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Collective Article

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New Mediterranean Biodiversity Records (July 2016)

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Abstract

This contribution forms part of a series of collective articles published regularly in Mediterranean Marine Science that report on new biodiversity records from the Mediterranean basin. The current article presents 51 geographically distinct records for 21 taxa belonging to 6 Phyla, extending from the western Mediterranean to the Levantine. The new records, per country, are as follows: **Spain:** the cryptogenic calcareous sponge *Paraleucilla magna* is reported from a new location in the Alicante region. **Algeria:** the rare Atlanto-Mediterranean bivalve *Cardium indicum* is reported from Annaba. **Tunisia:** new distribution records for the Indo-Pacific lionfish *Pterois miles* from Zembra Island and Cape Bon. **Italy:** the ark clam *Anadara transversa* is reported from mussel cultures in the Gulf of Naples, while the amphipod *Caprella scaura* and the isopods *Paracerceis sculpta* and *Paranthura japonica* are reported as associated to the –also allochthonous– bryozoan *Amathia verticillata* in the Adriatic Sea; in the latter region, the cosmopolitan Atlantic tripletail *Lobotes surinamensis* is also reported, a rare finding for the Mediterranean. **Slovenia:** a new record of the non-indigenous nudibranch *Polycera hedgpethi* in the Adriatic. **Greece:** several new reports of the introduced scleractinian *Oculina* patagonica, the fangtooth moray *Enchelycore anatina*, the blunthead puffer *Sphoeroides pachygaster* (all Atlantic), and the lionfish *Pterois miles* (Indo-Pacific) suggest their ongoing establishment in the Aegean Sea; the deepest bathymetric record of the invasive alga *Caulerpa cylindracea* in the Mediterranean Sea is also registered in the Kyklades, at depths exceeding 70 m. **Turkey:** new distribution records for two non-indigenous crustaceans, the blue crab *Callinectes sapidus* (Atlantic origin) and the moon crab *Matuta victor* (Indo-Pacific origin) from the Bay of Izmir and Antalya, respectively; in the latter region, the Red Sea goatfish *Parupeneus forsskali*, is also reported. **Lebanon:** an array of records of 5 alien and one native Mediterranean species is reported by citizen-scientists; the Pacific jellyfish *Phyllorhiza punctata* and the Indo-Pacific teleosteans *Tylerius spinosissimus*, *Ostracion cubicus*, and *Lutjanus argentimaculatus* are reported from the Lebanese coast, the latter notably being the second record for the species in the Mediterranean Sea since 1977; the native sand snake-eel *Ophisurus serpens*, rare in the eastern Mediterranean, is reported for the first time from Lebanon, this being its easternmost distribution range; finally, a substantial number of sightings of the lionfish *Pterois miles* further confirm the current establishment of this lessepsian species in the Levantine.

Introduction

Being both a biodiversity hot-spot and a sensitive confined system, the Mediterranean Sea is currently facing threats and challenges that are expected to persist or escalate in the following years: habitat degradation emerges as the most important, followed by climate change and fishing impact among several others (Bianchi *et al*., 2012). In this context, systematic recording of biodiversity and community composition changes, especially in coastal areas, is of key significance for identifying shifting trends, detecting potential impacts, and proposing policy action. The series of collective articles on new Mediterranean biodiversity records published in

Mediterranean Marine Science at regular intervals offer the opportunity to collect and disseminate information that is vital for assessing the impacts of alien species and their role in the ongoing changes of biodiversity patterns in the Mediterranean Sea (Katsanevakis *et al*., 2014a).

Submissions to the Collective Article are peer-reviewed by at least one reviewer and the editor. Contributing authors appear as co-authors and are also cited at the beginning of the sub-section corresponding to their record. Taxonomy follows the World Register of Marine Species (WoRMS Editorial Board, 2016). The new records are presented according to the major geographical zones of the Mediterranean Sea, from west to east, arranged in corresponding subchapters. The location of new records is illustrated on a map (Fig. 1). Altogether, new records are provided for 21 taxa, belonging to 5 Phyla: Chlorophyta, Porifera, Cnidaria, Mollusca, Arthropoda, and Chordata (Table 1). The reports include new distribution points and range expansion for 18 non-

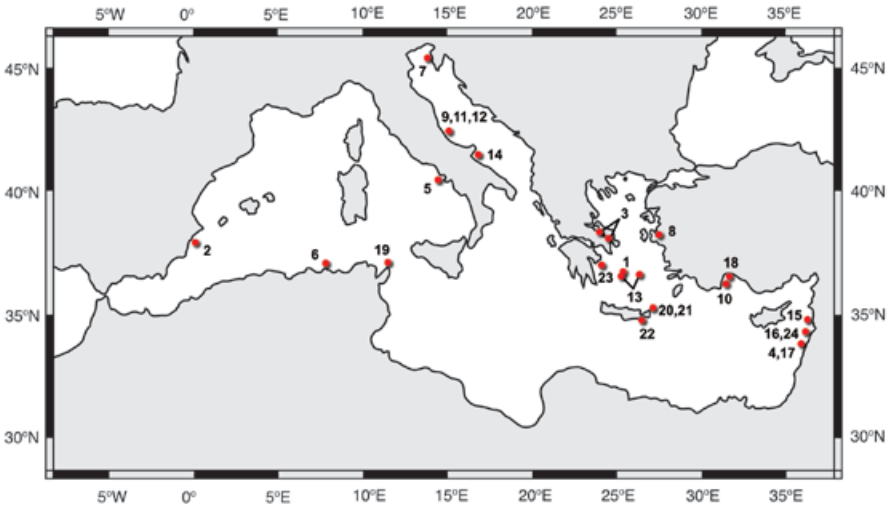

Fig. 1: Locations of records of new species in the Mediterranean Sea presented in "New Mediterranean Biodiversity Records (July 2016)". Numbers of locations are given in Table 1.

Table 1. List of species presented in "New Mediterranean Biodiversity Records (July 2016)", including sub-chapter (SC), locality of record and country. LN = location number (Fig. 1). [* Due to multiple sightings, no point location is given for *Pterois miles* records from Lebanon].

Taxon	SC	Location	Country	LN
Phylum CHLOROPHYTA				
Caulerpa cylindracea	3.1	Sifnos Island, Kyklades	Greece	1
Phylum PORIFERA				
Paraleucilla magna	1.1	Santa Pola Harbour, Alicante	Spain	2
Phylum CNIDARIA				
Oculina patagonica	3.2	North & South Evoikos Gulf	Greece	3
Phyllorhiza punctata	4.3	Sarafand	Lebanon	4
Phylum MOLLUSCA				
Anadara transversa	1.3	Gulf of Naples	Italy	5
Cardium indicum	1.2	Annaba	Algeria	6
Polycera hedgpethi	2.1	Škocjan Inlet, Koper	Slovenia	7
Phylum ARTHROPODA				
Callinectes sapidus	3.3	Sahilevleri, Izmir Bay	Turkey	8
Caprella scaura	2.2	Ortona Harbour	Italy	9
Matuta victor	4.1	Phaselis, Antalya	Turkey	10
Paracerceis sculpta	2.2	Ortona Harbour	Italy	11
Paranthura japonica	2.2	Ortona Harbour	Italy	12
Phylum CHORDATA				
Enchelycore anatina	3.4	Ios & Polyaigos Isls, Kyklades	Greece	13
Lobotes surinamensis	2.3	Manfredonia	Italy	14
Lutjanus argentimaculatus	4.3	Tripoli	Lebanon	15
Ophisurus serpens	4.3	Beirut	Lebanon	16
Ostracion cubicus	4.3	Tyr, Beirut	Lebanon	17
Parupeneus forsskali	4.2	Konyaalti, Antalya	Turkey	18
Pterois miles	1.4	Zembra Island & Haouaria	Tunisia	19
	3.6	Kavo Sidero, NE Crete	Greece	20
	3.6	Kouremenos, NE Crete	Greece	21
	3.6	Agios Panteleimonas, SE Crete	Greece	22
	4.3	Lebanese coast	Lebanon	*
Sphoeroides pachygaster	3.5	Saronikos Gulf	Greece	23
Tylerius spinosissimus	4.3	Beirut	Lebanon	24

indigenous taxa, as well as extended bathymetry records for the invasive alga *Caulerpa cylindracea*. The records of three rare native species, the Atlanto-Mediterranean bivalve *Cardium indicum,* the Atlantic tripletail *Lobotes surinamensis,* and the sand snake-eel *Ophisurus serpens*, the latter two being for the first time confirmed as present in the Adriatic Sea and the Levantine region respectively, are noteworthy. Moreover, the establishment of the Indo-Pacific lionfish Pterois miles in the Mediterranean is currently ongoing, as suggested by 3 new records of the species in eastern Crete.

The substantial contribution of citizen science to the monitoring and recording of biodiversity is highlighted in this article, since for 8 out of the 21 total taxa reported herein, at least one observation or specimen is provided by volunteering non-professionals. Some of those reports are of particular significance, such as the confirmed finding of the Mangrove red snapper *Lutjanus argentimaculatus*, the second record for the species since it was first reported from the Mediterranean four decades ago. Moreover, the reported 47 sightings of the introduced lionfish *Pterois miles* by divers spanning over just four years underline the importance of a participatory approach to biodiversity data collection. Overall, in a shifting Mediterranean ecosystem, citizen science could prove valuable for timely recording of induced changes over an extended geographic range.

