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Abstract

This article includes 23 new records of alien and cryptogenic species in the Mediterranean Sea, belonging to 4 Phyla (Chordata, Echinodermata, Arthropoda and Mollusca), distributed from the Alboran to the Levantine Sea. Records are reported from eight countries listed from West to East as follows: **Algeria**: new records of the Atlantic blue crab *Callinectes sapidus*; **Spain**: further spread and establishment of the sea slug *Lamprohaminoea ovalis* in continental shores; **Tunisia**: first record of the Atlantic Blue Crab *Callinectes sapidus* in the Gulf of Gabes; **Italy**: a new occurrence of the pufferfish *Lagocephalus sceleratus* in Northern Ionian waters; first record of *Cephalopholis taeniops* in the Ionian Sea; first record of the redlip blenny, *Ophioblennius atlanticus* in the Ionian Sea; **Slovenia**: first record of the isopod *Paranthura japonica* in Slovenia; **Greece**: first record of the molluscs *Eunaticina papilla, Plocamopherus ocellatus* and the fish *Cheilodipterus novemstriatus*; first record of the ascidian *Ecteinascidia turbinata* in Kriti; the long-spined sea urchin *Diadema setosum* in the Ionian Sea; **Turkey**: first record of the sea spider *Ammothea hilgendorfi*; the stomatopod *Cloridina* cf. *ichneumon*; the fishes *Pempheris rhomboidea* from the Sea of Marmara and *Paranthias furcifer* from the Aegean Sea; **Lebanon**: new records of the fishes *Arothron hispidus*, *Rachycentron canadum*, *Heniochus intermedius* and *Acanthurus monroviae*; first record of *Acanthostracion polygonius*. The records of *Cloridina* cf. *ichneumon* from southern Turkey and the fish *Acanthostracion polygonius* from Lebanon, both being the first Mediterranean records, are noteworthy.

Introduction

Xenodiversity, defined as the structural and functional diversity of non-indigenous species (NIS) (Leppäkoski & Olenin, 1998), instigated by global scale movements since the colonial era, has had such effects on the planet that it is considered to be a defining feature of the current geological epoch (Lewis & Maslin, 2015). Modern research not only confirms the role played by human activities in the significant redistribution of species worldwide (Katsanevakis *et al.*, 2014a; Van Kleunen *et al.,* 2015; Essl *et al.*, 2015; Dyer *et al.*, 2017), but also shows that the rate of introduction of new species is increasing without restraint (Seebens *et al.*, 2017). Biological invasions may have profound impacts on native wildlife, ecosystem processes and services, economic activities, and even human health (Grosholz, 2002; Wallentinus & Nyberg, 2007; Molnar *et al.*, 2008; Vilà *et al.*, 2010).

In the Mediterranean Sea, a semi-closed basin with more than 17,000 reported species and high endemism (Coll *et al.*, 2010), 22 coastal countries, and home to 480 million people (EEA, 2015), nearly 1000 marine alien species have been reported, of which more than 660 are already established (Zenetos *et al.*, 2010, 2012, Zenetos & Galanidi, 2020). Quality data on the presence and dispersion of xenodiversity is imperative for management plans aiming to protect local ecosystems and their services to humans. Therefore, the collective work of international experts working locally and reporting on the spatial distribution of alien and rare species in the Mediterranean, contributes significantly to this venture.

The Mediterranean Marine Science journal, through its Collective Article, Series A, offers a platform to facilitate the collection of such data. In the current issue, records are grouped by country, from West to East. The locations of NIS records are illustrated on the following map (Fig. 1), and further information corresponding to each report can be found in Table 1. In the current article, 23 new records of alien species are reported from 8 countries along the Mediterranean coast. It includes records of the Atlantic blue crab *Callinectes sapidus* from Algeria and Tunisia, the cephalaspidean *Lamprohaminoea ovalis* from Spain, the silver-cheeked toadfish *Lagocephalus sceleratus*, the African hind *Cephalopho-*

Table 1. List of species reported in this paper, dedicated Sub-chapter (SC), latitude & longitude of locations, country of report, location number corresponding to Figure 1 (LN).

	SC	Latitude	Longitude	Country	LN
Chordata					
Arothron hispidus	8.1	34.23	35.65	Lebanon	1
Rachycentron canadum	8.1	34.38	35.77	Lebanon	2
Heniochus intermedius	8.1	34.45	35.82	Lebanon	3
Acanthurus monroviae	8.1	34.25	35.66	Lebanon	4
Acanthostracion polygonius	8.2	33.334911	35.213408	Lebanon	5
Cephalopholis taeniops	4.2	37.088572	15.305572	Italy	18
Ophioblennius atlanticus	4.3	37.54351	15.14295	Italy	19
Lagocephalus sceleratus	4.1	39.816667	18.122222	Italy	15
Paranthias furcifer	7.4	38.86694	26.90222	Turkey	11
Pempheris rhomboidea	7.3	40.37646	27.32111	Turkey	13
Cheilodipterus novemstriatus	6.4	36.322496	28.210627	Greece	8
Ecteinascidia turbinata	6.2	35.18673	25.71878	Greece	10
Mollusca					
Lamprohaminoea ovalis	2.1	38.17225	-0.483639	Spain	21
Lamprohaminoea ovalis	2.1	38.866354	1.259869	Spain	22
Eunaticina papilla	6.1	37.651425	24.03459	Greece	12
Plocamopherus ocellatus	6.5	36.125726	29.578819	Greece	9
Echinodermata					
Diadema setosum	6.3	37.04417	21.558928	Greece	16
Diadema setosum	6.3	36.158506	22.949159	Greece	17
Arthropoda					
Callinectes sapidus	1.1	35.181527	-1.6609665	Algeria	23
Callinectes sapidus	3.1	33.884841	10.24685	Tunisia	20
Paranthura japonica	5.1	45.564775	13.744303	Slovenia	14
Cloridina cf. *ichneumon*	7.2	36.2454	35.4522	Turkey	7
Ammothea hilgendorfi	7.1	36.47242	34.37331	Turkey	6

Fig. 1: Location of new species, as reported in this article. Location numbers correspond to Table 1.

lis taeniops, the redlip blenny *Ophioblennius atlanticus* and the long-spined sea urchin *Diadema setosum* from the Ionian Sea, the first records of the isopod *Paranthura japonica* and the Indian Ocean twospot cardinalfish *Cheilodipterus novemstriatus* from Slovenia and Greece respectively, the papilla moon snail *Eunaticina papilla*, the mangrove tunicate *Ecteinascidia turbinata* and the Atlantic creolefish *Paranthias furcifer* from the Aegean Sea. Moreover, new records of the white-spotted pufferfish *Arothron hispidus*, the cobia *Rachycentron canadum*, the Red Sea bannerfish *Heniochus intermedius* and the Monrovian doctorfish *Acanthurus monroviae* from Lebanon, the first occurrence of the dusky sweeper *Pempheris rhomboidea* from the Sea of Marmara, the range extension of the Pacific sea spider *Ammothea hilgendorfi* from Turkey, the first record of *Plocamopherus ocellatus* in Greek waters. The records of two new species in the Mediterranean Sea, namely the Indo-West Pacific mantis shrimp *Cloridina* cf. *ichneumon* and the honeycomb cowfish *Acanthostracion polygonius*, are noteworthy.

1. ALGERIA

1.1 New record of the Atlantic blue crab *Callinectes sapidus* Rathbun, 1896 (Decapoda: Brachyura: Portunidae) in the south-western Mediterranean

Nardjes ABDELALI and Samir GRIMES

The American blue crab *Callinectes sapidus* Rathbun, 1896, is native to the estuaries and coastal waters of the western Atlantic. Galil *et al.* (2002) suggested that *C. sapidus* was transported into the Mediterranean in ballast tanks. Four specimens of the invasive American blue crab *C. sapidus* were captured at a depth between 10 and 40m on muddy bottoms by a fisherman in December 2019 near the Harbour of Honaine Tlemcen, western Algerian coast (35.181527°N, -1.6609665°E). The first report of the species in Algeria was from Oued Z'hor-Jijel on the eastern coast (Benabdi *et al.*, 2019), about 923 km from Honaine, the location of the current record. We assume that *Callinectes sapidus* arrived in Algerian coastal waters unaided, spreading from the Moroccan coastal waters since the species has been recorded from Marchica lagoon, Morocco in 2017 (Chartosia *et al.*, 2018) and from Kariat Arekman (Taybi & Mabrouki, 2020), which are located about 110 and 97.8 km from Honaine harbour. This hypothesis is based on several considerations, mainly the direction and the velocity of the currents along the Mediterranean coast of Morocco and the Algerian coast, combined with high fecundity and significant larval dispersal ability (considering that females produce up to 5 million eggs per spawn; Yonathan *et al.*, 2008). The semi-enclosed and confined conditions of the port and the lagoon, may explain the presence of this species in such an environment, as both these semi-enclosed environments are characterized by varying salinity due to, in the case of Honanie Harbour, to the presence of a source of fresh water. With this second report on *C. sapidus* along the Algerian coast in the last three years, we hypothesize that the species occupies other areas along the Algeria coast, yet unexplored. The two areas reported are characterized by very good ecological status. Accordingly, we strongly recommend future investigations on this species in areas adjacent to the sites reported by Benabdi *et al.* (2019) and

Fig. 2: *Callinectes sapidus* specimen collected at Honaine, Algeria; Left: dorsal view, right: ventral view. Photo credit: Mahjoubi Ramy.

in this paper, as well as in other Algerian waters, close to oueds (rivers), taking into account the high adaptability of the species to variations in salinity. In addition, the increasing number of occurrences of *C. sapidus* in Algerian and Moroccan Mediterranean waters suggests an extensive monitoring of this species as regards its potential economic impact, in particular on fisheries. The species presents a risk for local biodiversity, yet it may also constitute an economic opportunity. Even if the current densities of this species in the area seem to be low, its ability to expand and to reach high abundances should be considered. Thus, we should be ready for potential economic exploitation in Algeria, given that local consumption of *C. sapidus* may reduce its potential negative impacts on indigenous fauna (Mancinelli *et al.*, 2017).

