specimens were preserved in 4% formalin in seawater. Samples were examined at the Department of Biology, Manisa Celal Bayar University (Türkiye) using a light microscope (Leica) with photographic equipment (Leica DM750). The identification of the samples was made on the basis of the descriptions by Cormaci *et al.* (2014).

Cladophora battersii was found from the coast of Çeşme (İzmir; 38.3354° N, 26.3197° E) in June 2022 at

10 m depth. Thalli were filamentous and rigid, consisting of an intertwined main axis with strong pseudodichotomic branching, 1 to 3 cm long and dark green in colour (Fig. 19A). The main axis cells are cylindrical that produce one or two lateral branches. The main axis has a diameter of 70-80 (-100) µm in middle parts, 2-4 times as long as broad. Apical cells tapering with a rounded to pointed tip, 50-60 µm in diameter, 1.5-4 times as long as broad (Fig. 19B). Rhizoids are unknown. *Cladophora battersii* is known from Britain, Ireland, Adriatic Sea, France, Italy, Sardinia, Spain, Morocco, Croatia and Greece (Guiry & Guiry, 2023).

Valonia aegagropila was found from the coast of Gökçeada Island (40.2359° N, 25.9042° E) in April 2022 at 1 m depth (Fig. 19C). Thalli were ball-like cushions or mats, coenocystic, yellowish-green in colour. Vesicles elongate, clavate, subclavate or subcylindrical, 2-3 cm long and 1-3 (-5) mm in diameter (near the apices) (Fig. 19D). *Valonia aegagropila* differs from *Valonia*

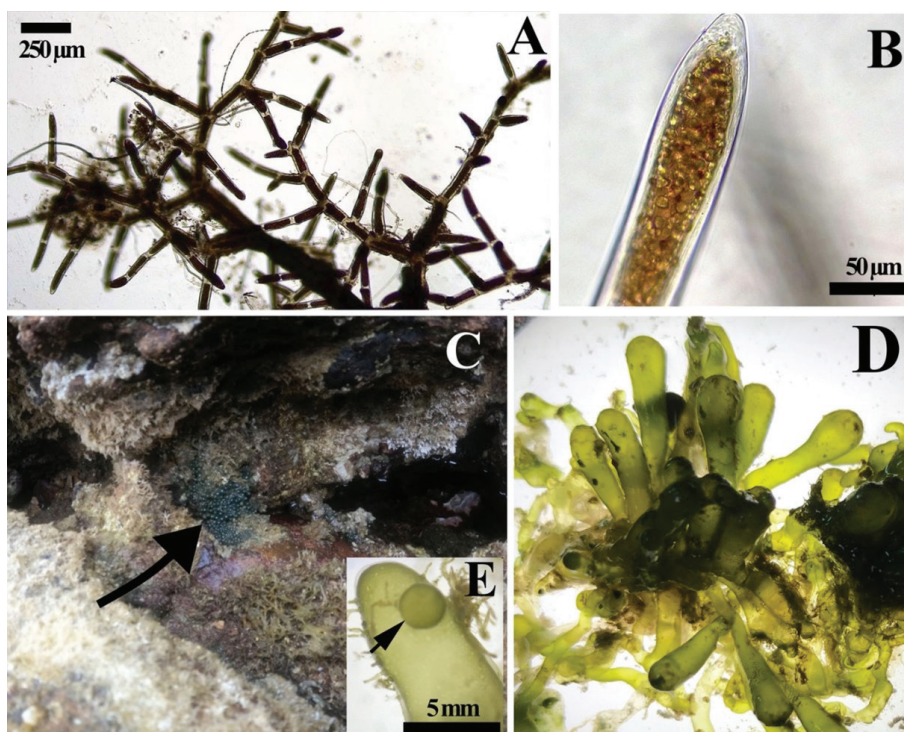


Fig. 19: The green algae *Cladophora battersii* (A: habit and B: apical cell) and *Valonia aegagropila* (C: general view of thallus under water, D: portion of a cushion and E: apical branching) from Türkiye.

utricularis (Roth) C. Agardh by apical branching (Fig. 19E). *Valonia aegagropila* is known from the Atlantic Ocean (Western Atlantic, Salvage Islands, Trindade and Martim Vaz, Canary Islands), Pacific Ocean (China, Japan, Taiwan, Indonesia, Malaysia, Philippines, Vietnam,

Singapore), Indian Ocean (Pakistan, Oman, Red Sea, Sudan, Somalia, Kenya, Madagascar, India), Australia, and the Mediterranean Sea (Adriatic Sea, Balearic Islands, Sardinia, France, Greece, Italy, Spain) (Guiry & Guiry, 2023).

4.2 First record of *Nezumia aequalis* (Günther, 1878) in the Syrian marine waters (Eastern Mediterranean)

Ranim Mohamad OTHMAN and Mohamad Younis GALIYA

A single specimen of Smooth grenadier *Nezumia aequalis* (Günther, 1878) was caught with a trawl net in Ras Albasit, Syrian marine waters (35.8524°N, 35.8378°E) on 17 January 2023, with other fish species such as *Sillago sihama* (Forsskal, 1775).

The species was identified using the taxonomical keys of Whitehead *et al.* (1986), Golani *et al.* (2006), Marques & Almeida (1998; 2001) and Collette (2016). Subsequently, it was preserved in 7% formaldehyde and deposited at the Laboratory of Hydrobiology, Faculty of Sciences, Tishreen University, Lattakia, Syria.

