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Collective Article A

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Abstract

This Collective Article presents information on 37 taxa belonging to 6 Phyla and extending from the western Mediterranean to the Levantine Sea. The new records were found in 10 countries as follows: **Algeria:** first reports on the presence of the fish species *Lesueurigobius sanzi*, *L. friesii*, *L. suerii* and *Luvarus imperiali*; **France:** first record of the alien nudibranch *Godiva quadricolor*; **Italy:** first record of an adult-sized red emperor snapper *Lutjanus sebae* from the southern Tyrrhenian Sea; first record of the pantropical rhodophyte *Chondria curvilineata* and the Lessepsian fish *Siganus luridus* from southern Sicily; record of a large pregnant female Dusky shark *Carcharhinus obscurus* off Sicily; **Albania:** first record of the fish *Ruvettus pretiosus*, new records of the alien molluscs *Conomurex persicus*, *Bursatella leachii*, *Dendostrea* cf. *folium*, *Fulvia fragilis* and *Ruditapes philippinarum* and additional report of the alien bivalve *Pinctada imbricata radiata*; **Montenegro:** first record of the sea slug *Thecacera pennigera* in the Adriatic Sea; **Greece:** first record of the invasive calcarean sponge *Paraleucilla magna* in Greek waters; occupancy estimation of the established cryptogenic rhodophyte *Ganonema farinosum*, the alien crustacean *Percnon gibbesi* and the alien fish species *Fistularia commersonii*, *Siganus luridus*, and *S. rivulatus* along the Cretan coastline; first record of the alien mollusc *Sticteulima lentiginosa* in Greek waters suggesting a westward unintentional expansion of this species; **Turkey:** photographic evidence of interactions of the monk seal *Monachus monachus* with sea-cage farms in the Turkish Aegean Sea and first record of the yellow boxfish *Ostracion cubicus* in the Turkish Mediterranean; **Cyprus:** first records of the rare speleophilic fish *Thorogobius ephippiatus* and *Grammonus ater* in Cyprus, extending the known distribution of the latter Mediterranean endemic species eastwards; first records of the alien fish *Kyphosus vaigiensis* and the alien crustacean species *Macrophthalmus indicus* and *Carupa tenuipes* as well as additional records of the alien echinoderm *Diadema setosum* and the alien ascidian *Symplegma brakenhielmi* in the country; **Lebanon:** first report on the presence of the four alien fish species *Cephalopholis taeniops*, *Equulites popei*, *Pseudupeneus prayensis* and *Sphoeroides pachygaster*; **Egypt:** first record of the Lessepsian fish *Synchiropus sechellensis* in the Egyptian Mediterranean waters.

Introduction

The identification and cataloguing of biodiversity form basic steps towards its sustainable management and conservation (Levin *et al*., 2014) as required for all contracting parties to the Convention on Biological Diversity. The Mediterranean Sea is recognized as a biodiversity hotspot, supporting a high number of marine species, including a considerable percentage of endemics, and also being susceptible to imminent pressures, such as biological invasions (Goffredo & Dubinsky, 2013). However, several Mediterranean regions remain understudied, biodiversity data are often 'hidden' in grey literature sources only, while the compilation and updating of species catalogues constitutes a huge challenge, especially when covering broad geographic and taxonomic scopes such as alien species (Bailly *et al*., 2016; Zenetos *et al*., 2017). The establishment of networks of local and international experts reporting on and verifying the presence of alien or rarely recorded native species in a given area could substantially contribute towards this challenge.

Recognizing the importance of archiving records of species found in the Mediterranean Sea, the Mediterranean Marine Science journal offers the opportunity to publish biodiversity records, either native or alien, through its Collective Article, Series A, on 'New Mediterranean Biodiversity Records'. 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 records. Taxonomy follows the World Register of Marine Species (WoRMS Editorial Board, 2017). Exceptions are recent changes such as the slender ponyfish *Equulites elongatus* (Günther 1874), which has been recently re-identifed as *Equulites popei* (Whitley, 1932) (Suzuki & Kimura, 2017).

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 approximately illustrated on a map (Fig. 1) and the related information (i.e. Phylum, sub-chapter, country, location and location number on map) in Table 1.

In the current article, new records are provided for 37 species (10 native and 27 alien and cryptogenic), belonging to 6 Phyla (i.e. Rhodophyta, Porifera, Mollusca, Arthropoda, Echinodermata, and Chordata) and spanning across 10 Mediterranean countries (Table 1), from the sea surface down to a depth of 334 m. It includes new records of the native fish species *Lesueurigobius sanzi*, *L. friesii*, *L. suerii* and *Luvarus imperialis* from the southern sector of the western basin. The finding of the alien nudibranch *Godiva quadricolor* in Mediterranean France indicates either unaided spread from neighbouring sites of known presence or introduction through shipping or aquaculture. The first record of the alien snapper *Lutjanus sebae* in the western basin is noteworthy, constituting the first reported adult-sized individual in the Mediterranean. The alien rhodophyte *Chondria curvilineata* and the Lessepsian fish *Siganus luridus* are reported for the first time from southern Sicily, extending their distribution area in the Mediterranean. Moreover, a large pregnant female of the rarely reported shark *Carcharhinus obscurus* reported off Sicily suggests that the species may occupy a wider range than previously believed. One more native fish, *Ruvettus pretiosus* is being reported for the first time from Albanian waters. New records of the alien molluscs *Conomurex persicus*, *Bursatella leachii*, *Dendostrea* cf.

folium, *Fulvia fragilis* and *Ruditapes philippinarum* as well as additional findings of the alien bivalve *Pinctada imbricata radiata* are provided from Albania herein, an understudied area regarding its molluscan and alien diversity. The cosmopolitan sea slug *Thecacera pennigera*, a species occasionally reported from the Mediterranean is recorded for the first time from the Adriatic Sea. The invasive calcarean sponge *Paraleucilla magna* is reported for the first time in Greek waters, and the second in the eastern Mediterranean Sea, collected from a mussel farm. Species occupancy estimation, defined as the probability of presence in a sampling unit, is provided for the established cryptogenic rhodophyte *Ganonema farinosum*, the alien crustacean *Percnon gibbesi* and the alien fish *Fistularia commersonii*, *Siganus luridus*, and *S. rivulatus* along the Cretan coastline. The alien mollusc *Sticteulima lentiginosa* is reported for the first time from Greek waters, suggesting a westward unintentional expansion. Interactions of the endangered monk seal *Monachus monachus* with sea-cage farms is presented based on photographic evidence from the Turkish Aegean Sea. The yellow boxfish *Ostracion cubicus* is reported for the first time from the Mediterranean coasts of Turkey. Two rarely reported speleophilic fish, *Thorogobius ephippiatus* and the Mediterranean endemic *Grammonus ater* are recorded for the first time in a marine cave of Cyprus, extending their known distribution eastwards. New records of the alien fish *Kyphosus vaigiensis*, the alien crustaceans *Macrophthalmus indicus* and *Carupa tenuipes* as well as additional records of the alien echinoderm *Diadema setosum* and the alien ascidian *Symplegma brakenhielmi* in Cyprus are presented in this work. Moreover, four alien fish species, *Cephalopholis taeniops*, *Equulites popei*, *Pseudupeneus prayensis* and *Sphoeroides pachygaster* are newly reported from Lebanon. The large number of individuals (442) of the Lessepsian fish species *Synchiropus sechellensis* collected from Egyptian Mediterranean waters, including the first Mediterranean record of female individuals, suggest that this species has established a large population in the area and that further studies and monitoring are required.

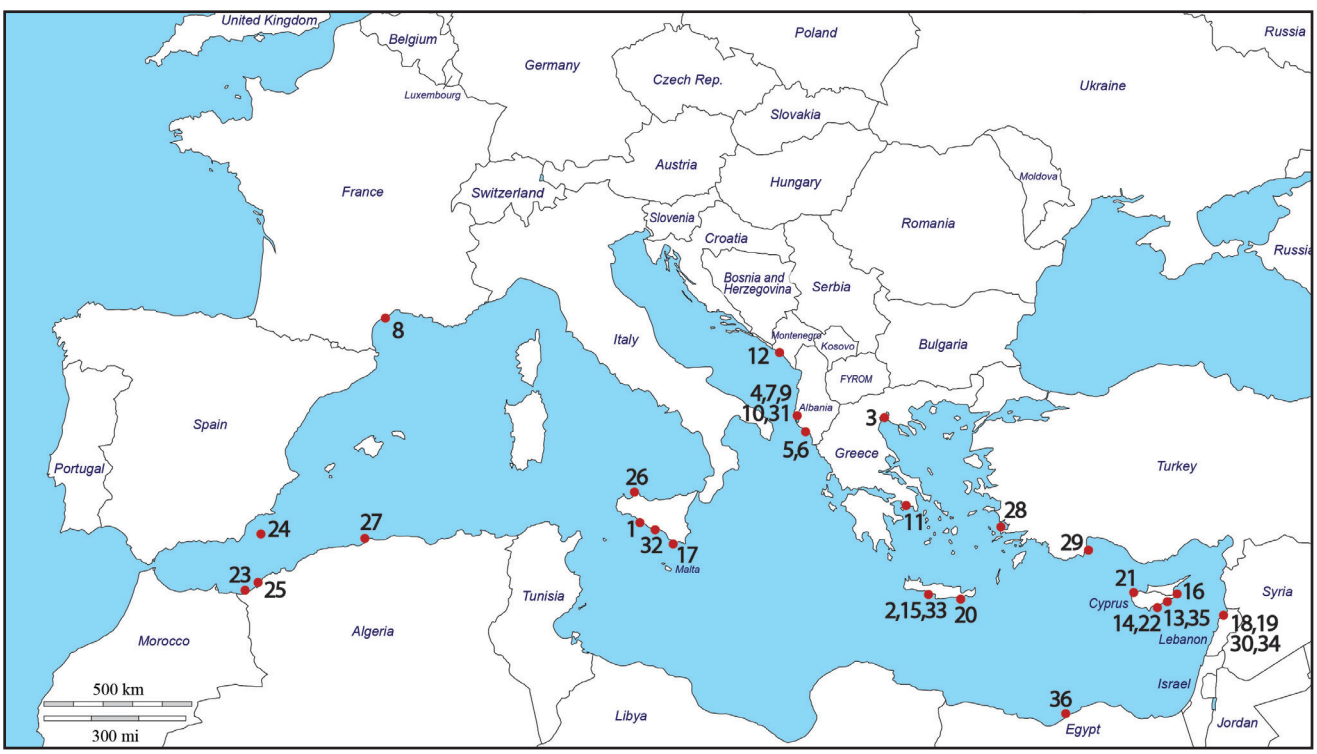

Fig. 1: Locations of records of new species in the Mediterranean Sea presented in "New Mediterranean Biodiversity Records (July 2017)". Numbers of locations are given in Table 1.

Table 1. List of taxa presented in New Mediterranean Records (July 2017), locality of record and country. SC=sub-chapter; LN=location number (Fig. 1). [* Point locations represent more than one site in the broader area].

Taxon	SC	Location	Country	LN
Phylum Rhodophyta				
Chondria curvilineata	2.1	Agrigento, Strait of Sicily	Italy	1
Ganonema farinosum	4.2	Kriti	Greece	2*
Phylum Porifera				
Paraleucilla magna	4.1	Chalastra, NW Thessaloniki Gulf	Greece	3
Phylum Mollusca				
Bursatella leachii	3.2	Vlora Bay	Albania	4
Conomurex persicus	3.2	Porto Palermo Bay	Albania	5
Dendostrea cf. *folium*	3.2	Porto Palermo Bay	Albania	6
Fulvia fragilis	3.2	Vlora Bay	Albania	7
Godiva quadricolor	1.3	Étang de Thau	France	8
Pinctada imbricata radiata	3.2	Vlora Bay	Albania	9*
Ruditapes philippinarum	3.2	Vlora Bay	Albania	10
Sticteulima lentiginosa	4.3	Saronikos Gulf	Greece	11
Thecacera pennigera	3.3	Porto Montenegro (Tivat, Boka kotorska)	Montenegro	12
Phylum Arthropoda				
Carupa tenuipes	4.9	Larnaca Bay	Cyprus	13
Macrophthalmus indicus	4.8	Vasiliko Bay	Cyprus	14*
Percnon gibbesi	4.2	Kriti	Greece	15*
Phylum Echinodermata				
Diadema setosum	4.9	Decosta Bay and Cyclops Bay (Protaras, Famagusta)	Cyprus	16*
Phylum Chordata				
Carcharhinus obscurus	2.3	off Marina di Ragusa, Sicily	Italy	17
Cephalopholis taeniops	4.10	off Tripoli	Lebanon	18
Equulites popei	4.10	off Tripoli	Lebanon	19
Fistularia commersonii	4.2	Kriti	Greece	20
Grammonus ater	4.6	Kakoskali Island, Western side of Cyprus	Cyprus	21
Kyphosus vaigiensis	4.7	off Limassol	Cyprus	22
Lesueurigobius friesii	1.1	Algerian coast	Algeria	23*
Lesueurigobius sanzi	1.1	Algerian coast	Algeria	24*
Lesueurigobius suerii	1.1	Algerian coast	Algeria	25*
Lutjanus sebae	1.4	Palermo, NW Sicily	Italy	26
Luvarus imperialis	1.2	El Djamila port, Bay of Algiers	Algeria	27
Monachus monachus	4.4	Güllük Bay, Gerence Bay	Turkey	28*
Ostracion cubicus	4.5	Üçadalar, Gulf of Antalya	Turkey	29
Pseudupeneus prayensis	4.10	off Ramkine islet	Lebanon	30
Ruvettus pretiosus	3.1	Gjuheza Cape, Karaburun peninsula	Albania	31
Siganus luridus	2.2	Rocca San Nicola, southern coast of Sicily	Italy	32
	4.2	Kriti	Greece	33*
Siganus rivulatus	4.2	Kriti	Greece	33*
Sphoeroides pachygaster	4.10	off Abdeh	Lebanon	34
Symplegma brakenhielmi	4.9	Larnaca Bay	Cyprus	35
Synchiropus sechellensis	4.11	off Alexandria	Egypt	36
Thorogobius ephippiatus	4.6	Kakoskali Island, Western side of Cyprus	Cyprus	21

