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New Mediterranean Biodiversity Records (October, 2014)

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Abstract

The Collective Article 'New Mediterranean Biodiversity Records' of the Mediterranean Marine Science journal offers the means to publish biodiversity records in the Mediterranean Sea. The current article is divided in two parts, for records of alien and native species respectively. The new records of alien species include: the red alga *Asparagopsis taxiformis* (Crete and Lakonikos Gulf, Greece); the red alga *Grateloupia turuturu* (along the Israeli Mediterranean shore); the mantis shrimp *Clorida albolitura* (Gulf of Antalya, Turkey); the mud crab *Dyspanopeus sayi* (Mar Piccolo of Taranto, Ionian Sea); the blue crab *Callinectes sapidus* (Chios Island, Greece); the isopod *Paracerceis sculpta* (northern Aegean Sea, Greece); the sea urchin *Diadema setosum* (Gökova Bay, Turkey); the molluscs *Smaragdia souverbiana*, *Murex forskoehlii*, *Fusinus verrucosus*, *Circenita callipyga*, and *Aplysia dactylomela* (Syria); the cephalaspidean mollusc *Haminoea cyanomarginata* (Baia di Puolo, Massa Lubrense, Campania, southern Italy); the topmouth gudgeon *Pseudorasbora parva* (Civitavecchia, Tyrrhenian Sea); the fangtooth moray *Enchelycore anatina*

(Plemmirio marine reserve, Sicily); the silver-cheeked toadfish *Lagocephalus sceleratus* (Saros Bay, Turkey; and Ibiza channel, Spain); the Indo-Pacific ascidian *Herdmania momus* in Kastelorizo Island (Greece); and the foraminiferal *Clavulina multicamerata* (Saronikos Gulf, Greece). The record of *L. sceleratus* in Spain consists the deepest (350-400m depth) record of the species in the Mediterranean Sea. The new records of native species include: first record of the ctenophore *Cestum veneris* in Turkish marine waters; the presence of *Holothuria tubulosa* and *Holothuria polii* in the Bay of Igoumenitsa (Greece); the first recorded sighting of the bull ray *Pteromylaeus bovinus* in Maltese waters; and a new record of the fish *Lobotes surinamensis* from Maliakos Gulf.

Introduction

To gain a better understanding of the functioning of marine ecosystems and effectively manage them in an era of global change and cumulative anthropogenic pressures, there is a need for good spatio-temporal knowledge of the region's biota at the relevant scales. Although the state of knowledge of marine biota at the taxonomic level (i.e. regional species lists) is relatively high for the Mediterranean in most regions and for most eukaryotic groups, in comparison to most other seas (Coll *et al*., 2010), accurate information about the geographical distribution of marine species is scant (Levin *et al*., 2014). Furthermore, the high rates of new introductions of alien species and the continuous expansion of their range (Katsanevakis *et al*., 2013a) require continuous efforts for monitoring and reporting their occurrence. Such information is vital to assess the impacts of alien species and their role in the ongoing changes of biodiversity patterns in the Mediterranean Sea (Katsanevakis *et al*., 2014).

Collecting detailed biodiversity data and mapping spatial patterns of marine biodiversity across large spatial scales is challenging, and usually requires extensive and expensive sampling. Often, such information remains in the grey literature and thus is largely unavailable to the scientific community. The *Mediterranean Marine Science* journal, recognizing the importance of archiving records of species found in the Mediterranean Sea, offers the means to publish biodiversity records through its Collective Article 'New Mediterranean Biodiversity Records'. Submissions to the Collective Article are peer-reviewed by at least one reviewer and the editor, and the contributors of records are co-authors, their names appearing in alphabetical order. The present article is divided into two main sections, the first for non-native and cryptogenic species, and the second for native species. The contributing authors are also cited at the beginning of the sub-section corresponding to their record.