The collected specimen measured weighted 3.88 g and was identified as *Nezumia aequalis* (Fig. 20) based on the combination of morphological, meristic and anatomical characters. Its body was compressed with pointed snout, small teeth and large eyes (31.81% of head length). The suborbital ridge was extending back under eye. The specimen had two dorsal fins; the first one was short and long, with two spines, ten rays and serrations on the second spine; the second dorsal fin was long with very short finrays. The origin of pelvic fin was under the base of pectoral fins; origin of anal fin was located under the posterior one-third of first dorsal fin. Spinules on body scales were lanceolate (Fig. 20C); gillrakers on the first arch were nine while on the second arch were 14. Pelvic finrays were eight. Snout to first dorsal spine length (2.5 cm) was larger than the length from anterior most part of the orbital bone to anus (2.2 cm). The outline of the sagittal otolith was trapezoidal (Fig. 21), the cranial end broad, with a short slightly rounded tip. Caudal end was thinner and ended up rounded. Antirostrum was short and round (Fig. 21-1) and had a slight excisura (Fig. 21-6). The outer face was convex while the inner was flat. Ostium was open (Fig. 21-2). The ventral margin was almost even (Fig. 21-3). The dorsal margin was toothed strongly and more irregular (Fig. 21-4). Our results of the morphological, meristic and anatomical study agreed with all

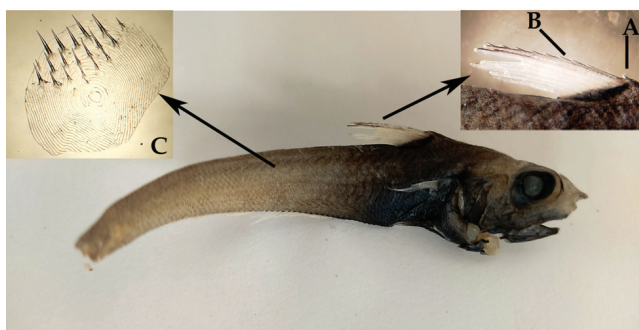


Fig. 20: General view of *Nezumia aequalis* caught from Syrian marine waters (the delicate final part was cut). (A) First ray spinous, small, closely adhered to second ray; (B) Second ray spinous, serrated on leading edge; (C) Spinules on body scales lanceolate.

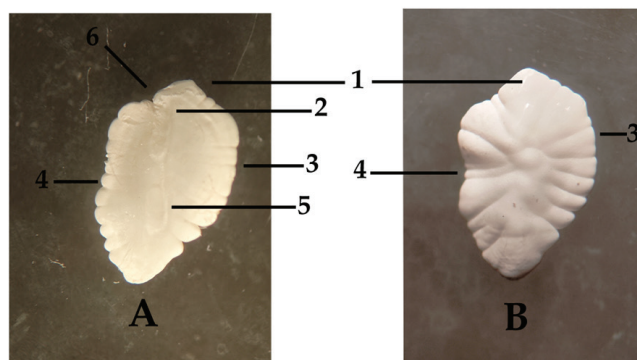


Fig. 21: Sagittal otoliths (otolith length: 5 mm, otolith width: 3 mm). (A) inner face view; (B) outer face view. 1 - rostrum; 2 - ostium; 3 - ventral margin; 4 - dorsal margin; 5 - sulcus; 6 - excisura.

abovementioned key literatures.

This is a new record of this species from Syrian water and contributes to the knowledge on biodiversity of fish fauna in Syrian marine waters.

4.3 First record of *Caprella acanthifera* Leach, 1814 (Amphipoda, Caprellidae) in the Southeastern Mediterranean Sea

Razy HOFFMAN and Bella S. GALIL

Caprella acanthifera Leach, 1814 is widely distributed in the northeastern Atlantic Ocean and the Mediterranean Sea, including a record from Lattakia, Syria (Karrom *et al.*, 2008). An extensive survey undertaken in the mid 20th century along the Israeli coast record-

ed solely *C. grandimana* Mayer, 1882 (as *C. acanthifera grandimana*) (Gottlieb, 1960; Guerra-García *et al.*, 2001), however, surveys in the past decade revealed two other caprellids *Caprella andreae* Mayer, 1890 and *Paracaprella pusilla* Mayer, 1890 (Montesanto *et al.*, 2022).

Subsequent studies of the shallow rocky subtidal failed to report *C. acanthifera*, until a survey of shallow rock pools (10-50 cm water depth) along the northern coast of Israel undertaken in April 2023 revealed its presence at three sites (33.086675° N, 35.105680° E; 33.055150° N, 35.102070° E; 33.043310° N, 35.099040° E). A total of 97 individuals were collected (SMNH CRU 30281, 30282, 30283), specifically 53 males 22 females (including three ovigerous), and 22 juveniles. Adult male specimens possess blunt dorsal tubercles on 2nd segment, 2nd gnathopod palm with semicircular excavation (Fig. 22), dactyl bearing 2 thickened bulges; propodus hind-margin of pereopods 5-7 spinose, setose; gills oval to elongate. Though reported to live on sponges, hydroids, ascidians, anthozoans, bryozoans, seagrasses and a variety algal species (Guerra-García *et al.*, 2010), the Israeli specimens were all found clinging to the common red seaweed *Spyridia filamentosa* (Wulfen) Harvey, 1833, a species widely distributed in many temperate and tropical seas. Taking into account the high frequency of previous investigations of the rocky subtidal along the northern Israeli



Fig. 22: Male specimen of *Caprella acanthifera* collected at Achziv marine protected area, Israel (scale bar = 500 µm).

coast, *C. acanthifera* is likely a recent arrival, as it had not been previously recorded in the area.