1. WESTERN MEDITERRANEAN

1.1 On the records of *Lesueurigobius sanzi* (De Buen, 1918) and other *Lesueurigobius* species along the Algerian coast

N. Babali

- *Lesueurigobius sanzi* (De Buen, 1918) belongs to family Gobiidae, present from Portugal to Mauritania, off northern Namibia and in the Alboran Sea, western Mediterranean Sea (Miller, 1986). According to the MEDITS-Handbook (2016), the species has reached the Balearic Islands, North of Spain, Gulf of Lion, Maltese Islands and South of Sicily but without records along the Algerian coast.
  During stock assessment of demersal resources ARGELIA0204, from February until March 2004, many individuals of *Lesueurigobius sanzi* (Fig. 2A), identified according to Lloris and Rucabado (1998), have been caught by bottom trawl along the west Algerian coast, with one individual in the central Algerian waters (Massuti *et al.*, 2004). The species was also recorded during a survey performed by CNRDPA from May to June 2012 in the western Algerian waters (CNRDPA, 2012).
  Two other species belonging to genus *Lesueurigobius*, with a wider distribution in the Mediterranean Sea but with no previous documented records from the Algerian coast (Miller, 1986; MEDITS-Handbook, 2016), have been caught:
- *Lesueurigobius friesii* (Risso, 1810) (Fig. 2B), distinguished from other species by yellowish-brown spots on the body and dorsal fins (Miller, 1986), in 1982, 2004 and 2012 in western Algerian waters (ISTPM, 1982; Massuti *et al.*, 2004; CNRDPA, 2012). The species has been recorded in the Gulf of Bejaia in central Algerian waters (36.684° N, 5.313° E, two individuals at 78 m depth) in 2004 (Massuti *et al*., 2004).

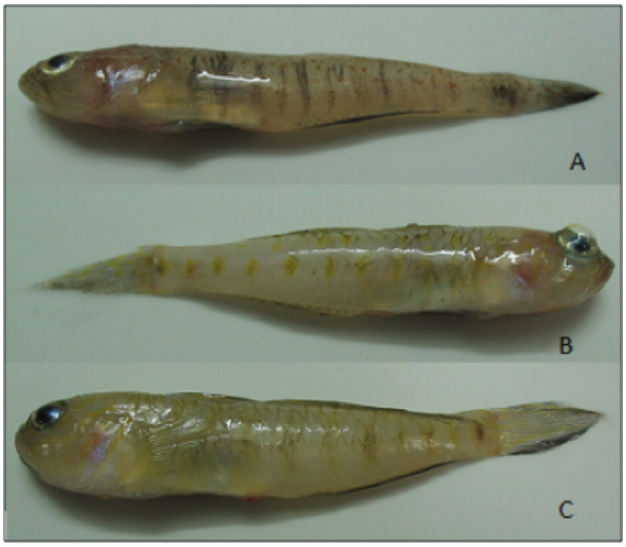

Fig. 2: Specimens of A: *Lesueurigobius sanzi*, B: *Lesueurigobius friesii*, C: *Lesueurigobius suerii* collected during the ARGELIA0204 campaign.

- *Lesueurigobius suerii* (Malm, 1874) (Fig. 2C), characterized by a naked nape and antero-dorsal longitudinal neuromast rows of the lateral line system (Miller, 1986), has been recorded for the first time in 2004 (Massuti *et al.*, 2004) in western Algerian waters and seems to have reached eastern Algerian waters in 2012 (one individual caught in the Bay of Annaba, 37.015° N, 8.002° E, between 87 and 95 m depth) (CNRDPA, 2012).

The first records of *Lesueurigobius* species from the Algerian coast are presented in Table 2.

It seems that species of the genus *Lesueurigobius* are progressing towards the eastern Algerian waters and the records of *Lesueurigobius sanzi* in different parts of the western Mediterranean basin and even in central Mediterranean waters (Malta and south of Sicily) indicate a distributional extension, which may be a consequence of global climate change.

Table 2: First records of *Lesueurigobius* species from Algerian waters.

Species	Area coordinates	Number of Individuals	Date	Depth (m)
Lesueurigobius friesii	35.411° N, 1.615° W 36.1° N, 2.066° W	09	4-10/09/1982	235-326
Lesueurigobius sanzi	36.73° N, 2.411° E	04	14/09/1982	334
	36.406° N, 1.327° W and 35.117° N, 1.961° W	50	14-17/02/2004	40-83
	36.646° N, 2.596° E	1	24/02/2004	94
Lesueurigobius suerii	35.379° N, 1.347° W 36.145° N, 0.202° E	114	14-22/02/2004	46-83

1.2 First record of *Luvarus imperialis* (Rafinesque, 1810) in Algerian waters

A. Mouzai Tifoura and A. Bennoui

The Louvar or *Luvarus imperialis* (Rafinesque, 1810) is the only member of the Luvaridae family. It is an oceanic, mesopelagic species (50-100 to 200-250 m) off the continental shelf, sometimes epipelagic near the coast; apparently solitary (Fischer *et al.*, 1987).

Louvars have been reported from most of the world's oceans and seas, but they are not considered abundant anywhere. They can be found in southern parts of the Atlantic, in northern and southern parts of the Indo-Pacific (Japan, Australia) (Dulčić *et al*., 1999).

In the Mediterranean Sea, *L. imperialis*, has always been a very rare species. It has been recorded in Greece (Papaconstantinou, 2014), the Balearic Islands (Grau *et al*., 2000) and Tunisia (Bradai *et al.*, 2004).

In Algerian waters, an individual of *L. imperialis* (Fig. 3) was captured on May 25, 2009 by small scale fisheries in the Bay of Algiers, close to El Djamila port (36.75292° N, 2.82868° E). The individual with undetermined sex measured 100 cm (total length) and weighed about 60 to 70 kg (total weight).

The identification of the specimen was based on the description presented in FishBase and the FAO Species Identification Guide for the Mediterranean and Black Sea.

The basic morphological features are: a deep and compressed body, tapering to a slender caudal peduncle with a strong fleshy horizontal keel and a pair of smaller keels at the base of the caudal fin on each side. The head is bulky, its dorsal profile rising steeply from the snout, low down mouth, small and toothless (teeth present in juveniles), small and low down eye.

Well-developed pectoral fins, rudimentary pelvic fins; dorsal fin set far back on body with 12-14 fin rays and starting on the neck for juveniles with 22-24 rays; anal fin similarly far back in adults, with 13-14 fins and 15-18 rays for juveniles; lunate caudal fin.

The colour is highly distinctive, the back is metallic blue, the flanks are pink-red, the silvery belly with rosy reflections; pectoral, anal and caudal fins are pink or red, dorsal fin is pink in front, then blackish. The maximum length is 200 cm and about 60-150 cm in the Mediterranean Sea. The spawning period starts at the end of spring and continues during the summer (Fischer *et al.*, 1987).

It has been reported that the louvar passes three stages during its life: "*Hystricinella*" from 0.5 to 2.6 cm, "*Astrodermella*" from 2.6 to 40 cm and "*Luvarella*" from 40 to 100 cm (Dulčić *et al*., 1999).

Fig. 3: *Luvarus imperialis* (Rafinesque, 1810) at El Djamila port (Algeria) (photos by DPRH of Algiers).

1.3 *Godiva quadricolor* (Barnard, 1927) spread to Mediterranean France

F. Crocetta and M. Malegue

The nudibranch *Godiva quadricolor* (Barnard, 1927) (Nudibranchia: Facelinidae), originally described from South Africa, occurs in tropical and temperate waters of Africa and in several Indo-Pacific regions, mainly in the intertidal area of brackish lagoons (Cervera *et al*., 2010; Betti *et al.*, 2015).

Found in areas subjected to maritime traffic and anthropization, it also recently spread to the Mediterranean Sea, presumably introduced through ballast water or aquaculture. Soon after its first record from Fusaro Lagoon (Italy) in 1985 (Cattaneo-Vietti *et al*., 1990 as *Facelina coronata*), it was subsequently recorded from Algeciras Bay and Salobrena on the Mediterranean coastline of Spain (Cervera *et al*., 2010), and in Piallassa della Baiona (Macali *et al*., 2013; Betti *et al*., 2015), Sabaudia Lake (Macali *et al*., 2013), and Noli (Betti *et al*., 2015) along eastern and western coasts of Italy.

Here we report on the further spread of *G. quadricolor* in the Mediterranean Sea, based on its first observations from France. Since November 2015, a high number of specimens of this taxon has been repetitively observed and photographed by amateur scuba divers from the Étang de Thau (43.38948° N, 3.58843° E) (Fig. 4), where the species can now be commonly observed at low depths on muddy bottoms with algae, in artificial substrata (mostly pillars), and among oyster banks.

No certain data are available on how the species colonized the Étang de Thau. In fact, it may have reached Mediterranean France through unaided spread from the nearby known Mediterranean sites of presence, or it may have been locally introduced through shipping or aquaculture from the Mediterranean or the other worldwide populations.

Fig. 4: *Godiva quadricolor* (Barnard, 1927) from Étang de Thau (Mediterranean France).

1.4 First record of an adult-sized red emperor snapper, *Lutjanus sebae* (Cuvier, 1816), in the Mediterranean Sea

A. Deidun and S. Piraino

The family Lutjanidae (Perciformes) comprises about 105 fish species, occurring throughout tropical and subtropical marine waters (Froese & Pauly, 2017). These fishes are called "snappers" because of their large mouth and large canine teeth, and are characterized by a long spiny dorsal fin fused to a shorter soft fin, a short-based anal fin, and a usually truncate caudal fin. Out of 69 *Lutjanus* species, four taxa are known to occur as non-indigenous in the Mediterranean Sea – either considered as Lessepsian migrants (*L. argentimaculatus*) or introduced through shipping or as aquarium releases (*L. jocu*, *L. fulviflamma*, and *L. sebae*) (Zenetos *et al*., 2016a).

Lutjanus sebae (Cuvier, 1816) has a native distribution in the Western Pacific and Indian Ocean, extending from Australia and New Caledonia to southern Japan, East Africa, and the southern Red Sea (Froese & Pauly, 2017), living at a depth range of 5 - 180 m (Anderson & Allen, 2001). Also known as the emperor red snapper, *L. sebae* is long-lived (up to 40 years), may attain large sizes, and is a commercially important species, increasingly considered as a valuable candidate for offshore cage aquaculture in Southeast Asia (Imanto *et al*., 2006).

Recently, Zenetos *et al*. (2016a) reported on the first finding of a single juvenile individual (12 cm) of *L. sebae* in the Mediterranean, which was seemingly released by an aquarium hobbyist in the Saronikos Gulf of Athens in 2009, and captured one year later by a fisherman in the same area. At the end of December 2016, a large *L. sebae* individual (weight = 11.2 Kg) was caught off the city of Palermo, NW Sicily (38.236819° N, 13.294576° E), in the southern Tyrrhenian Sea, over a mixed sand-rocky seabed by means of a fishing rod baited with squid at an approximate depth of 100-120 m. This depth is consistent with the preferred bathymetric range for adults of the species, whereas juveniles occur in shallow, inshore waters. Since the specimen was consumed, morphometric and meristic counts were not taken directly. Instead, length measurements were estimated from the photo (Fig. 5) as

Fig. 5: *Lutjanus sebae* from off NW Sicily (southern Tyrrhenian, western Mediterranean).

follows: SL = 42.1 cm; FL = 48.3 cm; TL = 51.0 cm.

In *L. sebae*, age at 50% sexual maturity is 4 to 6 years at 43-46 cm FL and 46-49 cm TL (O'Neill *et al*., 2011). Therefore, the present finding may be considered as the first record of the species in the western Mediterranean, and the first record of an adult-sized *L. sebae* individual in the entire basin. Considerations regarding the possible mode of introduction of this large *L. sebae* individual remain speculative. The sheer distance between NW Sicily and Greece and the absence of additional records closer to the Suez Canal entry point do not support the inclusion of *L. sebae* as a new element within the Erythraean invasion, whereas the intentional aquarist release hypothesis is not corroborated due to the large size and age of the fish. However, the record of *L. sebae* from Tyrrhenian coastal waters, characterized by winter temperatures which are slightly lower than in the Eastern Aegean Sea, shows that this thermophilic species is tolerant to winter sea temperatures across both the eastern and western Mediterranean basins, revealing an unexpected potential for its further establishment in the Mediterranean Sea.

2. CENTRAL MEDITERRANEAN

2.1 *Chondria curvilineata* (Ceramiales, Rhodophyta) on southern coast of Sicily (Strait of Sicily)

G. Alongi

During a study on the phytobenthic community of the southern coast of Sicily (Italy), numerous specimens of *Chondria curvilineata* F.S Collins & Hervey were found at Siculiana Marina (Agrigento, Straits of Sicily), along the coastline of the "*Torre Salsa*" (37.34904° N, 13.36280° E) Natural Reserve. *C. curvilineata* is a pantropical species first sampled in the Mediterranean Sea in Corsica in 1981 and some years later it was reported from Egypt and Greece (see Verlaque *et al.*, 2015 and references therein).