1. WESTERN MEDITERRANEAN

1.1 Occurrence of the exotic sponge *Paraleucilla magna* (Porifera: Calcarea: Amphoriscidae) off the east coast of Spain

A. Izquierdo-Muñoz and E. Rubio-Portillo

Paraleucilla magna Klautau, Monteiro & Borojevic, 2004 is a calcareous sponge, currently undergoing a fast range expansion in the Western and Central Mediterranean Sea. It was originally described from the Brazilian coast, in the Atlantic Ocean and recorded for the first time in the Mediterranean Sea in 2001, in Mar Piccolo and Mar Grande, Taranto (North-west Ionian Sea, Longo *et al*., 2004). Subsequently, it was recorded in the Tyrrhenian, Adriatic Sea and Malta (Zammit *et al*., 2009). In Mediterranean Spain, it was first detected at the Catalonian coast in 2008 (Frotscher & Uriz, 2008) and has recently been reported from six localities extending along the Spanish Mediterranean coastline, from La Herradura to Port Lligat (Guardiola *et al*., 2016).

During a benthic sampling at Santa Pola Harbour (38.1896° N, 0.5578° W) in February 2016, specimens of a calcareous white sponge were collected and identified as *Paraleucilla magna* according to Longo *et al*.(2007) after dissection and examination of the calcareous spicules. Notably, other specimens appeared frequently in a photographic sampling of the coral *Oculina patagonica* implemented between 2010 and 2012 (Fig. 2), in Alicante harbour and the Marine Protected Area of Tabarca (see Rubio-Portillo *et al*., 2014 for further details), a few kilometres from Santa Pola harbour, and were also identified as *P. magna* by Prof. Alfonso A. Ramos (unpublished data). Hence, we confirm the recent presence of *P. magna* in Santa Pola harbour, and also report on the establishment of the species in Alicante harbour and Tabarca.

The most plausible vector of introduction of *P. magna* in the region is attachment to ship hulls. This way of dispersion could explain the occurrence of the non-native sponge in frequently visited locations, such as harbours or semi enclosed habitats. This can also explain its presence in the Tabarca MPA; the island is usually visited by recreational boats and the anchoring zone is in close proximity to the sampling location where the sponge was observed.

Fig. 2: Specimens of *Paraleucilla magna* (lower right quadrant of the picture); in the upper left quadrant, another non-indigenous species, the scleractinian *Oculina patagonica*, is visible.

The Mediterranean Sea is very susceptible to introductions of alien species, but most reported species belong to the most conspicuous organism groups such as molluscs, crustaceans and fishes. *Paraleucilla magna* is, up to now, the only non-indigenous sponge recorded in the area, and presumably its distribution is larger than recorded, probably due to identification difficulties, which exclude it from relevant benthic studies.

1.2 Confirmation of the presence of the rare bivalve *Cardium indicum* in Algeria

N. Babali

Cardium indicum Lamarck, 1819 belongs to the family Cardiidae (Mollusca: Bivalvia) and is characterized by a large posterior slot. It originates in West Africa and its Mediterranean distribution only concerns the extreme south-western part up to Tunisia (Ghisotti, 1971; Voskuil & Onverwagt, 1989; Delongueville & Scaillet, 2011). During a demersal stock assessment campaign performed by the Algerian research centre for the development of fisheries and aquaculture (CNRDPA), one empty complete shell of *C. indicum* measuring 95 mm x 85 mm (Fig. 3) was found on May 14, 2012 between 34 and 53 m depth in Annaba (East Algeria), between 37.0519° N, 7.3758° E and 37.2527° N, 7.2580° E). The good and fresh condition of the valves, as well as the presence of the ligament, suggest that the specimen died recently.

The regression of the species in the Mediterranean Sea was attributed to the regional cooling at the end of Pliocene (see Delongueville & Scaillet, 2011). However, this and other recent records (e.g. Ghisotti, 1971; Delongueville & Scaillet, 2011) confirm the current presence of this species in the Mediterranean basin.

Fig. 3: Empty shell of *Cardium indicum* Lamarck, 1819 collected on 14/05/2012 in Algeria.

1.3 First record of living specimens of *Anadara transversa* in the Gulf of Naples (Italy)

G. Servello and F. Crocetta

Anadara transversa (Say, 1822) (Mollusca: Bivalvia: Arcidae) is an ark clam native to the western Atlantic Ocean. Since 1972, it is spreading in the Mediterranean Sea through shipping, being initially recorded in Turkey, and subsequently in Greece, Italy, Slovenia, Croatia and Spain. Its Italian distribution includes all the Adriatic shores up to Apulia, the Gulf of Taranto, the Messina Strait area and the eastern Sicilian coast, the Gulf of Naples, the Sabaudia Lake and Sardinia (Stasolla *et al.*, 2014; Germanà, 2015, and references therein). Nevertheless, living specimens were found at each of these localities except for the Gulf of Naples, where the species had been known to exist only on the basis of two empty shells (Crocetta *et al.*, 2009).

During a fishing expedition on June 7, 2016, the latter author (FC) obtained a rope with 2 kilos of local mussels (*Mytilus galloprovincialis* Lamarck, 1819) from

a mussel farm off Miseno (Bacoli, Naples) (40.778300° N, 14.090436° E), since these are popularly believed to be a more attractive bait to sparids than the stabulated ones. The associated biota had already been removed from the mussels, but around 4 kilos of discard [mostly constituted by mussels <20 mm and few other species (Fig. 4A)] were obtained from the mussel farms in order to be used for attracting fishes while fishing. Among a set of ten native molluscan species, 27 living specimens of *A. transversa* were also observed (Fig. 4B), ranging from 6.1 to 14.6 mm in total length (Fig. 5). The material is currently preserved in the latter author's private collection (Naples, Italy). Interestingly enough, *Arcuatula senhousia* (Benson in Cantor, 1842) was not found in the examined lot, but the rope came from different mussel farms and depths than the material found in previous lots.

The examined lot constitutes the first finding of living specimens of *A. transversa* in the Gulf of Naples, 11 years since the initial report of empty shells. During this period, several shells were found in Lake Fusaro, another local mussel culture site, by one of the authors (FC), but no living specimens have everbeen recorded at that locality. As already hypothesized in Crocetta *et al.* (2009), the present finding in a mussel farm could presumably suggest continuous introduction of this species to the Gulf of Naples through aquaculture activities. Unfortunately, no effective benthic programs are carried out locally, and sightings of alien species are mostly due to accidental findings and citizen science. Field research in local mussel farms bottoms (Bacoli, Fusaro Lake, Licola, Napoli) and neighbouring sites is necessary to evaluate a possible establishment success of current and future alien species.

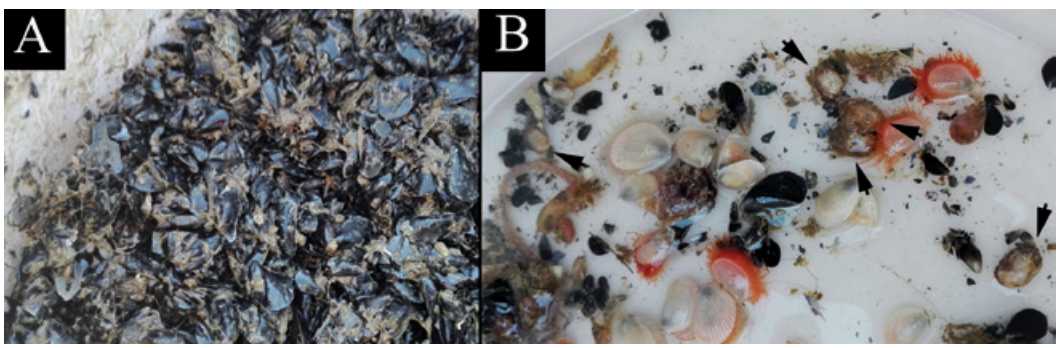

Fig. 4: A. Magnification of the mussel discard analyzed in this note. B. Five specimens of *Anadara transversa* (Say, 1822) (black arrows) among native species.

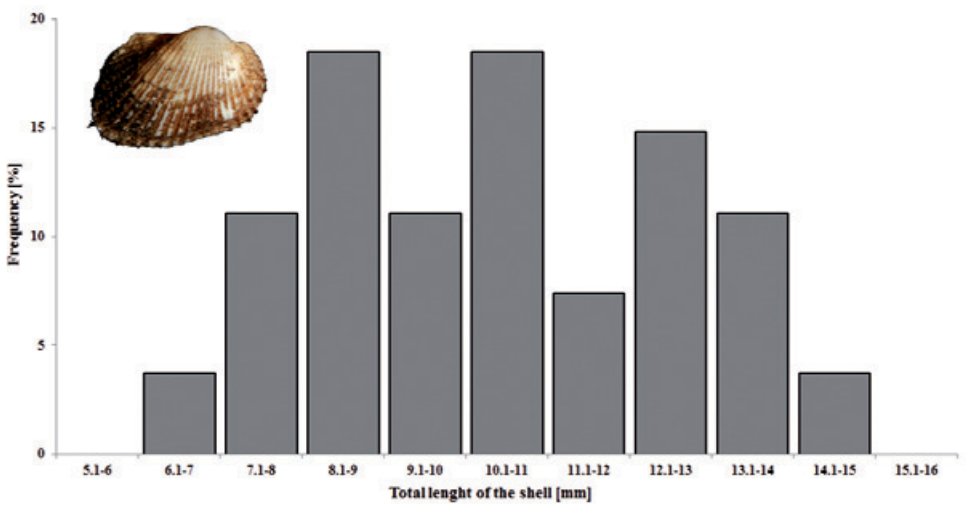

Fig. 5: Histogram of the length [mm] - frequency [%] distribution of *Anadara transversa* (Say, 1822) specimens collected (N = 27).