Acknowledgements

Daniele Grech would like to thank the Co-Editor-in-Chief, Vasilis Gerovasileiou, and all reviewers for sharing their time, knowledge, and expertise during the review process of all sub-sections of this Collective Article. Juan Sempere-Valverde was supported by a FPI Grant (PRE2018-086266) from Ministerio de Ciencia, Innovación y Universidades (Project CGL 2017-82739-P) co-financed by ERDF European Union and Agencia Estatal de Investigación, Gobierno de España. Juan Sempere-Valverde and María del Rosario Martín-Hervás would like to thank Luis Sánchez-Tocino and David Ballesteros for the *in situ* identification and posteriori verification of the reported specimens, to Francisco Sedano and Luis Sánchez-Tocino for providing the photos, and to Juan Lucas Cervera Currado and Ángel Á. Valdés for the taxonomic verification of the juvenile of *Cyerce graeca*. Enric Madrenas and Leila Carmona thank Jordi Regàs (Club d'Immersió Biologia) and Prof Juan Lucas Cervera Currado (Universidad de Cádiz) for their help with the identification of *Algarvia alba* specimen. Francesco Tiralongo and Roberto Cappuccinelli are grateful to Giorgio Trova for providing us photo and data about the caught of the rare specimen of *Pontinus kuhlii*. Daniele Grech would like to stress that the sighting of *Gymnura altavela* record has been possible only because of data sharing among Citizen Science events, contributing to the increased knowledge of biodiversity dive site. The authors are in debt to the SCUBA diver Simone Perria and the entire group “Subacquei per la scienza” (Underwater divers for science) composed by the underwater photographers Consuelo Demontis, Carlo Lutz, Mauro Salis, Marco Secchi, Gianni Turnu and the co-author and video maker member Claudio Masala, all attending the Citizen Science initiative. Sahar Chebaane and Chaima Ben-Griira would like to thank Lamia Nasraoui for transporting the

specimen to TunSea researchers and Mr Moncef Miledi for sharing his pictures and providing the specimen. Sahar Chebaane is financially supported through doctoral fellowships provided by Agência Regional para o Desenvolvimento da Investigação, Tecnologia e Inovação (AR-DITI-M1420-09-5369-FSE-000002). Lorenzo Zacchetti, Filippo Domenichetti and Michela Martinelli would like to acknowledge the crew of the R/V “Dallaporta” for their professional skills in conducting the fishing surveys. This research was conducted within a program for the evaluation of 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. The work of Serena Mucciolo and Andrea Desiderato was performed in the framework of the expedition carried out under the IDUB project 2102325000 of the University of Lodz. Jakov Dulčić is grateful to all the employees of the fishers’ cooperative “Istra” from Poreč (especially to Mr. R. Momić) for the available data on specimens. The work of Borut Mavrič and Domen Trkov was conducted as part of the Slovenian national monitoring of alien species 2021-2023 (Contract No. 2330-21-670002), Life Pinna project (LIFE20 NAT/IT/001122 PINNA) and Slovenian national research corefunding No. P1-0237. The work of Borut Mavrič and Lovrenc Lipej was conducted as part of the National monitoring of alien species 2021-2023 (Contract No. 2330-21-670002). The authors thank Leon Lojze Zamuda, Ana Fortič and Tihomir Markovec, who helped with the field- and lab-work. Andrea Toso and Joachim Langeneck thank Daniele and Francesco Cazzato for the *D. maroccanus* specimen and the catch data, and prof. Stefano Piraino for his suggestions on the manuscript. Alen Soldo and Rigers Bakiu would like to thank Sherif Durmishaj for providing the infor-

mation about the specimen. Öznur Yazılan Çamlık and Ergün Taşkın work has been supported by TÜBİTAK (Ankara, Türkiye) (121Y215). Ranim Mohamad Othman and Mohamad Younis Galiya would like to thank Faculty of Sciences, Tishreen University, Lattakia, Syria for providing the financial support. Razy Hoffman and Bella S. Galil gratefully acknowledge Prof. J.M. Guerra-García, University of Seville, Spain, for confirming the species' identification.

