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VASILIKI KOUSTENI, RIGERS AGRON BAKIU, AHMED BENHMIDA, FABIO CROCETTA, VINCENZO DI MARTINO, AIKATERINI DOGRAMMATZI, NIKOLAOS DOUMPAS, SHERIF DURMISHAJ, IOANNIS GIOVOS, MEHMET GÖKOĞLU, MEHMET FATIH HUSEYINOGLU, CARLOS JIMENEZ, STEFANOS KALOGIROU, PERIKLIS KLEITOU, LOVRENC LIPEJ, ARMANDO MACALI, ALEN PETANI, SLAVICA PETOVIĆ, ERMELINDA PRATO, RUBINO FERNANDO, YASSINE RAMZI SGHAIER, BESSY STANCANELLI, SERKAN TEKER, FRANCESCO TIRALONGO, DOMEN TRKOV

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New Mediterranean Biodiversity Records (April, 2019)

Vasiliki KOUSTENI[1], Rigers Agron BAKIU[2,3], Ahmed BENHMIDA[4], Fabio CROCETTA[5], Vincenzo Di MARTINO[6], Aikaterini DOGRAMMATZI[1], Nikolaos DOUMPAS[7], Sherif DURMISHAJ[8], Ioannis GIOVOS[7], Mehmet GÖKOĞLU[9], Mehmet Fatih HUSEYINOGLU[10,11], Carlos JIMENEZ[12], Stefanos KALOGIROU[13], Periklis KLEITOU[7,14], Lovrenc LIPEJ[15], Armando MACALI[16], Alen PETANI[17], Slavica PETOVIĆ[18], Ermelinda PRATO[19], Fernando RUBINO[19], Yassine Ramzi SGHAIER[20], Bessy STANCANELLI[21], Serkan TEKER[9], Francesco TIRALONGO[22] and Domen TRKOV[15]

[1] Hellenic Centre for Marine Research, Institute of Marine Biological Resources and Inland Waters, 19013, Anavyssos, Greece
[2] Department of Aquaculture and Fisheries, Faculty of Agriculture and Environment, Agricultural University of Tirana, Koder-Kamez, Albania
[3] ACEPSD, Albanian Center for Environmental Protection and Sustainable Development, Tirana, Albania
[4] Agence de Protection et d'Aménagement duLittoral, 02 rue Mohamed Rachid Ridha,1002 Tunis, Belvédère, Tunisia
[5] Department of Integrative Marine Ecology, Stazione Zoologica ''Anton Dohrn'', Villa Comunale, I-80121 Napoli, Italy
[6] CNR/ISAFoM (National Research Counsil of Italy/Institute for Agricultural and Forestry System in the Mediterranean); via Empedocle, 58; 95125 Catania, Italy
[7] iSea, Environmental Organization for the Preservation of the Aquatic Ecosystems, Thessaloniki, Greece
[8] Fishing Center Orikum, Vlore, Albania
[9] Akdeniz University, Fisheries faculty, Antalya, Turkey
[10] Biosphere Research Center, Istanbul, Turkey
[11] University of Kyrenia, Girne, Cyprus
[12] Enalia Physis Environmental Research Center, Nicosia, Cyprus
[13] Hellenic Centre for Marine Research, Hydrobiological Station of Rodos, 85100 Rodos, Greece
[14] Marine & Environmental Research (MER) Lab Ltd., Limassol, Cyprus
[15] Marine Biology Station, National Institute of Biology, Piran, Slovenia
[16] University of Tuscia, Department of Biological and Ecological Sciences, Ichthyogenic Experimental Marine Centre (CISMAR) Tarquinia, Viterbo, Italy
[17] Put Kotlara 6, 23000 Zadar, Croatia
[18] University of Montenegro, Institute of Marine Biology, P.O. Box 69, 85330 Kotor, Montenegro
[19] CNR/IRSA (National Research Council of Italy/Water Research Institute) S.S. Taranto, Via Roma, 3; 74123 Taranto, Italy
[20] Regional Activity Centre for Specially Protected Areas SPA/RAC, Boulevard du Leader Yasser Arafat, BP 337, 1080 Tunis Cedex, Tunisia
[21] Aqua Stories; via Vampolieri, 25/31 int. 27; 95022 Aci Catena, Catania, Italy
[22] Ente Fauna Marina Mediterranea, Avola, Siracusa, Italy

Abstract

The Collective Article on "New Mediterranean Biodiversity Records" offers the means to publish biodiversity records in the Mediterranean Sea. The current article presents new biodiversity data information on 18 taxa (14 alien, 3 native and 1 cryptogenic species) belonging to 5 Phyla that are reported for 11 different countries listed according to their geographic position from the western to the eastern Mediterranean Sea. **Algeria:** the alien green alga *Caulerpa taxifolia* var. *distichophylla* and the heterobranchs *Aplysia dactylomeda* and *Aplysia punctata* are first reported from the entire country. **France:** a new record of the alien hydroid *Porpita porpita* is reported from the Corsican Sea, representing the second record of the species in the western Mediterranean Sea. **Tunisia:** the alien fish *Scatophagus argus* is reported from the Gulf of Gabès, probably representing an aquarium release. **Italy:** the well-established Mediterranean alien bivalve *Malleus regula* is first reported from the entire country. **Slovenia:** the alien marine bivalve *Xenostrobus securis* is reported for the first time from the entire country. **Croatia:** the alien gastropod *Biuve fulvipunctata* is reported for the first time from the country but also from the entire Adriatic Sea. **Montenegro:** the alien bivalve *Rapana venosa* is reported for the first time from the Montenegrin waters. **Albania:** the well-established alien fish *Lagocephalus sceleratus* and the rare native shark *Rhizoprionodon acutus* are reported for the first from the entire country. **Greece:** the rare native ray *Leucoraja circularis* is reported for the first time from the Argolikos Gulf and for the first time for the entire country its identification is confirmed morphologically and molecularly; additional records of the alien nomad jellyfish *Rhopilema nomadic* document its expanding distribution, while the occurrence and the alien fishes *Sillago suezensis* and *Pomadasys stridens* are reported for the first time from Hellenic waters. **Turkey:** additional records of the Egyptian Prawn *Metapenaeopsis aegyptia* are reported with some biological information. **Cyprus:** the alien fish *Variola louti* is reported for the first time for the entire Mediterranean Sea, probably released from an aquarium, while the alien moon crab *Matuta victor* is reported for the first time from the entire country.

Introduction

The Mediterranean Sea is one of the world's biodiversity hotspots (Cuttelod *et al*., 2009). The overwhelming value of Mediterranean marine biodiversity has been largely recognized not only by academic scientists, but also by the mass media, decision makers and public opinion.

During the last decade, in particular, the collection of detailed Mediterranean marine biodiversity data has received great attention, given the fact that human activities, such as shipping, aquaculture, the aquarium trade and the opening/widening of the Suez Canal have led to the introduction of nearly 1,000 alien species into this basin, of which more than half are considered to be established and spreading (Zenetos *et al*., 2012).

This work presents records of species found in the Mediterranean Sea, per country, according to their geographic position from west to east. The location of new records is illustrated on a map (Fig. 1). New records are provided for 18 taxa, belonging to 5 Phyla, namely Chlorophyta (1 species), Cnidaria (2 species), Mollusca (6 species), Arthropoda (2 species) and Chordata (7 species).

Fig. 1: Map of the Mediterranean Sea showing the locations of the records of new species presented in "New Mediterranean Biodiversity Records (April 2019)". The number of locations is given in Table 1. For each of the 3a, 3b, 7, 9 and 11 locations the mean geographical location was calculated. The map was generated using the Scribble Maps Pro application.

Table 1. List of species presented in "New Mediterranean Biodiversity Records (June 2019)" (systematical order per phyla, species authorities as in single subchapters), including species status (SS: A, alien; N, native; C, cryptogenic), subchapter (SC), location/area, country of record, and location number (LN) as in Figure 1. For each of the 3a, 3b, 7, 9 and 11 LN the mean geographical location was calculated.