1.4 New record of the lionfish *Pterois miles* in Tunisian waters

K. Ounifi Ben Amor and R. Ghanem

The Indo-Pacific lionfish *Pterois miles* (Bennett, 1828) has been reported from several Mediterranean Sea areas: Israel, Lebanon, Turkey, and Cyprus (for a detailed distribution see Bariche *et al.*, 2013a; Kletou *et al.*, 2016). Recently, in 2015, two specimens of *P. miles* were recorded for the first time in Northern Tunisia (Western Mediterranean). The first specimen (Fig. 6) was captured in June 2015, in the waters surrounding Zembra Island

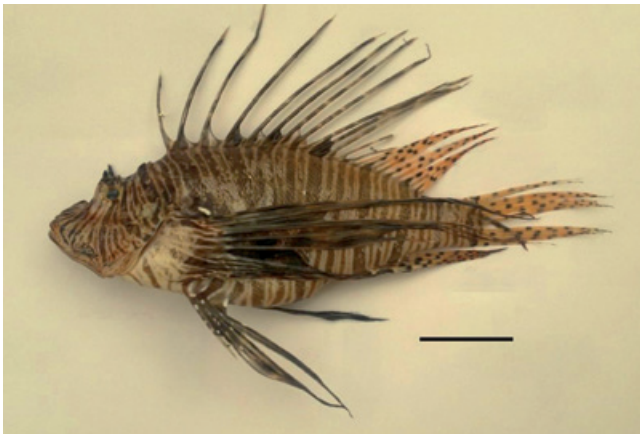

Fig. 6: *Pterois miles* captured off Zembra Island (Gulf of Tunis) (scale bar = 30mm).

(Gulf of Tunis) (37.1046° N, 10.8797° E) by gill net (28 mm mesh size), on sandy bottom at a depth of 5m. The second fish was photographed by a diver in Haouaria (Cape Bon) (37.02607° N, 11.04650° E), in September 2015, in a similar habitat and very shallow waters. The morphometric measurements and meristic characters of the collected specimen are in agreement with Bariche *et al*. (2013a) (Table 2). The preserved specimen (10% buffered formaline) was deposited in the Ichthyological Collection of the Faculty of Sciences of Tunis, with catalogue number FST-Pte-mil-01. Johnston & Purkis (2014) consider that the two lionfishes, *Pterois miles* and its congeneric *Pterois volitans* (Linnaeus, 1758) are among the most successful marine invaders. Indeed, they have spread at an unprecedented pace throughout the tropical Atlantic (Johnston & Purkis, 2014). Bariche *et al.* (2013a) suggested that this species reached the Mediterranean Sea via the Suez Canal. Nonetheless, aquarium trade was eventually identified as the most likely vector for lionfish and other marine tropical fish introductions (Johnston & Purkis, 2014). Other factors linked to its biology, such as antipredatory defences, distinctive predatory behaviour, low parasitism and ecological flexibility could probably explain its rapid dispersal. Up to date, invasion of this species in the Mediterranean is not as widespread as reported for the Atlantic. However, recent findings (Corsini-Foka & Kondylatos in Crocetta *et al.*, 2015; Kletou *et al.*, 2016) indicate a rapid increase in progress.

Recent investigations highlight records of invasive fishes surrounding Zembra (Ounifi Ben Amor *et al.,* 2016). This suggests that MPAs could be a bioinvasion hotspot. A precautionary approach and risk assessment should be adopted for efficient management. In addition, control of ornamental fish imports must be strengthened to minimize the risk of aquarium releases. This species is venomous causing injury and fatalities for divers and fishermen (Turan *et al.,* 2014). Thus, appropriate campaigns are required to raise awareness.

Table 2. Morphometric measurements in mm and as percentages of total length (%TL), standard length (%SL) meristic counts and weight in grams recorded in the specimen of *Pterois miles* from the Tunisian coast.

Specimen reference	**FST-Pte-mil-01**	
Morphometric measurements	**mm**	**TL%**
Total length	202	100
Barbel length	13	6.4
Head length	41	20.3
Body depth	53	26.2
Meristic counts		
Dorsal fin rays	10 + XIII	
Pelvic fin rays	5 + I	
Anal fin rays	6 + III	
Pectoral fin rays	14	
Caudal fin rays	15 + II	
Total weight (grams)	124	

2. ADRIATIC SEA

2.1 First record of the alien nudibranch *Polycera hedgpethi* in the eastern Adriatic

L. Lipej and D. Trkov

During mediolittoral sampling in the brackish lagoon of the protected area of Škocjan Inlet (Koper, Slovenia, northern Adriatic; 45.32558° N, 13.45553° E), a specimen of the alien nudibranch *Polycera hedgpethi* Er. Marcus, 1964 was found on 5th February 2015 (Fig. 7). It was hidden on the thalusses of the sea lettuce *Ulva* sp. at 0.5 m depth close to the opening of the canal that connects the lagoon with the coastal sea. The specimen was identified to species level according to the typical grey colour pattern and polyceratid body shape. The colour pattern is in accordance with the description of Keppel *et al*. (2012). After identification, the specimen was photographed alive under an Olympus SZX16 stereomicroscope. It is kept in the malacological collection of the Marine Biology station of the National Institute

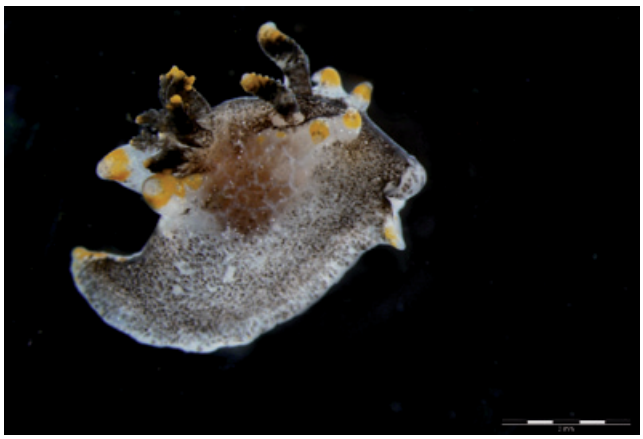

Fig. 7: *Polycera hedgpethi* from Škocjan Inlet, Koper, Slovenia (northern Adriatic) (Photo: B. Mavrič)

of Biology in Piran (Slovenia). Additional surveys of targeted alien species were carried out in the very same area and at other nearby localities of the lagoon in February and March; however, no other specimens of *P. hedgpethi* were found.

This is the first record of *P. hedgpethi* in Slovenia and the eastern Adriatic Sea, as well. Previous records in the Adriatic Sea were reported from the Venetian Lagoon (Sacca Sessola island), the docks of Marina di Ravenna, and Rimini (Keppel *et al*., 2012). *P. hedgpethi* was found in very shallow habitats, such as intertidal belts and ports (Wilson, 2006), mostly in the depth range from 0.2 to 0.5 m (Cervera *et al*., 1991; Keppel *et al*., 2012; Giacobbe & De Matteo, 2013). Specimens of *P. hedpethi* were found primarily on the bryozoan *Bugula neritina* (Linnaeus, 1758); however, a specimen found crawling on the sea lettuce *Ulva rigida* C.Agardh, 1823 has also been reported, as in our case.

In a detailed survey of *Polycera hedgpethi* records, Keppel *et al*. (2012) established that the species is found mainly in temperate biogeographical realms. In the Mediterranean Sea, *P. hedgpethi* was reported for the first time in 1986 by Cervera *et al.* (1991) in a coastal lagoon close to Naples (Italy).

In the Škocjan lagoon, other non indigenous species have already been recorded. Among molluscs, *Bursatella leachii* Blainville, 1817*, Arcuatula senhousia* (Benson in Cantor, 1842)*, Ruditapes philippinarum* (Adams & Reeve, 1850) and *Crassostrea gigas* (Thunberg, 1793) were reported, and among other invertebrates the reef-forming polychaete *Ficopomatus enigmaticus* (Fauvel, 1923) was found. All of them are considered as established in the area. The possible reasons of introduction to the Škocjan lagoon are probably related to maritime transport (fouling) or mariculture. According to Cervera *et al.* (2010), potential settlement of this species in Mediterranean harbours with intense maritime traffic can be expected in the near future.

2.2 Alien crustaceans associated to *Amathia verticillata*: new Mediterranean records of *Caprella scaura*, *Paracerceis sculpta* and *Paranthura japonica* in Italian waters

F. Tiralongo and E. Mancini

The bryozoan *Amathia verticillata* (delle Chiaje, 1822) is a widespread species. Its spreading is explained by its ability to produce vegetative fragments able to survive and grow on hard substrates (Robinson, 2004). This way, it can be introduced to new locations as fouling on ship hulls. It has often been recorded in harbours and marina areas in different seas around the world, especially in the last years (McCann *et al.*, 2015). Various hypotheses have been put forth about its actual native origin; however, it is typically considered to be native to the Caribbean Sea (Galil & Gevili, 2014). This non-indigenous species may facilitate the transport of other alien species, as demonstrated by this study and others. In particular, the recent case study of Marchini *et al*. (2015), in France, reported the same associated peracarid fauna.