2. SPAIN

2.1 *Lamprohaminoea ovalis* (Pease, 1868) (Mollusca: Gastropoda) is spreading in Spain

Miquel PONTES and Fabio CROCETTA

Lamprohaminoea ovalis (Pease, 1868) (Mollusca: Gastropoda: Haminoeidae) is a small cephalaspidean originally described from Tahiti (French Polynesia) and native to the Indo-west Pacific. This taxon is also widespread in the Mediterranean Sea, where it has been widely recorded under its junior synonym *L. cyanomarginata* (Heller & Thompson, 1983) and is now considered an established alien species (Oskars & Malaquias 2020). In fact, since its first sighting in Greece (2001: review in Crocetta *et al.*, 2017), the species has been recorded from both the eastern and the western basins (e.g. Fernández-Vilert *et al.*, 2018; Yokeş *et al.*, 2018 among recent records), although it is known in some countries, according to scattered records.

Regarding Spain, e.g. so far *L. ovalis* is only known in association with a single bloom observed in Mallorca (Balearic Islands) between December 2017 and January

Fig. 3: *Lamprohaminoea ovalis* from Alicante (Spain). Photo credit: Daniel Muñoz Rodríguez.

2018 (Fernández-Vilert *et al.*, 2018). We hereby report on the first sighting of four additional specimens at a Spanish locality close to the "Tabarca Reef" diving site, less than 3 miles from the shore and near Nova Tabarca Island (Alicante, Spain) (38.172250° N, -0.483639° E). All the specimens were found on the 31st August 2020 on a rock covered with algae, at 10 m depth. They measured about 5mm in total length, and two of them displayed the typical trailing behaviour already reported for the species (Crocetta & Vazzana, 2009). Finally, an additional specimen from Ibiza (Spain) (38.866354° N, 1.259869° E) has been posted by the "Nudibase – sharing Nudibranch knowledge" Facebook group, (https://www.facebook.com/groups/nudibase/?post_id=2253324748052115).

The current report from Alicante further extends the known distribution range of this species in the western basin, and is also the westernmost record in the Mediterranean Sea. In addition, the three records known so far from Spain suggest that the species is now established in Spain, and that it may spread further due to water temperature and climate changes.

3. TUNISIA

3.1 First record of the Atlantic Blue Crab *Callinectes* sapidus Rathbun, 1896 in the Gulf of Gabes (south-eastern Tunisia)

Radhouan El ZRELLI and Lotfi RABAOUI

The Atlantic Blue Crab, *Callinectes sapidus*, is a decapod species native to the western Atlantic Ocean and the Gulf of Mexico, which was introduced to several other regions across the globe. After its first occurrence in the Mediterranean Sea, in 1947 (in the Aegean Sea), *C. sapidus* has continued to spread throughout the basin, and is currently colonizing most of the Mediterranean coasts (Falsone *et al.*, 2020; Mancinelli *et al.*, 2020). In Tunisia, so far, the species has been recorded only in the north (Katsanevakis *et al.*, 2020). In this paper, we report on the first record of *C. sapidus* in the Gulf of Gabes (south-eastern Tunisia), and provide some information relating to its distribution area and fishery interest, as reported by local fishermen.

In August 2020, local fishermen targeting the blue swimming crab (*Portunus segnis*) in the central coastal area of the Gulf of Gabes (between Ghannouche and Zerkine) reported on the occurrence of a new blue crab species very similar to *P. segnis*, but no specimens were provided. Therefore, we established a communication network with

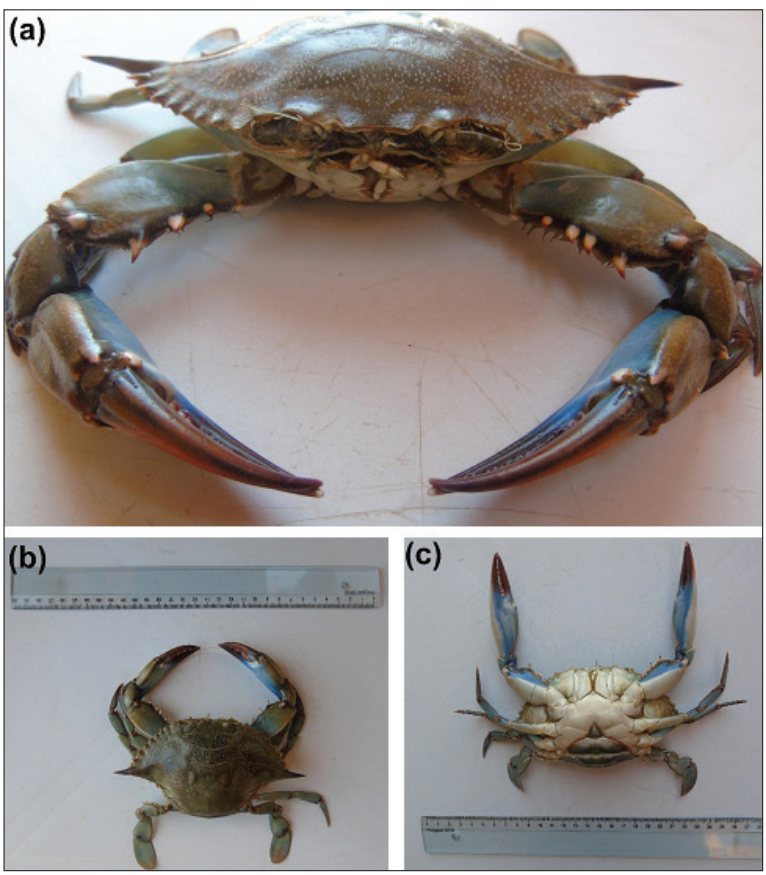

Fig. 4: *Callinectes sapidus*, captured on August 29th 2020, from the Gulf of Gabes. (a) frontal, (b) dorsal and (c) ventral sides of a female specimen.

the fishermen requesting their cooperation on providing samples and information about the occurrence area and capture frequency of this new species. After a few days, we received a single female specimen from a fisherman, which was examined carefully and identified as *C. sapidus* (Fig. 4). This specimen was collected on August 29th 2020 from the coastal area in front of Mtorrech (33.8848417° N, 10.2468500° E), at a depth of 6 m, and measured 13.8 cm in carapace length and 149.3 g in total weight.

According to local fishermen, *C. sapidus* occurred for the first time in their catch in early August 2020 and is currently found in the area extending between Mtorrech and Zerkine at a depth ranging between 6 and 22 m. Many local fishermen reported that the species is accidentally caught in the traps (called locally drayen) used to catch the blue swimming crab *P. segnis*. Fishermen reported that *C. sapidus* is being caught currently, with an average of 2-3 crabs per catch, and that the majority of specimens caught are females.

The repeated observations of the Atlantic blue crab in the Gulf of Gabes indicates that the species is under establishment in this region and that it has likely found the suitable conditions for its survival and reproduction. Within this context, it is worth noting that other introduced decapod species display very successful and efficient establishment in the Gulf of Gabes. This is, for example the case of the speckled shrimp *Metapenaeus monoceros*, the blue swimming crab *P. segnis*, and the northern brown shrimp *Penaeus aztecus*. The latter species are currently exploited in the Gulf of Gabes and their introduction provided new additional fishery resources in the region. At the beginning of its introduction, in 2014-2015, the blue swimming crab (*P. segnis*) caused serious economic problems to local fishermen because it had no commercial value in Tunisia at the time (Rabaoui *et al.*, 2015). However, after few years, with the establishment of companies exporting this new natural resource, fishermen have adapted to the situation and many of them have changed their fishing habits and started exploiting the stocks of *P. segnis*. The same scenario is likely for the Atlantic blue crab (*C. sapidus*) in case it shows rapid proliferation similar to that of *P. segnis*. When the person responsible at the local company exporting blue swimming crabs showed interest in *C. sapidus*, local fishermen understood that the latter species might be of major interest to the region's fisheries and thus decided to help in its establishment and proliferation in the Gulf of Gabes. Consequently, almost all local fishermen return *C. sapidus* crabs to the sea, once captured in their traps, with the prospect of future economic gains from its potential proliferation in the Gulf. This is an example of the benefits that may be reaped from introduced invasive species in the Gulf of Gabes, although the ecological impacts of these introductions remain unknown.

Although *C. sapidus* is considered one of the "worst invasive" species in the Mediterranean Sea and Europe (Katsanevakis *et al.*, 2014), the species seems to be welcomed by local fishermen in the Gulf of Gabes. Further studies are needed to monitor the spread and establishment of *C. sapidus* in the Gulf of Gabes and study its impacts on local biodiversity.

4. ITALY

4.1 On a new occurrence of *Lagocephalus sceleratus* (Gmelin, 1789) in Northern Ionian waters (Apulia Region, Italy)

Cataldo LICCHELLI and Francesco DENITTO

The family Tetraodontidae, known as puffer fishes, consists of 187 different species worldwide (Nader *et al.*, 2012). Puffer fishes are not natives to the Mediterranean Sea and occur in the subtropical and tropical regions of both the Atlantic and Indo-Pacific Oceans. A specimen of the Indo-Pacific *Lagocephalus sceleratus* (Gmelin, 1789) was caught on 14th November 2014 by a local fisherman using set gillnets (anchored) at 15 m depth, at a distance of approximately 2.5 nautical miles from the Ionian coast of the Salento Peninsula (Apulia Region, Italy) (39.816667° N, 18.122222° E). The total length of the specimen was 300mm and the total weight

Fig. 5: Specimen caught in Apulian Ionian waters. Photo credit: V. Bruno.