References

- Ayas, D., Ergüden, D., Çiftçi, N., 2022. First record of *Tetragnathus cuvieri* Risso, 1810 (Tetragnathidae) from the Eastern Mediterranean. *FishTaxa*, 23, 42-46.
- Ahlstrom, E.H., D'Ancona, U., Sanzo, L., Sparta, A., Bertolini, F. *et al.*, 1962. Fauna e Flora del Golfo di Napoli. Monografia 38: Uova, Larve e Stadi Giovanili di Teleostei. Monografia elaborata con l'uso del materiale raccolto e seriato da Salvatore Lo Bianco. *Copeia*, 1962, 858.
- 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*, 288 (1942), 20202469.
- Andreone, F., Boero, F., Bologna, M.A., Carpaneto, G.M., Castiglia, R. *et al.*, 2022. Reconnecting research and natural history museums in Italy and the need of a national collection biorepository. *ZooKeys*, 1104, 55-68.
- Battaglia, P., Malara, D., Ammendolia, G., Romeo, T., Andarolo, F., 2015. Relationships between otolith size and fish length in some mesopelagic teleosts (Myctophidae, Paralepididae, Phosichthyidae and Stomiidae). *Journal of Fish Biology*, 87, 774-782.
- Bauchot, M.L., Hureau, J.C., 1986. Sparidae. pp. 883-907. In: *Fishes of the North-Eastern Atlantic and the Mediterranean*, Vol. 2. Whitehead, P.J.P., Bauchot, M.L., Hureau, J.C., Nielsen, J., Tortonese, E. (Eds.). UNESCO, Paris, France.
- Ballesteros, M., Madrenas, E., Pontes, M., 2023. *OPK - Opistobranquis*. <https://opistobranquis.info/en/> (accessed 16 April 2023).
- Bavestrello, G., Betti, F., Canessa, M., Bo, M., 2023. The Red Coral Community in the Messina Strait: New Findings from the 1700s Lazzaro Spallanzani Collection. *Diversity*, 15 (2), 177.
- Bergh, L.S.R., 1881. Beiträge zu einer Monographie der Polyceraden, II. *Verhandlungen der königlich-kaiserlich Zoologisch-botanischen Gesellschaft in Wien (Abhandlungen)*, 30, 629-668.
- Bianchi, C.N., Morri, C., 2000. Marine biodiversity of the Mediterranean Sea: situation, problems and prospects for future research. *Marine Pollution Bulletin*, 40 (5), 367-376.
- Bilecenoglu, M., Yokeş, M.B., 2022. New additions to the fish fauna of Sea of Marmara: *Dentex maroccanus* Valenciennes, 1830 (Sparidae) and *Gobius couchi* Miller & El-Tawil, 1974 (Gobiidae). *FishTaxa*, 24, 42-48.
- Bo, M., Al Mabruk, S.A.A., Balistreri, P., Bariche, M., Batjakas, I.E. *et al.*, 2020. New records of rare species in the Mediterranean Sea (October 2020). *Mediterranean Marine Science*, 21 (3), 608-630.
- Bo, M., Bavestrello, G., Canese, S., Giusti, M., Angiolillo, M. *et al.*, 2011. Coral assemblage off the Calabrian Coast (South Italy) with new observations on living colonies of *Antipathes dichotoma*. *Italian Journal of Zoology*, 78, 231-242.
- Bradai, M.N., Quignard, J.P., Bouain, A., Jarboui, O., Ouannes-Ghorbel *et al.*, 2004. Ichtyofaune autochtone et exotique des côtes Tunisiennes: recensement et biogéographie. *Cy-bium*, 28 (4), 315-328.
- Brunetti, R., 2009. Botryllid species (Tunicata, Ascidiacea) from the Mediterranean coast of Israel, with some considerations on the systematics of Botryllinae. *Zootaxa*, 2289, 18-32.
- 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, Italy.
- Carnevale, A., Giglio, G., Leonetti, F.L., Lanteri, L., Milazzo, C. *et al.*, 2021. First documented record of smalleye square-tail *Tetragnathus cuvieri* Risso, 1810 (Perciformes, Stromateoidea) along Calabrian coasts (Southern Italy, Central Mediterranean). *Acta Adriatica*, 62 (1), 105-110.
- Castriota, L., Deidun, A., 2014. First record of *Pontinus kuhlii* in Maltese waters. *Marine Biodiversity Records*, (7), e2.
- Castro, P., Ng, P.K.L., 2008. *Rhadinoplax*, a new genus of Progeronidae Števcic, 2005 for *Carcinoplax microphthalmus* Guinot & Richer de Forges, 1981, and a redescription of *Paragalene longicrura* (Nardo, 1868) (Crustacea: Decapoda: Brachyura: Goneplacoidea). *Zootaxa*, 1777, 53-68.
- Cervera, J.L., García-Gómez, J.C., Ortea, J.A., 1988. A new species of the genus *Hermaea* (Gastropoda: Opisthobranchia: Sacoglossa) and redescription of two rare sacoglossans of the European Malacofauna. *Iberus*, 8 (2), 215-224.
- 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 (8), e11842.
- Collette, B.B., 2016. Macrouridae. p. 1968-1990. In: *The living marine resources of the Eastern Central Atlantic*. Vol. 3: *Bony fishes part 1 (Elopiformes to Scorpaeniformes)*. FAO Species Identification Guide for Fishery Purposes. Carpenter, K.E., De Angelis, N. (Eds.). FAO, Rome, Italy.
- Cormaci, M., Furnari, G., Alongi, G., 2014. Flora marina bentonica del Mediterraneo: Chlorophyta. *Bollettino dell'Accademia Gioenia di Scienze Naturali di Catania*, 47, 11-436.
- 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.
- d'Udekem d'Acoz, C., 1999. *Inventaire et distribution des crustacés décapodes de l'Atlantique nord-oriental, de la Méditerranée et des eaux continentales adjacentes au nord de 25°N*. Patrimoines naturels (M.N.H.N./S.P.N.), 40, 383 pp.
- Didier Laurent, S., Baus, F., Le Bris, S., 2014. *Gymnothorax unicolor* (Delaroche, 1809). DORIS, <https://doris.ffessm.fr/Especies/Gymnothorax-unicolor-Murene-chocolat-2626> (accessed 14 May 2014).
- Doderlein, P., 1891. *Manuale ittologico del Mediterraneo*. Vol. V. Tipografia del Giornale di Sicilia, Palermo.