Taxon	SS	SC	Location/Area	Country	LN
Phylum **CHLOROPHYTA** Reichenbach, 1828					
Caulerpa taxifolia var. distichophylla	A	1.1	El Surcouf and Annaba	Algeria	1a, 1b
Phylum **CNIDARIA** Verrill, 1865					
Porpita porpita	A	2.1	Gulf of Galeria, Corsica	France	2
Rhopilema nomadica	A	9.3	Rhodes, Santorini, Crete Islands	Greece	3a, 3b, 3c
Phylum **MOLLUSCA** Linnaeus, 1758					
Aplysia dactylomela	C	1.2	El Surcouf and Annaba	Algeria	1a, 1b
Aplysia punctata	N	1.2	El Surcouf and Annaba	Algeria	1a, 1b
Biuve fulvipunctata	A	6.1	Voluja bay, Marina	Croatia	4
Malleus regula	A	4.1	Gulf of Taranto	Italy	5
Rapana venosa	A	7.1	Njivice, Boka Kotorska Bay	Montenegro	6
Xenostrobus securis	A	5.1	Škocjan Inlet, Koper	Slovenia	7
Phylum **ARTHROPODA** Brünnich, 1772					
Matuta victor	A	11.2	Morfou Gulf	Cyprus	8
Metapenaeopsis aegyptia	A	10.1	Gulf of Antalya	Turkey	9
Phylum **CHORDATA** Haeckel, 1874					
Lagocephalus sceleratus	A	8.1	Bay of Vlora	Albania	10
Leucoraja circularis	N	9.1	Argolikos Gulf	Greece	11
Pomadasys stridens	A	9.4	Symi Island	Greece	12
Rhizoprionodon acutus	N	8.2	Sazani Island	Albania	13
Scatophagus argus	A	3.1	Kerkennah Archipelago	Tunisia	14
Sillago suezensis	A	9.2	Rhodes Island	Greece	15
Variola louti	A	11.1	Zephyros Reef	Cyprus	16

The list of species is presented in Table 1, according to the nomenclature proposed by the World Register of Marine Species (WoRMS, Editorial Board, 2019).

The majority of new records is reported from the central-eastern Mediterranean Sea and refers to alien species (N=14) consisting of Lessepsian taxa. Two records refer to native species of Chondrichthyes, the endangered *Leucoraja circularis* and the least concerned *Rhizoprionodon acutus,* while another two records refer to the heterobranchs *Aplysia dactylomela* and *Aplysia punctata*. It is worth mentioning that most of the records of alien species come from citizen scientists. This finding highlights the importance of citizen science in monitoring and filling gaps regarding the distribution of marine biota, and further supports the notion that engaging citizen scientists to survey local biota and detect non-native marine species in close collaboration with scientists should be encouraged.

ALGERIA

1.1. *Caulerpa taxifolia* var. *distichophylla* (Sonder) Verlaque, Huisman & Procaccini spreads to Algeria

Vincenzo DI MARTINO and Bessy STANCANELLI

Among the seven taxa of the genus *Caulerpa* present in the Mediterranean basin only one, namely *C. prolifera* (Forsskål) J.V. Lamouroux is considered native, while all the rest are considered as alien species (Aplikioti *et al.*, 2016 and references therein). *Caulerpa taxifolia* var. *distichophylla*, reported for the first time in the Mediterranean Sea in 2006 from the south coast of Turkey, was subsequently reported from Sicily, Cyprus, Malta, Greece, Libya, Lebanon, Syria and Tunisia (Verlaque *et al*., 2015; Chartosia *et al*., 2018). In the current paper we report the taxon from Algeria.

In September 2018, the taxon was found during recreational diving on sandy bottom, covering dead *Posidonia* mattes (Fig. 2) at a depth 2-4 m near two touristic resorts, where small fishing ports are found (Table 2). The samples were fixed in a solution of seawater and formaldehyde (4%) and stored in the CNR/ISAFOM algal herbarium in Catania. The samples collected were morphologically identified through measurements of the diagnostic structural features used by Jongma *et al.* (2012). The Algerian specimens were identical to those described previously in the Mediterranean Sea (Aplikioti *et al*., 2016, Shakman *et al*., 2017). In our study sites, *C. taxifolia* var *distichophylla* was accompanied by *Lophocladia lallemandii* (Montagne) Schmitz.

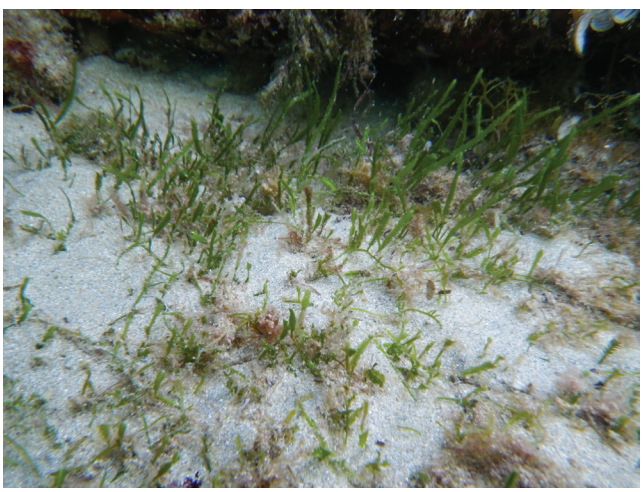

Fig. 2: *Caulerpa taxifolia* var. *distichophylla* at 3 m depth on sandy bottom in Annaba (Algeria).

Table 2. Sampling sites with geographical coordinates on whichof the locations in Algeria where *Caulerpa taxifolia* var. *distichophylla* was found.

	Annaba	El Surcouf
Latitude	36.946133N	36.794344N
Longitude	7.773864E	3.305253E

1.2. *Aplysia dactylomela* and *A. punctata* (Opisthobranchia: Aplysiidae) spread in the Algerian coastal waters

Vincenzo DI MARTINO and Bessy STANCANELLI

In this note, we present the first records of the two herbivorous heterobranchs *Aplysia dactylomela* (Rang, 1828), commonly called as "spotted sea hare", and *Aplysia punctata* (Cuvier, 1803), called as "small rose sea hare" or "common sea hare", from the Algerian coast.

Aplysia dactylomela was first reported in the Mediterranean Sea in 2002, off Lampedusa Island (Italy). Since then the species has been reported in many locations in the central and eastern part of the Mediterranean, with the latest records coming from the Tunisian and Libyan coasts (Rizgalla *et al*., 2019). *Aplysia punctata* is a circumtropical species distributed in the northeastern Atlantic Ocean (from Greenland to Norway, Baltic Sea, British Isles, Canary Islands, Madeira and Azores) and in the Mediterranean Sea (Ballesteros *et al*., 2012-2019).

In total, 45 snorkeling surveys were carried out in two Algerian sites between June and September 2018 at depths between 0-10 m and along transects oriented perpendicular to the coastline (Table 3). The seabed at both sites was characterized by photophilic vegetation with si-

gnificant presence of the algae *Caulerpa* spp., *Cystoseira* spp., *Halimeda tuna* (J. Ellis & Solander) J. V. Lamouroux, *Laurencia* spp., *Stypocaulon scoparium* (Linnaeus) Kützing and the seagrasses *Posidonia oceanica* (L.) Delile and *Cymodocea nodosa* (Ucria) Ascherson. During the surveys no specimens of the *Aplysia* species were captured. The measurements were performed on the individuals in their natural environment using a millimeter rod, trying to cause the least possible disturbance. All the observed individuals showed the characteristic coloration of the species, while no fertile individuals were observed.

Many of the observed *A. dactylomela* individuals were hidden at the base of some large rocks while others were intent on grazing voraciously on the seabed covered by red and green algae (Fig. 3a). The *A. punctata* individuals were observed on the seabed covered by green algae *Caulerpa spp.* and on the muddy bottom in the surrounding area of these plants (Fig. 3b). During the monitoring activities, 38 and 25 individuals of *A. dactylomela* and *A. punctata*, respectively, were recorded (Table 3). The present work adds one more introduced species to those reported by Grimes *et al*. (2018).