The study area was the harbour of Ortona (42.34813° N, 14.41034° E), located in the central Adriatic Sea,

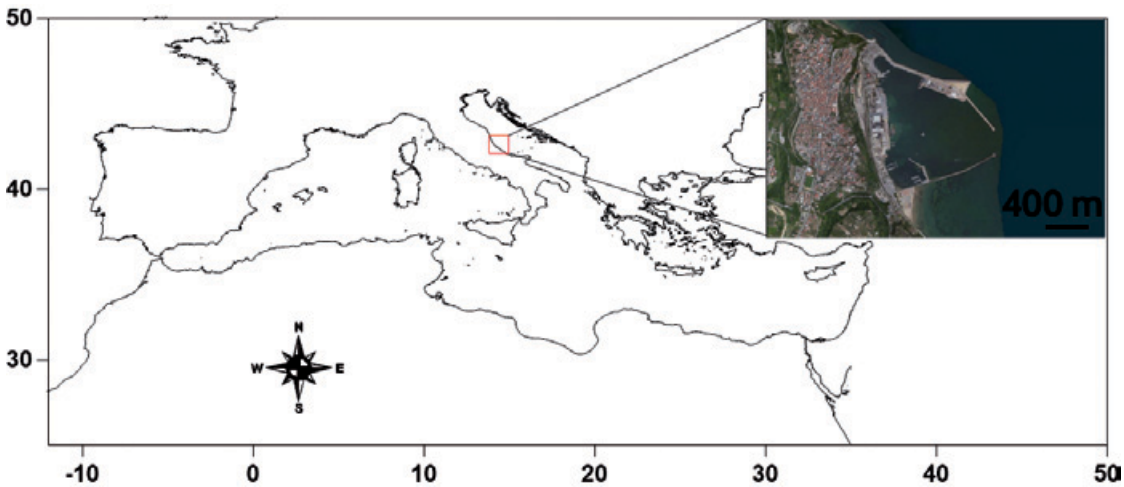

Fig. 8: Location of the sampling site, Ortona Harbour (Adriatic Sea), in the Mediterranean Sea.

Italy (Fig. 8). Benthic macrofauna was collected on August 18, 2015 by scraping the fouling organisms off the walls, a few centimetres below sea level. Most of the sampled surface was covered by *A. verticillata* colonies. A total of 4 m^2 were sampled. All the samples were immediately preserved in alcohol for subsequent laboratory analysis. All species were examined under a stereomicroscope and identified to the lowest possible taxonomic level. The following sessile organisms were also found in the sampled substrate, together with *A. verticillata*: *Scrupocellaria* sp., *Schizoporella* sp., *Sabella spallanzanii* (Gmelin, 1971), *Hydroides elegans* (Haswell, 1883), *Mytilus galloprovincialis* Lamarck, 1819 and *Ulva* sp. The associated fauna consisted of 22 species of invertebrates; Amphipoda, with 9 species, was the main group. *Elasmopus rapax*, with a total of 294 sampled specimens, was the dominant species, representing 60.49% of the total. Three non-indigenous peracarid species were found on *A. verticillata* colonies: *Caprella scaura* Templeton, 1836, *Paracerceis sculpta* (Holmes, 1904) and *Paranthura japonica* Richardson, 1909 (Fig. 9), representing, respectively, 2.26% (11 specimens), 13.79% (67 specimens) and 1.44% (7 specimens) of the total sampled specimens. Furthermore, we found an additional alien species associated with *P. sculpta*, namely, the serpulid *Hydroides elegans* (Haswell, 1883), considered as invasive (Schwan *et al*., 2016) and widespread. All sampled species were deposited in the collection of Ente Fauna Marina Mediterranea.

This study supports the common association of the three reported non-indigenous crustacean species with *A. verticillata*. Comparing our results with those of Marchini *et al.* (2015), we have found the same species association. The presence of these non-indigenous species as associated fauna in *A. verticillata* underlines the role that the spread of this latter species can play in the introduction of other alien species through transport on vessel hulls, which is considered the main way of introduction for *A. verticillata*.

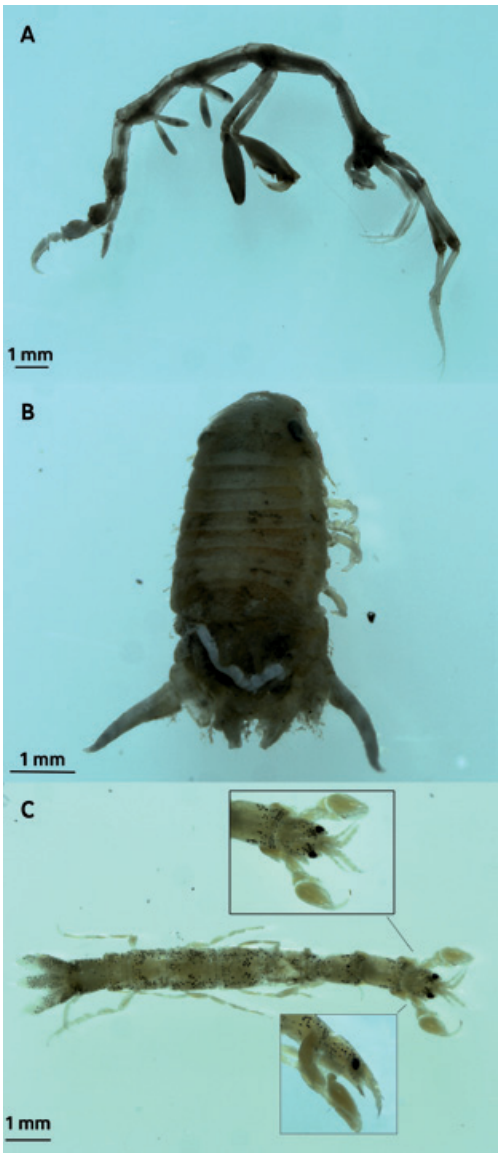

Fig. 9: Sampled specimens of (A) *Caprella scaura,* (B) *Paracerceis sculpta* (with the serpulid *Hydroides elegans*) and (C) *Paranthura japonica* with details of the dorsal (above) and lateral (below) view of the anterior part of the body. All the species were found on *Amathia verticillata*.

2.3 New record of *Lobotes surinamensis* from Italian waters (Adriatic Sea)

F. Tiralongo

In the Mediterranean Sea, the Atlantic tripletail, *Lobotes surinamensis* (Bloch, 1790), is considered a rare species (Akyol & Kara, 2012); globally, it is considered a cosmopolitan and widespread species of tropical and subtropical waters. The maximum total length reported for this fish is 1 metre. It can be found from estuaries to open waters. Adults are bentho-pelagic and feed on small fishes and benthic crustaceans. Juveniles are considered epipelagic and mimic a floating leaf and can be found among floating sargassum weed. Mediterranean records are mainly from the western and central part, but the species was also recorded in Israel and Greece (Kavadas & Bekas, in Katsanevakis *et al.,* 2014 and references therein). A specimen (Fig. 10) was caught in October 2015 in the Italian Adriatic coast (Manfredonia) (41.64379° N, 15.96879° E) by a trammel net at a depth of about 5 metres. In the Adriatic Sea, the species was recorded for the first time in 2010 (Dulčić & Dragičević, 2011) on the Croatian coast; other records date from 2011 and 2013 (Dulčić *et al*., 2014). This work represents the first record of *Lobotes surinamensis* in the Italian Adriatic Sea. Con-

Fig. 10: The specimen of *Lobotes surinamensis* caught in Manfredonia (Adriatic Sea).

sidering this and other recent works about the presence and distribution of the species in the Mediterranean Sea (Deidun *et al.,* 2010 and references therein), *Lobotes surinamensis* does not seem to be as rare as believed, especially in the Central Mediterranean Sea. Furthermore, the new record of this thermophilic species (described as a native of the Mediterranean Sea) in the Adriatic Sea seems to support northward expansion of *L. surinamensis* in the Mediterranean Sea and thus the "meridionalisation" phenomenon for this species. According to some authors, the presence of *L. surinamensis* in the Adriatic Sea could be linked to the anticyclonic circulation of the North Ionian gyre. In conclusion, evidence emerging from this study supports the hypothesis of current increasing abundance and range expansion of *L. surinamensis* in the Mediterranean Sea.

3. AEGEAN SEA

3.1 Deepest record of *Caulerpa cylindracea* in the Mediterranean

T. Hasiotis and S. Katsanevakis

Caulerpa cylindracea Sonder is considered as the invasive alien species with the highest cumulative impacts on Mediterranean habitats (Katsanevakis *et al.*, 2016). Although *C. cylindracea* grows in its native range (south-western Australia) from the intertidal zone down to a depth of only 6 m on reef flats and in intertidal pools, it is found on all kinds of soft and hard substrata in the Mediterranena Sea, with the highest abundance at depths of 0 to 30 m (Klein & Verlaque, 2008). The deepest published record of the species was at 70 m, in the Greek Ionian Sea (Panayotidis & Tsiamis, 2013). The deepest record of the species in the Greek Aegean Sea so far was from Kassos Island, observed during a video transect at 35–55 m depth (Tsiamis *et al.*, 2016).