Biodiversity Records

1. Non-native and cryptogenic species

1.1. First record of the red alga *Asparagopsis taxiformis* (Delile) Trevisan de Saint-Léon from Crete Island and the Lakonikos Gulf (Greece)

By D. Poursanidis and K. Tsiamis

Asparagopsis taxiformis (Delile) Trevisan de Saint-Léon (referring to the morphospecies complex *sensu lato* as pantropic - Andreakis *et al*., 2009) is included in the list of the 100 "Worst Invasives in the Mediterranean Sea" (Streftaris & Zenetos, 2006), exhibiting invasive behaviour in many regions, including the Greek seas (Tsiamis *et al*., 2010, 2013).

A. taxiformis was first reported from Greece in 2003 from Rhodes Island (Tsiamis, 2012), and during the last decade a rapid expansion has been recorded along the Greek coasts - the species being reported from the Ionian and the North Aegean Seas, the Cyclades and the Dodecanesos complex (Tsiamis, 2012; Fig. 1). Up to date, no information is available on its distribution in the Cretan Sea, and the nearby Lakonikos Gulf (SE Peloponnesus).

After a thorough investigation of the coastal area in the north of Heraklion County, in front of the Natural History Museum of Crete in May 2014, an area close to the port of Heraklion (35.342429°, 25.127565°), an established population of *A. taxiformis* was recorded and photographed (Fig. 2) by means of free diving. More than 50 individuals (thalli) were counted in the investigated area (300 m^2) at 2 m depth. Thalli were attached mainly to the edges of the rocky substratum, accompanied by the brown algae, *Dictyota* spp. and *Cystoseira* spp., the green algae *Ulva* spp., as well as by the alien crab *Percnon gibbesi* (H. Milne Edwards, 1853). A few thalli of *A. taxiformis* were also detected in Elafonisos (35.26922°N, 23.54055°E), Western Crete (Fig. 1), in April 2013. Plants were growing on rocks at 1 m depth, among luxuriant *Cystoseira*

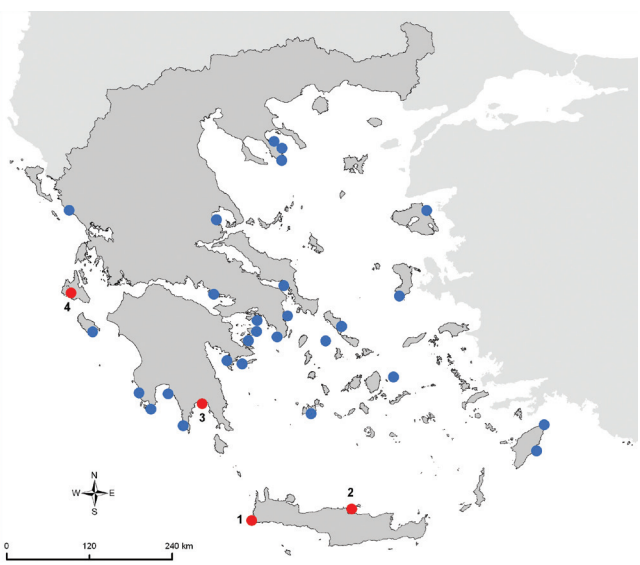

Fig. 1: *Asparagopsis taxiformis* distribution range along the Greek coasts. Blue dots denote published records based on Tsiamis (2012), while red dots denote the new regional findings (1 - Elafonisi, 2 - Heraklion, 3 – Gytheio, 4 - Kefallonia).

Fig. 2*: Asparagopsis taxiformis* among brown macroalgae in Heraklion, Crete Island (photo by D. Poursanidis).

spp. populations. A single thallus was found at Gytheio (36.75450°N, 22.57275°E, Lakonikos Gulf, SE Peloponnesus) in May 2013, growing on rocky substratum at 0.5 m depth, among dense *Ellisolandia elongata* (J. Ellis *&* Solander) K.R. Hind *&* G.W. Saunders populations (Fig. 1). Lastly, specimens have been spotted in Argostoli, Kefallonia, in 1 m depth on rocky substrate.

Finally, it should be noted that at least two cryptic taxa of different origin coexist under the name of *A. taxiformis* in the Mediterranean Sea: one of Atlantic origin, known in the Mediterranean from the early 19th century, and one of Indo-Pacific origin that corresponds to a recent introduction in the Mediterranean Sea (Andreakis *et al.,* 2009). On the basis of recent records, the Greek populations probably belong to the invasive Indo-Pacific strain (Tsiamis, 2012).