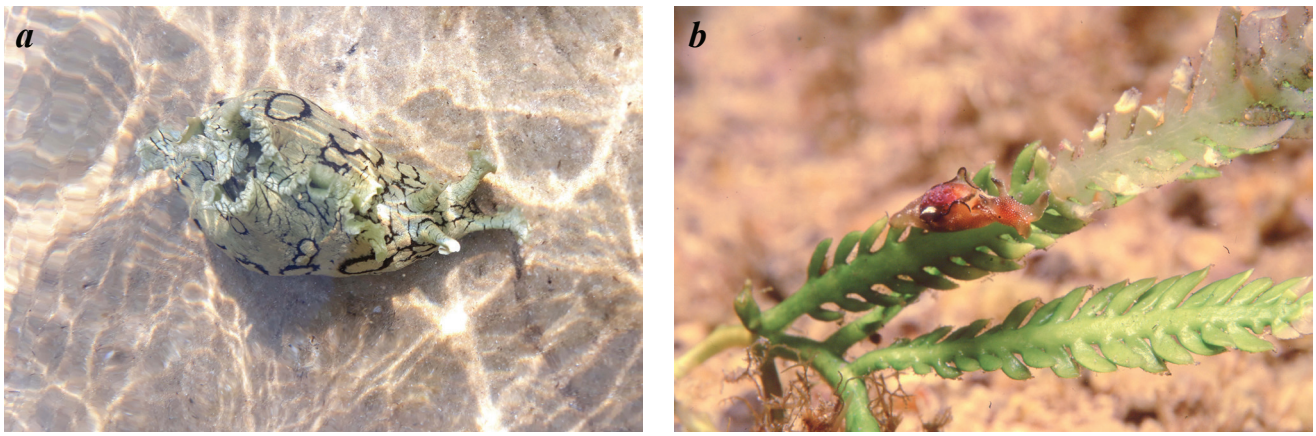

Fig. 3: a) *Aplysia dactylomela*, b) *Aplysia puncta.*

Table 3. Sampling locations and monthly distribution of *Aplysia* species.

Location	**Annaba**		**El Surcouf**	
Latitude	36.946133N		36.794344N	
Longitude	7.773864E		3.305253E	
Month	***A. dactylomela***	***A. punctata***	***A. dactylomela***	***A. punctata***
Jun-18	3	1	1	0
Jul-18	5	3	4	3
Aug-18	7	5	6	5
Sep-18	7	4	5	4
Total	**22**	**13**	**16**	**12**

FRANCE

2.1. A new record of *Porpita porpita* (Linnaeus, 1758) (Cnidaria, Hydrozoa) for the western Mediterranean Sea

Armando MACALI and Francesco TIRALONGO

Porpita porpita (Linnaeus, 1758) (Cnidaria, Hydrozoa), which is commonly known as the "blue button", is a colonial hydroid belonging to the family Porpitidae Goldfuss, 1818. It primarily inhabits the ocean surface, although habitats of larvae and medusae may extend to a depth of about 200 m. It maintains flotation by means of a disc-like chitinous float, the pneumatophore, derived from the perisarc surrounded by soft living tissue. As a free-floating pleustonic organism, the species is easily carried to shore primarily by water currents and wind (Pandya *et al*., 2013). Its distribution spread from tropical to sub-tropical waters of the Pacific, Indian and Atlantic Oceans (Chowdhury *et al*., 2016). For the Mediterranean Sea, the updated occurrence data of the species is reported in Figure 4 (Gravili *et al*., 2015; Furfaro *et al*., 2017; Saygin, 2017). Here we report a new Mediterranean record of *P. porpita* (Fig. 5) from the Corsican Sea. On 23th August 2018, a stranded specimen of 14 mm in diameter was collected at Delta du Fangu (Gulf of Galeria, Corsica, France – 42.42013N; 8.65780E). The specimen has been preserved in ethanol and deposited in the zoological collection of the "*Ente Fauna Marina Mediterranea"* (Ref. Code: #EFMM-230818). Our work represents the second record of the species in the western part of the Mediterra-

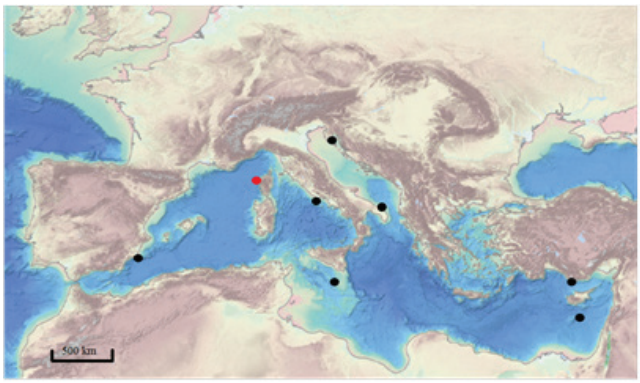

Fig. 4: Black circles indicate records of *P. porpita* in the Mediterranean Sea, the new record of the current study is represented in red.

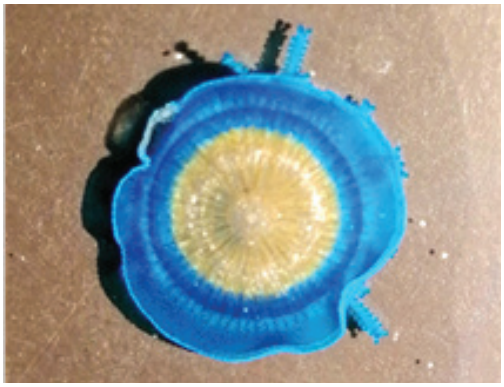

Fig. 5: The specimen of *P. porpita* collected in Corsica (France) at Delta du Fangu (Photo: A. Macali).

nean Sea. Although there are few and scattered records of the species across the Basin, it is probably more common than is indicated by the literature; indeed, only 7 records have been reported from the Mediterranean Sea to date, most of which in the central area.

TUNISIA

3.1. Occurrence of the spotted scat *Scatophagus argus* (Linnaeus, 1766) in south-eastern Tunisia

Yassine Ramzi SGHAIER and Ahmed BENHMIDA

The spotted scat *Scatophagus argus* (Linnaeus, 1766) is a species originating from the Indian Ocean and the tropical, subtropical and warm temperate Pacific (Ni & Kwok, 1999), occurring in coastal waters from southern India and Sri Lanka to southern Japan and Tahiti (Pinto & Punchihewa, 1996). The species was recorded for the first time from south-eastern Malta and the Mediterranean in 2007; aquarium release was considered the most probable vector of its introduction into the Mediterranean Sea (Zammit & Schembri, 2011).

On the 5th of April 2017, three specimens of *S. argus* were caught by the traditional fishing technique called *Charfia*, at a depth ranging from 0.3 to 2.5 m on a mixed *Posidonia oceanica* and *Cymodocea nodosa* meadow, on a muddy-sandy bottom in the Kerkennah Archipelago (34.568144N, 11.012772E), Gulf of Gabès, south-eastern Tunisia. The fisherman declared that the specimens were found in the capture chamber of the *Charfia* after a strong north-easterly wind buffeted the Kerkennah Archipelago. No other specimens were observed after this date. The specimens were approximately 15 cm in total length. One specimen was photographed and deposited at the Animal Biology and Evolutionary Systematic Unit, Biology Department of the Faculty of Sciences, University of Tunis El Manar (Fig. 6).

According to Zammit & Schembri (2011), all indications pointed to *S. argus* having established a breeding population since at least 2007 in the Maltese Islands. However, in a subsequent review, Evans *et al.* (2015) stated

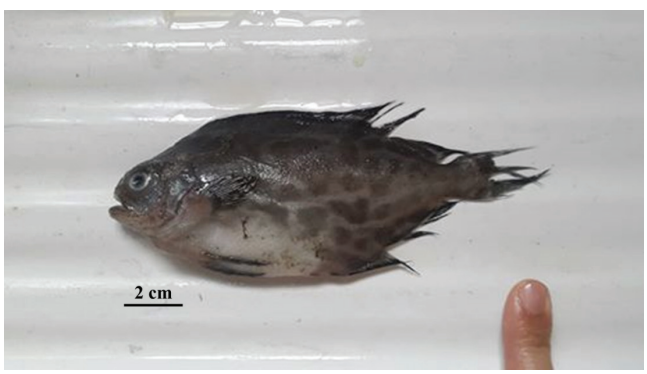

Fig. 6: The specimen of *Scatophagus argus* caught in the Kerkennah Archipelago, Tunisia.

that this species was not recorded again since its original discovery, leading to doubts as to whether *S. argus* is still established in Maltese waters. Taking into account the fact that the Maltese population died out after its original discovery, and that it is unlikely that the Tunisian specimens owe their origin to dispersal from the Maltese population, given the biology of the species, it is likely that the Tunisian specimens represent an independent introduction, probably an aquarium release. Environmental conditions in the Gulf of Gabès (sea surface temperature, availability of food) may provide a good habitat for *S. argus* thus leading to a population increase.