0,700 Kg (Fig. 5). *L. sceleratus*, commonly known as the silver-cheeked toadfish, is a widely distributed species that inhabits the tropical Indian and Pacific Oceans, from which it originates. It entered through the Suez Canal, rapidly invaded the Eastern Mediterranean Sea and in nearly 15 years reached the Western part of the basin (for a distribution review see Galanidi & Zenetos, 2019). Generally, this species inhabits sandy or muddy substrate near shallow coral reefs or *Posidonia oceanica* meadows at depths of up to 100 m. However, occasionally, it has been also found living at a depth of 250 m in the Red Sea (Yaglioglu *et al.*, 2011). Taking into account the dates of its progressive Mediterranean invasion, we believe that the species reached the Apulian Ionian waters by natural expansion of the populations established in the eastern Mediterranean basin, moving along the coasts through the Aegean Sea and Greek Ionian Sea (Galanidi & Zenetos, 2019 and references herein), the Adriatic Sea (Sulić Šprem *et al.*, 2014), and finally reaching the area reported herein. This first record from the Salento Peninsula area, has been recently posted in the "Segnala gli Alieni del Mare" App developed within the framework of the "European Maritime and Fisheries Fund (EMFF) Operational Programme, Italy 2014/2020 Measure 1.40" for the collection of historical and future data of alien species in Apulian waters.

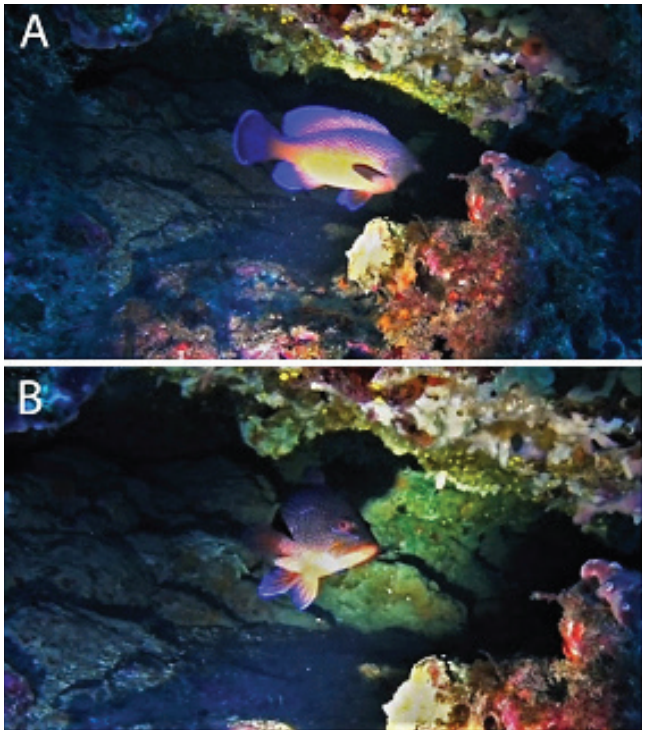

Fig. 6: (a) Specimen of *Cephalopholis taeniops* filmed at Siracusa (Italy) on 25 September 2019. (b) Specimen of *Cephalopholis taeniops*, evidence of horizontal blue line departs just below the eye.

4.2 First record of *Cephalopholis taeniops* (Valenciennes, 1828) in the Ionian Sea

Andrea SPINELLI and Dyana VITALE

The African hind, *Cephalopholis taeniops* (Valenciennes, 1828) (Serranidae: Epinephelinae) is an exotic fish belonging to the grouper family, living on sandy to rocky bottoms between 10 and 200 m depth (Engin *et al.*, 2016; Stern *et al.*, 2019). It occurs along the eastern Atlantic coasts of Africa, from Morocco to Angola, including Cape Verde, Principe Island and São Tomé Island (Guidetti *et al.*, 2010). In the Mediterranean, since its first report from Libya in 2002 (Ben Abdallah *et al.*, 2007), *C. taeniops* has been reported from different sites in the Strait of Sicily (i.e. Malta and Lampedusa) and Israel during the period 2008-2009, and later Çandarli Gulf, Aegean Sea, as summarized by Engin *et al.* (2016). The last record in the Mediterranean is from Almeria, Southern Spain, western basin (Stern *et al.*, 2019). On 25th September 2019, one more specimen of *C. taeniops* was observed during a free dive off Syracuse, eastern coast of Sicily (37.088572° N, 15.305572° E). The specimens initially swimming near a *Posidonia oceanica* meadow rapidly took refuge on the rocky bottom at 12 m depth and hid inside a large crevice using. The surface water temperature was 24°C. The observed specimen (Fig. 6a) had an approximate total length of 40 cm, and was recorded by a local spear-fisher (Mr. Concetto Felice) who shot a short video clip (publicly accessible on YouTube). The livery represented by a reddish-orange head, body and median fins with small blue spots and horizontal blue lines starting just below the eye (Fig. 6b) agree with the description of *C. taeniops* summarized in Guidetti *et al.* (2010) and according to Heemstra & Randall (1993). Around Italy, several specimens of *C. taeniops* have been recorded in the marine reserve of Lampedusa, from where the species may have spread to the coasts of Sicily, transferred by the Atlantic surface current. This record further demonstrates the important contribution of a "citizen science" approach to monitoring the spread of exotic species in the Mediterranean Sea. (Stern *et al.*, 2019)

4.3 First record of the redlip blenny, *Ophioblennius atlanticus* (Valenciennes, 1836), from the Ionian Sea

Francesco TIRALONGO and Ernesto AZZURRO

The family Blenniidae currently comprises 407 valid species, 27 of which are known to occur in the Mediterranean Sea (Rothman *et al.*, 2020; Tiralongo, 2020) and 20 in Italian marine waters (Tiralongo *et al.*, 2016; Azzurro *et al.*, 2018). This also includes the Redlip blenny, *Ophioblennius atlanticus* (Valenciennes, 1836), a non-indigenous fish, originary of eastern Atlantic waters, which has been reported only twice in the Mediterranean Sea; first from Malta (Falzon, 2015) and later from Lampedusa Island, Strait of Sicily (Azzurro *et al.*, 2018). Here we provide a third Mediterranean record of this species, which was spotted on 25th July 2020, on the rocky bottoms of Aci Castello (Catania, Sicily, Ionian Sea: 37.54351^{o} N; 15.14295^{o} E) at a depth of 1 m. The individual (Fig. 7)

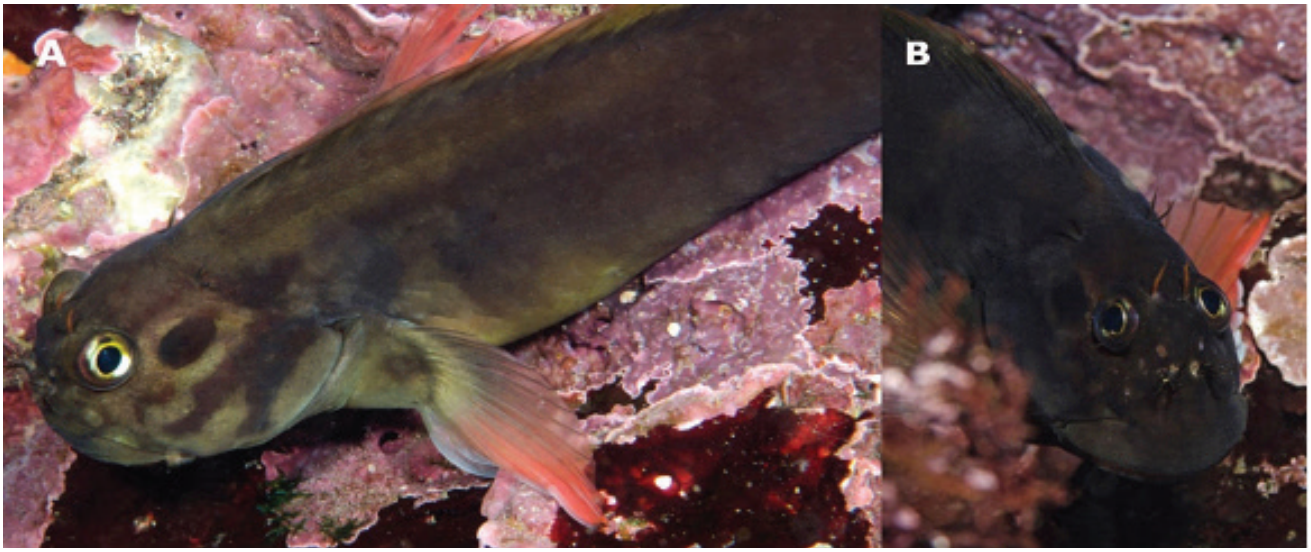

Fig. 7: The *Ophioblennius atlanticus* specimen photographed at Aci Castello (A), Ionian Sea, and head, frontal view (B). Estimated total length, 15 cm.

was photographed underwater by an amateur photographer and identified on the basis of the photograph, which allowed to distinguish key external taxonomical characters of this species. In particular, the typical eye-like spot behind the eye, the simple filamentous supraorbital cirri and the bifid cirri laterally on the nape allowed us to distinguish the specimen from all the other Mediterranean species (Azzurro *et al.*, 2018). Indeed, between all the other species recorded in the Mediterranean Sea, only *Aidablennius sphynx* (Valenciennes, 1836) has elongated, filamentous and simple supraorbital cirri, but it lacks cirri on the nape and displays a markedly different colour pattern, with irregular vertical dark spots on a greenish-yellowish background.

This finding is the first documented observation of *O. atlanticus* in the Ionian Sea and the second one for Italian waters. Considering that all Mediterranean Redlip blenny records has been observed at or close to Sicily, monitoring activities should be implemented for Sicily in order to study species distribution and verify the existence of an established population, as requested by the European Union Marine Strategy Framework Directive - "Descriptor 2".