1.2. First record of *Grateloupia turuturu* Yamada (Halymeniales, Rhodophyta) in the Eastern Mediterranean Sea

By R. Hoffman

The genus *Grateloupia* C. Agardh, with over 90 species currently accepted taxonomically is the largest in the family Halymeniaceae. It is highly distributed in the Indian, Pacific and Atlantic oceans; however, some species are also found in the Western and Central Mediterranean Sea as well as the Adriatic Sea (Guiry & Guiry, 2014). Six of them are regarded as non-native species having arrived in the Mediterranean through aquaculture (Hoffman, 2013).

During a continuous algal survey conducted along the Israeli Mediterranean shore, twenty five gametophytic and tetrasporophytic specimens of *Grateloupia turuturu* Yamada (Fig. 3) were collected exclusively at Zikim Beach (31.61248°N, 34.50388°E), near the border with the Gaza Strip, in late winters of 2013 and 2014. Most of them were found scattered in the algal drift washed ashore and one was found attached to kurkar conglomerate rock at 1.5 m depth. Zenetos *et al.* (2010) indicate that this is the first record of the Genus *Grateloupia* from the Levant Mediterranean Sea.

Morphological and cellular features of samples examined are in agreement with those published by Figueroa *et al*. (2007) and Verlaque *et al*. (2005). The thallus is mostly composed of several elongate blades (Fig. 3) up to 16 cm long, rising from a discoidal holdfast ~5 mm in diameter; stipe 5-13 mm long; blade brownish-red or crimson, soft and slippery (gelatinous) in texture, strongly adherent to paper, 0.6-3 cm wide and 120-220 µm thick; blade of tetrasporophyte mostly undivided, with frequent marginal proliferations, tapering towards the apex; gametophyte composed of undivided blades, broadly expanded from the base and irregularly lobed at the apex, with cleft margins. Structure multiaxial, thallus consisting of a cellular cortex and a very loose filamentous medulla (Fig. 4); cortex 20-40 µm thick, composed of 3-4 layers of small pigmented and rounded cells decreasing progressively in size towards the thallus surface; medulla transparent, 80-140 µm thick. Cystocarps spherical, 150-200 µm in diameter, located inside the medulla and scattered mostly in the middle part of the blade. Trasporangia are divided cruciately, 29-35 µm long and 18-26 µm wide, scattered over the blade, arising from the cortical cells.

Fig. 3: Tetrasporophyte specimen of *Grateloupia turuturu*. Notice the proliferation of some blades and the greenish coloration, which is due to a few moments of preservation in alcohol.

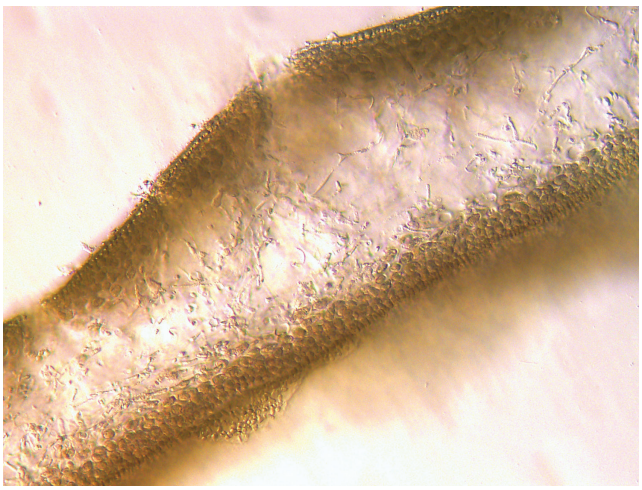

Fig. 4: Transverse-section of gametophyte blade showing compact thin cortex and the loose filamentous medulla containing a cystocarp that has already released all carpospores (scale bar = 100µm).

Grateloupia turuturu is reported for the first time in the Eastern Mediterranean Sea. The species spread to the Western Mediterranean Sea through oyster aquaculture; however, as there are no oyster farms along the Israeli coast, it might have arrived in the Eastern Mediterranean through shipping.