The specimens were collected in August 2015 in shallow sandy rocky habitats in sheltered and/or moderately wave-exposed areas protected by a barrier of *Posidonia oceanica* (L.) Delile.

Our specimens were creeping and forming loosely tangled mats on *Cystoseira* spp., with erect axes 1-2 cm high and up to 500 µm in diameter, attached by bundles or distinct tufts of simple multicellular rhizoids. Erect axes terete and lax are irregularly branched (up to 200 µm in diameter) with short irregularly arranged claveformis branchlets. Apices are truncated and apical cells are sunken in a terminal depression. Five large pericentral cells are present with the distal convex ends swollen and thickened so as to reveal the cortication lines curved toward the apex of the branch (Fig. 6). No fertile specimens were found; therefore, according to Verlaque *et al*. (2015), it is probable that *C. curvilineata* reproduces only vegetatively in the Mediterranean Sea, as is true of another invasive alien species, *Womersleyella setacea* (Cormaci *et al*., 1994).

C. curvilineata is clearly distinguished from the other species of *Chondria* with apices blunt, the apical cells sunken in terminal depression, reported to date from the Mediterranean Sea: *C. coerulescens* (J. Agardh) Sauvageau, *C. collinsiana* M. Howe, *C. dasyphylla* (Woodward) Agardh and *C. scintillans* G. Feldmann. In fact, *C. curvilineata* differs from *C. coerulescens*, *C. dasyphylla* and *C. scintillans* as regards the presence of the typical cap-like thickenings detectable in superficial view (lacking in the other species). *Chondria curvilineata* is similar to *C. collinsiana* in showing bands in superficial view caused by thickened ends of pericentral cells; but *C. collinsiana* consists of erect axes arising from a crustose holdfast and produces thicker branchlets (250-450 µm in diameter) while *C. curvilineata* shows a creeping habit with slender branchlets. However, the presence of *C. collinsiana* in the Mediterranean Sea requires confirmation (Gómez Garreta *et al*., 2001) and according to Verlaque (1994) the record of that species in the Aegean Sea by Athanasiadis (1987) could be a misidentification for *C. curvilineata.*

The finding of *C. curvilineata* from the southern coast of Sicily represents the first record of this species from Italy. Such a record extends the distribution area of this alien species to the central sector of the Mediterranean Sea, although it remains rather rare and little known in the Mediterranean Sea.

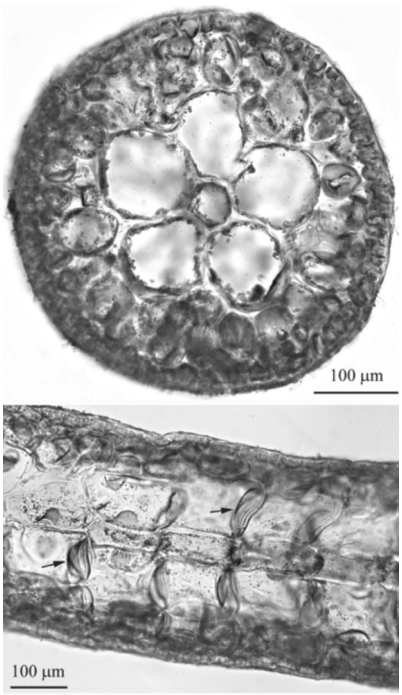

Fig. 6: *Chondria curvilineata*. Transversal section showing five large pericentral cells (top image). Longitudinal section showing pericentral cells with conspicuous distal cap-like thickenings (arrows) (bottom image).

2.2 First record of *Siganus luridus* (Siganidae) from the southern coast of Sicily

L. Castriota and A. Spinelli

The dusky spinefoot *Siganus luridus* (Rüppell, 1828) is one of the most invasive Lessepsian fish species that has immigrated to the Mediterranean Sea. This species has successfully settled in the eastern Basin and recent findings show that it is expanding northward along the Adriatic coasts (Lipej *et al*., 2017). Although a permanent population has been recorded in the Pelagie Islands (Straits of Sicily) in 2003 (Azzurro & Andaloro, 2004), this species does not appear to have settled yet along the coasts of Sicily, having been documented only on the northern coast and the Strait of Messina as single specimens (Lipej *et al*., 2017 and literature therein). On 30th March 2017, at 10:00 a.m., four similar sized specimens of *Siganus luridus* were observed during a free dive, at Rocca San Nicola (near Licata), about in the middle of the southern coast of Sicily (37.1116083° N, 13.856567° E), swimming over a *Posidonia oceanica* meadow on sandy bottom at 5m of depth; a bank of about twenty specimens of *Sarpa salpa* (Linnaeus, 1758) were swimming thereabouts. The surface water temperature in the area was 16° C. One of the four sighted specimens, captured by spearfishing and photographed immediately after capture, measured 27.8 cm in total length (Fig. 7). *Siganus luridus* is a herbivore species mainly feeding on benthic algae and, in the Pelagie Islands, it feeds at the same trophic level as the native fishes *S. salpa* and *Sparisoma cretense* (Linnaeus, 1758) probably showing a partitioning of resources (Azzurro *et al*., 2007; Alomar *et al*., 2016). As *S. luridus* reaches the maximum total length of about 30 cm and mature specimens have been found in the Pelagie Islands measuring 13-14 cm in length (Azzurro & Andaloro, 2004), we can confirm with a high degree of certainly that the specimens reported here are adults. According to Castriota & Andaloro (2005), the success of *S. luridus* in the Mediterranean Sea has been attributed to its large eco-physiological plasticity. This note represents the first record of *S. luridus* from the southern coast of Sicily and, considering its high adaptability to local trophic resources, its further expansion in this area is most likely.

Fig. 7: Specimen of *Siganus luridus* speared at Rocca San Nicola (Sicily) on 30 March 2017.

2.3 Record of a large pregnant female of *Carcharhinus obscurus* (Lesueur, 1818) in the Mediterranean Sea

G. Insacco and B. Zava

The Dusky shark, *Carcharhinus obscurus* (Lesueur, 1818), is a large apex predator with a cosmopolitan distribution (Ebert *et al*., 2013). The species has been rarely found in the Mediterranean (Serena, 2005); most records are from the western and central-southern regions, along the North African coasts and the Strait of Sicily. It is likely that this species ranges further east in the Ionian Sea and Levantine Basin (Fergusson & Compagno, 2000). Records have been sporadic but possibly underestimated because of misidentification with similar "grey sharks"/ requiem sharks (Musick *et al*., 2016). On 9th June 2016, a pregnant female of *Carcharhinus obscurus* was caught by two professional fishermen using a traditional trammel net (called in Sicilian vernacular "inpardata"), about 6 miles off Marina di Ragusa, province of Ragusa, Sicily, Italy, approximate coordinates 36.726° N, 14.524° E, on a rocky bottom at about 45 m of depth. The specimen that was dying, was measured, photographed (Fig. 8 and Fig. 9) and identified according to Serena (2005) and Ebert *et al*. (2013).

According to previous literature, *Carcharhinus obscurus* is a large shark that reaches 420 cm in length and 450 kg in weight (Compagno *et al*., 1989; Dudley *et al*., 2005). The maximum sizes recorded in the Mediterranean Sea were 311 cm for a male and 349 cm for a female

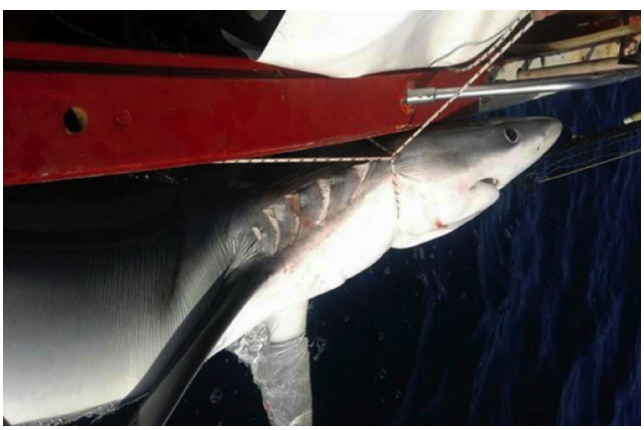

Fig. 8: *Carcharhinus obscurus* (Lesueur, 1818) caught off Marina di Ragusa, Sicily, Italy (6.9.2016) (photo Lorenzo Casaurano).

(Fergusson & Compagno, 2000). Our specimen reached 410 cm in TL, the maximum size for the Mediterranean, and was caught in a trammel net; during the hauling operations, while the net was approaching the vessel, the dying female gave birth to 16 pups (see Fig. 9), of about 100 cm in TL, still alive; the pups were released into the sea. The specimen had a lead-greyish dorsal area, with a whitish ventral area. As described in the literature for the adult specimens, tips of pectoral and pelvic fins, lower lobe of caudal fin and dorsal fins were uniformly greyish coloured. Figure 9 shows, in the red circle, one of the pups with the tip of lower lobe of caudal fin and the second dorsal fin dusky.

Carcharhinus obscurus is a placentally viviparous shark species characterised by extensive seasonal migrations, at least in the North Pacific and Atlantic Oceans. Females move into shallow coastal waters in the warmer months to give birth. Litters are produced every two to three years, normally ranging in number from 3-16 pups and in size from 70 to 100 cm. The capture in the net probably stressed the animal, forcing it to give birth to the pups. Shark and ray females after capture often deliver living pups with the last movements of their body. Significant population declines have been estimated in other large shark species in the Mediterranean Sea as a result of intensive coastal and pelagic fishing pressure. However, there is currently insufficient information on the occurrence of *C. obscurus* in the Mediterranean Sea to make an assessment beyond Data Deficient in this region (Musick *et al*., 2016). Based on recent capture data, the species may occupy a wider range than previously believed; however, their population size must be very low.

Fig. 9: Female *Carcharhinus obscurus*: the red circle shows the detail of the tail of a pup during birth (photo Lorenzo Casaurano).

3. ADRIATIC SEA

3.1 First record of the Oilfish, *Ruvettus pretiosus* (Cocco, 1833) in Albanian waters

I. Giovos and R. Bakiu

The Oilfish *Ruvettus pretiosus* (Cocco, 1833) is the only species of the genus *Ruvettus* found and has obtained its common name from the very oily flesh that has purgative properties, when eaten by humans. This fish is considered to be an oceanic and bentho-pelagic oceanodromous, inhabiting marine and oceanic waters, over the continental shelf and in oceanic waters between 100-800 m (Nakamura & Parin, 1993). It reaches its maximum Total Length (TL) at 300 cm and its diet includes fish, crustaceans and cephalopods (Nakamura & Parin, 1993).

R. pretiosus is distributed in the Atlantic, Pacific, and Indian oceans as well as in the Mediterranean Sea (Collette *et al*., 2015). Several specimens of the species have been recorded in the Adriatic Sea (Bettoso & Dulcic, 1999), the Turkish Seas and the Greek Seas (Karachle *et al*., 2016) and along the Libyan Coast (Elbaraasi *et al*., 2007). Hereby, we present the first records of *R. pretiosus* in the Albanian waters.

On 22nd February 2017, two *R. pretiosus* individuals were landed at Radhime (Vlorë), South Albania. The two individuals were captured by a professional fisherman using a longline near Gjuheza Cape (Karaburun Peninsula, 40.396620° N, 19.237838° E), at a depth of 280 m (Fig. 10). TL, Standard Length (SL) and Weight (W) for each of them were 152 and 154 cm, 128 and 130 cm, 30 and 30.1 kg, respectively. One of the individuals was transferred at the Museum of Natural Science in Tirana,

Albania, and later it was embalmed by the experts of the institution. The other one was embalmed by the Head of the Radhime Fishing Organisation.

Fig. 10: A, B: *R. pretiosus* specimens landed at Radhime (Vlore).

3.2 Alien Mollusca in Albania: increasing knowledge

E. Xharahi, F. Crocetta and A. Golemaj

Mollusca is one of the major phyla worldwide, and as such it is composed of a high number of species. In the Mediterranean Sea, it accounts for more than 2000 species (out of around 17000 known), of which more than 200 are considered aliens (Sabelli & Taviani, 2014). The knowledge on some areas still remains considerably poor even at the beginning of the XXI century, presumably due to both undersampling and political instability. Regarding Albania, several efforts recently culminated in an updated check-list of molluscs (Dhora, 2014). However, as a matter of fact, the overall number of species known from the area is still low when compared with nearby countries such as Croatia, Italy or Greece, which presumably is due to a general poor knowledge of the local biota. Within the framework of a recent project (ESENIAS-TOOLS) carried out by one of the authors (FC), aiming to increase knowledge on alien species occurring in several Mediterranean countries, we hereby report on some recent faunal findings by two of us (EX and AG) in Albania during an 8-year long local shell research in the Vlora area, and focusing in particular on six alien Mediterranean molluscs, some of which constitute first records from the country.

Conomurex persicus (Swainson, 1821) is a species native to the south coast of Arabia and part of the Persian Gulf, and presumably arrived in the Mediterranean through shipping; it only slightly resembling the native *Conus ventricosus* Gmelin, 1791. We hereby report on the finding of a single empty shell (Fig. 11A) in Porto Palermo Bay (40.063056° N, 19.793333° E), where it was found near the pier under small fishing boats in August 2015, on a sandy-muddy bottom at 8 m depth, by E. Xharahi. The shell is currently preserved in the EX private collection (Vlora). A single shell of *C. persicus* had already been recorded from the northern Adriatic Sea, although there is no certainty as regards its living presence in the area (review in Crocetta, 2011). A similar situation holds here (see below).