5. SLOVENIA

5.1 First record of *Paranthura japonica* from Slovenia

Ana FORTIČ and Borut MAVRIČ

Specimens of *Paranthura japonica* Richardson, 1909 (Isopoda) were found during a sampling of the fouling community on the 25th of February 2020 in the Port of Koper (45.564775° N, 13.744303° E), Gulf of Trieste. The dominant macrofaunal elements in samples collected from the protective band surrounding the terminal were mussels and arborescent bryozoans. The following alien and cryptogenic species were recorded during sample examination: *Styela plicata* (Lesueur, 1823), *Botryllus schlosseri* (Pallas, 1766), *Bugula neritina* (Linnaeus, 1758), *Tricellaria inopinata* d'Hondt & Occhipinti Ambrogi, 1985, *Caprella scaura* Templeton, 1836 and for the first time in Slovenia, *Paranthura japonica*. Six specimens of the paranthurid were found and identified based on the following characters: piercing mouth appendages, exopods with distal concavity on mesial margin and incomplete segmentation of the pleon, with pleonites 1-5 segmented laterally and fused dorsally (as in Marchini *et al.*, 2014 and Lorenti *et al.*, 2016) (Fig. 8). The *P. japonica* specimens were preserved in 80% ethanol and stored in the NIS collection of the Marine Biology Station Piran.

Paranthura japonica is native to the North-western Pacific Ocean and was probably introduced to the Mediterranean Sea by human activity. It is believed to have arrived in France (Arcachon) with oyster spats from Japan (Lavesque *et al.*, 2013, Marchini *et al.*, 2014) and later transferred to the Mediterranean Sea, where it was recorded in several countries: Italy (Marchini *et al.*, 2014, Lorenti *et al.*, 2016), France, Spain, Malta (Ulman *et al.*, 2017), Greece and Tunisia (Tempesti *et al.*, 2016). *Paranthura japonica* lives in various habitats, including soft sediments, seagrass and algal beds, as well as the fouling community of harbours, ports and marinas, often in transitional waters (Lorenti *et al.*, 2016). Although surveys of the fouling community have been conducted regularly in artificial habitats along the Slovenian coast in recent years, this paranthurid was not found. This suggests that the species may have been introduced recently. Koper is the largest port for foreign ships in Slovenia and, therefore, *P. japonica* was very likely transferred to Slovenian waters by ships from Venice or more distant localities. Further sampling is required in order to assess the status of this species in Slovenia.

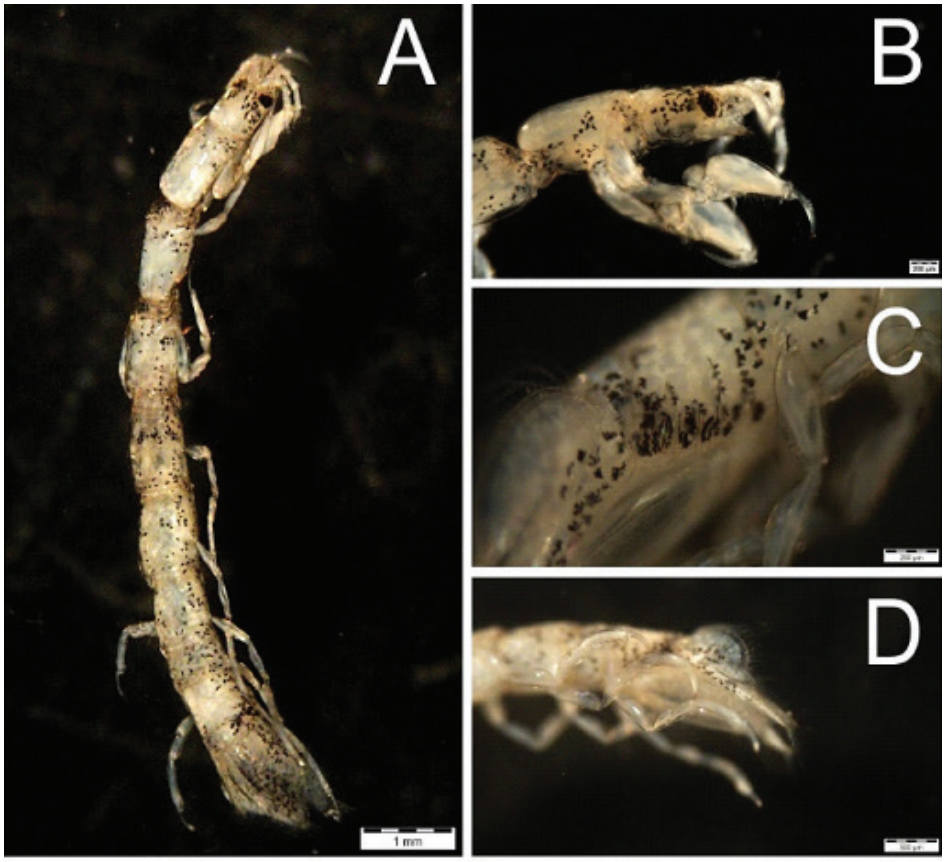

Fig. 8: Photograph of a whole specimen of *Paranthura japonica* (A), including a number of enlarged key diagnostic features: head with big eyes and piercing mouth appendages (B), incomplete segmentation of the pleon (C) and the shape of the uropodal exopod (D).

6. GREECE

6.1 Range expansion of another Indo-Pacific mollusc in the Mediterranean. *Eunaticina papilla* (Gmelin, 1791) reaches the Aegean Sea

Panayotis OVALIS and Argyro ZENETOS

Eunaticina papilla (Gmelin, 1791), a gastropod belonging to the family Naticidae, was originally described as *Nerita papilla* Gmelin, 1791. A detailed description of the species is presented in Beu & Raine (2009), while its taxonomic status along with a long list of synonyms, is discussed in Beu *et al.* (2004).

Eunaticina papilla occurs widely in the Indo-Pacific as far north as southern Japan and as far SW as South Africa. In Australia, it is found in New South Wales, Queensland, Victoria and South Australia (Beu *et al.*, 2004). The species is also distributed in the Red Sea (Dekker & Orlin, 2000). In the Mediterranean, *E. papilla* has been reported from Iskenderun Bay (Öztürk & Bitlis, 2013) where it is presumably established (P. Ovalis, pers. observation).

We hereby report on the finding of an additional *E. papilla* (Fig. 9) in material caught by a fishing boat operating at a depth of about 45 m in the outer Saronikos Gulf, off Lavrio (37.651425°N, 24.034590°E) on July 7th 2020. The presence of the species in the area can presumably be

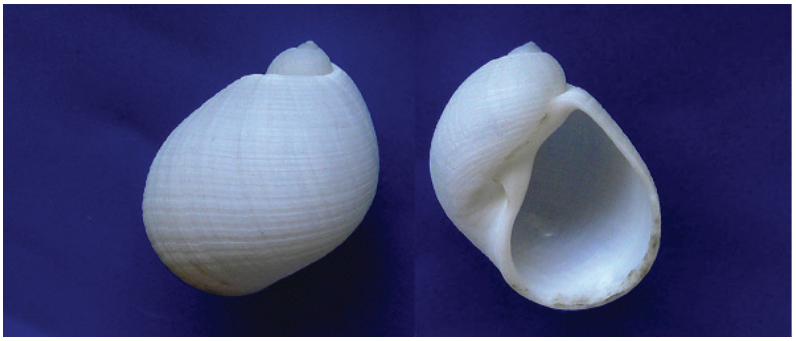

Fig. 9: *Eunaticina papilla* from Saronikos Gulf. Size 16.39 mm.

attributed to ship transfer in ballast waters. The Saronikos Gulf is a hot spot for alien species and *Euthymella colzumensis* (Ovalis & Zenetos in Dragičević *et al.*, 2019) is the latest reported NIS.

6.2 First record of the ascidian *Ecteinascidia turbinata* Herdman, 1880 (Tunicata, Ascidiacea) along the coasts of Crete Island (Greece)

Federica MONTESANTO and Francesco MASTROTOTARO

Ecteinascidia turbinata was originally described by Herdman from Bermuda (Herdman, 1880), who collected further specimens in Alexandria (Egypt, Mediterranean Sea) in 1882 (Herdman, 1882). Later, Herdman stated that the Mediterranean specimens were a distinct species, *E. moorei* (Herdman, 1890). In 1933, Harant & Vérnièrs synonymized these two species.

E. turbinata is native and widespread in the tropical Western Atlantic, while it is considered a cryptogenic species in the Mediterranean Sea (Maciver *et al.*, 2016). Findings of *E. turbinata* in the Mediterranean have been reported from Egypt, France, Spain, Tunisia, Italy, Malta, Israel and Greece (Argolikos Gulf, Peloponnese) (Maciver *et al.*, 2016 and references therein). We report a new finding of *E. turbinata* in Agios Nikolaos marina (Cretan Sea) (35.18673°N, 25.71878°E) on artificial substrata (*e.g.* ropes, chains, piles) at 2-3 m depth, in October 2019. Three 50 m^2 transects were investigated by scuba diving to estimate the density of the colonies. Specimens were collected and preserved in 4% formalin solution after narcotization with menthol crystals, for morphological analysis purposes.

An average of 22 ± 2 colonies was estimated along the transects. The zooids, joined at their base by a system of vascular stolons, ranged from 10 to 400 in number/colony (Fig. 10A). The tunic is thin and transparent, with orange spots (Fig. 10B). Zooids (up to 3 cm) display siphons close to each other, encircled by an orange ring. The oral siphon has about fifty branchial tentacles of different orders. The siphonal musculature is marked, with transverse muscles not crossing the intersiphonal space. The pharynx has 30 rows of stigmata, with up to 50 stigmata/row (at the level of the 10th stigmata). The stomach is orange in living specimens, with 2 oblique bands. The intestinal loop curves slightly toward the dorsal side of the zooid, forming an open loop without a secondary curve, ending in a bi-lobed anus at the level of the 8-10th stigmata (Fig. 10C). The gonads lie in the intestinal loop, with testis constituted by several vesicles arranged around the ovary and the spermiduct ending near the anus. The ovary contains 8-9 yellow oocytes (Fig. 10C-D). The peribranchial cavity contains up to 10 larvae (1 mm trunk length), with 5 adhesive organs, otolith and ocellus (Fig. 10D-E).