1.3. A new record of the Indo-West Pacific mantis shrimp, *Clorida albolitura* Ahyong & Naiyanetr, 2000 (Stomatopoda, Squillidae) in the Gulf of Antalya, Turkey

By B. A. Balci and M.R. Özen

Clorida albolitura Ahyong & Naiyanetr, 2000 (Fig. 5), is a member of the Squillidae family. The native distribution area of *C. albolitura* is Taiwan, North-east Australia, West Indian Ocean and Madagascar. The presence of this species in the Red Sea is unclear. *C. albolitura* was recorded for the first time on the Ashdod coast of Israel, eastern Mediterranean (Levantine Sea) (Ahyong and Galil, 2006), and subsequently in the Gulf of Iskenderun, Turkey (Galil *et al.*, 2009).

The specimen reported herein was caught during a bottom trawl operation carried out on 31 January 2014. The operation was conducted with R/V "Akdeniz Su" of the Akdeniz University Fisheries Faculty, Antalya-Turkey. The trawl operation occurred between 36.60448°N, 31.69847°E and 36.81583°N, 31.04722°E, at 25-30 m depths, approximately two miles offshore in the Gulf of Antalya. The specimen was photographed and preserved in a formalin solution. Species identification was made using the key given by Ahyong and Naiyanetr (2000) and Ahyong (2001). The preserved specimen was labelled and added to the Akdeniz University Fisheries Faculty Marine Museum (Nr. 140).

The effects of the lessepsian crustacean *C. albolitura* on the marine ecosystem and on fisheries are still unclear. However, another west-indopacific alien stomatopod (*E. massavensis*) that is more abundant and has expanded in the eastern Mediterranean (Gökoğlu & Oray, 1997; Ahyong & Galil, 2006) causes problems to fishing gears and fishermen, who have to spend more time on cleaning their gears (Gökoğlu & Oray, 1997). *C. albolitura* is even smaller than *E. massavensis* (Ahyong & Galil, 2006) and has no commercial use. Like *E. massavensis*, *C. albolitura* might also negatively affect the ecosystem and fishing activities in the area.

Fig. 5: *Clorida albolitura*, caught in the Gulf of Antalya.

The present record, 1000-1500 km far from the previous ones, is the third record of this species in the Mediterranean Sea. It seems that the species has adapted to the Mediterranean ecosystem and its distribution area is expanding northward and westward.

1.4. On the occurrence of the mud crab *Dyspanopeus sayi* (Smith, 1869) in the central Mediterranean (Ionian Sea)

By M. Pastore, M. Belmonte and E. Prato

Dyspanopeus sayi (Smith, 1869) is a marine decapod species indigenous to the Atlantic coast of North America. It is considered an alien species for the Mediterranean (Galil *et al.,* 2002) and was collected for the first time in the lagoon of Venice and in the Po River Delta (western Adriatic Sea) (Froglia & Speranza, 1993; Florio *et al*., 2008).

D. sayi have been collected by hand, on mussel culture (*Mytilus galloprovincialis* Lamk.) from Mar Piccolo of Taranto in the Ionian sea, central Mediterranean (40.475959°N, 17.26456°E). A total of 14 specimens were recorded in September 2011 (11 individuals) and May 2012 (3 ovigerous females). Males had sizes ranging from 18.3 to 24.5 mm (CW) and from 13.7 to 18.1 (CL) with a weight ranging from 2.05 to 5.04 g, smaller than specimens reported for Alfacs Bay (26.3 mm CW) (Schubart *et al*., 2012) (Fig. 6A). Females were smaller than males with a range of 15.9 to 21.0 mm (CW) and 12.5 to 16.3 mm (CL), and a weight of 1.4 – 2.6 g.