We herein report a recent (early June 2016) deeper observation that, to our knowledge, is the deepest published record of the species in the Mediterranean Sea, at depths between 71 and 74.5 meters, south of Sifnos Island (west of Kitriana islet) in the Aegean Sea. *C. cylindracea* was observed in high densities at these depths (Fig. 11), during an ROV transect of approximately 600 m (36.8954° N, 24.7184° E – location of ROV dive) conducted within the framework of the MARISCA project (www.marisca.eu). *C. cylindracea* was observed next to rocky outcrops / reefs, in areas with biogenic and detrital sands. Sparse *Codium bursa* (Olivi) C. Agardh individuals were also present in the area, often overgrown by *C. cylindracea* (Fig. 11).

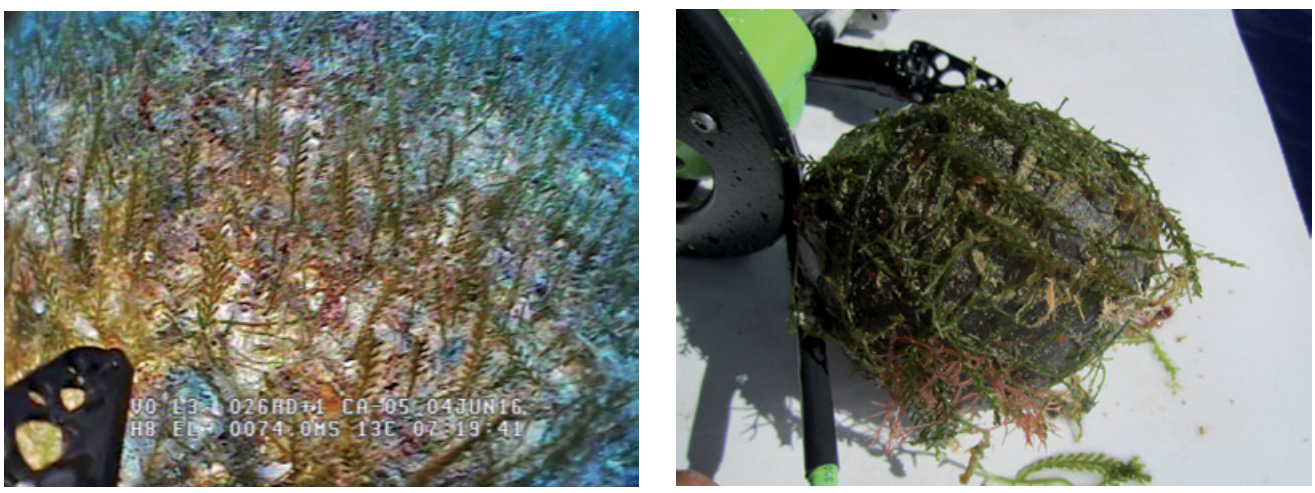

Fig. 11: ROV photo (with depth indication – 74 m) of the *C. cylindracea* field (left) and a *Codium bursa* individual overgrown by *C. cylindracea*, retrieved by the ROV (right).

3.2 Futher expansion of *Oculina patagonica* in Evoikos Gulf

M. Sini and T. Dailianis

The colonial scleractinian *Oculina patagonica* De Angelis, 1908 was first recorded in the Mediterranean Sea in 1966, in the Gulf of Genoa (Italy) (Zibrowius, 1974). Since then it has become widespread in both the western and eastern Mediterranean basins (Sartoretto *et al.,* 2008). In the Aegean Sea, *O. patagonica* was first detected in 2005 (Salomidi *et al.*, 2006), in the bay of Kaki Vigla, close to the port of Piraeus. During the following years, it was found colonising extensive areas of the upper infralittoral, in the wider area of Saronikos Gulf, and was characterized as locally invasive (Salomidi *et al.,* 2013). In the neighbouring gulf of South Evoikos, the species was recently recorded at a single site, namely, Aliveri (personal observation by Maria Salomidi according to ELNAIS, 2016).

We report a second record of *O. patagonica* from another site in the South Evoikos Gulf (Dilesi; 38.362861° N, 23.645500°; Date: 14/6/2016), along with the first records of the species at several sites of the North Evoikos Gulf (Fig 12). At the Dilesi site, five colonies were recorded along a dock and other submerged artificial structures at 0.5-1.5 m depth. At the North Evoikos Gulf sites, *O. patagonica* was found along Cape Skorponeria (38.506090° N, 23.353844° E; Date: 15/6/2016), Glaronissi islet (38.521767° N, 23.390646° E; Date: 17/06/2016), and "Mirmiggia" reef (38.500047° N, 23.499743° E; Date: 17/06/2016). At the latter sites, the species was very abundant and numerous colonies were observed on natural rocky substrates between 0.5 and 11 m depth. Overall, colonies were found to grow on relatively dimly-lit surfaces, and area coverage reached several square centimetres. These records provide evidence of further expansion of *O. patagonica* in the Aegean Sea.

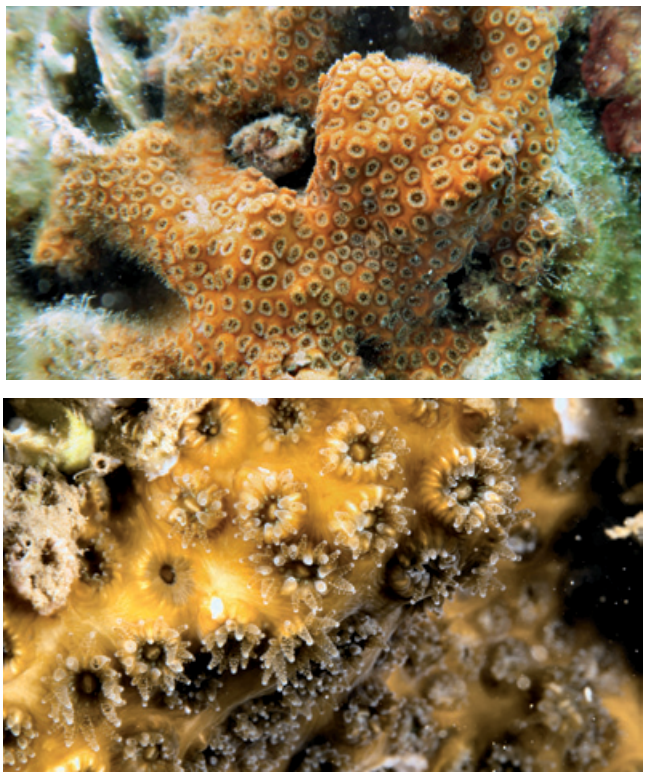

Fig. 12: Colonies of the scleractinian *Oculina patagonica* at the Skorponeria - North Evoikos Gulf (up) and Dilessi - South Evoikos Gulf (down) sites. Photos: Maria Sini (up) and Thanos Dailianis (down).

3.3 New record of the American blue crab, *Callinectes sapidus* from Izmir Bay, Aegean Sea, Turkey

A. Özgül and O. Akyol

The American blue crab (or merely 'blue crab'), *Callinectes sapidus* Rathbun, 1896 is an invasive and commercially important species, native to the Atlantic coasts, from Nova Scotia to Uruguay (Galil & Zenetos, 2002). It is very likely that *C. sapidus* was transported to the Mediterranean via ballast waters (Nehring, 2011). In the Mediterranean, the blue crab was first recorded in the 1940s in Egypt and, since then, successive records have been documented from Italy, Israel, the Aegean Sea and the southern coast of Turkey until 1983 (Galil & Zenetos, 2002).

On 6 August 2015, a large male *C. sapidus* specimen (Fig. 13) was provided by a small-scale fisherman who caught it with his trammel net (stretched mesh size 72 mm). The capture site is located on the Sahilevleri coast (38.41333° N, 27.01136° E), Narlıdere, Izmir Bay, at a depth of 14 m on a sandy-muddy bottom. Carapace length (CL) was 73 mm and carapace width (CW, including lateral spines) was 150 mm. The specimen was fixed in 5% formaldehyde solution and deposited in the marine resources collection of Ege University, Fisheries Faculty (ESFM-MAL/2015-03).

In the Turkish Aegean Sea, *C. sapidus* was first mentioned only by name among the Brachyurans of Izmir Bay and its adjacent areas by Kocataş (1971). The author stated that the blue crab has been found abundantly in

Fig. 13: A large male specimen of *Callinectes sapidus*, captured from Izmir Bay (Photograph: O. Akyol)

Söke (Karina) Lagoon, Southern Aegean Sea. Although, *C. sapidus* is well-known from southern Turkish lagoons such as Köyceğiz-Dalyan, Beymelek, Akgöl, Karataş and Yumurtalık, it is unknown from the Bay of Izmir. Bakır & Çevirgen (2010) did not include *C. sapidus* in the checklist of the crustacean species of Izmir Bay. The occurrence of *C. sapidus* in Izmir Bay is not unexpected, due to the recent record of the species from the north of Chios Island (Thessalou-Legaki & Pafilis, in Katsanevakis *et al*., 2014b), close to Izmir Bay. However, these findings do not clearly indicate an established population, and further monitoring of the dispersion of the species in the area is required.