This species differs from *E. thurstoni* Herdman, 1890 by the presence of pigmented spots, stronger musculature, no transverse muscles in the intersiphonal space, a higher number of stigmata rows (~15 in *E. thurstoni*) and

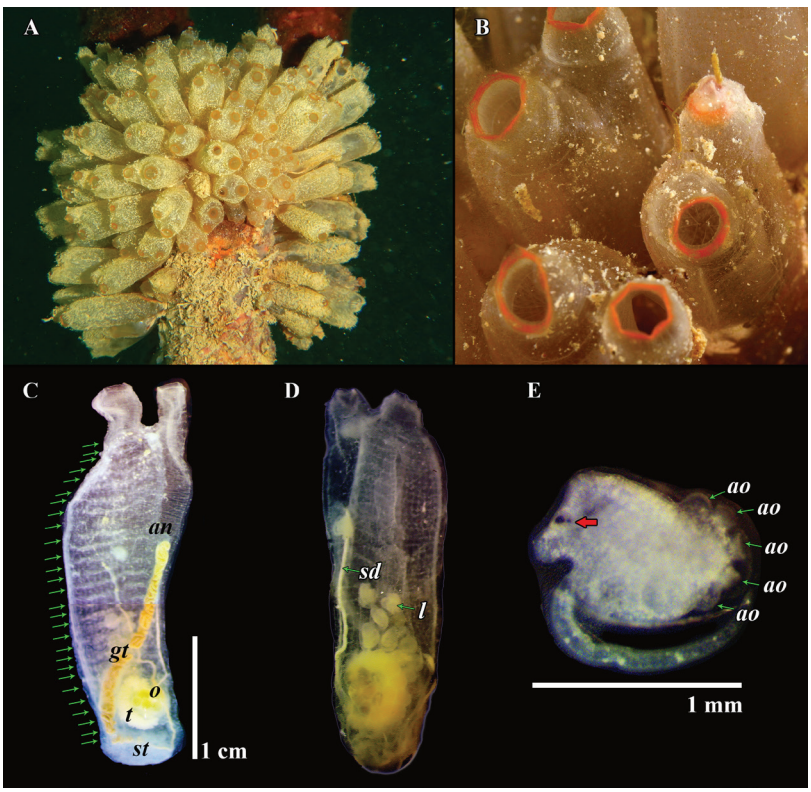

Fig. 10: *Ecteinascidia turbinata*. A: Colonies of *E. turbinata*, showing numerous tight erected zooids. B: Magnification of the siphons encircled by an orange ring. C: Zooid extracted from the tunic, green arrows point out the rows of stigmata. D: Zooid extracted from the tunic with larvae incubated in the peribranchial cavity and the spermiduct ending near the anus. E: Larva with otolith and ocellus (red arrow) and five adhesive organs (green arrows). an, anus; ao, adhesive organs; gt, gut loop; l, larva; o, ovary; sd, spermiduct; st, stomach; t, testis.

a different number of stomach folds (5 in *E. thurstoni*) (Kott, 1985).

Recreational boating and aquaculture facilities represent the most likely vectors of introduction of this species; this additional observation confirms its actual expansion in the Mediterranean Sea.

6.3 First record of *Diadema setosum* (Leske, 1778) in the Ionian Sea

Michail RAGKOUSIS, Alexandros TSATIRIS and Stelios KATSANEVAKIS

The sea urchin *Diadema setosum* (Leske, 1778) was first observed in the Mediterranean Sea in 2006 along the southern coast of Turkey (Yokeş & Galil, 2006). Subsequently (Dounas & Krystalas in Mytilineou *et al.*, 2016 and references therein), it spread south-eastwards to Lebanon (2009), Cyprus (since 2010: Katsanevakis *et al.*, 2020), and Israel (since 2016: Bronstein & Kroh, 2018) and westwards to Gökova Bay, Aegean Sea (2014), the island of Rhodes (2015) and Crete (2016). The Mediterranean population of *D. setosum* originates from a clade confined to areas surrounding the Arabian Peninsula (clade b), possibly introduced in a single introduction event (Bronstein & Kroh, 2018). According to the Ellenic Network on Aquatic Invasive Species (ELNAIS; Zenetos *et al.*, 2015), the westernmost records of *D. setosum* are from SW Kriti and the Argolikos Gulf (Peloponnese) (last update: 26.08.2019).

Here we report on the invasion of the Ionian Sea by *Diadema setosum*. The species was observed in the coastal waters of Proti island (W Peloponnese, Ionian Sea, Greece; 37.044170° N, 21.558928° E) on 18 July 2020, and in SW Kythira island, on the Aegean-Ionian border (36.158506° N, 22.949159° E), on 21 July 2020. Specifically, eight individuals were observed around Proti Island at ~6 m and one individual at 15 m depth, while two individuals were found in Kythira at 4 and 27 m depth, respectively. The identification of the species was based on Coppard & Campbell (2006); specifically, on the five white spots located on the mid-lines of the interabulacral, an orange ring around the periproctal cone, and a bold pattern of blue iridophores (Fig. 11). These records constitute the westernmost records of the species in the Mediterranean and demonstrate further spreading. It should be noted that the species distribution model developed by Bronstein *et al.* (2017) indicates that the Ionian Sea is unsuitable for *D. setosum*. Nevertheless, the record of eleven individuals at two sites suggests successful establishment of the species in the Ionian Sea is highly likely. Future studies should reconsider the niche dynamics of the species in the Mediterranean, considering the possibility of niche shift in its invaded range.

Note after acceptance: *Diadema setosum* was reported from southern Laconia and Kythira island in 2019 (Pirkenseer, 2020).

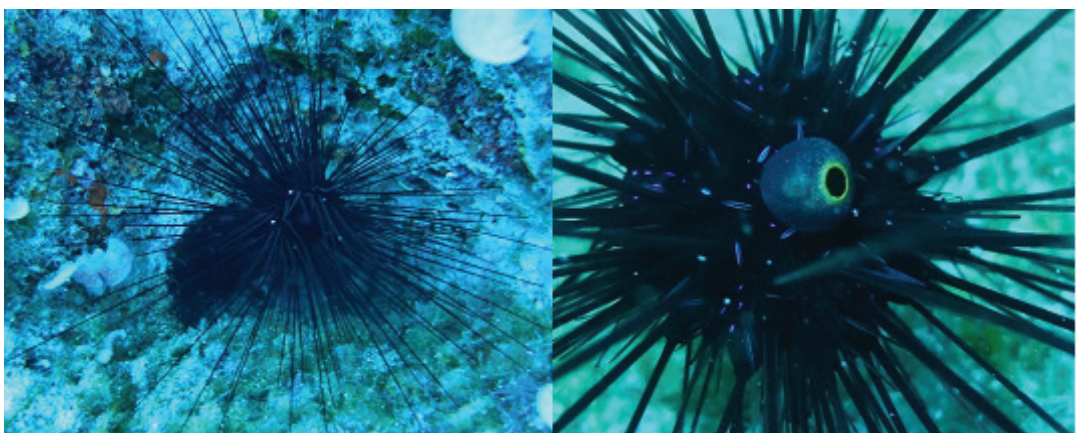

Fig. 11: *Diadema setosum* individuals observed in Proti island (Greek Ionian Sea): an adult specimen (left) with the characteristic five white spots on the test clearly visible; the magnified test of a juvenile individual, with the distinct orange ring around the periproct and the characteristic blue iridophores clearly visible.

6.4 First record of *Cheilodipterus novemstriatus* in Rhodes island (Dodecanese)

Anastasia MILIOU and Evgenios LOUDAROS

Cheilodipterus novemstriatus (Rüppell, 1838) is a fish of Indo-Pacific origin that has progressively invaded the Mediterranean Sea via the Suez Canal (a Lessepsian immigrant). The species was first recorded along the Mediterranean coast of Israel (Goren *et al.*, 2010) and was soon reported from Lebanon, Turkey, Cyprus and Syria (see Ali *et al.*, 2018 and references therein).

In a recent account of marine invasive species (Karachle *et al.*, 2017), *Cheilodipterus novemstriatus* (Rüppell, 1838) was included among the species likely to invade the Greek Seas. However, until end of 2019, it had not been reported (Zenetos *et al.*, 2018; Zenetos *et al.*, submitted) from Greek Waters. We hereby report on the first sighting of the species in the Levantine waters of Greece.

Swarms of *C. novemstriatus (*Fig. 12) were observed by scuba diving on the 20th and 22nd of August 2020 - Antony Quinn (Rhodes island) (36.322496° N, 28.210627°

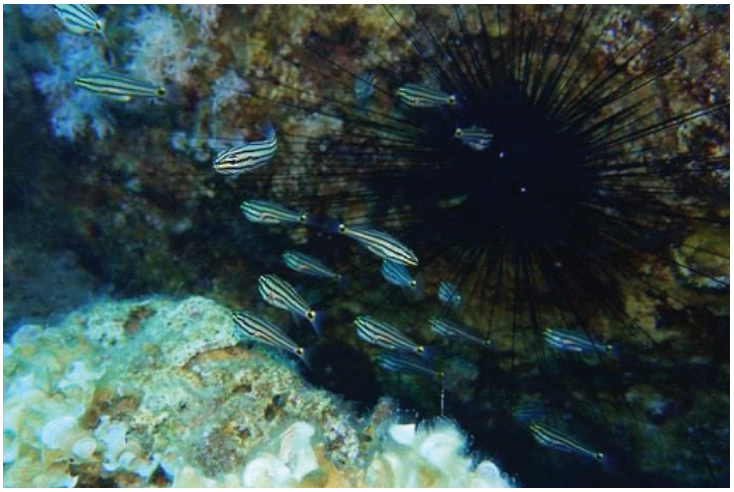

Fig. 12: Swarms of *C. novemstriatus* observed by scuba diving at Antony Quinn (Rhodes island), at 8-9 m depth.