- Doneddu, M., Trainito, E., Furfaro, G., 2020. *Trapania graeffei* (Bergh, 1881) (Gastropoda, Nudibranchia) is a valid Mediterranean species. *Bolletino Malacologico*, 56, 86-90.
- Douve, F., Ehler, C.N., 2011. The importance of monitoring and evaluation in adaptive maritime spatial planning. *Journal of Coastal Conservation*, 15, 305-311.
- Dulčić, J., Kovačić, M., 2020. *Ihtiofauna Jadranskoga mora*. Publisher, Golden marketing - Tehnička knjiga, Zagreb and Institut za oceanografiju i ribarstvo, Split, Croatia 677 pp.
- Dulčić, J., Soldo, A., 2004. The Mediterranean spearfish *Tetrapturus belone* Rafinesque, 1810, in the Adriatic waters: New record and review of Adriatic records. *Annales Series Historia Naturalis*, 14 (1), 45-48.
- Fabbrizzi, E., Giakoumi, S., De Leo, F., Tamburello, L., Chiare, A. *et al.*, 2023. The challenge of setting restoration targets for macroalgal forests under climate changes. *Journal of Environmental Management*, 326, 116834.
- Fabi, G., Grati, F., Puletti, M., Scarcella, G., 2004. Effects on fish community induced by installation of two gas platforms in the Adriatic Sea. *Marine Ecology Progress Series*, 273, 187-197.
- Ferrari, M., 2022. La straordinaria varietà italiana. *Le Scienze*, 644, 44-51.
- Fortič, A., Al-Sheikh Rasheed, R., Almajid, Z., Badreddine, A., Baez, J.C. *et al.*, 2023. New records of introduced species in the Mediterranean Sea (April 2023). *Mediterranean Marine Science*, 24 (1), 182-202.
- Fraschetti, S., Guarnieri, G., Bevilacqua, S., Terlizzi, A., Claudet, J. *et al.*, 2011. Conservation of Mediterranean habitats and biodiversity countdowns: what information do we really need? *Aquatic Conservation: Marine and Freshwater Ecosystems*, 21 (3), 299-306.
- Froese, R., Pauly, D., 2023. *Fishbase*. www.fishbase.org (accessed 7 February 2023)
- García-Gómez, J.C., Cervera, J.L., 1989. A new species and genus of aeolid nudibranch (Mollusca, Gastropoda) from the Iberian coasts. *Bulletin du Muséum National d'Histoire Naturelle (Paris)*, 11, 733-741.
- Garrabou, J., Gómez-Gras, D., Ledoux, J.B., Linares, C., Bensoussan, N. *et al.*, 2019. Collaborative database to track Mass Mortality Events in the Mediterranean Sea. *Frontiers in Marine Science*, 6, 707.
- Garrabou, J., Gómez-Gras, D., Medrano, A., Cerrano, C., Ponti, M. *et al.*, 2022. Marine heatwaves drive recurrent mass mortalities in the Mediterranean Sea. *Global Change Biology*, 28, 5708-5725.
- Gerovasileiou, V., Bianchi, C.N., 2021. Mediterranean marine caves: a synthesis of current knowledge. *Oceanography and Marine Biology: An Annual Review*, 59, 1-88.
- Gerovasileiou, V., Chintiroglou, C., Vafidis, D., Koutsoubas, D., Sini, M. *et al.*, 2015. Census of biodiversity in marine caves of the eastern Mediterranean Sea. *Mediterranean Marine Science*, 16 (1), 245-265.
- Gerovasileiou, V., Smith, C.J., Sevastou, K., Papadopoulou, K.-N., Dailianis, T. *et al.*, 2019. Habitat mapping in the European Seas - is it fit for purpose in the marine restoration agenda? *Marine Policy*, 106, 103521.
- Gerovasileiou, V., Akyol, O., Al-Hosne, D.Z., Alshikh Rashied, R., Ataç, E. *et al.*, 2020. New records of rare species in the Mediterranean Sea (May 2020). *Mediterranean Marine Science*, 21 (2), 340-359.
- Gerovasileiou, V., Bancila, R.I., Katsanevakis, S., Zenetos, A., 2022. Introduced species in Mediterranean marine caves: an increasing but neglected threat. *Mediterranean Marine Science*, 23 (4), 995-1005.
- 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.
- GBIF, Global Biodiversity Information Facility, 2023. <https://www.gbif.org/> (accessed 15 March 2023)
- Gili, J.M., Macpherson, E., 1987. Crustáceos Decápodos capturados en cuevas submarinas del litoral Balear. *Investigación Pesquera*, 51 (1), 285-291.
- Golani, D., Öztürk, B., Basust, N., 2006. *Fishes of the Eastern Mediterranean. Vol.24*. Turkish Marine Research Foundation. Istanbul, Turkey, 260 pp.
- Gomes-Pereira, J.N., Carmo, V., Catarino, D., Jakobsen, J., Alvarez, H. *et al.*, 2017. Cold-water corals and large hydrozoans provide essential fish habitat for *Lappanella fasciata* and *Benthocometes robustus*. *Deep Sea Research Part II: Topical Studies in Oceanography*, 145, 33-48.
- González, J.A., Matins, A., Santana Morales, J.I., Triay-Portella, R., Monteiro, C. *et al.*, 2014. New and rare records of teleost fishes from the Cape Verde Islands (Eastern-Central Atlantic Ocean). *Cybio*, 38 (4), 289-300.
- Gottlieb, E., 1960. The benthonic Amphipoda of the Mediterranean coast of Palestine. I. Notes on the geographical distribution. *Bulletin of the Research council of Palestine, section B: Zoology*, 9 (2-3), 157-166.
- Gravina, M.F., Cardone, F., Bonifazi, A., Bertrandino, M.S., Chimienti, G. *et al.*, 2018. *Sabellaria spinulosa* (Polychaeta, Annelida) reefs in the Mediterranean Sea: Habitat mapping, dynamics and associated fauna for conservation management. *Estuarine, Coastal and Shelf Science*, 200, 248-257.
- Grech, D., van de Poll, B., Bertolino, M., Rosso, A., Guala, I., 2020. Massive stranding event revealed the occurrence of an overlooked and ecosystem engineer sponge. *Marine Biodiversity*, 50 (5), 1-12.
- Guerra-García, J.M., Ros Clemente, M., Gordillo, I., Cabezas Rodríguez, M.D.P., Baeza-Rojano Pageo, E. *et al.*, 2010. Distribution patterns of intertidal and shallow water caprellids associated with macroalgae along the Iberian Peninsula. *Zoologica Baetica*, 21, 101-129.
- Guerra-García, J.M., Sánchez-Moyano, J.E., García-Gómez, J.C., 2001. Two new hairy species of *Caprella* (Amphipoda) from the Strait of Gibraltar, with a redescription of *Caprella grandimana*. *Journal of Crustacean Biology*, 21 (4), 1014-1030.
- Guiry, M.D., Guiry, G.M., 2023. *AlgaeBase*. World-wide electronic publication, National University of Ireland, Galway. <https://www.algaebase.org> (accessed 10 May 2023).
- Gul, G., Ismen, A., Arslan, M., 2014. Age, growth, and reproduction of *Dentex maroccanus* (Actinopterygii: Perciformes: Sparidae) in the Saros Bay (North Aegean Sea). *Acta Ichthyologica et Piscatoria*, 44, 295-300.
- Iveša, N., Béres, T., Török, J.K., 2020. Northernmost record of the rare brachyuran crab, *Paragalene longicrura* (Nardo, 1868) (Decapoda, Progeronidae) from the Istrian Peninsula.