The ovigerous females showed eggs in an advanced stage of development. They have been kept in an aquari-

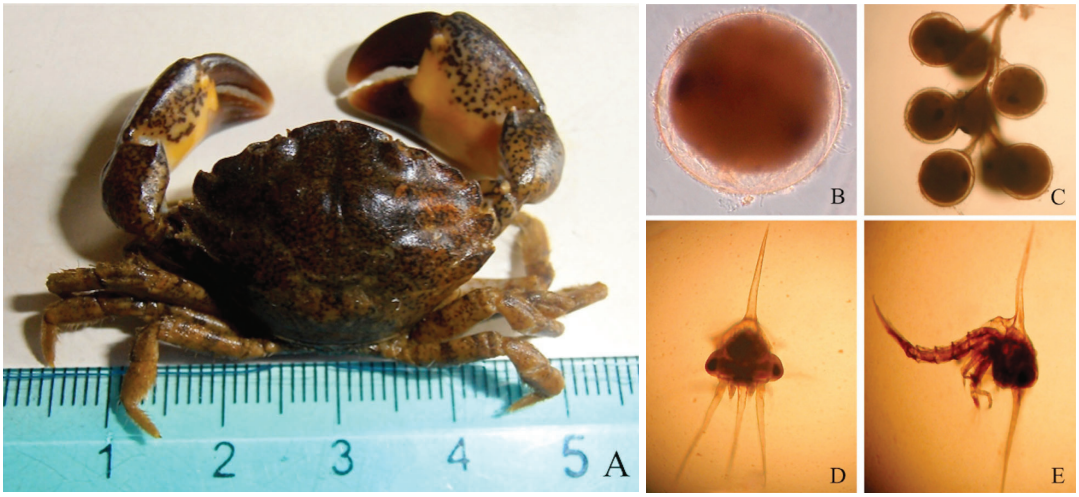

***Fig. 6*:** Male adult of *Dyspanopeus sayi* (A); eggs (B; C); first zoea: frontal (D) and lateral view (E).

um with well-aerated filtered seawater at a salinity of 36‰ and temperature of 18±2°C until hatching. The eggs, were linked by thin mucus, like bunches; the diameter were measured with an ocular micrometer and showed an average diameter of 259 ± 15 microns (Fig. 6B,C).

The brood size was determined by counting the number of eggs for each female. The main information on morphological characteristics of first zoea is reported in Table 1. No larva reached the second zoea stage.

The measurement characters of first zoea agreed with previous descriptions of larvae morphology from North American populations (Chamberlain, 1961; Clark, 2007) (Table 1; Fig. 6D, E), while few differences with previous studies were observed as regards the setation pattern.

The introduction of this species in Mar Piccolo waters is probably due to two main factors: shipping and the presence of mussel farms. Mar Piccolo is an important area for the region's economy due to the presence of mussel culture. *Dyspanopeus sayi* were found on longlines of commercial mussel farms and this is not surprising, since this species actively feeds on adult sized bivalves such as *Mytilus galloprovicialis*. In the Adriatic Sea, it has exterminated prey species such as *Mytilus galloprovincialis*, *Mytilaster lineatus*, *Ostrea edulis* and *Crassostrea gigas* in a very small locally restricted area (Mizzan, 1998). Although the data suggest a slow spread

Table 1. Morphological characteristics of first zoea. Abbreviations: RDL, rostrodorsal length; CL, carapace length; CW, carapace width; RL, rostral spine; AL, antenna length (protopod process); s, setae.

Feature	Present study central Mediterraneam	Chamberlain (1961) Chesapeake (E Atlantic)	Clark (2007) Florida (E Atlantic)	Schubart (2012) W Mediterranean
RDL (µm)	1259±59	1200	–	1863.5±12.4
CL (µm)	352±18	–	–	514.4±31.9
CW (µm)	374±24	–	–	612.5±31.5
RL (µm)	509±42	–	–	786.0±12.2
AL (µm)	561±43	–	–	832.3±50.0
Maxillula				
coxal end (s)	7	6	7	7
basial end (s)	5	5	5	5
endopod (s)	1+6	1+6	1+6	1+6
Maxilla				
coxal end (s)	4+4	5–8	4+4	4+4
basial end (s)	5+3-4	5–9	5+4	5+4
endopod (s)	3+5	7–8	3+5	3+5
First maxilliped				
coxa (s)	1	1	1	1
basis (s)	2+2+3+3	2+2+3+3	2+2+3+3	2+2+3+3
endopod (s)	2,2,1,2,5	2-3,2,1,1-2,4-5	3,2,1,2,5	3,2,1,2,5
exopod (s)	4	4	4	4
Second maxilliped				
coxa (s)	0	0	0	0
basis (s)	4	4	4	4
endopod (s)	1,1,5	1,1,4-5	1,1,5	1,1,5
exopod (s)	4	4	4	4

of this invasive species northwards to the Central Mediterranean Sea, it is necessary to maintain high vigilance in order to prevent its spread to the mussel-culture of Mar Piccolo and, thus, further investigation and good collaboration with local fisherman is required.