Bursatella leachii Blainville, 1817 is a circumtropical species widely distributed both in the Red Sea and the Atlantic, which since the last century has colonized the entire Mediterranean Sea. We hereby report on the sighting of a large number of specimens (Fig. 11B) in Vlora Bay (site: "old beach", 40.420278° N, 19.429722° E) since 2013, where the species was commonly observed by two of the authors (EX and AG) on a sandy bottom at low depths. In addition, this taxon was also commonly observed in fishermen's nets, as a bycatch of local fishery from sandy bottoms with *Posidonia oceanica* (Linnaeus) Delile, 10-20 m depth. No material of this species was preserved. The species was already known from all the other Adriatic countries, having been reported so far from Italy, Slovenia, Croatia and Montenegro (review in Zenetos *et al*., 2016b).

Pinctada imbricata radiata (Leach, 1814) is usually considered a Lessepsian migrant, and is an unmistakable species within the invaded area, only slightly resembling the native *Pteria hirundo* (Linnaeus, 1758) when both are juveniles. We hereby report on the common presence of specimens and shells (Fig. 11C) in Vlora Bay (sites: Vlore, 40.4880556° N, 19.426944° E; Zvernec, 40.531944° N, 19.378611° E; Orikum, 40.338333° N, 19.468611° E) since 2014, when the species was commonly observed alive at low depth in *Posidonia oceanica* (Linnaeus) Delile meadows by two of the authors (EX and AG), and can usually be found beached in huge quantities after storms. Around 30 shells are currently preserved in the EX and AG private collections (Vlora).

Dendostrea cf. *folium* (Linnaeus, 1758) is presumably a Lessepsian immigrant that has already invaded the entire eastern Mediterranean, where it dominates the infralittoral fringe (FC, unpublished data). We hereby re-

port on the finding of a large number of specimens (Fig. 11D) in Porto Palermo Bay (40.063611° N, 19.793333° E), where they were found near the pier under small fishing boats in June 2016, on a rocky bottom at 1-2 m depth, by E. Xharahi. Twelve shells are currently preserved in the EX private collection (Vlora). However, all these specimens, despite living, were found mechanically detached from a substrate.

Fulvia fragilis (Forsskål in Niebuhr, 1775) is commonly considered as a Lessepsian migrant, although its spreading in the Mediterranean seems to be facilitated not only by larvae dispersal, but also by shipping, having been found often near main harbours. We hereby report on the finding of several specimens (Fig. 11E) in Vlora Bay (north-west side, 40.4525° N, 19.478333° E) since 2013, when the species was commonly observed alive at tide level, on a sandy bottom, by two of the authors (EX and AG), and may still be frequently collected beached after storms. Twenty-one shells are currently preserved in the EX and AG private collections (Vlora). After being already recorded from all the other Mediterranean subregions, our records constitute the first from Albania and from the Strait of Otranto as a whole, therefore suggesting a possible incoming invasion from the Adriatic Sea.

Ruditapes philippinarum (Adams & Reeve, 1850) is a species native to Japan and the Indo-Pacific, introduced to several areas around the world for aquaculture activities, including the Mediterranean Sea. Despite high similarities with *Ruditapes decussatus* (Linnaeus, 1758), it can be easily distinguished from the native taxon by the much more pronounced decussate sculpture, the more angulated shell both posteriorly and anteriorly, a general oval outline, and the almost fused siphons. We hereby report on the common presence of specimens and shells (Fig. 11F) along the entire Vlora Bay (40.457222° N, 19.398055° E) since at least 2013, when the species was commonly observed alive at tide level, on a sandy bottom, by two of the authors (EX and AG). Around 30 shells are currently preserved in the EX and AG private collections (Vlora).

So far, only seven alien Molluscan taxa were recorded from Albania, although all of them suffer a high degree of uncertainty, being often recorded as simple names in mere lists with no photos or deposited material to be further checked, in addition to strong taxonomic uncertainties resulting from the mentioned data (FC, unpublished data based on the ESENIAS-TOOLS project). Among the species reported here, and to the best of our knowledge, only *P. imbricata radiata* was previously known from the country (Katsanevakis *et al*., 2011), although only on the basis of a single specimen and an empty shell, and therefore the present records are the first to suggest its local establishment. This taxon presumably arrived in the area through larval dispersal from the Ionian Sea. On the contrary, the living presence of *B. leachii*, *F. fragilis* and *R. philippinarum* is hereby first cited from Albania. The high number of *F. fragilis* specimens found would suggest that this species will soon presumably start invading the Adriatic Sea, so that further records from the area are soon awaited. On the contrary, the presence of *B. leachii* and *R. philippinarum* in Albania is not surprising, as both taxa were already recorded since decades from several areas of the Adriatic shores (review in Zenetos *et al*., 2016b, for *B. leachii*; review in Crocetta, 2012, for *R. philippinarum* in Italy). Therefore, their local putative absence up to the present records was presumably only based on lack of field research or data publication. With regards to *B. leachii*, it is strongly suspected that it arrived in the area through secondary spreading from already impacted areas. On the contrary, two possible vectors may be suspected for the Philippine clam: larval dispersal from other Adriatic areas, where it is extremely common and recorded everywhere, or local introduction for aquaculture purposes. Finally, records of *C. persicus* and *D.* cf. *folium* should be mentioned. The first one is only based on a single empty shell found under fishing boats, although in quite fresh conditions. This leads to suspect that the species lived nearby and was presumably fished in Albanian waters. However, further field research did not lead to the discovery of an established population. Taking into account that *C. persicus* is widely distributed and even invasive in Greek soft bottoms (FC, personal observation), an arrival through larvae dispersal seems to be highly possible. The same holds for the *D.* cf. *folium* specimens reported here, for which again no populations were found *in situ*, although we are prone to consider these records as based on specimens fished nearby. Although at the present stage records of both latter taxa cannot be considered as valid even regarding a casual presence in the area, they may be easily re-evaluated in the future, especially in case of findings of established populations somewhere in the area. If on the one hand further field research is required along the Albanian shores so as to obtain local knowledge comparable to the other Mediterranean countries, on the other hand it is worth highlighting that during the last years even countries usually considered poor in scientists and amateurs are now entering a network of Mediterranean malacological studies. If this continues, it may result in valuable outcomes not only for the malacology of the entire Mediterranean but also for Mediterranean marine biology as a whole.

3.3 First record of the sea slug *Thecacera pennigera* (Montagu, 1815), (Nudibranchia, Polyceridae) in the Adriatic Sea

S. Petović and L. Lipej

During a biological monitoring program focused on fouling communities, performed in Porto Montenegro (Tivat, Boka kotorska, Montenegro) (42.43171° N, 18.69116° E) marina by SCUBA diving, a specimen of a nudibranch *Thecacera pennigera* (Montagu, 1815) was recorded on 17th April 2017. The nudibranch was easily determined due to its transparent white body with characteristic orange and black scattered spots and a length

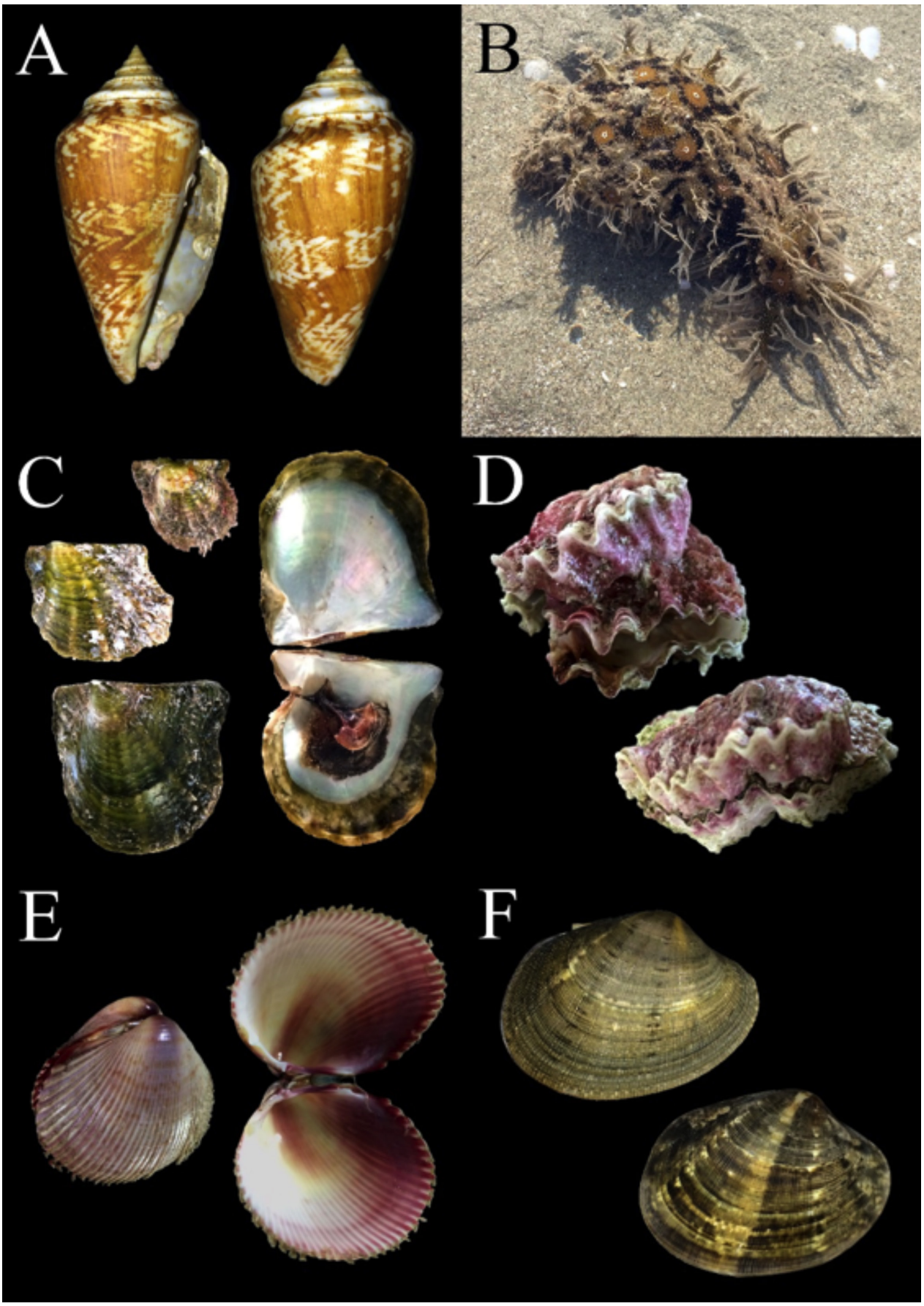

Fig. 11: Alien molluscan species from Albania reported in this paper; specimens not to scale. A. *Conomurex persicus*. B. *Bursatella leachii*. C. *Pinctada imbricata radiata*. D. *Dendostrea* cf. *folium*. E. *Fulvia fragilis*. F. *Ruditapes philippinarum*.

of approximately 50 mm. The observed specimen (Fig. 12) was found in the fouling assemblage from the berth at 6 m of depth. It was found associated with the belt of colonial hydrozoan polyps on the pier covered by a high density of the sedentary polychaeta *Sabella spalanzani*. According to many authors however, this species is generally related with the bryozoans of the genus *Bugula* (Trainito & Doneddu, 2014), which were also recorded in the studied area.

Thecacera pennigera is a cosmopolitan species, described from the south coast of England and then recorded in the North Atlantic Ocean, South and West Africa, off the coast of Brazil, Japan, Korea, Pakistan, and more recently in Australia and New Zealand (Rudman, 1997). In the Mediterranean Sea it is considered an occasional sea slug recorded until now from the coast of Israel (Barchana, 2008) and the waters surrounding Italy, the Tyrrhenian Sea (Cattaneo-Vietti & Chemello, 1987) and the Mar Piccolo, Taranto-Ionian Sea (Kapiris *et al*., 2014). The species was not reported in the latest survey of opisthobranch mollusks in the Adriatic Sea (Zenetos *et al*., 2016b). Thus, our finding could be considered as the first record for the area.

It is well-known that marinas are considered as species gateways. Previously, some other new records were reported in the very same area such as the finding of the alien sponge *Paraleucilla magna* Klautau, Monteiro & Borojevic, 2004. It should be pointed out that the pier where the nudibranch was found was constructed only in 2015. Since the Porto Montenegro marina is considered a location with very intense maritime traffic, it could be assumed that *T. pennigera* arrived with ballast waters. Further study of the marine biodiversity in the area will show whether the finding of the sea slug *T. pennigera* is an ephemeral case or whether this species was, to date, overlooked in the area and the Adriatic in general.

Fig. 12: Specimen of *Thecacera pennigera* from Tivat, Montenegro.

4. EASTERN MEDITERRANEAN

4.1 First record of the invasive sponge *Paraleucilla magna* (Porifera, Calcarea) in Greek waters

F. Azevedo, S. Galinou-Mitsoudi and V. Gerovasileiou

The geographical origin of the calcareous sponge *Paraleucilla magna* Klautau, Monteiro & Borojevic, 2004 remains unknown while the species keeps spreading through the Atlantic and the Mediterranean Sea. This species was first found in the 90's in Brazil (Rio de Janeiro), where its population grew very fast mainly in ports and mussel farms, and soon after it was reported from the Mediterranean Sea. It was first recorded in Mar Piccolo and Mar Grande of Taranto (Ionian Sea, Italy) in 2001, although, mussel farmers mentioned that this species had been present in the area for 20-30 years (Longo *et al*., 2007). To date, *P. magna* has been reported from different locations in the Ionian and Adriatic seas (Italy, Croatia and Montenegro), the Tyrrhenian Sea (Italy), the Mediterranean Spanish coast, Malta, and the Sea of Marmara (Turkey) (see Dailianis *et al*., 2016; Mačić & Petović, 2017).