ITALY

4.1. First record of *Malleus regula* (Mollusca, Bivalvia) in Italian waters

Ermelinda PRATO and Fernando RUBINO

Malleus regula (Forsskål in Niebuhr, 1775) is reported for the first time in Italian coastal waters based on field observations carried out since 2016 in Mar Piccolo, a semi-enclosed marine basin in the Gulf of Taranto (Ionian Sea, Central Mediterranean). In particular, during a visual survey in August 2018, several specimens of *M. regula* were noticed on the poles of mussel farms and rocky substrata at about 2 m depth in the first inlet of Mar Piccolo (40.484809N; 17.249412E). A single individual was collected and subsequently photographed, measured, and weighed. The specimen measured 70 mm in length (maximum distance along the anterior-posterior axis), 30 mm in height (maximum distance along the dorsal-ventral axis), and 1.8 g in total weight (Fig. 7a, b). It was then deposited in the collection of the CNR-IRSA of Taranto (Italy). On the other hand, the analysis of photographic material obtained during field campaigns in 2016 led us to backdate its arrival in the area to that date (Fig. 7c).

M. regula is native to the Western Indian Ocean, Persian Gulf, and Red Sea. It is a very "polymorphic" species, as reported by Forsskål (1775) in his original description (as *Ostrea regula*) and evidenced by its long list of synonyms (http://www.marinespecies.org). Its first records in the Mediterranean basin date back to nearly a century ago in Israel and Lebanon (Pallary, 1938), presumably having entered the Mediterranean via the Suez Canal. Subsequent records, including the entire eastern Mediterranean coastline (Zenetos *et al*., 2004; Crocetta *et al*., 2017), attest its successful establishment.

Taranto houses the shipyard of the Italian Navy, the largest Italian mussel farms, as well as an expanding trade port, and is considered the fourth hotspot of introduction of marine alien species in Italy (Servello *et al*., 2019). However, the present record confirms the continuous spread of the species in the Mediterranean along a putative Lessepsian route and the species presumably reached the Italian coastline via natural dispersal. The absence of earlier records of this newcomer may be attributed to a very recent introduction or to the fact that it may have been overlooked until now.

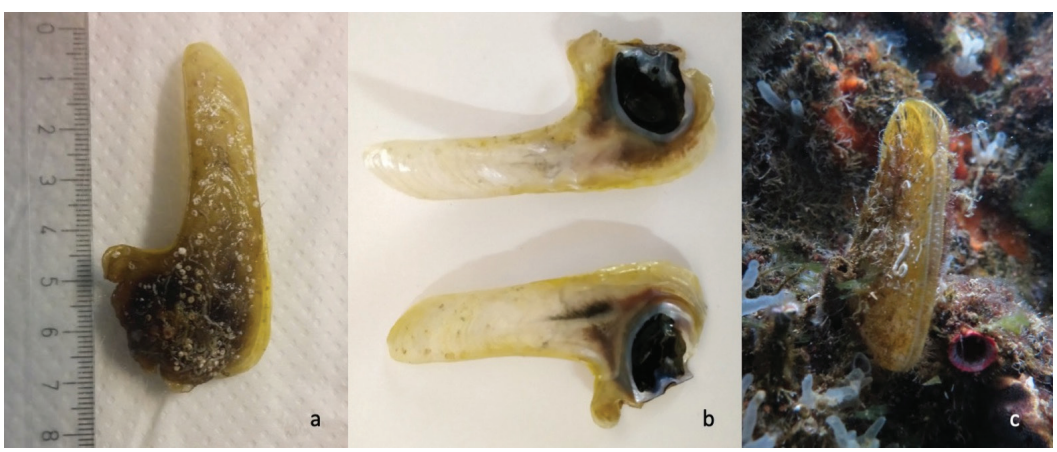

Fig. 7: a) *Malleus regula* from the Mar Piccolo of Taranto (Ionian Sea); b) internal valvae; c) specimen observed in 2016 on a rocky substrate.

SLOVENIA

5.1. First record of the alien marine bivalve *Xenostrobus securis* in Slovenia

Lovrenc LIPEJ and Domen TRKOV

The black-pygmy mussel *Xenostrobus securis* (Lamarck, 1819) is a brackish mytilid bivalve, native to Australia and New Zealand. Nowadays it is present more or less globally and is considered as a biological pollutant. During the last two decades, it was recorded in different areas of the Mediterranean Sea, such as the French and the Spanish lagoons and the Italian coastlines of the Tyrrhenian and the Adriatic Seas (see Barbieri *et al*., 2011 and references therein). It is considered as a bioengineer species, able to withstand variable and unstable salinity conditions (Iwasaki & Yamamoto, 2014) and is otherwise well-adapted to extreme living environments. Wilson (1968) reported the possibility of this species to survive several months in hypersaline environments and without feeding.

The first record in the Adriatic Sea dates back to 1991 in the Venice area (Cesari, 1994). However, lack of additional records in the northernmost parts of the Adriatic Sea before 2010 were attributed to the paucity of recent studies on faunal benthic assemblages (Crocetta, 2011).

The field samplings reported here have revealed the presence of the black-pygmy mussel in the Škocjan Inlet coastal lagoon and its connecting channels in the city of Koper. Large accumulations of these bivalves were found attached to a variety of hard substrata in channels such as pipelines, surfaces under bridges (Fig. 8), concrete walls and similar man-made structures, but always in shaded and very shallow environments. All habitat types in which the alien bivalve was found could be considered as eurytherm and euryhaline from an ecological point of view. At many localities, *X. securis* was found together with the native mussel *Mytilus galloprovincialis*, and also on large-sized colonies of the alien serpulid *Ficopomatus enigmaticus* (Table 4, Fig. 8). Crocetta (2011) reported the species in many localities, from Grado to Trieste; thus, the first record of this bivalve species in Slovenia was expected.

Mariculture and maritime transport are considered as the most probable vectors for its introduction. The dispersal of *X. securis* in Slovenia probably originated from the Škocjan Inlet lagoon, which is otherwise connected with the port of Koper. Due to the regular inspection of non-indigenous species in the area during the period 2015-2019, as well as the restricted number of localities where *X. securis* was found, the arrival of this species in the studied area should be considered as recent, presumably during the last few years.

Fig. 8: Records of *Xenostrobus securis* in Slovenia. A specimen (A) found in massive accumulations under a bridge (B) in a marine channel at Koper. Many specimens were also found living within the colony of the alien serpulid polychate *Ficopomatus enigmaticus* (C).

Table 4. Localities in Koper, where *Xenostrobus securis* specimens were found with accompanying oceanographic data (temperature and salinity).

Date	N	E	Habitat	T (°C)	S
23 May 2018	45.542833	13.722961	channel at sea	-	-
6 Jul 2018	45.542833	13.722961	among *Ficopomatus*	-	-
8 Aug 2018	45.542833	13.722961	among *Ficopomatus* and *Mytilus*	26.8	33
8 Aug 2018	45.534406	13.735386	close to river mouth	26.8	34
8 Aug 2018	45.534606	13.735761	entrance to Škocjan lagoon	26.8	34
8 Aug 2018	45.541497	13.725122	connecting channel	28.8	31
8 Aug 2018	45.541392	13.724111	connecting channel	30.6	30
17 Jan 2019	45.541497	13.725122	connecting channel	-	-
17 Jan 2019	45.542300	13.723294	among *Ficopomatus*	-	-

CROATIA

6.1. *Biuve fulvipunctata* (Baba, 1938) (Mollusca: Heterobranchia) reached the Adriatic Sea

Alen PETANI and Fabio CROCETTA

The white-speckled chelidonura *Biuve fulvipunctata* (Baba, 1938) is a cephalaspidean gastropod characterized by an elongated body divided into an anterior cephalic shield, a posterior visceral hump, and a one-sided long tail; the parapodial lobes practically reach the middle of the upper side, and an internal, membranous, brown-coloured shell is always present. External coloration is usually very variable in this taxon, and may range from indigo blue with orange/yellow spots and few white patches to light/dark brown with small white dots. Despite that, it always displays a distinctive W-shaped pattern of white pigment on the upper side of the head (Zenetos *et al.,* 2004).