1.5. First record of *Callinectes sapidus* Rathbun, 1896 (Crustacea, Brachyura) from Chios Island, Eastern Aegean Sea

By M. Thessalou-Legaki and P. Pafilis

The blue crab (*Callinectes sapidus*) is a successful invasive species. Native to the waters of the western Atlantic Ocean (in both Americas), it was introduced to Europe and Japan and has been repeatedly reported from the Mediterranean Sea (Zenetos *et al.*, 2010). Although some specimens have been found in the western part of the Mediterranean Basin, the majority of the records come from the eastern side. Recent reports on the species in areas adjacent to Greece include localities along the eastern coastline of the Adriatic (Croatia and Albania) and the Italian coasts (Stasolla & Innocenti, 2014 and references therein). Towards the East, the species occurs all around Turkey: the Levantine, Aegean and Marmara Seas, with additional records from the Dardanelles and the Turkish Black Sea (Yaglioglu *et al*., 2014).

The first observations from Greek waters date from the mid 20th century. The actual distribution of the species includes the Greek Ionian and Aegean coastlines. On the continental coast of the Northern Aegean, especially in the inner Thermaikos Gulf, the species supports a recently increased fishery production, and can even be found in freshwater ecosystems. The insular documented range of the species is rather restricted. The presence of the blue crab has been confirmed only for Crete, Rhodes and Corfu (ELNAIS, 2014). Here we enlarge the island list by adding the island of Chios.

During a field survey on 19/8/2013, we encountered several individuals of *C. sapidus* in a small canal at the location Marmaro (Kato Kardamyla Bay, North Chios – 38.54073^{o}N, 26.11214^{o}E). The canal (maximum width 1.5 m) carries fresh water from Kardamyla hills and flows into the bay, mixing its waters with sea along the last meters of its length. We detected 12 individuals of *C. sapidus* at a distance of 50 m from the sea and easily captured a male individual with using fishing net at a depth of 0.4 m (Fig. 7). The bottom of the canal was muddy and the waters rather eutrophic, supporting dense algal vegetation. The specimen had only one claw. It measured 65.67 mm in carapace length and 168.43 mm in carapace width (including lateral spines). Its total weight was 230.55 g.

The present finding indicates that the species invades any favourable site regardless of its dimensions, but it is suggested that its presence on the island is restricted due to estuarine habitat preference: a recent survey for marine alien species with fourteen stations around Chios at depths

Fig 7: *Callinectes sapidus* male from Kato Kardamyla Bay, northern Chios.

0-10 m did not reveal its occurrence (Katsanevakis & Tsiamis, 2009). Because of the scarcity and the small size of the estuarine habitats on the Aegean islands, and the unknown impact of such an invader on their fragile biota, a detailed record of the species on the islands is urgently needed.

1.6. First record of the isopod *Paracerceis sculpta* in the Aegean Sea: established populations in north-Aegean marinas

By K. Fryganiotis and Ch. Ch. Chintiroglou

Paracerceis sculpta (Holmes, 1904) is a widely distributed sphaeromatid isopod (Espinosa-Pérez & Hendrickx, 2002). In the Mediterranean, it has been reported for the first time from the Lake of Tunis (Regiz, 1978); a few years later, from the Venice Lagoon (Forniz & Sconfietti, 1983) and Sicily (Forniz & Maggiore, 1985), and nowadays the species is rather common near the Strait of Gibraltar (Castelló and Carballo, 2001). In the eastern Mediterranean *P. sculpta* has been assigned the status of an established alien species (Zenetos *et al*., 2010) without, however, information on either its distribution or population characteristics being available.