This work reports on the first record of *Paraleucilla magna* in the Aegean Greek waters, and the second in the eastern Mediterranean Sea, after its recent finding in the Sea of Marmara (Topaloğlu *et al*., 2016). The examined specimen (UFRJPOR 8343) was collected from a sock of a mussel farm in the NW of the Gulf of Thessaloniki (Chalastra), North Aegean Sea (40.566° N, 22.782° E), at a depth of 2-7 m. It had the typical morphology of *P. magna*: white to light cream colour *in vivo*, foliaceous body shape with prominent oscula (Fig. 13A) and the characteristic skeleton of the species (Fig. 13A-B, Table 3).

The sponge was first observed on the socks of the mussel farm in the area in August 2014 and afterwards its abundance and coverage on the mussel socks increased, reaching a relevant occurrence of >75% (examination of 8 socks per month) and an average height of 22 cm, until December 2014, when the mussel farmers thinned the socks. Mussel farmers noticed the re-appearance of the sponge in August 2015, which was followed by an increase in abundance until December 2015, when the examined specimen was collected.

P. magna demonstrates a very high reproductive effort among Porifera and while in Brazil larvae are continuously released year-round, in the Mediterranean they are released mainly in summer but in higher numbers (Lanna *et al*., 2015). This high fecundity might be related with a strong invasive potential probably stimulated by high temperatures (Lanna *et al*., 2015), which can explain the spreading success of this species in the Mediterranean Sea.

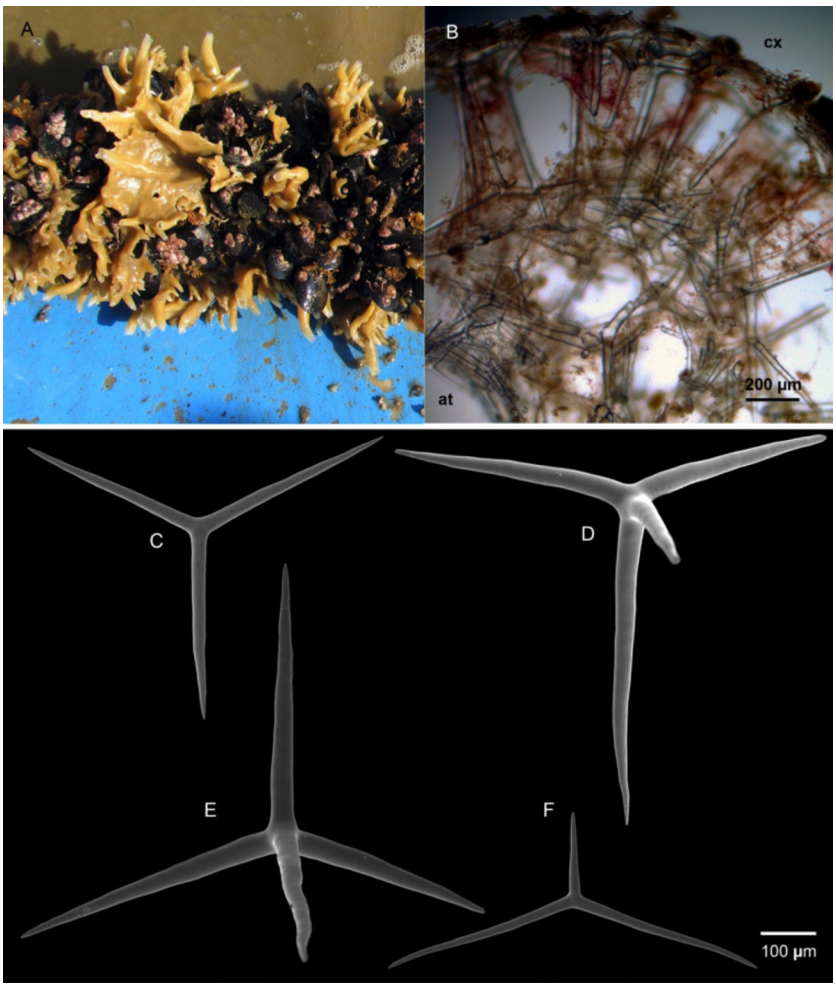

Fig. 13: A, Specimens of *Paraleucilla magna* collected from mussel farms in Thermaikos Gulf. B, Cross-section of the skeleton (cx: cortex, at: atrium). Micrographies of the spicules: C, cortical triactine; D, cortical tetractine; E, subatrial tetractine; F, atrial triactine.

Table 3. Spicule measurements of *Paraleucilla magna* (UFRJPOR 8343).

Spicule	Actine	Length (µm)				Width (µm)				n
		min	mean	sd	max	min	mean	sd	max	
Cortical triactines	Paired	226.8	272.7	39.0	356.4	10.8	14.3	4.4	21.6	20
	Unpaired	172.8	248.4	47.8	334.8	10.8	14.6	4.3	21.6	20
Cortical tetractines	Paired	324.0	517.9	80.4	648.0	32.4	42.1	3.8	48.6	20
	Unpaired	324.0	461.2	67.0	626.4	32.4	42.4	2.6	43.2	20
	Apical	278.2	481.0	133.1	802.5	32.9	32.9	5.8	42.8	20
Subatrial triactines	Paired	270.0	330.3	44.8	410.4	16.2	24.3	4.9	32.4	13
	Unpaired	324.0	401.3	44.7	486.0	16.2	24.1	4.2	32.4	13
Subatrial tetractines	Paired	183.6	342.4	101.1	637.2	16.2	27.8	7.9	43.2	20
	Unpaired	162.0	297.5	162.0	475.2	16.2	28.9	8.1	43.2	20
	Apical	86.4	108.0	16.5	129.6	21.6	21.6	0	21.6	7
Atrial triactines	Paired	237.6	374.8	79.0	507.6	16.2	21.3	3.7	32.4	20
	Unpaired	86.4	179.8	60.0	291.6	16.2	20.8	3.2	27.0	20

4.2 Occupancy estimation of five established alien and cryptogenic species along the Cretan coastline

K.G. Vougioukalou and S. Katsanevakis

Simple presence records of alien species, although being useful as indicators of species distribution ranges, do not provide quantitative information on the status of their populations. Population density and abundance are the most informative state variables but they are data-demanding and related surveys are relatively high-cost and require significant field effort. Species occupancy, defined as the probability of presence in a sampling unit, is a low-cost alternative that has been proposed as an appropriate state variable to study alien invasions (Katsanevakis *et al*., 2011; Issaris *et al*., 2012). In this study, the occupancy of eleven alien species in the upper infralittoral zone (0-5 m) of rocky bottoms along the coastline of Kriti was investigated based on a snorkelling visual survey, conducted in the summer of 2016. Five of them were detected (*Fistularia commersonii*, *Ganonema farinosum* [cryptogenic], *Percnon gibbesi*, *Siganus luridus*, and *Siganus rivulatus*) in at least one site, while the other six (*Aplysia dactylomela* [cryptogenic], *Bursatella leachii*, *Pempheris rhomboidea*, *Sargocentron rubrum*, *Stephanolepis diaspros*, *Synaptula reciprocans*) were not detected at all, although they have been reported before in Kriti, which is indicative of their low occupancy. The field protocol and method proposed by Issaris *et al*. (2012), which properly takes into account imperfect detectability, was adapted and applied. Specifically, 19 sites were surveyed (Fig. 14; Table 4); at each site, two 30-min snorkelling surveys were conducted by the same observer, recording the presence or absence of the target species. Photographic material and video footage were taken to document the records. The resulting presence/absence data for each site and each survey were used to estimate the occupancy and detectability of each species. A maximum likelihood framework, according to the single-season model of MacKenzie *et al*. (2006), was applied. The PRESENCE v10.7 (Hines 2006) software package was used for all estimations (except for *F. commersonii*, due to insufficient data; in this case the naïve estimate of occupancy is given, i.e. the number of sites with detection divided by the total number of sites). *F. commersonii* had the lowest occupancy as it was recorded in only one site, while the highest occupancy was observed for *S. luridus*, followed by *S. rivulatus*, *G. farisosum* and *P. gibbesi* (Table 5). The present results confirm that the two *Siganus* spp. are very common and widespread in Kriti (with occupancies of 0.95 and 0.89 respectively, based on 30-min snorkelling surveys). These species have severe impacts on rocky habitats due to overgrazing as they transform the ecosystem from one dominated by diverse algal forests to another dominated by rocky barrens (Katsanevakis *et al*., 2014). Hence, their high occupancy is of great concern.

Table 4. Sampling sites with their geographical coordinates (in decimal degrees) and sampling dates.

Site	Latitude (N)	Longitude (E)	Sampling date
S1	35.1447°	24.5129°	21/7/2016
S2	35.1028°	24.5643°	21/7/2016
S3	35.1798°	24.2714°	28/7/2016
S4	35.2022°	24.1247°	28/7/2016
S5	35.1830°	24.2429°	29/7/2016
S6	35.1743°	24.4149°	02/8/2016
S7	35.4044°	25.0190°	05/8/2016
S8	35.0064°	25.7395°	05/8/2016
S9	35.1260°	25.7471°	06/8/2016
S10	35.4142°	24.6456°	09/8/2016
S11	35.3606°	24.4068°	09/8/2016
S12	35.3251°	23.5488°	10/8/2016
S13	35.2702°	23.5378°	10/8/2016
S14	35.4892°	23.5786°	10/8/2016
S15	35.0076°	24.7592°	12/8/2016
S16	34.9281°	24.9170°	12/8/2016
S17	34.9301°	24.9226°	12/8/2016
S18	35.3608°	24.3797°	18/8/2016
S19	35.4579°	24.1671°	18/8/2016

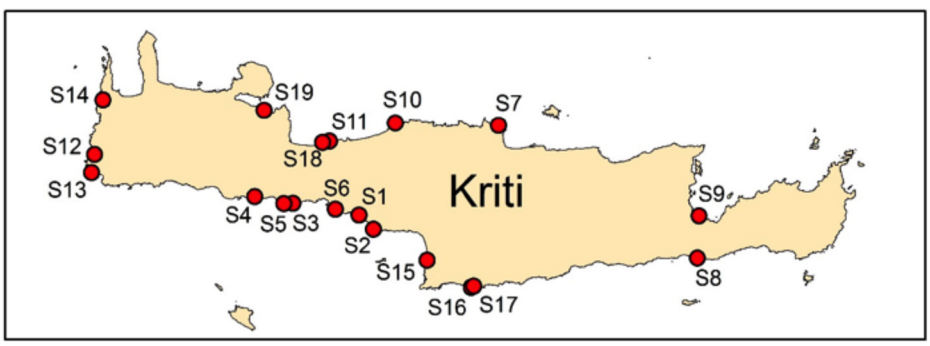

Fig. 14: Sampling sites of the occupancy survey in Kriti (see also Table 4).

4.3 Another alien mollusc in Saronikos Gulf (Greece)

P. Ovalis and A. Zenetos

Sticteulima lentiginosa (A. Adams, 1861) is an alien micromollusc established in the Mediterranean Sea (Zenetos *et al*., 2017). In fact, although its taxonomy is still unclear, absence of early Mediterranean records and confirmed presence in the Red Sea suggest an Indo-Pacific origin for this taxon (Tringali, 1994), which presumably entered the Mediterranean through Lessepsian migration. Although its first report from the Mediterranean is relatively recent (1989) (S. Turkey: Tringali, 1994), subsequent conspicuous and recent records led us to consider it as established (Bakır & Öztürk 2016; Guarnieri *et al*., 2017). In May 2015, three fresh dead *Sticteulima lentiginosa* shells were found in material caught in gill nets by a local fisherman, at a depth of 45-55 m (Fig. 15). The fishing boat operated in Saronikos Gulf (Greece), off Kavouri (37.819247° N, 23.766398° E).

This record is the first one in Greek Seas and suggests a westward unintentional expansion of the species. It is highly possible that the species is more widespread in the country, and has been unreported until now due to its small size. However, its finding in Saronikos Gulf could also be attributed to ship transfer. In fact, the wider Saronikos Gulf (Aegean Sea) has already been characterized as a hot spot for the introduction of marine alien species, mostly via shipping (Siokou *et al*., 2013).

Table 5. Records of the target species and estimated occupancy in the study area. Records that have not been previously reported in ELNAIS (Zenetos *et al*., 2015), i.e. were >20 km from the closest record in ELNAIS, are identified by an asterisk (based on the maps that were available online in ELNAIS on 21/4/2017).

Species	Sites	*Occupancy ψ* (±SE)
Fistularia commersonii	S8	0.052**
Ganonema farinosum	S1, S3, S6, S12, S13, S15, S18*, S19	0.42 ± 0.11
Percnon gibbesi	S1*, S7, S11, S13, S15, S19*	0.32 ± 0.11
Siganus luridus	S1, S2, S3, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17, S18	0.95 ± 0.05
Siganus rivulatus	S1*, S2*, S3, S5, S6*, S7*, S8, S9*, S10*, S11*, S12, S13, S14, S15*, S17, S18*, S19	0.89 ± 0.07

**naïve estimate of occupancy (number of sites with detection divided by the total number of sites)

Fig. 15: *Sticteulima lentiginosa* from Saronikos Gulf (Greece). Total height 1.2 mm. [Photo: Costas Kontadakis].