E) at 8-9 m depth. The species was often seen in the region in August 2020, which testifies that the species is already established in the area.

6.5 First record of the Lessepsian nudibranch *Plocamopherus ocellatus* Rüppell & Leuckart, 1828 in Greek waters

Markos DIGENIS, Michail RAGKOUSIS
and Vasilis GEROVASILEIOU

The nudibranch *Plocamopherus ocellatus* Rüppell & Leuckart, 1828 originates from the Red Sea. It was first recorded in the Mediterranean from the coasts of Israel where it is currently established (Rothman & Galil, 2015). In addition, it is presumably established in Lebanon and Turkey, while it has also been reported from Cyprus (Crocetta *et al.*, 2015). Despite being a large and conspicuous species, it is considered rare, with approximately 30 specimens recorded in the scientific literature by 2015 (Rothman & Galil, 2015). No additional records have been published since then.

In August 2020, two individuals were sighted close to each other and photographed (Fig. 13) while surveying (by scuba diving) the semi-submerged "Blue Cave" of Kastellorizo Island (36.125726° N, 29.578819° E). The nudibranchs were spotted in the semidark zone of the cave, at a distance of approximately 22 m from the entrance, at 12 m depth, crawling on a wall. Interestingly, the cave wall was dominated by branching bryozoans (Fig. 13), which are generally known to form part of the nudibranch's diet (Crocetta *et al.*, 2015; Rothman & Galil, 2015). The individuals found were approximately 4 and 6 cm in length and had brownish mauve body colour with distinct yellow spots of different sizes and shapes (Fig. 13). Other identification criteria included a prominent oral veil edged with branched appendages, large knob-like protuberances near the gill and the five tripinnate branchial leaves in the middle of the dorsum composing the gill (Valdés & Templado, 2002). The body colour patterns substantiate that the individuals found did not belong to the congeneric *Plocamopherus tilesii* Bergh, 1877, which is translucent white with yellow and brownish purple spots (Yokeş *et al.*, 2012).

Plocamopherus ocellatus has been reported from a variety of shallow water habitat types (<50 m), including muddy bottoms, coral reefs, algae-covered hard substrates, polluted harbours, marinas, and shipwrecks (Crocetta *et al.*, 2015; Rothman & Galil, 2015). The current report constitutes the first published record of *P. ocellatus* from a marine cave environment (Gerovasileiou *et al.*, 2016) and the first record of *P. ocellatus* in Greek waters (Zenetos *et al.*, 2018).

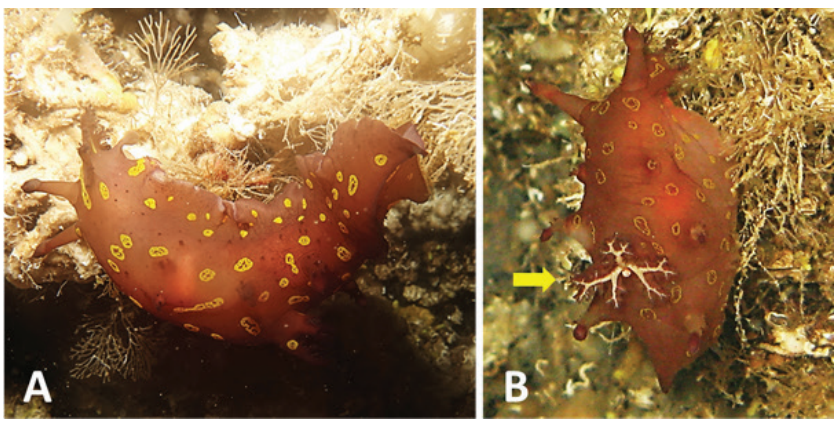

Fig. 13: (A) *Plocamopherus ocellatus* on a wall of the semi-submerged "Blue Cave" with branching bryozoans; Photo credit: Michail Ragkousis; (B) Dorsal view of *P. ocellatus* with branchial leaves (yellow arrow); Photo credit: Markos Digenis.

7. TURKEY

7.1 Range extension of the Pacific sea spider *Ammothea hilgendorfi* (Böhm, 1879) (Arthropoda: Pycnogonida) in the Mediterranean Sea

Cengiz KOÇAK

Ammothea hilgendorfi (Böhm, 1879) is a common littoral to infralittoral ammotheid species found along the coasts of Japan, and has also long been known from the Pacific coasts of California and Mexico (Bamber, 2012). In 1978**,** two immature specimens of *A. hilgendorfi* were found at Southampton Water, Hampshire (southern England), northeast Atlantic by Bamber (1985). The author also confirmed the presence of an adult specimen from the same location (Bamber, 1988). The species was also collected in 2010 from the southern North Sea on the east coast of England (Blackwater Estuary, Essex) (Bamber, 2012). Later, Faasse (2013) recorded the species from Zierikzee (south-western Netherlands), which constitutes the first record from the Atlantic coast of continental Europe.

In the Mediterranean Sea, this species has been only reported from the lagoon of Venice (northern Adriatic, Italy) by Krapp & Sconfietti (1983). This was the first published record of the species outside its native range in the Pacific Ocean. Later on, Mizzan (2018) reported the species from the same region and confirmed the presence and wide spread of *A.hilgendorfi* in the lagoon of Venice. To date, the species has not been reported from other areas of the Mediterranean Sea.

In this study, two specimens of *A. hilgendorfi* were collected from Mersin Bay (Turkey, eastern Mediterranean). The species was identified following Krapp & Sconfietti (1983) and Bamber (1985). The specimens were deposited in the Museum of the Faculty of Fisheries, Ege University, İzmir, Turkey (ESFM).

Material examined: 1 adult ♀, 1 immature (EFSM-PYC/2010-14), Mersin Harbour (Mersin Bay, Turkey), 36.47242° N, 34.37331° E, *Ulva rigida* C. Agardh, 1823, *Hypnea musciformis* (Wulfen) J.V. Lamouroux , 1813, 0.5 m, 21.07.2010. ♀: Trunk length (frontal margin of cephalic segment to tip of 4th lateral process), 2.05 mm, trunk width (across 1st lateral processes), 1.32 mm. Trunk fully segmented with well-separated lateral processes, chelifores reduced to rounded processes, fused with the anterior margin of the cephalic segment, no apparent articulation (Fig. 14).

Krapp & Sconfietti (1983) hypothesize an introduction of *A. hilgendorfi* into the northern Adriatic by immigration through the Suez Canal, on the hull of ships. The same is probably true for the Mersin Bay population.

Although no males have been found in this study, the presence of a female bearing a number of eggs in its dilated femora, and an immature specimen, indicates that a reproducing population of *A. hilgendorfi* has become established in Mersin Bay.

This new record of *A. hilgendorfi* extends the known distribution of the species to the eastern Mediterranean. Therefore, the non-native species *A. hilgendorfi* now has an established distribution in the Mediterranean Sea, ranging from the northern Adriatic (central Mediterranean) to Mersin Bay (eastern Mediterranean).

7.2 First record of the Indo-West Pacific mantis shrimp *Cloridina* cf. *ichneumon* (Fabricius, 1798) in the Mediterranean

Ayşegül ERGENLER and Cemal TURAN

The stomatopod crustacean *Cloridina* cf. *ichneumon* (Stomatopoda, Squillidae) is reported for the first time from Iskenderun Bay, south-eastern Mediterranean Coast of Turkey (36.2454º N, 35.4522º E). A female speci-

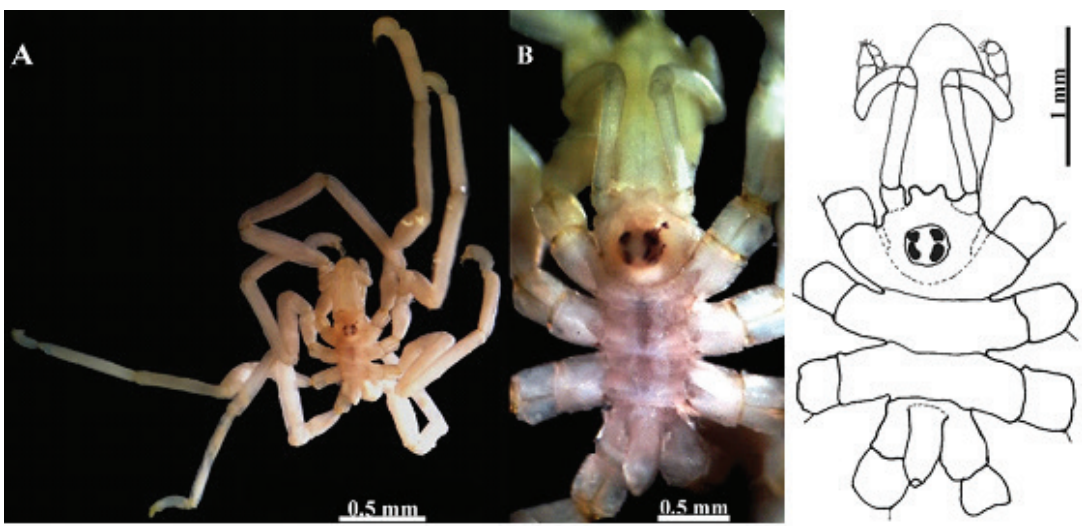

Fig. 14: *Ammothea hilgendorfi* (Böhm, 1879): left- ♀, from Mersin Harbour, A. Dorsal view; B. Trunk, dorsal view. Right: Line drawing of trunk, dorsal view.