Native and widely distributed in the Indo-West Pacific, *B. fulvipunctata* was first recorded as an alien species in the Mediterranean Sea in 1959. Soon after its first record in Turkey, it colonized almost the entire basin, with subsequent records in both the easternmost parts (Israel, Cyprus) and in central (Malta, Italy) and western parts (France, Spain) (review in Malaquias *et al.,* 2016). However, no records of this taxon were known from the Adriatic Sea.

During a diving expedition performed by Đani Iglić and Alen Petani in Voluja bay (Marina, Croatia) (43.48306N, 16.08028E), on the 29th of November 2018, a single specimen of *B. fulvipunctata* was found in the local marina at 2-3 m depth, on a stone rubble bottom with *Caulerpa*. Subsequent research in the same area led first to the finding of three additional specimens by Alen Petani, on the 23rd of December 2018, and then of one

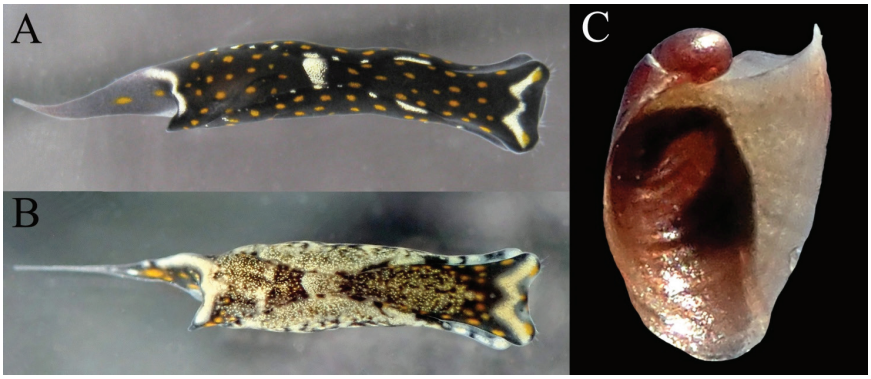

Fig. 9: *Biuve fulvipunctata* (Baba, 1938) from Marina (Croatia). A. C. The biggest specimen found (8 mm total length) and its shell (1.6 mm total height). B. Another specimen with a different coloration (7.3 mm total length).

more by Pero Ugarković, Neven Lete, and Jakov Prkić, on the 30th of December 2018. Two specimens from Marina and the shell of one of them are shown in Figure 9.

The present finding constitutes not only the first record of this species from Croatia, but also for the entire Adriatic Sea. Although there is no certainty regarding a possible pathway connected to its arrival in the area, the very recent spreading of *B. fulvipunctata* in the Mediterranean Sea indicates arrival in the Adriatic Sea through natural dispersal from already established Mediterranean populations.

MONTENEGRO

7.1. First record of *Rapana venosa* (Valenciennes, 1846) in Montenegrin waters

Slavica PETOVIĆ

The Rapa whelk *Rapana venosa* is a large marine and brackish water gastropod with a voracious predatory behaviour, native to the Sea of Japan, the Yellow Sea, East China Sea, and Bohai Sea (Tsi *et al*., 1983). Since its first record from the Black Sea in 1946 (Novorossiysk Bay) (Drapkin, 1963), it expanded its bio-geographical range to the Mediterranean, being mostly recorded in the Adriatic Sea. In this area, the first record (Ghisotti, 1974) was collected in 1973 off Ravenna-Cattolica. The species is currently established in the Italian north Adriatic (Servello *et al*., 2019) and has spread to Slovenia (Lipej *et al*., 2012).

Here, we report the first finding of *R. venosa* from Montenegro, Boka Kotorska Bay, where a very fresh empty shell (Fig. 10) was collected in Njivice (Herceg Novi) 42.43826944^0 N, 18.51755000^0 E. In particular, it was collected in summer 2017 by a local diver at 8 m depth. The substrate type was dominantly sandy. This is first finding from Montenegrin waters, where the species was expected (Karachle *et al*., 2017).

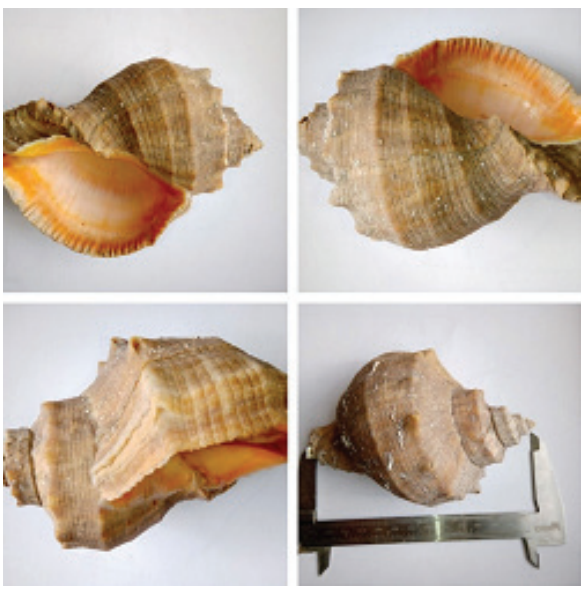

Fig. 10: Shell of *R. venosa* collected from Njivice (Boka Kotorska Bay). Total height 131 mm, width 87 mm, aperture height 69 mm, aperture width 44 mm.

ALBANIA

8.1. First record of the silver-cheeked toadfish *Lagocephalus sceleratus* (Gmelin, 1789) in Albanian waters

Rigers Agron BAKIU and Sherif DURMISHAJ

The silver-cheeked toadfish (*Lagocephalus sceleratus*) (Gmelin, 1789) is widely distributed in the tropical and subtropical waters of the Indian and Pacific Ocean, including the southern African shores and the Red Sea. This species entered the Mediterranean in 2003 (Filiz & Er, 2004). To date, this Lessepsian immigrant has estab-

lished populations along the coasts of the eastern Mediterranean basin and has expanded towards the western part of the Mediterranean Sea, reaching Spanish territorial waters, in 2014 (Izquierdo-Muñoz *et al*., 2014), while it is established along the Algerian coasts (Grimes *et al*., 2018). In the Adriatic, it has been recorded since 2012 (Dulcic *et al*., 2014).

Lagocephalus sceleratus is considered as a pest by fishermen in the neighbouring country (Greece), because it is capable of reducing the local stocks of important commercial cephalopod species, damaging fishing gears, deterring customers from buying fish and introducing additional effort to discard the fish (Galanidi *et al*., 2018).

On the 9th of February 2019, one individual of *L. sceleratus* was landed by a tourist boat at the Orikum (Radhime), South Albania, Fishing Centre. It was fished by a tourist using a fishing line with a single hook in the Bay of Vlora *(*40.462455N, 19.341216E*),* at a depth of 30 m (Fig. 11). The total length and weight were 23 cm and 0.35 kg, respectively. The specimen was eventually kept for further investigation in the freezer at the Orikum Fishing Centre, in Vlora (Albania).

Fig. 11: *L. sceleratus* individual landed at the Orikum (Radhime) Fishing Centre, Albania (Photo: Sherif Durmishaj and Rigers Bakiu).

8.2. First record of the milk shark *Rhizoprionodon acutus* (Rüppell, 1837) from Albanian waters

Rigers Agron BAKIU

The milk shark (*Rhizoprionodon acutus*) is a species with a wide distribution including the Eastern Atlantic (Mauritania to Angola); the Indo-West Pacific (Persian G, Red Sea and East Africa to Indonesia), north of Japan, south of Australia (Froese & Pauly, 2018), which has rarely been recorded in the Mediterranean Sea. The first Mediterranean record of *R. acutus* was from the Ionian Sea (southern Italy), where an adult female measuring 725 mm in total length was caught off Taranto (Pastore & Tortonese, 1984); however, according to Damalas & Megalofonou (2012), the presence of this shark was registered in the open waters of the south-eastern Mediterranean Sea during 2003-2005.