4.4 Recent sightings of *Monachus monachus* around sea-cage farms in the Turkish Aegean Sea

O. Akyol and H. Şen

In the past, the Mediterranean monk seal *Monachus monachus* (Hermann, 1779) (family Phocidae) has often been considered as the rarest world-wide pinnipeds, only surviving at some Mediterranean and eastern Atlantic localities. However, very recent sightings from Israeli and Lebanese waters indicate a potential better status for the species in the eastern Mediterranean (Scheinin *et al*., 2011; Mytilineou *et al*., 2016).

The global population of *Monachus monachus* is estimated to be 600–700 individuals, of which 300–400 live in Greece, followed by Cyprus and Turkey (Karamanlidis & Dendrinos, 2015). Güçlüsoy *et al*. (2004) reported that the number of *M. monachus* living along the Turkish coasts was approximately 104, based on sightings between 1994 and 1998. Additionally, the authors reported records of 17 pups and 22 dead seals between 1994 and 2002 (Güçlüsoy *et al*., 2004). The Monk seal – marine aquaculture interaction is a well-known phenomenon, and *M. monachus* is sometimes a major problem for fish farms due to attacks on fishes in cages. Güçlüsoy & Savaş (2003) reported 40 attacks on 11 fish farms in the Turkish Aegean Sea between 1992 and 2000, which resulted in damage to cage nets and the escape of farmed fishes. This short paper provides photographic evidence of monk seal interactions with sea-cage farms in the Turkish Aegean Sea.

From March 2016 to February 2017, several sightings (n = 7) have been reported from four different fish farms along the Turkish Aegean Sea coasts (Table 6; Fig. 16). In particular, few individuals were reported from

Table 6. Details of sea-cage farm records of the Mediterranean monk seal in the Turkish Aegean Sea.

Date	n	Location	Lat. N	Long. E	Proof	Observer	Notes
30 Mar. 2016	1	Güllük Bay	37.190°	27.368°	Visual	Farm staff	Swimming at noontime
25 Aug. 2016	1	Güllük Bay	37.276°	27.389°	Visual	Scientist	Swimming at noontime
28 Oct. 2016	1	Güllük Bay	37.190°	27.368°	Photo	Scientist	Swimming in the morning (Fig. 16a)
05 Dec. 2016	1	Güllük Bay	37.168°	27.523°	Photo	Farm staff	On the cage at noontime (Fig. 16b)
15 Dec. 2016	1	Gerence Bay	38.509°	26.371°	Visual	Farm staff	Attack to a sea-cage
12 Feb. 2017	1	Güllük Bay	37.190°	27.368°	Video	Farm staff	On the cage at noontime (Fig. 16c)
23 Feb. 2017	1	Güllük Bay	37.276°	27.389°	Visual	Scientist	Swimming at noontime

Fig. 16: Recent sightings of *Monachus monachus* at the sea-cage farms of the Turkish Aegean Sea. (a) Swimming off Kazıklı cove, Güllük Bay – 28 October 2016; (b) On the floating cage off Salih Island, Güllük Bay – 05 December 2016; (c) On the floating cage off Kazıklı cove, Güllük Bay – 12 February 2017. [Photographs: (a) H. Şen, (b) provided by a fish farm employee and (c) O. Gökmen, Aquaculture technician].

three fish farms in the Bay of Güllük (Bodrum, SE Aegean Sea), whilst a single specimen was reported from one fish farm in the Bay of Gerence (Izmir, NE Aegean Sea).

Based on our intermittent observations, we suggest that more seals may be present in both areas. Further observations are necessary to determine whether the established populations are locally present because Mediterranean monk seals are a natural heritage and should be monitored continuously.

4.5 First record of the yellow boxfish, *Ostracion cubicus* Linnaeus, 1758 (Tetraodontiformes: Ostraciidae) in the Turkish Mediterranean

M. Gökoğlu and J. Korun

Üçadalar is an important diving area for tourism in the Gulf of Antalya. An unusual fish was spotted (15 m depth) and photographed during a dive on 5 April 2017 in this area (36.457308° N, 30.548092° E). This fish was identified as a yellow boxfish, *Ostracion cubicus* Linnaeus, 1758. It belongs to the Ostraciidae that include 22 species (Matsuura, 2015; Eschmeyer *et al*., 2017). Boxfishes feed on a variety of benthic invertebrates. They graze on a variety of encrusting organisms, including sponges, tunicates, hydroids, and algae (Debelius, 1998; Matsuura, 2001). They are found around coral reefs and rocks and on open sand bottoms and seagrass beds down to about 100 m depth (Matsuura, 2001).

The yellow boxfish is native to the Indo-Pacific region as well as the south-eastern Atlantic Ocean (Bariche, 2011). It was recorded for the first time in the Mediterranean Sea on the Lebanese coast by Bariche (2011). The estimated size of the individual was about 25-30 cm in total length. It presented one single dorsal fin located on the posterior side of the body and no pelvic fins (Bariche, 2011; Yennawar & Tudu, 2010); yellowish and bluish body colour with black–edged blue spots (Fig. 17); a four-ridged and spineless carapace; blunt ridges, but the ventral more prominent than the dorsal ones.

With this new record, the number of fish species originating from the Red Sea (Lessepsian migrants) reached 60 in the Gulf of Antalya.

4.6 First records of the speleophilic fish species *Thorogobius ephippiatus* and *Grammonus ater* in Cyprus

L. Hadjioannou and J. Hartingerova

Cave-dwelling fish species are quite understudied, especially in the eastern part of the Mediterranean. During fieldwork, intended to study the ecology of coralligenous assemblages and bioconstructions of cryptic marine environments, we recorded two new fish species for Cyprus.

Fig. 17: Yellow boxfish (*Ostracion cubicus* Linnaeus 1758) photographed from Üçadalar in the Gulf of Antalya (Photo: Yakup Koç) on 5 April 2017, 15 m depth, 25-30 cm TL.

Thorogobius ephippiatus (Lowe, 1839)

This speleophilic leopard-spotted goby (Fig. 18) was photographed in a crevice at ~5 m depth, near a large underwater cave, on 24th August 2012 on the western side of Cyprus, on the island of Kakoskali (35.074462° N, 32.333162° E). With a widespread distribution, covering from the Eastern Atlantic to the Mediterranean Sea (Miller, 1986), this record of *T. ephippiatus* marks a new South-Eastern-most point of its range. There is a large gap of knowledge on this cave-dwelling species, as the scattered findings of it show. The nearest location where it has been previously reported is Kriti (Kovačić *et al*., 2011).

Grammonus ater (Risso, 1810)

A highly cryptic, inconspicuous and uncommon species, endemic to the Mediterranean (Froese & Pauly, 2017), has also recently been discovered in a cave in Kriti (Gerovasileiou *et al*., 2015). This sample (Fig. 19) was caught in a trap, intended to catch invertebrates, set in an underwater cave, situated at ~9 m depth next to Kakoskali island on the western side of Cyprus (35.074462° N, 32.333162° E), on 3rd August 2014. This finding expands the distribution range of the endemic *G. ater* further east and into the Levantine basin. The size (TL = 364 mm) and morphological characters of the specimen (dorsal finrays: 68-74; anal finrays 51-52; pectoral finrays 19-20) confirm the identification according to Nielsen (1986).

Fig. 18: *Thorogobius ephippiatus* photographed at ~5 m depth, at Kakoskali Island.

4.7 First record of the brassy chub *Kyphosus vaigiensis* (Quoy & Gaimard, 1825) from Cyprus

N. Michailidis and M. Rousou

Kyphosus vaigiensis is a widespread herbivorous species found circumtropically in the Atlantic, Pacific and Indian Oceans, the Red Sea and the Mediterranean

Fig. 19: *Grammonus ater* collected from an underwater cave of Cyprus and photographed under a stereoscope.

(Knudsen & Clements, 2016). Although not native to the Mediterranean, it has been reported from the Mediterranean waters of Spain (1998), France (2009), Libya (2010), Sicily (2013), Malta (2015) and Israel (2016) (Vella *et al*., 2016; Goren *et al*., 2016, and references cited within). Whether the introduction path to the Mediterranean Sea is the Suez Canal or the Straits of Gibraltar is still unclear (Mannino *et al*., 2015), but given that the species' juveniles are usually pelagic and are found associated with floating objects (Knudsen & Clements, 2016), its introduction should possibly be attributed to natural range expansion rather than dispersal due to human activities (Zenetos *et al*., 2012).

On 5 December 2016, a *K. vaigiensis* specimen was caught off Limassol, Cyprus (34.68° N, 33.10° E), on bottom-set trammel nets at a depth of 33 m. The specimen was photographed and morphologically examined; meristic characters were recorded, while biometric measurements were taken using electronic callipers (nearest mm) and weight balances (nearest g).

The morphological characteristics of the specimen correspond to the description of *K. vaigiensis* provided in the literature, including records in the Mediterranean. The body shape is elongated and oval; the colour is silver

Fig. 20: *Kyphosus vaigiensis* caught off Limassol, Cyprus on 5/12/2016.

with several parallel bronze/brown longitudinal stripes from the operculum up to the caudal fin, while stripes are also present from the nasal and mouth to the operculum, and around the eyes (Fig. 20). The total wet weight of the fish is 403 g. Meristic counts are the following: single dorsal fin with eleven spines and fourteen rays (D, XI+14); anal fin with three spines and thirteen rays (A, III+13); pectoral fin with sixteen rays (P, 16) and ventral fin with one spine and five rays (V, I+5); 60 lateral line scales (LL, 60); eight rakers on the upper and twenty-one on the lower limb of the first gill arch (GR, 8+21). Morphometric measurements are given in Table 7.

This is the seventh record of *K. vaigiensis* from the Mediterranean after the first just 20 years ago, and only the second record from the Levant, with the first also being in 2016. Whether these records indicate a recent establishment of this tropical species in the Mediterranean, possibly facilitated by warmer environmental conditions (Vella *et al.*, 2016), remains to be seen.

4.8 Presence of the Lessepsian migrant *Macrophthalmus (Macrophthalmus) indicus* Davie, 2012 (Crustacea: Brachyura: Macrophthalmidae) in Cyprus (East Mediterranean Sea)

M. Rousou and C.C. Chintiroglou

The genus *Macrophthalmus* Desmarest, 1823 is mainly found in soft bottom habitats of tropical and subtropical regions and it includes around 55 species, among which *Macrophthalmus (Macrophthalmus) graeffei* A. Milne Edwards, 1873, an Indo-Pacific species considered to have spread through the Suez Canal into the Eastern Mediterranean Sea (Davie, 2012; and references therein).

Table 7. Morphometric measurements of *Kyphosus vaigiensis* from Limassol, Cyprus.

measurement	mm	%
total length (TL)	272	–
fork length	254	93.4 TL
standard length (SL)	233	85.7 TL
preanal length	133	57.1 SL
predorsal length	75	32.2 SL
prepelvic length	73	31.3 SL
prepectoral length	56	24 SL
max. body depth	104	44.6 SL
caudal peduncle depth	26	11.2 SL
head length (HL)	56	24 SL
preorbital length	15	26.8 HL
eye diameter	14	25 HL
interorbital width	25	44.6 HL

The review of Australian *Macrophthalmus* species undertaken by Davie (2012) revealed that the Lessepsian migrant *M. graeffei* described in the Mediterranean Sea was in fact a new species, *Macrophthalmus indicus* Davie, 2012, of Indian Ocean and Red Sea origin, with the true *M. graeffei* being restricted to the western Pacific. The *Macrophthalmus* specimens collected in the Mediterranean and previously assigned to *M. graeffei* (e.g. Pancucci-Papadopoulou *et al.*, 2010; Galil *et al*., 2015) are now listed as the alien *M. indicus* (Corsini-Foka *et al.*, 2015; Katsanevakis *et al.*, 2015).

A total of ten *M. indicus* specimens were collected by MER Lab using a Van-Veen grab (surface of 0.1 m^2), between the years 2011 and 2013 from six stations (muddy sand substrates, 4.2-10.3% organic matter) in Vasiliko Bay (Cyprus) (Table 8). Six individuals were found in port stations (depths 6-10 m) and four in fish farm stations (depths 31-49 m). One specimen was male and nine specimens were females, two being ovigerous (Table 8, Fig. 21). The carapace of females ranged from 7 to 14 mm in length and from 11 to 23 mm in width (Table 8).

Given the repeated findings over a 3-year period and the presence of ovigerous females, *M. indicus* can be considered to be firmly established and reproducing in Cypriot waters. A larger review of ecological information from previous collections may help us better understand the environmental preferences and constraints of this species, and perhaps allow us to model what areas may be vulnerable for invasion in the future. There is also still very little information available on what impact the establishment of this species is having on the indigenous Mediterranean fauna. Both would be rewarding avenues for future investigation.

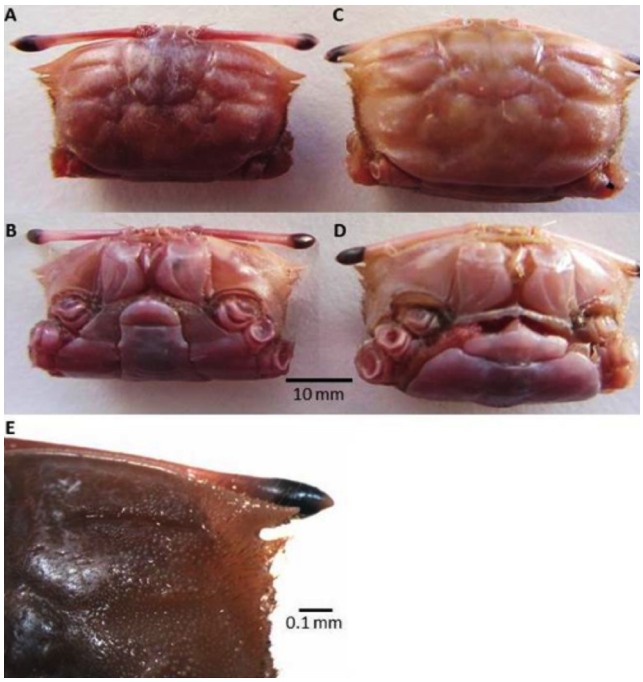

Fig. 21: *Macrophthalmus indicus* from Cyprus (♂ (12.0 mm x 20.0 mm), A: dorsal view, B: ventral view; ♀ (14.0 mm x 22.0 mm), C: dorsal view, D: ventral view; ♀ (14.0 mm x 23.0 mm), E: detail showing the style at the end of the cornea, superior orbital margin, lateral teeth.