- la (Adriatic Sea, Croatia). *Crustaceana*, 93, 131-156.
- Jardas, I., A. Pallaoro, N. Vrgoč, S. Jukić-Peladić, Dadić, V., 2008. *Crvena knjiga morskih riba Hrvatske*, (Red Book of Sea Fishes of Croatia). Zagreb, Ministarstvo kulture. Državni zavod za zaštitu prirode, Republika Hrvatska, 396 pp.
- Karrom, M., Zeini, A., Alnesser, A., 2008. A Taxonomical Study of the Family Caprellidae (Amphipoda) in the Coastal Region of Lattakia. *Tishreen University Journal for Research and Scientific Studies - Biological Sciences Series* 30 (4), 202-216. (in Arabic with English abstract)
- Karydis, M., 2021. Biodiversity Changes in the Mediterranean Marine Environment: The role of species Invasions and Climate Change. *Advances In Marine Biology*, 1.
- Katsanevakis, S., Poursanidis, D., Hoffman, R., Rizgalla, J., Rothman, S.B.S. *et al.*, 2020. Unpublished Mediterranean records of marine alien and cryptogenic species. *Bioinvasions Records*, 9, 165-182.
- Keskin, A.C., Dereli, H., Irmak, E., 2014. First record of the red-spotted wrasse *Lappanella fasciata* (Cocco, 1833) (Labridae) in the Aegean Sea. *Journal of Applied Ichthyology*, 30, 1035-1036.
- Kossmann, R., 1878. Kurze Notizen über einige neue Crustaceen sowie über neue Fundorte einiger bereits beschriebenen. *Archiv für Naturgeschichte*, 44 (1), 251-258.
- Koulouri, P., Mogias, A., Gerovasileiou, V., 2022. Ocean Literacy across the Mediterranean Sea region in the Era of 2030 Agenda and Decade of Ocean Science for Sustainable Development (2021-2030). *Mediterranean Marine Science*, 23 (2), 266-269.
- Kousteni, V., Anastasiadis, A., Bariche, M., Battaglia, P., Bonifazi, A. *et al.*, 2022. New records of rare species in the Mediterranean Sea (May 2022). *Mediterranean Marine Science*, 23 (3), 417-446.
- Kovačić, M., Lipej, L., Dulčić, J., 2020. Evidence approach to checklists: critical revision of the checklist of the Adriatic Sea fishes. *Zootaxa*, 4767 (1), 1-55.
- La Mesa, G., Annunziatellis, A., Filidei, E., Fortuna, C.M., 2015. Modeling environmental, temporal and spatial effects on twaite shad *Alosa fallax* by catches in the central Mediterranean Sea. *Fisheries Oceanography*, 24 (2), 107-117.
- Lamine, E.B., Di Franco, A., Romdhane, M.S., Francour, P., 2018. Can citizen science contribute to fish assemblages monitoring in understudied areas? The case study of Tunisian marine protected areas. *Estuarine, Coastal and Shelf Science*, 200, 420-427.
- Levin, N., Coll, M., Fraschetti, S., Gal, G., Giakoumi, S. *et al.*, 2014. Biodiversity data requirements for systematic conservation planning in the Mediterranean Sea. *Marine Ecology Progress Series*, 508, 261-281.
- Lipej, L., Trkov, D., Mavrič, B., 2018. Polži zaškrgegarji slovenskega morja (*Heterobranchs of the Slovenian Sea*). National Institute of biology, Marine Biology Station (Eds), Piran, Slovenia, 308 pp.
- Lisco, S.N., Pierri, C., Lazic, T., Bonifazi, A., Gravina, M.F. *et al.*, 2021. *Sabellaria alveolata* versus *Sabellaria spinulosa* reefs along the Italian coasts: a new methodological proposal to compare different growth models. *Geosciences*, 11, 426.
- Lobo, J., Costa, P.M., Teixeira, M.A., Ferreira M.S.G., Costa, M.H. *et al.*, 2013. Enhanced primers for amplification of DNA barcodes from a broad range of marine metazoans. *BMC Ecology*, 13, (34).
- Mancusi, C., Bairo, R., Fortuna, C., Gil De Sola, L., Morey, G. *et al.*, 2020. MEDLEM database, a data collection on large Elasmobranchs in the Mediterranean and Black Seas. *Mediterranean Marine Science*, 21 (2), 276-288.
- Martin-Hervás, M.R., Carmona, L., Jensen, K.R., Licchelli, C., Vitale, F. *et al.*, 2020. Description of a new pseudocryptic species of *Elysia* Risso, 1818 (Heterobranchia, Sacoglossa) in the Mediterranean Sea. *Bulletin of Marine Science*, 96, 127-143.
- Marques, A.M., Almeida, A.J., 1998. Notes on the biology of *Nezumia sclerorhynchus* and *Nezumia aequalis* (Gadiiformes: Macrouridae) from the Algarve slope, northeast Atlantic. *Cybius: International Journal of Ichthyology*, 22 (1), 21-29.
- Marques, A., Almeida, A.J., 2001. Otolith morphology of *Nezumia sclerorhynchus* and *Nezumia aequalis* (Macrouridae): a useful tool to species identification and ecological studies. *Boletim do Museu Municipal do Funchal*, 205-212.
- Mastrototaro, F., Montesanto, F., 2022. The new Checklist of the Italian Fauna: Ascidiacea. *Biogeographia—The Journal of Integrative Biogeography*, 37 (1), ucl0031.
- Mastrototaro, F., Aguilar, R., Alvarez, H., Blanco, J., García, S. *et al.*, 2020a. Mesophotic rocks dominated by *Diazona violacea*: A Mediterranean codified habitat. *European Zoological Journal*, 87 (1), 688-695.
- Mastrototaro, F., Chimienti, G., Montesanto, F., Perry, A.L., García, S. *et al.*, 2019. Finding of the microphagous deep sea ascidian *Dicopia antirrhinum* Monniot, 1972 (Chordata: Tunicata) in the Tyrrhenian Sea and updating of its distribution. *The European Zoological Journal*, 86 (1), 181-188.
- Mastrototaro, F., Montesanto, F., Salonna, M., Viard, F., Chimienti, G. *et al.*, 2020b. An integrative taxonomic framework for the study of the genus *Ciona* (Ascidiacea) and description of a new species, *Ciona intermedia*. *Zoological Journal of the Linnean Society*, 190 (4), 1193-1216.
- Micaroni, V., Strano, F., Crocetta, F., Di Franco, D., Piraino, S. *et al.*, 2022. Project “Biodiversity MARE Tricase”: A species inventory of the coastal area of Southeastern Salento (Ionian Sea, Italy). *Diversity*, 14, 904.
- Micaroni, V., Strano, F., Di Franco, D., Crocetta, F., Grech, D. *et al.*, 2018. Project “Biodiversity MARE Tricase”: a biodiversity inventory of the coastal area of Tricase (Ionian Sea, Italy) - Mollusca: Heterobranchia. *The European Zoological Journal*, 85 (1), 179-192.
- Mikac, B., 2015. A sea of worms: polychaete checklist of the Adriatic Sea. *Zootaxa*, 3943 (1), 1.
- Montesanto, F., Albano, M., Ayas, D., Betti, F., Capillo, G. *et al.*, 2022. New records of rare species in the Mediterranean Sea (December 2022). *Mediterranean Marine Science*, 23 (4), 968-994.
- Mrakovčić, M., Brigić, A., Buj, I., Čaleta, M., Mustafić, P. *et al.*, 2006. *Crvena knjiga slatkovodnih riba Hrvatske*. Ministarstvo kulture i Državni zavod za zaštitu prirode (Eds), Zagreb, Croatia, 256 pp.
- Muus, B.J., Nielsen, J.G., 1999. *Die Meeresfische Europas in Nordsee, Ostsee und Atlantik*. Stuttgart (Kosmos-Naturführer), 336 p.