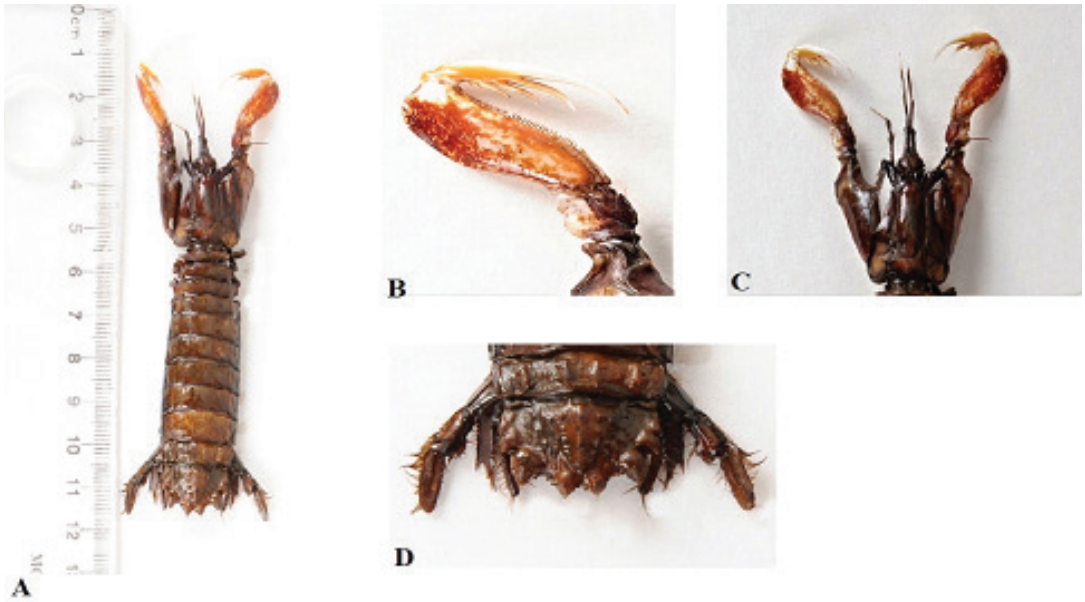

Fig. 15: The captured female specimen of the mantis shrimp *C.*cf. *ichneumon*. A: Dorsal view, B: Raptiroal claw, C: Carapax, D: Uropod. Photo credit: A. Ergenler.

men of the mantis shrimp *C.*cf. *ichneumon* (total length 98 mm, carapace length 27 mm, telson length 28 mm, weight 3.5 g) was caught by a trammel net at a depth of 40 m on 25th September 2019 (Fig. 15a).

Description of the specimen: Eyes small, cornea bilobed, set obliquely on stalk; stalk expanded proximally, eyes appressed for most of their length, extending to about the end of the first segment of antennular peduncle; ocular scales sub-truncate; raptorial claw tough; (Fig. 15b) rostral plate triangular as long as wide, apex rotated; carapace toughly constricted anteriorly (Fig. 15c), anterolateral spines of carapace tough, not extending past base of rostral plate; 4 dactylar teeth, outer margin curved; indiscrete dorsal ridge of carpus; mandibular palp present; 4 epipods present; thoracic somites lacking submedian carinae; low, unarmed intermediate carinae present on last 4 somites; lateral process of fifth thoracic somite an angular lobe, directed anterolaterally; abdomen flat, depressed and basal prolongation of uropod with 7 fixed spines on inner margin and broad, rounded lobe on outer margin of inner spine (Fig. 15d).

Holthuis (2000) considered *Cloridina ichneumon* as a synonym of *Cloridina microphthalma*. Ahyong (2016) reported *C. ichneumon* for the first time from the coasts of Singapore and noted certain morphometric details, such as: total length of anterolateral spines of the carapace (14 mm) and mandibular palp (17 mm) for female individuals; the petasma (28 mm); post-anal carina either absent or unclear and raptorial claw with 4 or 5 dactylar teeth. The characteristics of the present finding are in agreement with the description of Ahyong (2016). In the captured specimen, the telson structure is pointed and some parts are blunt, the carapace structure is triangular, the raptoral part is different from the clamp structure. Therefore, the specimen classifies as *Cloridina* cf. *ichneumon.*

Cloridina ichneumon has a wide distribution in the Indo-Pacific, from East Africa to India, the Andaman Sea, the Gulf of Thailand, the South China Sea and New Caledonia; and Singapore (Manning, 1990; Ahyong, 2016). The presence of *C.* cf. *ichneumon* in the Mediterranean may be attributed either to marine transportation (vessels) or unaided introduction via the Suez Canal. However, this first record from southern Turkey coupled with the low migration capability of the species indicate vessel transfer as the most likely pathway of introduction in the Mediterranean Sea.

7.3 First occurrence of *Pempheris rhomboidea* in the Sea of Marmara

Sercan YAPICI and Ferhat YALGIN

The opening of the Suez Canal in 1869 resulted in the so-called Lessepsian bioinvasion of the Mediterranean Sea. According to recent literature, 89 alien fish species have already established in the Mediterranean (Zenetos & Galanidi, 2020).

Pempheris rhomboidea is a small-sized Indo-Pacific fish and is easily differentiated by its large eyes, oblique mouth and laterally compressed deep body. On June 30th 2017, a recreational fisherman captured a single specimen of *P. rhomboidea* (Fig. 16) from Karabiga/Çanakkale (40.37646° N, 27.32111° E) using a fyke net at the depth of 4 m. A video of the specimen was uploaded to a Facebook group. The authors contacted and informed the fisherman and obtained the necessary information (Sampling date, depth, and location).

Mediterranean records of the genus *Pempheris* are confusing. The first Mediterranean record of the genus *Pempheris* was identified as *Pempheris vanicolensis* (Mouneimne, 1979). The species rapidly expanded its distribution in the Mediterranean and has been reported from various countries (Golani *et al.*, 2017). Koeda *et al.* (2014) suggesting that the introduced species was

Fig. 16: Captured *P. rhomboidei* from Karabiga/Çanakkale.

Pempheris mangula and that previous reports of *P. vanicolensis* in the Mediterranean Sea were misidentifications of *P. mangula*. Azzurro *et al.* (2015) conducted a study based on molecular methods and concluded that the introduced *Pempheris* in the Mediterranean was *P. rhomboidea*. Thus, global consensus has been reached on the member of genus *Pempheris* in the Mediterranean. Based on this consensus, its first record in the Mediterranean originates from Lebanon while the northernmost record from Kuşadası Bay (Tzomos *et al.,* 2010). Here, we report on its northernmost occurrence, in the Sea of Marmara. Human-mediated drivers have caused a change in the marine biota of the Mediterranean and its adjacent seas. Consequently, further observation and monitoring studies are required to determine the distribution of alien species.

7.4 First record of the Creole-fish *Paranthias furcifer* (Valenciennes, 1828) in the Aegean Sea

Sercan YAPICI and Nail SEVINGEL

The family Serranidae consists of 578 valid species. The exotic Serranids in the Mediterranean comprise three species of tropical Atlantic origin and six species of Indo-Pacific origin (Golani *et al.,* 2002). *Paranthias furcifer* is naturally distributed throughout eastern Atlantic Ocean and western Atlantic Ocean. It is a marine tropical to subtropical fish that lives on rocky and reef bottoms at depths from 8 to 100 m (see Dulčić & Dragičević, 2012).

On 21st October 2019, a single specimen of *P. furcifer* (Fig. 17) was captured off İzmir (38.86694° N, 26.90222° E) by spear gun at a depth of 12 m. Sea temperature was 19°C. The morphological identification procedures described by Heemstra & Randall (1993) were followed. The examined specimen measures 297 mm in TL and weighs 355.42 g. The detailed morphologic and meristic

Table 2. Comparison of the meristic and morphometric data of *Paranthias furcifer* in the Mediterranean Sea.

	Dulčić and Dragičević, 2012	Present study
Dorsal rays	IX, 18	IX, 17
Anal rays	III, 9	III, 9
Pectoral rays	19	20
Pelvic rays	I, 5	I, 5
Metric measurements (mm)		
Total length	285	297
Fork length	-	264
Standart length	214	240
Body depth	67	78.2
Head length	64	64.5
Eye diameter	12	12.5
Preorbital distance	17	19.6
Postorbital distance	34	35.9
Interorbital distance	16	19
Depth caudal peduncule	22	24.7
Prepelvic distance	74	76.9
Preanal distance	143	143.1
Predorsal distance	70	79.4
Length of dorsal fin	126	124.2
Length of anal fin	36	36.6
Length of pectoral fin	60	59.7
Length of pelvic fin	74	75.3

Fig. 17: A specimen of *Paranthias furcifer* from the Aegean Sea. (a: Fresh specimen, b: after defrosting).

data of the specimen are presented in Table 2.

As regards the Mediterranean records of the species, it has been reported only from the Adriatic Sea (Dulčić & Dragičević, 2012) and Lebanon (Crocetta *et al.*, 2015). Dulčić & Dragičević (2012) discussed possible modes of its introduction to the Mediterranean Sea and considered this species as a vagrant fish because it was found at a great distance from its geographic distribution. These authors associated its presence in the Adriatic Sea with the arrival of an oil platform from the Gulf of Mexico. Zenetos *et al.* (2016) have attributed the presence of *P. furcifer* in the Mediterranean to two potential pathways, Transport stowaway (shipping) or intentional release in nature from an aquarium (domestic or public). Both pathways appear to be possible in our case.

8. LEBANON

8.1 New records of four rare non-indigenous fishes in the Mediterranean from Lebanon

Michael BARICHE and Sinan MAVRUK

Arothron hispidus (Linnaeus, 1758)

The White-spotted Puffer, *Arothron hispidus* (Actinopterygii: Tetraodontidae), is a highly toxic pufferfish naturally occurring in the Indo-Pacific region, from the Red Sea to the West Pacific Ocean. In its native range, it is known to live in various types of habitats, such as rocks and corals, and also estuaries (Froese & Pauly, 2020). Although some previous controversial records of the genus exist, its first substantiated record from the Mediterranean is from Protaras, Cyprus (Bariche *et al.*, 2018). Here we present the first record of the species from Lebanon and the second for the Mediterranean Sea. On 3rd February 2020, a single specimen (20 cm TL) of *Arothron hispidus* was captured by an angler at 10m depth, off the village of Kfar Abeeda (34.23°N, 35.65°E). The bottom was sandy and muddy with scattered large boulders. The photograph was sent to the author for identification (Fig 18A). The species can be easily recognized as it differs from other congeners, particularly *A. reticularis* (Bloch & Schneider, 1801), by its colour pattern and the absence of continuous dark-brown bands over the body (Froese & Pauly, 2020; Bariche *et al.*, 2018). As speculated by Bariche *et al.* (2018), this second record is most likely associated with an aquarium release event, given that the species is a common ornamental aquarium fish. However, the proximity of Lebanon to the Suez Canal and pending genetic evidences, the species may have also entered the Mediterranean as a Lessepsian migrant.