3.4 First record of the fangtooth moray *Enchelycore anatina* from the Kyklades, Central Aegean Sea

M. Ragkousis and V. Gerovasileiou

A native to the eastern Atlantic, the fangtooth moray *Enchelycore anatina* (Lowe, 1838) was first recorded in the Mediterranean Sea off Tel Aviv-Jaffa, Israel, in 1979 (Ben-Tuvia & Golani, 1984). Since then, there have been more records of the species along the eastern and central Mediterranean Sea (Guidetti *et al*., 2012; Kapiris *et al*., 2014), suggesting gradual establishment in the region.

We report the first records of *E. anatina* in the Kyklades archipelago (Greece), filling the gap between previous sightings from the eastern (Kalogirou, 2010) and western Aegean Sea (Golani *et al.*, 2002). Two individuals were spotted and photographed on the 3rd and 29th of June 2016 respectively; the first at Ios Island (36.747599° N, 25.367095° E), during an underwater survey conducted by the authors, and the second one by two recreational divers at Polyaigos Island (36.752878° N, 24.618846° E).

The individual sighted at Ios was found in a crevice, between boulders on a rocky slope at a depth of 8 meters (Fig. 14A). The second moray was photographed at the semi-dark entrance zone of a semi-submerged cave, between boulders (Fig. 14B) at a depth of 2 meters. Since *Gymnothorax unicolor* (Delaroche, 1809) and *Muraena helena* Linnaeus, 1758, the only moray eels known to inhabit the Mediterranean Sea (Ben-Tuvia & Golani, 1984), are morphologically distinct from *E. anatina*; identification was possible by sight and based on the photographic evidence.

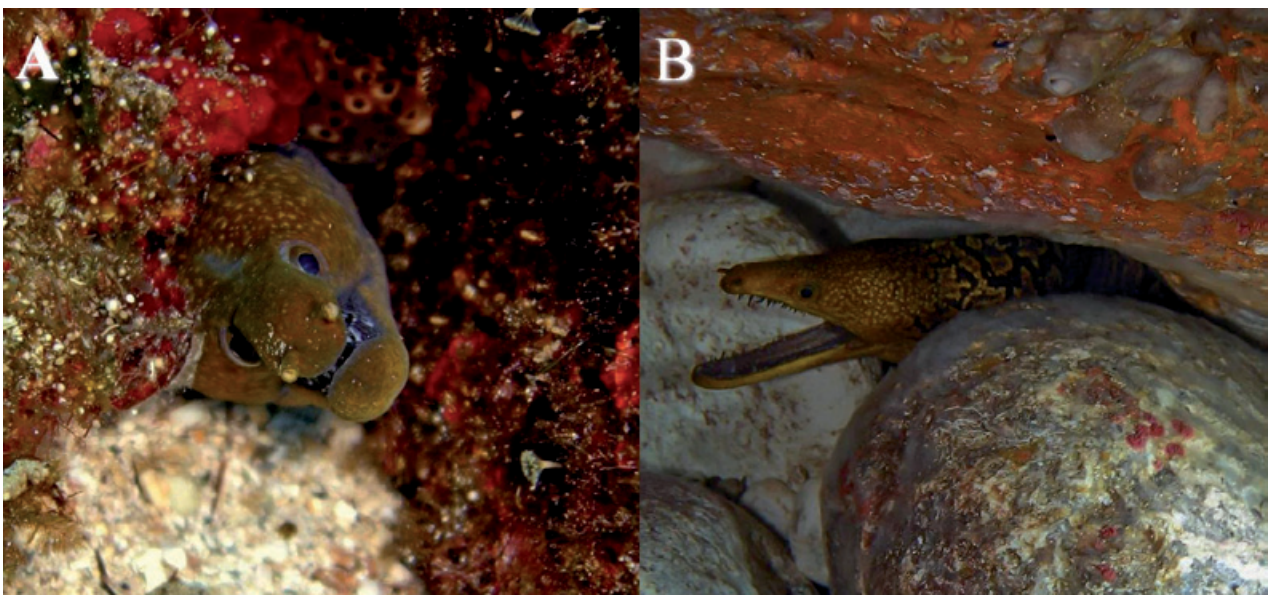

Fig. 14: *E. anatina* individuals photographed at (A) Ios Island (Photo: V. Gerovasileiou) and (B) Polyaigos Island (Photo: N. Premezzi).

3.5 First record of the alien species *Sphoeroides pachygaster* in Saronikos Gulf

Ch. Mytilineou and C. Stamouli

Sphoeroides pachygaster (Müller & Troschel, 1848) is an alien species of Atlantic origin. In the Mediterranean Sea, the species was observed for the first time in 1979, in the western basin (Oliver, 1981), and since then, several records of the species have been reported. The species seems to form a well-established population in the Mediterranean Sea, the latest records being from Syria (Rahman *et al.*, 2014) and Egypt (Farrag *et al*., 2016). In the Hellenic Seas, the species has been reported in the Kyklades (Serifos and Sikinos islands) and the Dodecanese area (Rodos, Leros and Astypalaia islands) (Zachariou-Mamalinga & Corsini, 1994; Peristeraki *et al.*, 2006). This study documents the occurrence of the species in Saronikos Gulf.

On 5 June 2015, one individual of *S. pachygaster* was caught in Saronikos Gulf (37.3414° N, 23.2982° E) at a

depth of 250 m by a bottom trawl (net mesh size: 40 mm stretched, net shape: diamond) during the experimental fishing of the EPILEXIS programme. The individual was a mature female (stage IV), with total length 509 mm and total weight 2,523 g (Fig. 15). Stomach content included specimens of shrimp (*Parapenaeus longirostris*) and fishes (*Gadiculus argenteus argenteus* and *Merluccius merluccius*).

Fig. 15: *Sphoeroides pachygaster* caught in Saronikos Gulf (TL = 509 mm). June 2016 (Aegean Sea).

3.6 First record of *Pterois miles* from Kriti, Greece

A. Sterioti

The lionfish or devil firefish *Pterois miles* (Bennett, 1828) originating in the Indian Ocean was observed for the first time in Greek waters in the summer of 2015 at the eastern part of Rodos island (Corsini-Foka & Kondylatos in Crocetta *et al*., 2015), while it is kept alive at the Rodos aquarium since early 2016. Herein, we refer to four captures of *P. miles* from the coasts of Kriti isl., all reported by artisanal fishermen. The first two were caught in November 2015 off Kavo Sidero (NE Kriti), between 35.314722° N, 26.295833° E and 35.317778° N, 26.328056° E, over rocky bottom and reefs. This location is rich in fisheries (*Scorpaena sp., Scyllarides latus, Sparisoma cretense, Mullus surmuletus, Diplodus sargus*). The third was found dead on the collected nets 2.5 nm off the coast of Kouremenos bay (35.202222° N, 26.301944° E), caught from a depth of 33 m over rocky bottom. Its weight was 450 g and total length 25 cm.

One additional specimen of *P. miles* was caught in nets on 24 July 2016, early in the morning during commercial fishing in SE Kriti. The location was Agios Panteleimonas, between Makrys Gialos and Koutsouras (35.015833° N, 25.966111°E and 25.946667°E), 1.5 to 2.0 nautical miles from the coast of south Kriti (Libyan Sea). The nets were placed at depths of 18 to 30 meters, over mixed rocky and sandy bottom covered by algae. The total length of the captured individual was 10 cm. Other main species caught during the same fishing session included groupers *Epinephelus marginatus*, white seabream *Diplodus sargus sargus*, bogue *Boops boops*, scorpionfish *Scorpena* sp., and red mullet *Mullus surmuletus*. This individual was maintained on the boat in a cooler with continuous water renewal prior to being delivered to the aquarium personnel. It was transferred in a well-oxygenated tank to the Cretaquarium, 110 Km from the capture area. Upon arrival, it was placed in a tank at the quarantine area (Fig. 16) in order to undergo anti-parasite treatments before being introduced in the aquarium's exposition tanks, enriching the existing collections. The aquarium is an ideal place for displaying this introduced venomous species, in order to educate and inform regarding the potential threats to the public. The reported findings indicate the ongoing establishment of the lionfish *P. miles* in the southeastern part of the Aegean Sea.

Fig. 16: *Pterois miles* (Photo: C.K. Doxa, G. Bardanis) at Cretaquari um.

4. LEVANTINE

4.1 Occurence of *Matuta victor* (Crustacea: Decapoda) in Turkey

M. Gökoğlu and D. Julian

The Moon crab *Matuta victor* (Fabricius, 1781) belongs to the family Matutidae De Haan, 1835 and is widely distributed in the Indo-Pacific (Gulf of Suez, Red Sea, Gulf of Oman, Arabian Sea, East Africa, Madagascar, Comoro Is., Bay of Bengal, Andaman Sea, Malaysia, Indonesia, South China Sea, Japan, New Caledonia, Australia, New Hebrides) and in the Mediterranean Sea, where two specimens were collected in Haifa Bay (Israel) in 2012 (Galil & Mendelson, 2013), and several specimens have been sighted in Lebanon since 2013 (Crocetta & Bariche in Crocetta *et al.*, 2015).

On the 15th of August 2015, during underwater sampling performed at 2-3 m depth on sandy bottoms near the Ancient City of Phaselis (36.522350° N; 30.550764'

Fig. 17: *Matuta victor* from the Ancient City of Phaselis in the Gulf of Antalya (Foto: Adnan Büyük).