The present study constitutes the first report on *P. sculpta* in the Aegean Sea, providing also basal population characteristics (sex ratio, biometry) for its north-sector populations, to assess whether the species has been actually established in the area.

Populations of *P. sculpta* were found at 14 stations randomly located in two float marinas of the north Aegean Sea (Fig. 8), one in the Thermaikos Gulf (40.52272^{o}N, 22.85386^{o} E) and the other in Toroneos Gulf (40.13212^{o}N,

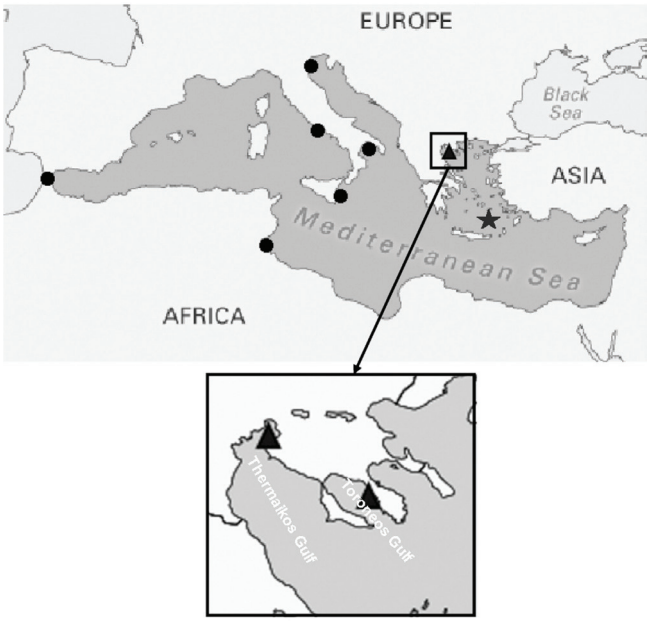

Fig. 8: Distribution of *Paracerceis sculpta* in the Mediterranean Sea (circles) and location of North Aegean records (triangles). In the East Mediterranean (star), the symbol does not correspond to the exact location.

23.74361°E). Eighty-four dip-net samples were collected from the artificial substrata, in summer (2009 & 2010) and 584 *P. sculpta* (Fig. 9) individuals were identified (453 and 131 from Thermaikos and Toroneos, respectively; 100% frequency of occurrence in both marinas), suggesting flourishing populations. In Thermaikos, 62.91% of the collected individuals were males, and in Toroneos 58.78%. Eight (8) individuals collected from Thermaikos were identified as juveniles, suggesting the presence of a self-maintaining, reproducing population in the area. Males were much larger than females, whereas mean length by sex was rather similar between the two studied marinas (Table 2). It seems, therefore, that the species' populations are well established in the surveyed, north Aegean, area.

Paracerceis sculpta is a relatively resistant organism (Espinosa-Pérez & Hendrickx, 2002), able to live in a wide temperature (13 to 29.8°C) and salinity range (28 to 46 psu). The species can live in both soft and hard substrata from very shallow waters to about 200 m depth. This broad ecological requirement seems to provide an extra reason of its wide global distribution.

In all cases, the occurrence of *P. sculpta* refers to ports, as a member of the fouling hard-substrata com-

Table 2. Frequency of occurrence (F), number of individuals (N) and mean length of each sex of *Paracerceis sculpta* at two locations (Thermaikos and Toroneos Gulf).

	Thermaikos Gulf			Toroneos Gulf		
	F (%)	**N**	**Mean Length (mm)**	**F (%)**	**N**	**Mean Length (mm)**
males	100	285	5,91±0,71	100	77	5,62±0,27
females	100	160	2,63±0,29	100	54	2,69±0,28
juveniles	100	8	1,47±0,15	-	-	-