- Nakamura, I., 1986. Istiophoridae. p. 1000–1005. In: *Fishes of the North-eastern Atlantic and the Mediterranean. Vol. 3*. Whitehead, P. J. P., Bauchot, M.-L., Hureau, J.-C., Nielsen, J., Tortonese, E. (Eds). Unesco, Paris, France.
- Narayanaswamy, B.E., Coll, M., Danovaro, R., Davidson, K., Ojaveer, H. *et al.*, 2013. Synthesis of knowledge on marine biodiversity in European seas: from census to sustainable management. *PLoS ONE*, 8 (3), e58909.
- Ortea, J., Bacallado, J.J., Moro, L., 2003. Una nueva especie de *Melanochlamys* Cheesman, 1881 de las islas Canarias, descrita en honor al Dr. Wolfredo Wildpret de la Torre (Mollusca: Opisthobranchia: Cephalaspidea). *Vieraea*, 31, 303-307.
- OBIS, Ocean Biogeographic Information System, 2023. www.obis.org (accessed 15 March 2023).
- Pais, A., Chessa, L.A., Delrio, G., 2005. Northernmost occurrence of the Offshore rockfish, *Pontinus kuhlii* (Scorpaeniformes: Scorpaenidae), in the Mediterranean Sea. *Acta Ichthyologica et Piscatoria*, 35 (2), 143-145.
- Paz-Sedano, S., Martín Álvarez, J.F., Gosliner, T.M., Pola, M., 2022. Reassessing North Eastern Atlantic-Mediterranean species of *Trapania* (Mollusca, Nudibranchia). *Zoologica Scripta*, 51 (4), 447-459.
- Post, A., 1990. Families Paralepididae, Sudidae, Omosudidae, Alepisauridae, Anotopteridae. pp. 373-389. In: Whitehead, P.J.P., Bauchot, M.L., Hureau, J.C., Nielsen, J., Tortonese, E. (Eds), 1984. *Fishes of the North-Eastern Atlantic and the Mediterranean*, UNESCO, Paris, France.
- Prkić, J., Petani, A., Igljić, D., Lanča, L., 2018. Stražnjoškrznjaci Jadranskoga mora - Slikovni atlas i popis hrvatskih vrsta (*Opisthobranchs of the Adriatic Sea – Photographic atlas and list of Croatian species*), Grafikart d.o.o. 464 p.
- Ragkousis, M., Zenetos, A., Ben Souissi, J., Hoffman, R., Ghanem, R. *et al.*, 2023. Unpublished Mediterranean and Black Sea records of marine alien, cryptogenic, and neonative species. *Bioinvasions Records*, 12, 339-369.
- Relini, G., Lanteri, L., 2010. Osteichthyes. *Biologia Marina Mediterranea*, 17, 649-674.
- Salvador, X., Fernández-Vilert, R., Moles, J., 2022. Sea slug night fever: 39 new records of elusive heterobranchs in the western Mediterranean (Mollusca: Gastropoda). *Journal of Natural History*, 56 (5-8), 265-310.
- Sanfilippo, R., Rosso, A., Viola, A., Guido, A., Deias, C., 2022. Architecture and tube structure of *Sabellaria spinulosa* (Leuckart, 1849): Comparison with the Mediterranean *S. alveolata* congener. *Journal of Morphology*, 283, 1350-1358.
- Santin, A., Aguilar, R., Akyol, O., Begburs, C.R., Benoit, L. *et al.*, 2021. New records of rare species in the Mediterranean Sea (March 2021). *Mediterranean Marine Science*, 22 (1), 199-217.
- Sartoretto, S., Francour, P., Harmelin, J.G., Charbonnel, E., 1997. Observations in situ de deux Labridae profonds, *Lappanella fasciata* et *Acantholabrus palloni*, en Méditerranée nord-occidentale. *Cybium (Paris)*, 21, 37-44.
- Sauvage, H.E., 1878. Description de poissons nouveaux ou imparfaitement connus de la collection du Muséum d'Histoire Naturelle; famille de scorpenidés, des platycéphalidés et des triglidés. *Nouvelles Archives, Muséum National d'Histoire Naturelle, Series 2*, 1, 109-158.
- Schaefer, N., Barale, V., 2011. Maritime spatial planning: opportunities & challenges in the framework of the EU integrated maritime policy. *Journal of Coastal Conservation*, 15, 237-245.