Rachycentron canadum (Linnaeus, 1766)

The Cobia, *Rachycentron canadum* (Actinopterygii: Rachycentridae) is a circumtropical large predator from the tropical and sub-tropical waters of the Atlantic and Indo-Pacific Oceans. In its native range, the species is rather solitary and can be found over a wide variety of habitats, including rocks, coral reefs, mangroves and soft bottoms (Froese & Pauly, 2020). The species had already been reported four times, but exclusively from the Levant basin and the Mediterranean coast of Turkey (reviewed in Crocetta *et al.*, 2015). Here, we report a new *R. canadum* individual found in Lebanese waters on 28th May 2020; it was a large individual measuring about 180 cm in total length and was captured in Al-Qalamoun (34.38°N, 35.77°E) by a large fixed trap, similar to the French madrague. A video and photos (Fig. 18B) were shared privately to one of the authors who published them on social media. The species is easy to identify, having a broad and depressed head and a typical body colouration (Froese & Pauly, 2019).

Heniochus intermedius Steindachner, 1893

The Red Sea bannerfish *Heniochus intermedius* (Actinopterygii: Chaetodontidae) is a native fish to the Western Indian Ocean, and is endemic to the Red Sea and the Gulf of Aden (Froese & Pauly, 2020). In its native habitat, the species is solitary or lives in pairs, and is usually closely associated with coral reefs (Randall, 1983). The species was first reported from the Mediterranean, Gulf of Antalya, in 2002 and thereafter from several locations in the eastern and central Mediterranean (Golani *et al.*, 2017). Here, we report two new occurrences of *H. intermedius* along the Lebanese coast. On 6th July 2018, an individual was observed at the fish market in Tripoli (34.45°N, 35.82°E). The fish was not kept but was photographed and shared through a WhatsApp Messenger angler group (Fig. 18C). The second individual was captured on 17th July 2018 by a shore angler at about 5 m depth, off Beirut (33.94°N, 35.58°E), and its photograph was shared on a Facebook® fishermen group (Fig. 18D). The species is characterized by its elongated fourth dorsal

Fig. 18: (A) *Arothron hispidus* (B) *Rachycentron canadum* (C) *Heniochus intermedius* (D) *Heniochus intermedius* (E) *Acanthurus monroviae* individuals from Lebanon.

spine and body colouration, with two characteristic broad brown-blackish bands. The first band extends from the front of the dorsal fin to the abdomen and pelvic fins and the second one from the middle dorsal to the rear of the anal fin (Randall, 1983). Although, the bottom type and fishing method was not recorded for the first individual, the second fish were captured over a muddy bottom, unlike previous records of the species in the Mediterranean.

Acanthurus monroviae Steindachner, 1876

The Monrovia doctorfish, *Acanthurus monroviae* (Actinopterygii: Acanthuridae) is naturally distributed in the tropical waters of the eastern central Atlantic. It lives mainly on hard bottoms such as rock and coral reefs, as well as lagoons (Froese & Pauly, 2020). This species entered the Mediterranean though the Strait of Gibraltar and was first recorded in the Alboran Sea, Malaga (Golani *et al.*, 2017), and thereafter from various parts of the Mediterranean Sea (Bariche *et al.*, 2020). We hereby report on the first occurrence of *A. monroviae* in Lebanese waters and the second one for the Levant basin. On 30th June 2019, a single specimen of *A. monroviae* was caught at 5 m depth, off Batroun (34.25°N, 35.66°E), by a shore angler over a sandy bottom with large boulders (Fig. 18E). The photo of the individual was shared via a WhatsApp Messenger fishermen group. The species differs from other surgeonfishes by its brown colouration and yellowish blotch around the spine on the caudal peduncle.

8.2 First record of *Acanthostracion polygonius* Poey, 1876 in the Mediterranean Sea from the Lebanese waters

Ghazi BITAR and Ali BADREDDINE

Acanthostracion Bleeker, 1865 is a genus of Boxfishes (Trunkfishes/ or Cowfishes), represented by four species (Froese & Pauly, 2020): *Acanthostracion guineensis* (Bleeker, 1865), *Acanthostracion notacanthus* (Bleeker, 1863), *Acanthostracion polygonius* Poey, 1876, and *Acanthostracion quadricornis* (Linnaeus, 1758). From a distribution point of view, *A. notacanthus* is limited to the eastern Atlantic around the oceanic islands of St. Helena, Azores and Ascension, while *A. polygonius* and *A. quadricornis* are known from the western Atlantic. *Acanthostracion guineensis* is found along the coast of the Gulf of Guinea (Tyler, 1965). Concerning the Honeycomb cowfish, *A. polygonius* known from the western Atlantic Ocean is distributed along the coast of New Jersey (US) and Bermuda to South America up to Brazil. It is also found throughout the Caribbean and Antilles but not the Gulf of Mexico (Tyler, 1965; Froese & Pauly, 2020). Until now, *A. polygonius* had not been reported from the Mediterranean Sea or the Red Sea (R. Aguilar, pers. comm.). In this note, we present the first record of the Honeycomb cowfish *Acanthostracion polygonius* Poey, 1876 in Lebanese waters, Mediterranean Sea.

One specimen of *A. polygonius* was caught on August 1st 2020 by a recreational longline fisher at a depth of 60 m in Saida, South Lebanon (33.334911°N, 35.213408°E). Subsequently, video/photos of this specimen were shared with us by the fisher for more detailed information.

From a morphological point of view, the collected specimen (Fig. 19) measuring about 450 mm in length,

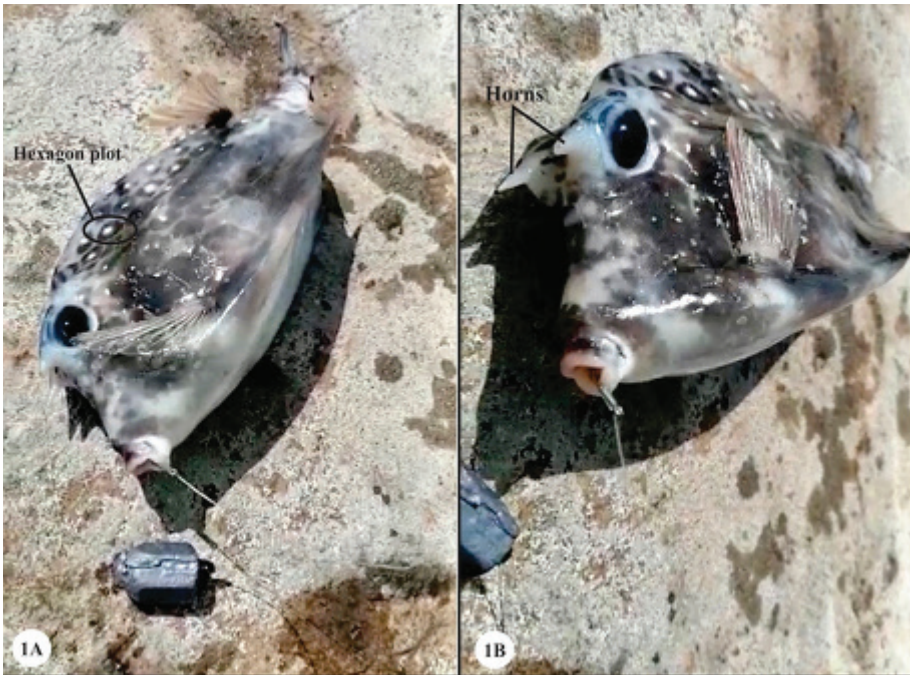

Fig. 19: The collected specimen. 1A. *Acanthostracion polygonius* with its distinguishing hexagonal plot, 1B. *Acanthostracion polygonius* with its distinguishing horns and pectoral fins.

is characterized by its grey to bluish, nearly triangular body, which is covered by distinguishing heavy bold dark hexagonal plots (Fig. 19A). It is also characterized by its sloped face with one pair of tiny horns (Tyler, 1965) in front of the eyes and a small mouth with fleshy lips (Fig. 19B). The specimen is also characterized by the absence of pelvic fins and the rounded form of its caudal fin (Tyler, 1965). All these distinguished morphometric and morphological characters are in agreement with the specimens reported from the western Atlantic (Tyler, 1965) and Brazilian waters (García-Hernández, 2018).

Recently, new records of marine species, fishes (Actinopterygii) in particular, are increasingly reported in the Mediterranean Sea. This is partly related with the involvement of citizen scientists, especially fishers, who prove to be an effective monitoring tool. It is worth noting that the majority of the new species recorded are generally introduced to the Mediterranean from the Indo-Pacific via the Suez Canal (Zenetos, 2017; 2019).

Concerning *Acanthostracion polygonius*, it is known to be commercially important in the aquarium trade (Froese & Pauly, 2020). In the Mediterranean Sea, the introduction of fish species by the aquarium trade has been well-demonstrated during the last decades (Zenetos *et al.*, 2016). Alternatively, the presence of *A. polygonius* in Lebanese waters may be related to ship-mediated transport.

From a conservation point of view, cooperation between researchers and fishers should be supported in view of ensuring long-term monitoring of key marine species in Lebanese waters and anticipating the effect of the invasion by new species.

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