E), different crab species were observed. Among them, a single specimen of *M. victor* was found (Fig. 17), constituting the first record of this species from Turkey. The number of Lessepsian species in Turkish marine waters has increased particularly during the last decade (Cinar *et al.*, 2011) and the current record confirms this view.

4.2 First record of Forskål's goatfish *Parupeneus forsskali* (Perciformes: Mullidae) in the Gulf of Antalya

M. Gökoğlu and S. Teker

The Eastern Mediterranean has distinct water characteristics within the Mediterranean ecosystem due to its increased temperature and salinity. This difference altered biodiversity after the opening of the Suez Chanel, through which many marine organisms have been introduced to the Mediterranean ever since. One of these organisms is Forskål's goatfish or *Parupeneus forsskali* (Fourmanoir & Guézé, 1976). The latter is endemic to the Red Sea and the Gulf of Aden (Bariche *et al.*, 2013b). Its presence in the Mediterranean Sea was first reported by Çınar *et al.* (2006).

On 15 March 2016, during underwater work at depths of 8-10 m on sandy-gravelly bottom at Konyaalti beach (36.883522° N, 30.678739° E) different fish species mixing sediment with their barbels were observed. Through underwater photographs and video taken in situ, one of the fish was identified as *P. forsskali* (Fig. 18). The Gulf χof Antalya is one of the regions with the highest incidence of exotic migration in the Eastern Mediterranean. So far, 51 lessepsian fish species have been identified in the Gulf of Antalya (Gokoğlu & Teker, 2015). With this record, the number of lessepsian fish species in the Gulf of Antalya increases to 52. *Parupeneus forsskali* was first sighted in Mersin Tasucu, Mediterranean Sea (Çınar *et al.*, 2006). The second individual was sighted after 4 years in the same area. After this date, Bariche *et al.* (2013b) reported one more specimen caught with trammel nets off the North coast of Beirut (Lebanon). Sonin *et al.* (2013) have reported the species during the same period from the coast of Israel. The species has also been reported by Iglesias & Frotte (2015) off the coast of Cyprus and Gürlek *et al.* (2016) off the coast of Iskenderun (Turkey). *P. forsskåli* is reported from the Gulf of Antalya for the first time. These data suggest that the distribution of the species has expanded westwards.

Fig. 18*: *Parupeneus forsskali from Konyaalti Beach in Antalya (Photo: Mehmet Gokoglu)

4.3 Citizen scientists contribute to better knowledge of the Mediterranean marine biota: records of five alien and a native species from Lebanon

F. Crocetta and M. Bariche

Our knowledge of the Levantine fauna is still very poor compared to other western and central Mediterranean countries. In addition, Lebanon lies along the natural pathway of Lessepsian migration and is also subject to colonization by Atlantic species, two phenomena that seem to be increasing due to multiple natural and anthropogenic changes. All this, coupled with the increasing help of citizen scientists and fervent sea-lovers throughout the Mediterranean Sea, increase the possibilities of unrecorded or interesting faunal findings (see Crocetta & Bariche in Crocetta *et al.*, 2015). Based on records coming from amateur or professional activities, we hereby report unpublished data from Lebanon for five alien Indo-Pacific and one native Atlantic-Mediterranean species. These include: i) three first records for the country, namely for the cnidarian *Phyllorhiza punctata* Lendenfeld, 1884 (Rhizostomeae: Mastigiidae) and the fishes *Tylerius spinosissimus* (Regan, 1908) (Tetraodontiformes: Tetraodontidae) and *Ophisurus serpens* (Linnaeus, 1758) (Anguilliformes: Ophichthidae); ii) subsequent records of two fishes so far known from the Mediterranean Sea on the basis of single records from Lebanon, namely *Ostracion cubicus* Linnaeus, 1758 (Tetraodontiformes: Ostraciidae) and *Lutjanus argentimaculatus* (Forsskål, 1775) (Perciformes: Lutjanidae); iii) the establishment of *Pterois miles* (Bennett, 1828) (Scorpaeniformes: Scorpaenidae), as documented by a significant increase of records for this species.

Phyllorhiza punctata Lendenfeld, 1884

The white spotted Australian jellyfish *P. punctata* is native to the south-western Pacific, from Australia to Japan, although its distributional range has recently expanded in the eastern Atlantic, including the USA and Mexico as well as to the Mediterranean basin, where it has been recorded from several countries since 1965 (review in Gueroun *et al.*, 2015). We hereby report the presence

of this species from the south of Lebanon, off Sarafand (33.439316° N, 35.200751° E), where a single specimen was sighted and photographed on the surface by a local fisherman on the 27th of October 2015 (Fig. 19A).

***Ophisurus serpens* (Linnaeus, 1758)**

The sand snake-eel *O. serpens* is native to the Atlantic-Mediterranean biogeographic realm, with records from the Indo-Pacific being disputed recently (Tighe, 2015). While it is considered relatively common in the western and central areas of the Mediterranean Sea, it is a rare species in the Adriatic and the easternmost Mediterranean Sea. Moreover, no confirmed records are known from the Levant basin, where its earlier record was recently refuted (Golani, 2005). We hereby report the presence of this species from the vicinity of Beirut (33.937005° N, 35.529879° E), where a single specimen was caught on a muddy bottom at ca. 200 m depth by a local fisherman in February 2007 (Fig. 19B). Our record is the first for Lebanon, and also confirms the presence of this fish in the easternmost part of the Mediterranean basin.

***Tylerius spinosissimus* (Regan, 1908)**

The spiny blasoop *T. spinosissimus* is native to the Indo-Pacific region. Despite the absence of confirmed records from the Red Sea it is widely considered as a Lessepsian species, recorded from few countries so far in the Mediterranean (Golani *et al.*, 2011; Turan & Yaglioglu, 2011). We hereby report the presence of this species from the north of Beirut, off Okaibeh (34.059547° N, 35.633823° E), where a single specimen (2.52 cm total length, 1.86 cm standard length. Meristic formula: –D: 8; –A: 7; –P: 14) was caught by lampara fishing at 0-40 m of depth on the 8th of December 2006 (Fig. 19C). The specimen was preserved and deposited in the marine collection of the American University of Beirut (catalogue number AUBM OS3803). So far, the species was unreported from Lebanon and, therefore, our record constitutes an addition to the known Mediterranean occurrence records.

***Ostracion cubicus* Linnaeus, 1758**

The yellow boxfish *O. cubicus* is native to the Indo-Pacific realm, which includes the Red Sea, and inhabits lagoons and semi-sheltered reefs. This fish has been listed among potential Lessepsian immigrants, as it was exclusively recorded from the North of Lebanon, off Ramkine Island on the basis of a photo (Bariche, 2011). Despite its unmistakable shape and colours, no substantiated records have appeared since, thus raising doubts about its effective presence in the Mediterranean Sea (CIESM, 2013). We hereby report another record from South Lebanon, off Tyr (approx. 33.284339° N, 35.184774° E), where a photo of a specimen appeared in As-Safir [an Arabic-language daily newspaper in Lebanon] on the 3rd of March 2015 and from Beirut (33.89309° N, 35.46640° E), where a single specimen (34.6 cm total length, 26.6 cm standard length. Meristic formula: –D: 8; –A: 9; –P: 11; –C: 10) was speared on a rocky bottom at 12 m depth on 2nd November 2015 (Fig. 19D). The specimen was preserved and deposited in the marine collection of the American University of Beirut (catalogue number AUBM OS3913).

***Lutjanus argentimaculatus* (Forsskål, 1775)**

The mangrove red snapper *L. argentimaculatus* is native to the Indo-Pacific region, including the Red Sea, and is so far known from the Mediterranean Sea by a single specimen recorded from Lebanon in 1977 (Mouneimné, 1979). While juveniles inhabit shallow-sandy shores, adults can be found in deeper rocky or open areas up to 80 m depth. A second individual of *L. argentimaculatus* was collected in Tripoli (34.504283° N, 35.830317° E) on the 17th of January 2014 at 45 m depth (Fig. 19E). It was found dead by scuba divers who were exploring an area ravaged by an illegal dynamite blast made on a shipwreck, a few hours earlier. The specimen was not preserved, but a piece of its flesh was donated to one of the authors (M.B.) and was subsequently barcoded. Its sequence is deposited in BOLD (ACU2979) and GENBANK (KR861539) (see Bariche *et al.*, 2015). Our record constitutes the second confirmed record of this species from Lebanon and the Mediterranean Sea as a whole, 37 years after the first record (see above). Since this species is easy to identify and reaches large sizes, it seems unlikely that an established population has been overlooked all these years. The most plausible explanation, on the basis of the record reported above, is that new propagule(s) have recently arrived in the Levant basin in a second intrusion attempt.