Since that time, no new record was reported from the Mediterranean Sea (Golani *et al*., 2013) until 9 July 2014, when a specimen of *R. acutus* was captured by long line, 50 km from Zarzis at a depth of 50 m (Ben Amor *et al*., 2016). On 8th February 2019, one female individual of *R. acutus* was landed by a professional fisherman at the Orikum (Radhime) Fishing Centre, South Albania. This individual was captured by long line that targeted tuna fish north of the Sazani Island, *(*40.522538N, 19.245093W), at a depth of 200 m (Fig. 12). Total length and total weight were 112 cm and 3.7 kg, respectively. After the measurements, the fish was frozen and kept for further investigation. The preliminary results show that this female carried no embryos and further examination regarding maturity, age, and/or stomach content is in progress. The specimen was kept in the freezer at the Orikum Fishing Centre, in Vlora (Albania).

Fig. 12: *Rhizoprionodon acutus* specimen landed at the Orikum (Radhime) Fishing Centre Albania (Photo: Sherif Durmishaj and Rigers Bakiu).

GREECE

9.1. First morphologically and molecularly confirmed record of the rare sandy skate *Leucoraja circularis* (Couch, 1838) in Argolikos Gulf (central Aegean Sea)

Vasiliki KOUSTENI and Aikaterini DOGRAMMATZI

The sandy skate *Leucoraja circularis* (Couch, 1838) is a relatively large species distributed in the north-eastern Atlantic, from Norway to Morocco, and in the Mediterranean Sea (McCully *et al*., 2015), where it is mainly found in the western and central basins (Mnasri *et al*., 2009 and references therein). Concerning Hellenic waters, sporadic records of *L. circularis* have been reported from the Aegean and Ionian Seas with the last reported in 2010 (Papaconstantinou, 2014 and references therein). This benthic skate occurs in offshore shelf waters and on upper slopes, from 50 to 800 m depth, and is mainly taken as bycatch in trawl and long line fisheries (McCully *et al*., 2015). According to the IUCN, *L. circularis* is considered as an endangered species whose population has decreased significantly over the last 60 years in the Mediterranean Sea (McCully *et al*., 2015). The increasing demersal trawl effort on the shelf and slope of the Mediterranean Sea, combined with slow growth, low fecundity and late

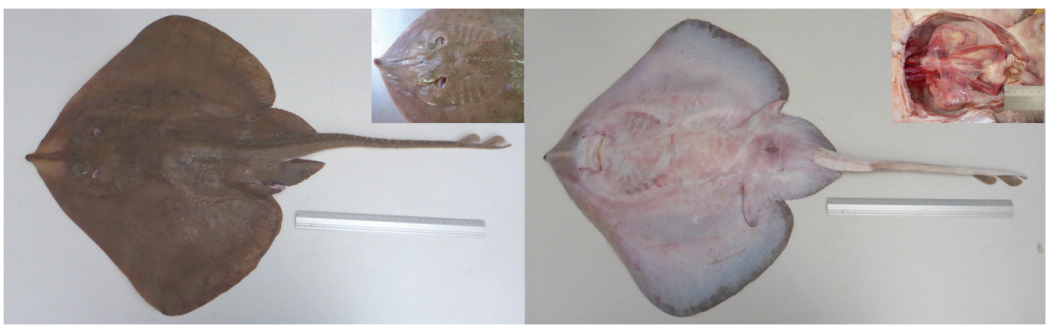

Fig. 13: Dorsal side (left) and ventral side (right) of a mature female *Leucoraja circularis* specimen caught in Argolikos Gulf (central Aegean Sea, eastern Mediterranean).

Table 5. Morphometric characteristics and meristic counts of a female specimen *Leucoraja circularis* caught in Argolikos Gulf (central Aegean Sea, eastern Mediterranean).

Morphometric characteristics	mm	%TL
Disc length (DL)	438	53.41
Disc width (DW)	523	63.78
Eye diameter (EYD)	22.92	2.80
Eye height (EYH)	7.61	0.93
Pre-orbital length (POB)	87.7	10.70
Pre-oral length (POR)	102.71	12.53
Pre-spiracular length (PSP)	118.9	14.50
Pre-branchial length (PGI)	151	18.41
Pre-first dorsal length (PD1)	721	87.93
Pre-second dorsal length (PD2)	765	93.29
Pre-pelvic length (PP2)	375	45.73
Pre-caudal length (PRC)	811	98.90
Interdorsal space (IDS)	3.38	0.41
Dorsal caudal space (DCS)	3.86	0.47
Snout tip to max. disc width	270	32.93
Snout tip to cloaca	378	46.10
Cloaca to tail tip	438	53.41
Pectoral fin anterior margin (P1A)	365	44.51
Pectoral fin posterior margin (P1P)	238	29.02
Pectoral fin inner margin (P1I)	93	11.34
Pectoral base (P1B)	375	45.73
Pectoral height (P1H)	214	26.10
Pelvic fin anterior margin (P2A)	60.75	7.41
Pelvic fin anterior lobe base	25.53	3.11
Pelvic fin posterior margin (P2P)	143.74	17.53
Pelvic fin posterior height (P2H)	54.64	6.66
Pelvic fin posterior lobe base	86.21	10.51
Pelvic fin base (P2B)	107	13.05
Pelvic fin inner margin (P2I)	73.15	8.92

Morphometric characteristics	mm	%TL
Head length (HDL)	208.0	25.37
Nostril width (NOW)	7.73	0.94
Anterior nasal flap length (ANF)	9.64	1.18
Prenarial length (PRN)	72.20	8.80
Mouth width (MOW)	62.84	7.66
Intergill length (ING)	59.81	7.29
First gill slit height (GS1)	17.73	2.16
Second gill slit height (GS2)	18.37	2.24
Third gill slit height (GS3)	18.40	2.24
Fourth gill slit height (GS4)	16.61	2.03
Fifth gill slit height (GS5)	9.47	1.15
Spiracle length (SPL)	19.59	2.39
Spiracle width (SPW)	16.04	1.96
Interorbital space (INO)	44.15	5.38
Interspiracular width (ISW)	52.34	6.38
Head height (HDH)	40.00	4.88
Trunk height (TRH)	41.35	5.04
Abdomen height (ABH)	41.35	5.04
Tail height (TAH)	27.45	3.35
Cloaca length	20.82	2.54
Cloaca width	6.14	0.75

Meristic characteristics	counts
Teeth rows of upper jaw	78
Teeth rows of lower jaw	84
Nictitating lamellae	15
Spines in head	8
Spines in the 4 rows in tail	43-45/38-39/36-38/45-47

maturation of the species make it especially vulnerable to fishing exploitation (McCully *et al*., 2015). Here we report the first record of *L. circularis* in the Argolikos Gulf (central Aegean Sea, eastern Mediterranean), which is confirmed by both morphological and molecular data.

On 1st July 2016, one female specimen of *L. circularis* (Fig. 13) was captured along the trawl route, between 37.371944N-22.976111E and 37.405278N-22.938556E, in the Argolikos Gulf (central Aegean Sea, Greece, eastern Mediterranean) at 540 m depth. The field sampling was conducted within the framework of the Mediterranean International Bottom Trawl Survey (MEDITS) by a bottom trawler using a 20 mm square-mesh codend trawl net. Species identification followed Fischer *et al*. (1987) and DNA barcoding was used as a complementary tool to the standard taxonomic features description for the species identification. Specifically, a fragment of the mitochondrial DNA cytochrome c oxidase subunit I (COI) gene was amplified using the polymerase chain reaction (PCR). The sequence obtained was deposited in GenBank (Accession number: MK552111). Our results confirmed the significance of DNA barcoding in solving misidentification issues of ray species, given that this specimen has been previously identified as *Leucoraja fullonica* (Couch, 1838) by Stamouli and Dogrammatzi (Lipej *et al*., 2017), based solely on morphological characteristics. The specimen was 820 mm in total length and 2417 g in total weight. The morphometric characteristics were in complete agreement with previous studies (e.g. Mnasri *et al*., 2009). Sexual maturity was assessed following the MEDITS maturity stage scale proposed for oviparous elasmobranchs (MEDITS, 2016), which assigned the specimen to stage 4a. The obtained morphometric characteristics and meristic counts of the specimen are summarized in Table 5.