- Servello, G., Andaloro, F., Azzurro, E., Castriota, L., Catra, M. *et al.*, 2019. Marine alien species in Italy: A contribution to the implementation of descriptor D2 of the marine strategy framework directive. *Mediterranean Marine Science*, 20 (1), 1-48.
- Silva, J.P., Pola, M., Cervera, J.L., Calado, G., 2015. First record of *Algarvia alba* García-Gómez and Cervera, 1989 (Gastropoda: Heterobranchia) outside the type locality. *Bulletin of Marine Biodiversity*, 46, 7-8.
- Soldo, A., Bakiu, R., 2021. Checklist of marine fishes of Albania. *Acta Adriatica*, 62, 1, 63-73.
- Spalding, M.D., Fox, H.E., Allen, G.R., Davidson, N., Ferdaña, Z.A. *et al.*, 2007. Marine ecoregions of the world: a bioregionalization of coastal and shelf areas. *BioScience*, 57 (7), 573-583.
- Spinelli, A., Castriota, L., 2017. A new record of *Gymnothorax unicolor* (Muraenidae) in the southern Tyrrhenian Sea. *Marine Biodiversity*, 47 (3), 785-786.
- Stern, N., Badreddine, A., Bitar, G., Crocetta, F., Deidun, A. *et al.*, 2019. New Mediterranean Biodiversity Records (July 2019). *Mediterranean Marine Science*, 20 (2), 409-426.
- Tamburello, L., Chiarore A., Fabbriizzi E., Colletti A., Franzitta G. *et al.*, 2022 Can we preserve and restore overlooked macroalgal forests? *Science of The Total Environment*, 806 (4), 150855.
- Taşkın, E., Çakır, M., 2022. Marine macroalgal flora on the Aegean and the Levantine coasts of Turkey. *Botanica Marina*, 65 (4), 231-241.
- Tiralongo, F., Crocetta, F., Riginella, E., Lillo, A.O., 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.
- Trainito, E., Doneddu, M., 2014. First record of living specimens of *Spinoaglaja wildpretii* (Gastropoda: Cephalaspidea: Aglajidae) from the Mediterranean Sea. *Marine Biodiversity Records*, 7, e39.
- Trainito, E., Fantin, M., Torsani, F., Furfaro, G., 2021. So large yet so unnoticed: the case of *Marionia gemmii* Almón, Pérez & Caballer, 2018 (Heterobranchia: Tritoniidae) in the Mediterranean Sea. *Cahiers in Biologie Marine*, 62, 65-70.
- Tsagarakis, K., Agius Darmanin, S., Al Mabruk, S.A.A., Auriemma, R., Azzurro, E. *et al.*, 2021. New records of rare species in the Mediterranean Sea (October 2021). *Mediterranean Marine Science*, 22, 627-652.
- Walls, R.H.L., Vacchi, M., Notarbartolo di Sciara, G., Serena, F., Dulvy, N.K., 2016. *Gymnura altavela* (Mediterranean assessment). The IUCN Red List of Threatened Species: e.T63153A16527909. (accessed on 18 January 2023).
- Whitehead, P.J.P., Bauchot, M.-L., Hureau, J.-C., Nielsen, J., Tortonese, E. 1986. *Fishes of the north-eastern Atlantic and the Mediterranean. Vol. II*. UNESCO, Paris, France, 517-1007pp.
- WoRMS Editorial Board, 2023. *World Register of Marine Species*. <https://www.marinespecies.org> (accessed 26 July 2023).
- Zenetos, A., Albano, P.G., López Garcia, E., Stern, N., Tsiamis, K. *et al.*, 2022. Established non-indigenous species in-

creased by 40% in 11 years in the Mediterranean Sea. *Mediterranean Marine Science*, 23 (1), 196-212.

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 (6), 1239-1255.

Supplementary Data

The following supplementary information is available online for the article:

Table S1. Species records metadata by Phylum, Sub-chapters (SC), Reference of the authors, basin (WMED - Western Medi-terranean Sea, CMED - Central Mediterranean Sea, ADRIA - Adriatic Sea, and EMED - Eastern Mediterranean Sea), Location, Ecoregion sensu Spalding *et al.* (2007), Location Number (LN) as in Figure 1, with Latitude, Longitude

Video S2: Daniele Grech & Claudio Masala: Underwater video of a *Gymnura altavela* specimen off Santa Caterina coast (Sardinia, Western Mediterranean Sea).