***Pterois miles* (Bennett, 1828)**

The common lionfish *P. miles* is native to the Indian Ocean, including the Red Sea to Sumatra, but its distribution range has recently expanded to the Atlantic Ocean as well as to the Mediterranean basin, where its occurrence as an alien has been ascertained in several eastern Mediterranean countries up to the Aegean coasts of Greece and Turkey (Corsini-Foka & Kondylatos in Crocetta *et al.*, 2015; Turan & Öztürk, 2015). The presence of this species in Lebanon is known since 2012, when two specimens were found in the north of Lebanon, off Al Minie (Bariche *et al.*, 2013a). We hereby report a total of 47 records from Lebanon communicated by local divers and spearfishers since 2013, all confirmed by us on the basis of photos and videos (Table 3). Although some of these records may be based on the same individual(s), as the species is known to be territorial, *P. miles* has indeed become a common encounter in Lebanese waters just a few years after its appearance. Additional oral commu-

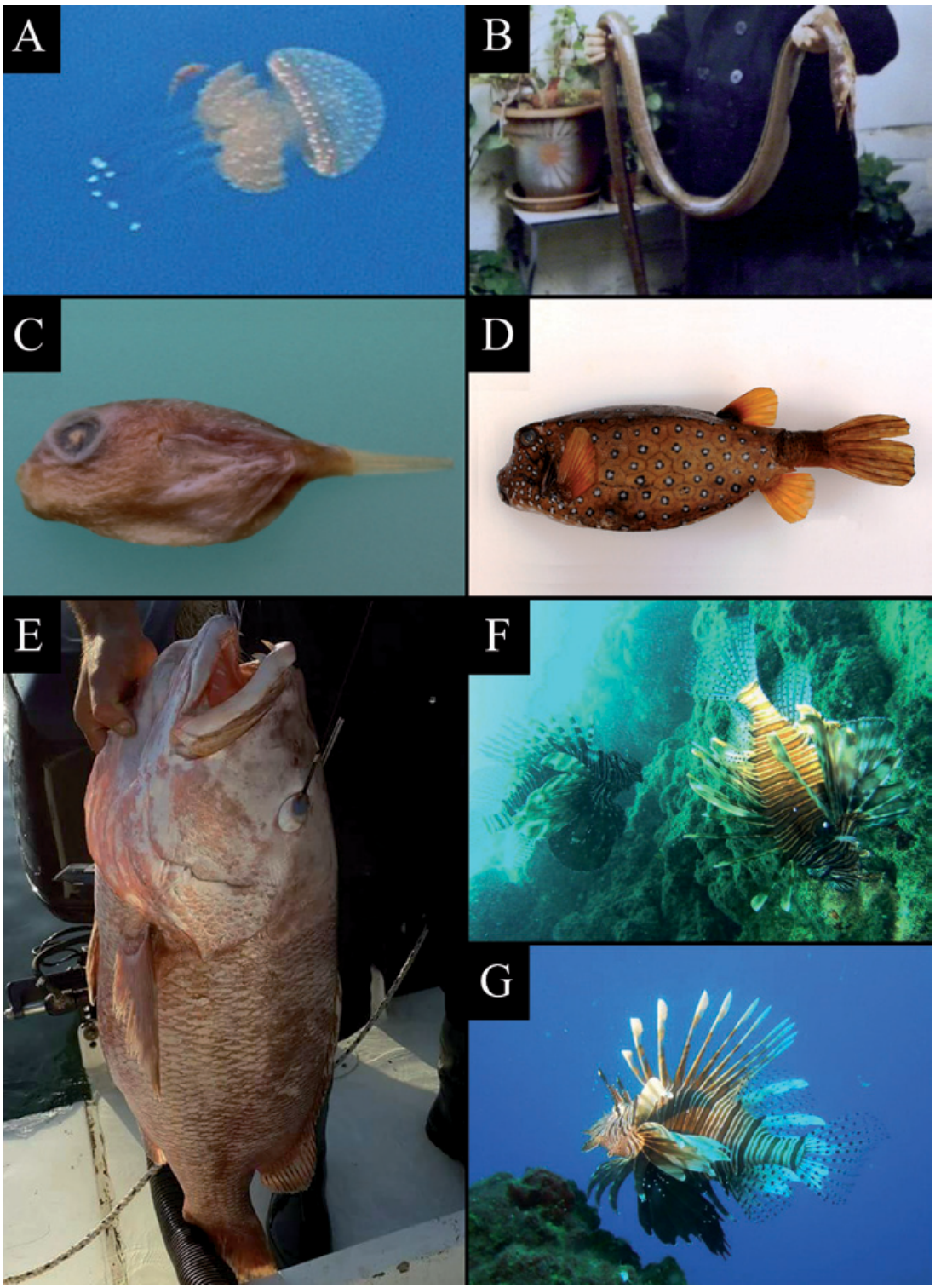

Fig. 19: A-D. New records from Lebanon. A. The white spotted Australian jellyfish *Phyllorhiza punctata* from Sarafand. B. The Sand Snake-eel *Ophisurus serpens* from Beirut. C. The spiny blasoop *Tylerius spinosissimus* from Okaibeh. D. The Yellow boxfish *Ostracion cubicus* from Beirut. E. The Mangrove red snapper *Lutjanus argentimaculatus* from Tripoli. F-G. The common lionfish *Pterois miles* from Beirut.

nications made by Lebanese citizen scientists also suggest the establishment of a population of this taxon in the wider Beirut area. Soon after the first Mediterranean records, Johnston & Purkis (2014) suggested that the oceanographic conditions in the Mediterranean were unfavourable for the dispersion of lionfish larvae, and that the invasion pressure in Lebanon should be considered as very low. Indeed, published records from all Mediterranean countries were based on few specimens so far, until Kletou *et al.* (2016) reported massive colonization of the entire south eastern coast of Cyprus. Based on the data of Kletou *et al.* (2016) and the present reports, we

Table 3. Lebanese records of the common lionfish *Pterois miles* communicated to us by citizen scientists, with year, date, site with coordinates, main substrate, depth (in meters) and number of specimens (N). Possible records based on the same individual/s are highlighted in the column of duplicates (D) with similar symbols.

Year	Date	Site	GPS - N	GPS - E	Substrate	Depth	N	D
2013	June, 16	Jounieh	34.003343°	35.630620°	Rocky	-	1	
2013	November, 20	Tripoli	34.436296°	35.744914°	Rocky	-	1	
2014	January, 05	Beirut	33.905473°	35.484831°	Rocky	30	1	*
2014	May, 05	Batroun	34.244077°	35.650418°	Rocky	35	1	
2014	June, 8	AUB wall	33.904784°	35.484840°	Rocky	30	1	#
2014	June, 12	AUB wall	33.904784°	35.484840°	Rocky	30	1	#
2014	June, 22	Byblos	34.130766°	35.621434°	Rocky	37	1	
2014	June, 22	AUB wall	33.904784°	35.484840°	Rocky	32	1	#
2014	August, 9	AUB wall	33.904784°	35.484840°	Rocky	27	1	
2014	August, 10	AUB wall	33.904784°	35.484840°	Rocky	25	3	#
2014	October, 6	AUB wall	33.904784°	35.484840°	Rocky	30	1	#
2014	October, 10	AUB wall	33.904784°	35.484840°	Rocky	28	1	#
2014	October, 12	AUB wall	33.904784°	35.484840°	Rocky	30	2	#
2014	October, 15	Batroun	34.101266°	35.626613°	Rocky	22	1	
2014	October, 24	AUB wall	33.904784°	35.484840°	Rocky	24	1	#
2014	October, 25	AUB wall	33.904784°	35.484840°	Rocky	23	1	#
2014	November, 1	AUB wall	33.904784°	35.484840°	Rocky	32	2	#
2014	November, 23	Beirut	33.887798°	35.454385°	Rocky	-	1	
2014	November, 25	AUB wall	33.905473°	35.484831°	Rocky	25	1	+
2015	February, 1	AUB wall	33.905473°	35.484831°	Rocky	30	1	+
2015	March, 7	Beirut	33.905473°	35.484831°	Rocky	25	1	*
2015	March, 14	Beirut	33.905473°	35.484831°	Rocky	28	1	*
2015	March, 26	Tabarja	34.024494°	35.606942°	Rocky	32	1	
2015	May, 28	Beirut	33.905473°	35.484831°	Rocky	21	2	*
2015	June, 14	AUB wall	33.904784°	35.484840°	Rocky	27	1	#
2015	June, 17	AUB wall	33.904784°	35.484840°	Rocky	28	1	#
2015	July, 10	AUB wall	33.904784°	35.484840°	Rocky	28	1	#
2015	July, 12	AUB wall	33.904784°	35.484840°	Rocky	28	1	#
2015	July, 19	AUB wall	33.904784°	35.484840°	Rocky	25	1	#
2015	July, 21	AUB wall	33.904784°	35.484840°	Rocky	31	1	#
2015	July, 25	AUB wall	33.904784°	35.484840°	Rocky	30	1	#
2015	July, 27	Palm island	34.485139°	35.763418°	Rocky	12	1	
2015	July, 28	AUB wall	33.904784°	35.484840°	Rocky	25	1	#
2015	August, 2	Beirut	33.905473°	35.484831°	Rocky	28	1	*
2015	August, 12	AUB wall	33.904784°	35.484840°	Rocky	30	1	#
2015	August, 13	AUB wall	33.904784°	35.484840°	Rocky	27	1	#
2015	August, 20	Tabarja	34.030281°	35.604876°	Rocky	-	1	
2015	September, 6	AUB wall	33.904784°	35.484840°	Rocky	28	1	#
2015	September, 22	AUB wall	33.904784°	35.484840°	Rocky	32	1	#
2015	September, 23	Dbayeh	33.965851°	35.548957°	Rocky	20	1	
2015	September, 25	Beirut	33.913003°	35.521232°	Rocky	15	1	
2015	October, 2	Byblos	34.117564°	35.633841°	Rocky	25	1	

can now definitively suggest that *P. miles* has followed different modelling parameters and, thus, has to be considered as established in the Mediterranean Sea and currently spreading.

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