Table 8. Characteristics of *Macrophthalmus indicus* sampling stations in Cyprus and specimen measurements. (MS: Muddy sand, CL: Carapace length (mm), CW: Carapace width (mm), B: Broken)

Station	Coordinates	Depth (m)	Sediment Type	Organic Matter (%)	Specimen number	Sampling date D/M/Y	Sex	CL (mm)	CW (mm)
TV 0m	34.69165° N, 33.319583° E	49	MS	7.23	2	18/06/2011	♀	10	16
							♀ Ovigerous	10	16
SW 50m	34.702016° N, 33.281616° E	41	MS	4.79	1	15/07/2011	♀	B	B
EMAT 50m	34.69843° N, 33.23206° E	31	MS	7.28	1	08/08/2011	♀	7	11
VAS.27	34.722716° N, 33.303816° E	6	MS	7.7	1	05/07/2013	♀	12	22
VAS.37	34.7161° N, 33.31995° E	10	MS	4.2	1	07/07/2013	♀	9	B
VAS.43	34.71823° N 33.317483° E	10	MS	10.31	4	07/07/2013	♂	12	20
							♀	14	23
							♀	B	B
							♀ Ovigerous	14	22

4.9 On three alien species from Cyprus (eastern Mediterranean Sea)

I. Savva and P. Kleitou

The Mediterranean Sea is currently one of the areas most impacted by biological pollution as a consequence of the synergistic interactions between multiple stressors. In this context, documentation of species distribution patterns has become an increasingly important step in ecological research, critical to identify shifts in species composition of the ecosystem. Cyprus lies at the easternmost tip of the Mediterranean, along the natural pathways of many of the Indo-Pacific taxa spreading from the Red Sea - according to the prevailing Mediterranean currents and, therefore, is particularly prone to alien invasion.

Carupa tenuipes (Dana, 1852) is widely distributed in the Indo-Pacific and was first found in the Mediterranean Sea in Turkey in 1996, and subsequently recorded from Israel in 2002 and from Greece in 2009 (Pancucci-Papadopoulou *et al.*, 2009 and references therein).

We here report on the sighting of a single specimen of *C. tenuipes* (Dana, 1852) from Cyprus on the 16th of November 2016 (Fig. 22A), found dead in a *Posidonia oceanica* (Linnaeus) Delile matte at 8 m depth during a scientific survey in the vicinity of Larnaca Bay (34.96534° N, 33.68134° E). The exoskeleton of the crab was in very good condition, indicating a recent death. The specimen is deposited in alcohol in the Marine and Environmental Research Lab Ltd. reference collection.

Diadema setosum (Leske, 1778) was reported from Cyprus based on a photograph taken in July 2016 at Cyclops Bay (southeast Cyprus) (Mytilineou *et al.*, 2016). Here, we report on additional records of *D. setosum* in Cyprus. Two specimens were found at Decosta Bay (Protaras, Famagusta) (35.00753°N, 34.06204°E) in 2012, based on photographs and a video (https://www.youtube.com/watch?v=fnxUv0NOCcU) and this constitutes the first evidence of *D. setosum* presence in Cyprus. In particular, one specimen was found lying on a sandy bottom at 1 m depth, and one was hidden in a small cave just near the shoreline. In addition, another specimen was found on the 30th of June 2016 exposed on a conglomerate substrate at 10 m depth, during a visual-census survey at a nearby location, Cyclops Bay (Protaras, Famagusta) (34.98571° N, 34.07942° E) (Fig. 22B). According to our knowledge, this also constitutes the first Mediterranean finding of a *D. setosum* with banded black and white long spines, which also exclude the possibility that our specimen is the same as that reported later by Mytilineou *et al*. (2016) from the same location.

Symplegma brakenhielmi (Michaelsen, 1904) is a colonial ascidian species with a worldwide distribution in warm seas. In the Mediterranean Sea, it was first reported from Lebanon in 2001, and subsequently found in Turkey and Israel in 2006 and 2009, respectively (Shenkar & Loya, 2009 and references therein). Despite the fact that *S. brakenhielmi* remains so far restricted to the Levantine Basin, it is currently considered established and common, particularly in some shallow areas (<5 m) and on artificial substrates off the Israeli coasts (Shenkar & Loya, 2009). Hitherto, the presence of *S. brakenhielmi* in Cyprus was only based on unpublished information, while in November 2016, it was further reported in two locations off northeastern and eastern Cyprus (the Karpas Peninsula and Famagusta, respectively) during a Short Scientific Mission of the COST Action Alien Challenge (Title: Alien Ascidian Taxonomy and Identification Training) (Ulman, 2016). Hereby, we present an additional record of a reddish-coloured colonial *S. brakenhielmi*, which was found South-East of Cyprus on the 12th of November 2016 (Fig. 22C), during an underwater visual-census survey. The colony was about 8 cm in di-

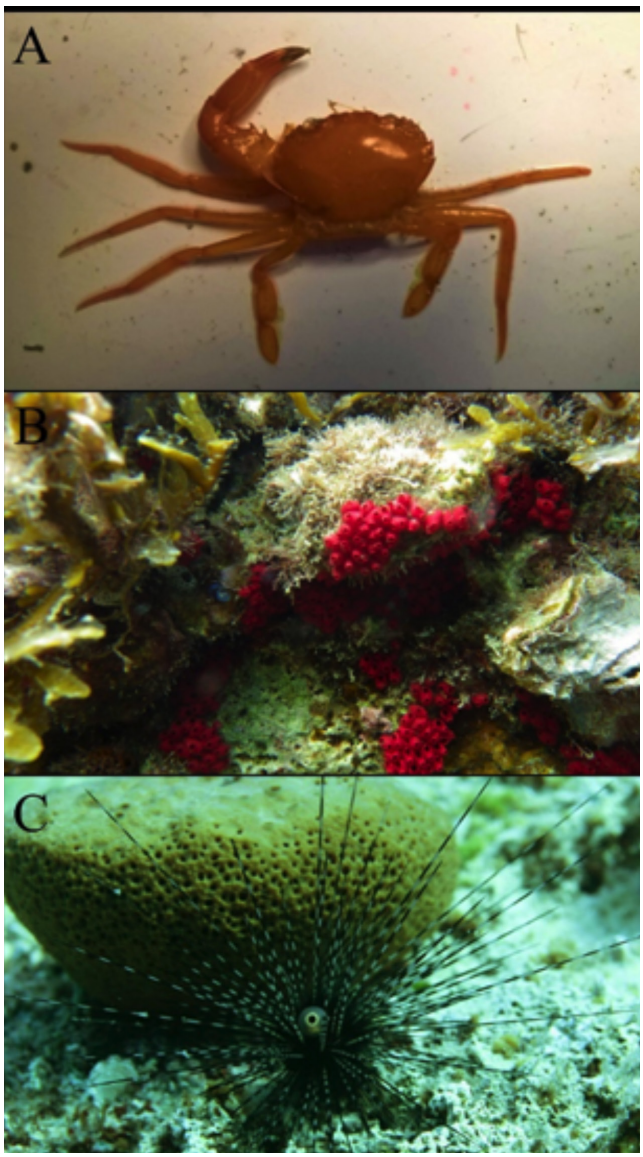

Fig. 22: A–C. New alien species reported from Cyprus. A. The crab *Carupa tenuipes* (Dana, 1852). B. The ascidian *Symplegma brakenhielmi* (Michaelsen, 1904). C. The sea urchin *Diadema setosum* (Leske, 1778).

ameter and was found on an artificial substrate (wave-breaker) in Larnaca Bay (34.96768° N, 33.67238° E).

All the records listed above add an additional piece of knowledge to alien invasions in Cypriot marine waters. In particular, the record of the crab *C. tenuipes* constitutes the first from the area, and fills some gaps in the known Mediterranean spreading of the species. On the contrary, multiple records of *D. setosum* backdate the first sightings date of this species in Cyprus to 2012 and suggest local establishment. Additionally, the presence of the ascidian *S. brakenhielmi* from three different districts of Cyprus may indicate local establishment, as is the case for the shallows off the Israeli coasts. Although some of the present records are the result of field work, limited benthic programs are locally carried out with the aim to effectively evaluate alien species spreading and its impacts. This will indeed constitute an interesting future local research topic, primarily in the light of Cyprus's geographic position and elongated coastline, which may offer the opportunity to test a possible alien colonization gradient from east to west, with the eastern shores colonized by several alien species (being nearer to the easternmost Levantine shores) and the western shores showing rarefaction, and from north to south, with the southern shores being more impacted (as they are closer to the Suez entrance) and the northern shores showing rarefaction.

4.10 Four marine fishes of different origins in Lebanon

F. Crocetta and M. Bariche

Lebanese and Syrian coasts (ca. 420 km) suffer from a general lack of updated faunal studies, despite the heavy colonization by species of Indo-Pacific and Atlantic origin. We hereby report unpublished data on four fishes from the coastal waters of Lebanon.

The African hind *Cephalopholis taeniops* (Valenciennes, 1828) is a serranid species native to the eastern tropical Atlantic Ocean, from Morocco to Angola, including Cape Verde, Principe, Sao Tome and the Canary Islands, where it lives on sandy or rocky bottoms up to 200 m depth. Since the beginning of the century, this fish started colonizing the Mediterranean Sea, with multiple records since 2002 from the central parts of the basin (Italy, Malta, and Libya), followed by two records in the eastern areas, from Haifa Bay in 2009 and from Çandarlı Gulf in 2015, respectively (review in Engin *et al.*, 2016). We hereby report on the presence of this species in Lebanon, from off the city of Tripoli (34.450494° N, 35.714642° E), where a single specimen (20.1 cm total length, 16.1 cm standard length. Meristic formula: D: IX+15; A: III+8; P: 18) was caught by trammel net at 32 m depth on rocky bottom in June 2016 (Fig. 23A). The specimen was preserved and deposited in the marine collection of the American University of Beirut (catalogue number AUBMOS3914).

The Indo-Pacific slender ponyfish *Equulites popei* (Whitley, 1932) is a leiognathid species native to a wide Indo-Pacific area, from the Red Sea and the east coast of Africa to Japan (Suzuki & Kimura, 2017). It has also been found in the Mediterranean Sea since 2011, with records from few countries so far (review in Yokeş, 2015; Zenetos *et al.*, 2017 as *Equulites elongatus*). *Equulites popei* can be easily distinguished from the similar Red Sea fish by its elongated and slender body and its length which is more than 3.3 times the standard length (SL) (see discussions in Suzuki & Kimura, 2017). We hereby report on the presence of this species in Lebanon, off Tripoli (34.629234° N, 35.975446° E), where a single specimen (9.85 cm total length, 8.16 cm standard length. Meristic formula: D: VIII+16; A: III+14; P: 16) was caught by a beach seine at 3-5 m of depth in March 2016 (Fig. 23B). The specimen was preserved and deposited in the marine collection of the American University of Beirut (catalogue number AUBM OS3920).

The West African goatfish *Pseudupeneus prayensis* (Cuvier, 1829) is a native western Atlantic mullid species, recently recorded from the Strait of Gibraltar and the western Mediterranean Sea (Spain and Tunisia). It is easily distinguishable from its co-familial species occurring in the Mediterranean by the presence of a spine on the opercular margin and teeth visible when the mouth is closed (review in Azzouz *et al.*, 2011). We hereby report on the presence of this species in Lebanon, off Ramkine islet (34.537908° N, 35.676938° E), where 5 specimens were caught with a trammel net at 62-65 m depth on a sandy bottom with large rocks in December 2016 (PP01-04) and April 2017 (PP05) (Fig. 23C). Meristic data obtained from these specimens are reported in Table 9. The specimens were preserved and deposited in the marine collection of the American University of Beirut (catalogue number AUBM OS3925).

The blunthead puffer *Sphoeroides pachygaster* (Müller & Troschel, 1848) is a pufferfish that occurs both in the Atlantic and the Indo-Pacific Oceans. Recently, it was also recorded in the Mediterranean Sea, a basin that was almost entirely colonized by this taxon in few decades (review in Lipej *et al.*, 2013). We hereby also report on the presence of this species in Lebanon, where 3 specimens (41.7-34.4 cm total length, 32.5-28.2 cm standard length. Meristic formula: D: XI; A: VIII-IX; P: 14) were caught with a long line on a soft bottom off Abdeh (34.563135° N, 35.933762° E), in April 2017 (Fig. 23D). The specimens were preserved and deposited in the marine collection of the American University of Beirut (catalogue numbers AUBM OS3927-29).