9.2 First record of *Sillago suezensis* Golani, Fricke & Tikochinski, 2013 from Greece

Francesco TIRALONGO and Nikolaos DOUMPAS

Sillago suezensis Golani, Fricke & Tikochinski, 2013 is a recently described species belonging to the family Sillaginidae. Its current known distribution includes the northern Red Sea and the eastern Mediterranean Sea. In the Mediterranean, it was first recorded (mistakenly as *Sillago sihama*) in Lebanon in 1975 (Mouneimne, 1977), and subsequently reported from several areas of the eastern Mediterranean Sea, namely, Israel, Turkey, Egypt and Cyprus (for details see Golani *et al*., 2013, Katsanevakis *et al.*, 2009). Hereby, we present the first record of the species from Greek waters. Two specimens of *S. suezensis* were caught in November 2018 by a recreational fisher at a depth of 2 m off Rodos Island (36.228941N, 28.150014E, south-eastern Aegean Sea, Greece). The specimens (Fig. 14) were frozen and sent to iSea for analysis. At the laboratory, all the main morphometric measurements and meristics were recorded (Table 6) and the

Fig. 14: The two specimens of *Sillago suezensis* caught in Greece (Rodos Island, south-eastern Aegean Sea) (Photo: N. Doumpas).

Table 6. Morphometric and meristic measurements of the two specimens of *Sillago suezensis* caught in Greece.

Morphometrics and meristics	Specimen 1	Specimen 2
Weight	62 g	67 g
Total length	204 mm	203 mm
Fork length	196 mm	196 mm
Standard length	182 mm	181 mm
Head length	51 mm	51 mm
Pre-anal length	114 mm	115 mm
Pre-pectoral length	55 mm	56 mm
Pre-pelvic length	61 mm	62 mm
Pre-orbital length	21 mm	22 mm
Pre-dorsal length	64 mm	67 mm
Body depth	39 mm	39 mm
Snout length	25 mm	25 mm
Dorsal fins	D_1 XI; D_2 I + 20	D_1 XI; D_2 I + 20
Anal fins	II + 21	II + 21

recordings were communicated to ELNAIS in order to confirm the identification. *Sillago suezensis* can be distinguished from its congeners by the following characteristics (Golani *et al*., 2014): (i) morphology of the swim bladder (posteriorly divided into 2 tapering extensions, projecting below the vertebral column and extending into the tail musculature; antero-laterally, lateral extensions each spreading a blind tubule); (ii) no scales on the preoperculum and most of the operculum; (iii) nostrils at the level of the upper quarter of the orbit with anterior nostril and a small flap, and nearly round posterior nostril close to the first one. The specimens were subsequently preserved frozen and deposited at iSea, Thessaloniki. After its first observation in 1975 in the Mediterranean Sea, *Sillago suezensis* rapidly colonized the eastern part of the basin. The Suez Canal, together with the ongoing climate change and human-based activities in the eastern Mediterranean, make the basin susceptible to the introduction of tropical and subtropical species (Arndt *et al*., 2018), such as *S. suezensis*.

9.3 Additional records of the venomous *Rhopilema nomadica* (Galil, 1990) from the Aegean Sea

Nikolaos DOUMPAS and Ioannis GIOVOS

The nomad jellyfish, *Rhopilema nomadica* (Scyphozoa: Rhizostomeae: Rhizostomatidae) is a native species to the Indian Ocean, reported for the first time in the Mediterranean Sea back in the 70s. Currently, the species has been recorded throughout the Levantine Sea (Galil, 2018) and in the central Mediterranean Sea (Italy, Malta, Tunisia - see Galil, 2018). *Rhopilema nomadica* is one of the invasive species with high negative impacts on ecosystem services and the biodiversity of European Seas (Katsanevakis *et al*., 2014). It is a highly venomous species, inflicting painful stings on humans. Swarms of the nomad jellyfish have been observed at several locations around the Mediterranean Sea, primarily in the Levantine Sea during summer months.

Zenetos *et al*. (2018) characterized it as a casual species in Greece, based on a single record from the Greek Ionian Sea (Siokou-Frangou *et al*., 2006). Here we present additional records of *Rhopilema nomadica* from Greek waters that document its expanding distribution. In total, five new records are presented, reported by citizen scientists, and verified by taxonomists (Table 7). Interestingly, the scuba diver from Rodos Island (Fig. 15) reported a swarm of 10-12 *Rhopilema nomadica* individuals. The above support the establishment of the species in Greek waters.

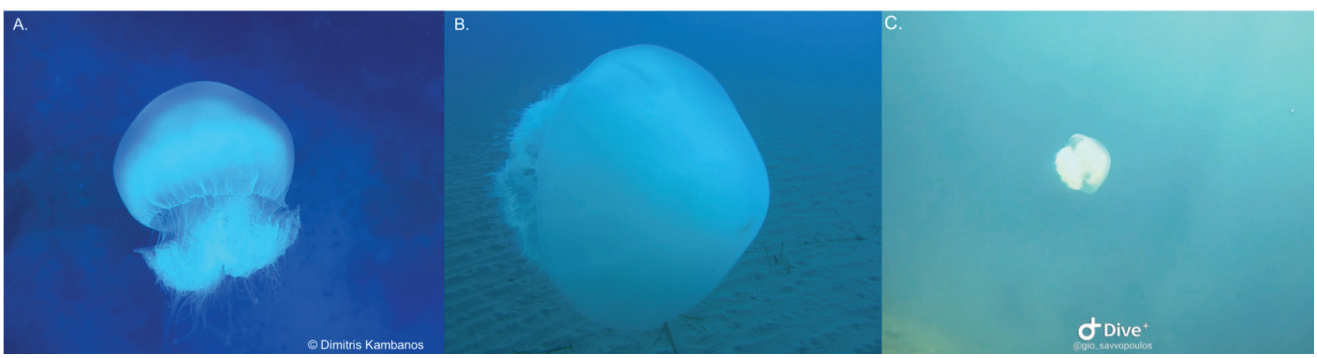

Fig. 15: Individuals of *Rhopilema nomadica* (Scyphozoa: Rhizostomeae: Rhizostomatidae) spotted in Santorini (A), Rodos (B) and Kriti (C) Islands (records 3, 4 and 5 from Table 7, respectively).

Table 7. Observations of *Rhopilema nomadica* reported within the framework of project "Is it Alien to you? Share it!!!"

# of record	Number of individuals	Coordinates	Island	Observer Type	Observation Date	Depth (m)
1	1	36.246833N, 28.163778E	Rodos Island	Spear-fisher	28/04/2017	10
2	1	36.373139N, 25.398861E	Santorini island	Scuba diver	21/02/2019	20
3	1	36.368722N, 25.398528E	Santorini island	Scuba diver	21/02/2019	6
4	10-12	35.907889N, 27.866639E	Rodos Island	Scuba diver	27/02/2019	20
5	1	35.291361N, 26.294750E	Kriti Island	Scuba diver	19/03/2019	3

9.4. First record of *Pomadasys stridens* (Forsskål, *1775)* in Greek waters

Stefanos KALOGIROU and Ioannis GIOVOS

Pomadasys stridens is an Indo-Pacific species distributed in the Indian Ocean, off the coast of South Africa and western India and the Red Sea (Golani *et al*., 2002). In the Mediterranean Sea, *P. stridens* is the only non-indigenous species of the family Haemulidae and was first reported from the Gulf of Genoa in 1969 by Torchio (Golani *et al*., 2002), leaving questions about the introduction pathway of the species in the basin; it possibly migrated through the Suez Canal (Tsiamis *et al*., 2018). In 1976, *P. stridens* was reported from Egypt and thereafter from Israel and Lebanon (Golani *et al*., 2002). More recently, *P. Stridens* was observed in Cyprus, Israel and Turkey (Akyol & Ünal, 2016). We hereby report the first record of the striped piggy, *Pomadasys stridens* (Forsskål, 1775), from Greek waters, south-eastern Aegean Sea.

Two specimens of *P. stridens* were captured in February 2019 by a commercial small-scale fisherman using trammel nets at a depth of 20 m off Symi Island in the south-eastern Aegean Sea (36.61N, 27.87E). Unfortunately, the specimens were not retrieved, because the fisherman reported his findings after disposal (Fig. 16). Photos allowed identification of the species on the basis of (i) three golden lateral bands on the upper half of the body and (ii) a black blotch at the tip of operculum, following Iwatsuki *et al.* (1995).

Fig. 16: *Pomadasys stridens* (Actinopterygii: Perciformes: Haemulidae) caught off Symi Island (Aegean Sea).

*Pomadasys stridens*is is considered to be established in south Turkey and shows a northward expansion in the Aegean Sea based on our reported finding and recent records of the species from Gökova Bay (Akyol & Ünal, 2016). *Pomadasys stridens*is, an edible fish, has been introduced to the local fish markets of several countries (S. Kalogirou, I. Giovos; Pers. Comm.).

TURKEY

10.1 Some biological properties of the Egyptian prawn *Metapenaeopsis aegyptia* (Galil & Golani, 1990) in the Gulf of Antalya

Mehmet GÖKOĞLU and Serkan TEKER

Metapenaeopsis aegyptia was first collected off the Mediterranean coast of Israel in 1987 and 1988 (Galil & Golani, 1990). After ten years, it has expanded its range to Rodos Island (Kevrekidis *et al*., 1998). The first record of *M. aegyptia* from the coasts of Turkey was reported by Yokeş & Galil (2006). Ten years later, Gökoğlu *et al.* (2016) recorded this species off Phaselis. *Metapenaeopsis aegyptia* is distributed in the Indian-western Pacific and eastern Mediterranean. The body is cream coloured, irregularly mottled with orange-red (Fig. 17). It is found on sandy and muddy bottoms. Information about this penaeid shrimp is limited. The purpose of this study was to determine some of the biological characteristics of this shrimp, which is rarely caught in the Gulf of Antalya.

Commercial trawling in the Gulf of Antalya was performed 3 times in October 2018 off Bogazkent (Coordinates: 36.798056-31.169167 and 36.822778-30.948889). The samples were captured with nets of 22 mm mesh size and brought to the laboratory of Akdeniz University, Fisheries Faculty. Species identification followed Galil & Golani (1990), Kevrekidis *et al.* (1998), and Yokeş & Galil (2006).

Sex was determined macroscopically by recording either the petasma in males or thelycum in females. Carapace length (CL) and body weight (W) were measured in all samples. CL was measured with digital callipers and W was measured with a 0.01g scale. The length-weight relationship was calculated according to the equation: $W = aL^b$, where W is the body weight in g, L is the carapace length in mm, 'a' is the coefficient related to the body form and 'b' is the exponent indicating isometric growth when equal to 3.

Fig. 17: *Metapenaeopsis aegyptia* caught in the Gulf of Antalya.

In this study, W and CL of *M. aegyptia* were measured

Table 8. Length-weight relationship parameters of *M. aegyptia* in the Gulf of Antalya.

Samples	N	Carapace Length (mm)		Body Weight (g)		a	b	r^2
		Min-Max	Mean (Se)	Min-Max	Mean (Se)			
Female	68	11.76-18.92	14.75 ± 0.14	1.66-5.85	2.94 ± 0.08	0.0024	2.63	0.86
Male	54	11.78-14,63	13.09 ± 0.07	1.72-3.23	2.34 ± 0.03	0.0027	2.62	0.82
All	122	11.76-18.92	14.02 ± 0.11	1.66-5.85	2.67 ± 0.05	0.0064	2.28	0.84

in 122 samples, 68 (55.73%) females and 54 (44.27%) males. The mean W and CL length was 2.67 ± 0.05 g and 14.02 ± 0.11 mm, respectively. In males, W ranged between 1.72 and 3.23 g (mean = 2.34 ± 0.03 g) and CL ranged between 11.78 and 14.63 mm (mean = 13.09 ± 0.07 mm. In females, W ranged between 1.66 and 5.85 g (mean = 2.94 ± 0.08 g) and CL ranged between 11.76 and 18.92 mm (mean = 14.75 ± 0.14 mm) (Table 8).

A total of 17 *M. aegyptia* individuals (3 males and 14 females) were captured off the coasts of Rodos Island, reaching 21 and 28 mm in CL, respectively (Kevrekidis *et al.*, 1998), while CL reached 12.4 mm in a male *M. aegyptia* individual caught off the coast of Israel (Galil & Golani, 1990). In this study, the length-weight relationship was $W=0.0064L^{2.28}$, $r^2 = 0.84$ for sexes combined, $W=0.0024L^{2.63}$, $r^2 = 0.86$ for females and $W=0.0027L^{2.62}$ $r^2 = 0.82$ for males. Negative allometric growth was found in *M. aegyptia* samples ($b < 3$, $p<0.05$) (Table 8).

CYPRUS

11.1. First observation of *Variola louti* (Forsskål, 1775) from the Mediterranean Sea

Mehmet Fatih HUSEYINOGLU and Carlos JIMENEZ

The yellow-edged lyretail, *Variola louti* (Forsskål, 1775) is an Indo-Pacific reef-associated Serranid fish with a distribution from the Red Sea to South Africa and the Pitcairn Islands, north to southern Japan, and south New South Wales, Australia (Froese & Pauly, 2018). Despite some reports of ciguatera poisoning (Schoelinck *et al.,* 2014), *V. louti* is a fish of commercial importance in several areas, and a targeted species for the aquarium trade. It inhabits shallow coastal waters but also off-shore deep habitats (>200 m depth) where it feeds on fish, crustaceans and other invertebrates (Nair *et al.,* 2018). The species has 9 dorsal spines, 13-14 dorsal soft rays, 3 anal spines, and 8 anal soft rays (Kuiter & Tonozuka, 2001). It is further characterized by yellowish-brown to orange-red colour with numerous red, pink and lavender coloured small spots and short dashes. Pectoral, dorsal, anal and caudal fins have a yellow posterior margin. Its front jaw has a pair of large canines, while 1-2 large curved canines exist on the side of the lower jaw. It has a lunate caudal fin (Schoelinck *et al*., 2014). *Variola louti* can reach up to 80 cm in total length and more than 10 kg in weight (Nair *et al.,* 2018).

An individual of *V. louti* exceeding 70 cm in TL (Fig. 18) was recorded on 25 October 2018 at a depth of 21 m at a popular scuba diving location, the Zephyros Reef, in Northern Cyprus (35.22031N, 33.12763E). The specimen was easily recognized due to its characteristic coloration and morphology (bluish spots all over the body and yellow-edged lyre tail), and its exhibiting aggressive interactions (most probably territorial) with other resident species.

It is highly probable that the observed specimen was the specimen released at the above location two years earleir, as ascertained by the authors. In fact, on 22 June 2016, a *V. louti* individual with an estimated TL of 35 cm, was released there by an amateur aquarium hobbyist along with another serranid fish (*Cephalopholis* sp.). The reasons for these releases were that (i) both fish grew too large for the aquarium and (ii) Zephyros is a good place for the fish to live. While the *Cephalopholis* sp. Individual was shot by a spearfisher a few days after its release, *V. louti* continued to live and grow at the same spot for more than 2 years.

Fig. 18: *Variola louti* on Zephyros Reef, Northern Cyprus.

11.2. First record of the moon crab *Matuta victor* (Fabricius, 1781) (Crustacea; Decapoda; Matutidae) from Cyprus

Periklis KLEITOU and Nikolaos DOUMPAS

The moon crab *Matuta victor* (Fabricius, 1781) (Crustacea; Decapoda; Matutidae) is a brachyuran species, native to the Indo-West Pacific, including the Red Sea. It is known to prefer shallow sandy areas, from the littoral zone down to 20 m depth (Ateş *et al*., 2017). Following its first record in 2012 from Israel (Galil & Mendelson, 2013), *M. victor* has quickly established in the eastern Mediterranean and reported from Lebanon (Crocetta *et al*., 2015), Turkey (Gökoğlu *et al*., 2016; Ateş *et al*., 2017) and Greece (Kondylatos *et al*., 2018). In this note, we present the first record of the species from Cyprus.

In the morning (07:00 a.m.) of 18/03/2019, a recreational fisher caught a *M. victor* individual (Fig. 19) using the surfcasting fishing technique and the "american" blood worm as bait. The specimen was captured over a sandy bottom at a depth of approximately 5 m in Morfou Gulf (approximately 35.215389N - 32.918639E). This record indicates that *M. victor* continues to spread in the basin, and its population should be closely monitored.

Fig. 19: *Matuta victor* (Crustacea; Decapoda; Matutidae) captured close to Sergianochori, Morfu, Cyprus.

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