The four species recorded here all constitute the first sightings in Lebanon. However, if on the one hand the

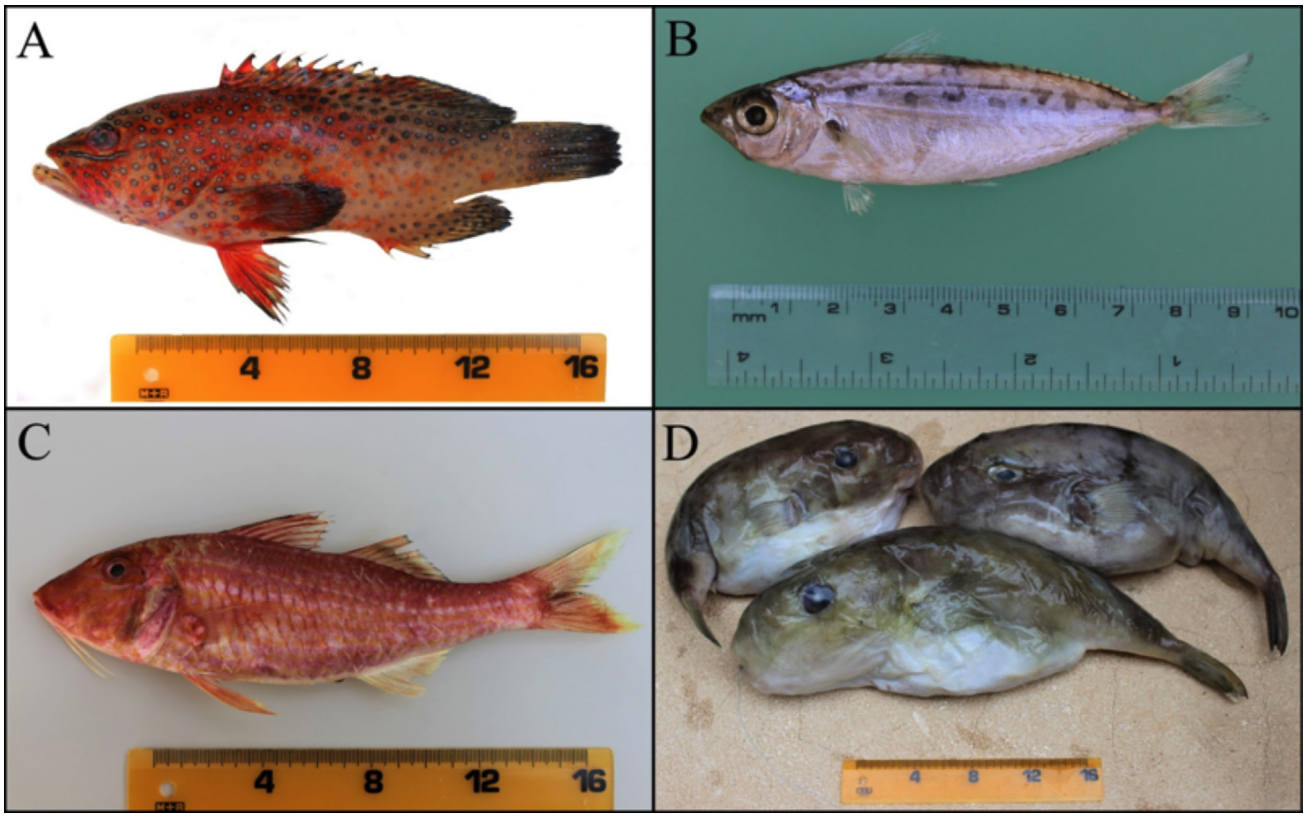

Fig. 23: The four fish species here newly reported from Lebanon. A. *Cephalopholis taeniops*. B. *Equulites popei*. C. *Pseudupeneus prayensis* (specimen PP05). D. *Sphoeroides pachygaster*.

Table 9. Morphometric measurements (in cm) and meristic formula of *Pseudupeneus prayensis* specimens (PP01-PP05) caught in Lebanon. Abbreviations used: TL: total length; SL: standard length; D: dorsal fins; A: anal fins; LL: lateral line scales.

	PP01	PP02	PP03	PP04	PP05
TL	23.21	18.72	17.84	17.25	22.56
SL	18.6	15.1	14.78	14.15	18.34
D	VIII, I+8	VIII, I+8	VIII, I+8	VIII, I+8	VIII, I+8
A	I+6	I+6	I+6	I+6	I+6
LL	31	31	31	31	31

presence of three species (*C. taeniops*, *E. popei*, and *S. pachygaster*) out of four was indeed expected in Lebanese coastal waters due to multiple occurrences in the neighbouring countries and the Mediterranean basin as a whole, on the other hand the current records of *P. prayensis* constitute the first from the eastern Mediterranean. Taking into account previous records from Spain and Tunisia, we suspect that the species has already almost entirely colonized several Mediterranean countries, but went unrecorded so far due to resemblance with other native and alien mullids already present in the basin.

4.11 A new Lessepsian migrant fish *Synchiropus sechellensis* Regan 1908 (Teleostei: Callionymidae) in Egyptian Mediterranean waters

E.H.Kh. Akel and S.I. Rizkalla

The dragonets of the family Callionymidae are a group of benthic marine fishes found in warm and temperate seas. This family comprises 195 species of which three have entered the Mediterranean: *Callionymus filamentosus* Valenciennes, 1837, *Synchiropus sechellensis* Regan, 1908, originating from the Indo-West Pacific

Ocean and Red Sea, and *Diplogrammus randalli* Fricke, 1983, known from the Red Sea (Seyhan *et al.*, 2017). *Synchiropus sechellensis* was first recorded in the Mediterranean Sea by Gökoğlu *et al*. (2014) from Antalya Gulf, Turkey and for the second, and third time in Aegean Hellenic waters (Kondylatos *et al*., 2016). The fourth time of occurrence was recorded in Cyprus (Michailidis & Chartosia, 2016). It must be noted that all the previous studies were carried out on a single male specimen each time. Overall, 442 specimens of *S. sechellensis* were obtained by a commercial bottom trawler operating off Alexandria (Egypt) on 8/3/2017 at 50 m depth (31.160066° N, 29. 52232° E).

The description, morphometric measurements and meristic counts agree with Fricke (1983) and previous studies in the Mediterranean (Table 10). The body is elongated. In males, the first spine of the first dorsal fin is long, followed by three little and shorter spines. Between the spines there is a yellow membrane with small black blotches at the fin base increasing in size upward to the distal part of the fin (Fig. 24A). In females, the first dorsal fin is shorter than that of the male and the membrane between the spines is orange with few black blotches (Fig. 24B). Second dorsal fin orange red in both sexes. Anal fin base red, distal part black. Caudal fin characterized by two wide, vertical, dark grey stripes. Snout short, eye large. Figure 24C shows the ventral view.

It is the first time that females of *S. sechellensis* have been collected from Egyptian waters and the Mediterranean as a whole, suggesting that this species has established a large population in the area. The new finding in Egypt, with such a large number of individuals (442), agrees with the view of Michailidis & Chartosia (2016) that the introduction of this species was not accidental but via the Suez Canal. There is no doubt that the fish species diversity in the Eastern Mediterranean, and likewise in Egypt, is undergoing evident changes. The extent to which invasive species may affect the ecological balance remains to be detected. Thus, continuous monitoring and studies are needed.

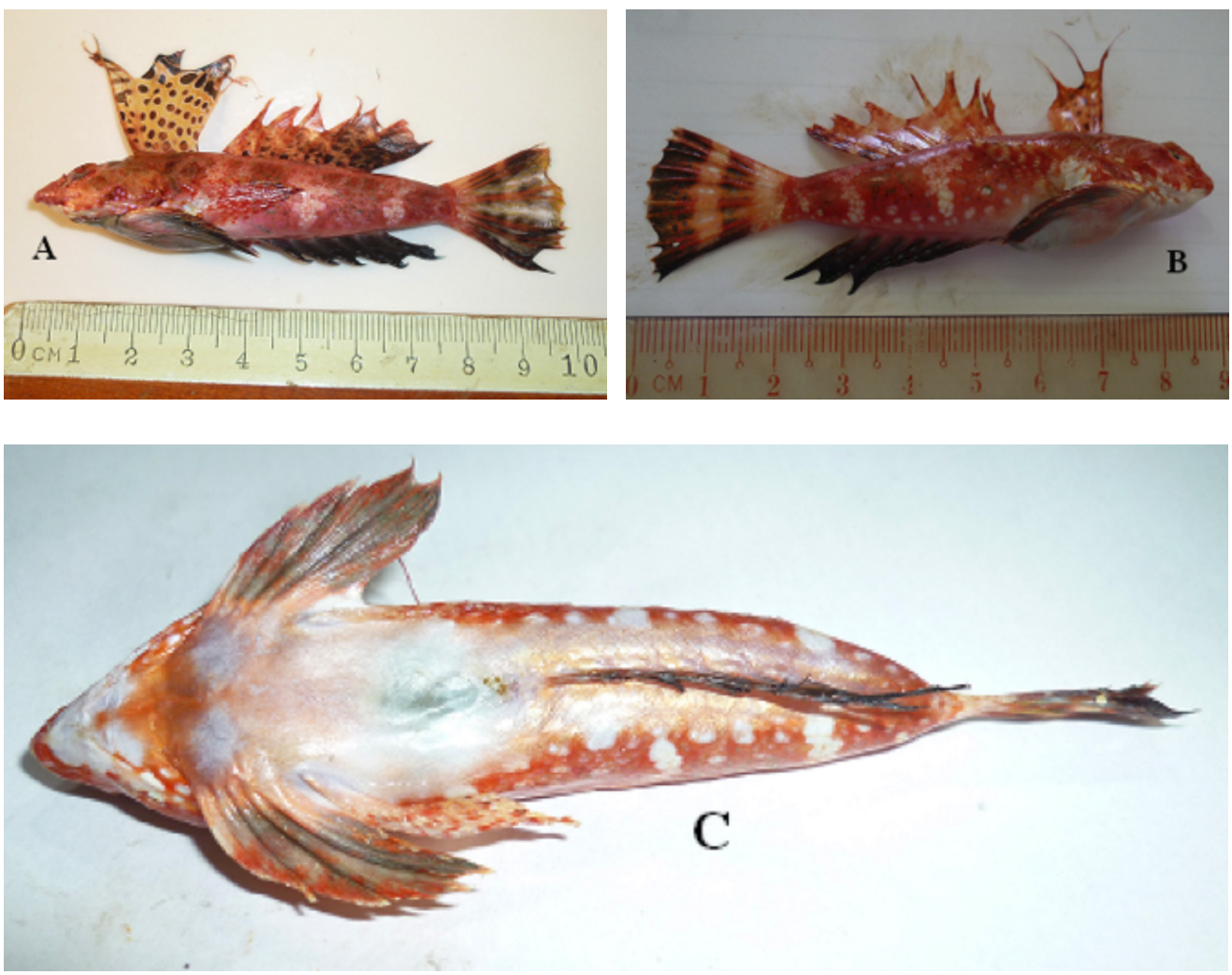

Fig. 24: *Synchiropus sechellensis* from Egypt: A, male with conspicuous first dorsal fin; B, female with smaller first dorsal fin and fewer black blotches; C, ventral view.

Table 10. morphometric and Meristic characters of *Synchiropus sechellensis* collected, (on 8/3/2017, off Alexandria, Egypt), compared with values recorded in Turkey, Greece and Cyprus (TL: Total length, HL: Head length).

Morphometric and meristic characters	**Present study**		**Gökoğlu *et al*., (2014), Turkey**	**Kondylatos *et al.*, (2016), Greece**	**Michailidis & Chartosia (2016), Cyprus**
	Male (No. = 15)	**Female** (No.=10)			
Morphometric characters	**Average**	**Average**	**One male**	**One male**	**One male**
Wet weight (g)	12.00	8.00	10.60	20.50	29.2
Total length (cm)	9.80	9.00	10.70	12.62	13.12
Standard length (% TL)	76.50	75.60	76.60	74.30	77.97
Pre dorsal fin length (% TL.)	20.40	20.00	22.40	19.00	85.94
Pre second dorsal fin length (% TL.)	32.60	33.30	-	-	-
Pre pectoral length (% TL.)	28.60	27.80	-	-	24.31
Pectoral length (% TL.)	19.40	20.00	-	23.10	-
Pre ventral fin length (% TL.)	19.40	21.10	-	-	15.78
Height of 1st dorsal spine (% TL)	38.80	24.40	-	-	-
Height of 2nd dorsal spine (% TL)	31.6	22.27	-	-	-
Height of 3rd dorsal spine (% TL)	29.60	15.50	-	-	-
Ventral fin length (% TL)	23.50	23.30	-	24.30	-
Pre anal fin length (% TL.)	39.80	41.10	-	-	38.95
Body depth (% TL)	13.30	14.40	16.47	14.90	16.08
Caudal peduncle length (% TL)	22.47	20.00	26.47	25.00	-
Caudal peduncle depth (% TL)	6.10	6.70	7.60	7.60	7.01
Anal fin length (% TL)	21.40	21.10	-	-	-
Head length (% TL)	21.40	20.00	26.40	23.40	22.10
Pre Orbital length (% H.L.)	33.30	27.87	-	32.90	31.38
Eye diameter (% H.L.)	19.07	16.70	-	25.70	13.10
Inter Orbital length (% H.L.)	23.87	22.20	-	-	24.48
Pre opercular length (% H.L.)	23.80	22.20	-	19.30	-
Meristic counts					
First dorsal fin spines	IV	IV	IV	IV	IV
Second dorsal fin rays	9	9	8	8	8
Pectoral fin rays	16	16	18 – 19	19	19
Pelvic fin rays	I, 5	I, 5	I, 5	I, 5	I,5
Anal fin rays	7	7	7	VI, I	VI +I
Caudal fin rays	10	10	I,7, II	I, 7, II	I, 7, II

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