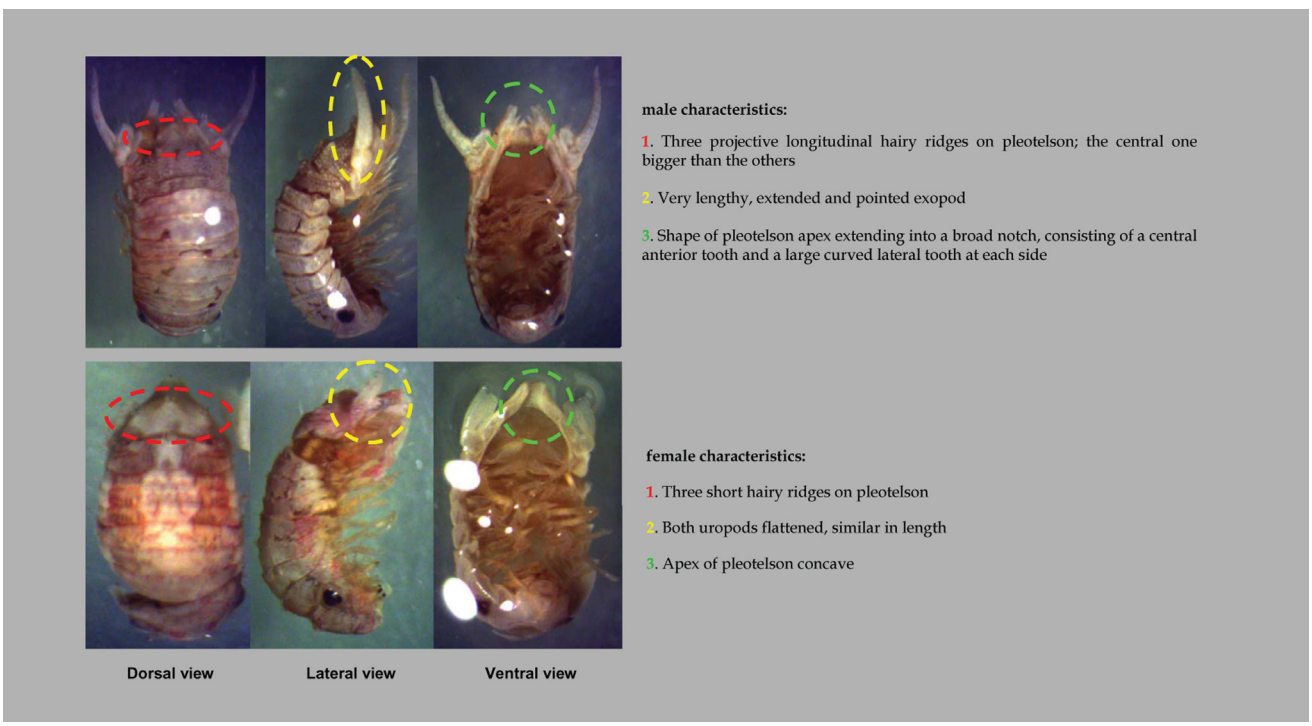

Fig. 9: Morphological characteristics of *Paracerceis sculpta* (Holmes, 1904).

munity. This signifies the importance of commercial and touristic navigation for its wide-scale distribution, amplifying the hypothesis that the species has been transported mainly by hull fouling (Castelló & Carballo, 2001; Hewitt & Cambell, 2001). In the present study all individuals were collected from small ports used mainly for touristic (most yachts coming from northwest Europe) and local fisheries purposes. Accordingly, the small-scale distribution of *P. sculpta* appears to be due to recreational boating. Considering the seascape of the Aegean Sea, i.e. extensive coastline, many islands and hundreds of closely related small marinas, as well as the expansion of cruising, further spread of the species may be predicted.

1.7. First record of the alien sea urchin *Diadema setosum* (Leske, 1778) (Echinodermata: Echinoidea: Diadematidae) from the Aegean Sea

By S. Yapici, Ü. Acar and A. Türker

The echinoderm *Diadema setosum* (Leske, 1778) is widely distributed in the Indo-West-Pacific Ocean, from the Red Sea and the east coast of Africa, to Japan and Australia (James and Pearse, 1971). The first record of *D. setosum* in the Mediterranean Sea was reported in 2006 off Kaş Peninsula, south-western coast of Turkey (Yokes & Galil, 2006), while its occurrence was ascertained along the Lebanese coastline in 2009 (Nader & Indary, 2011) and later, in 2010, at Antakya, south-eastern coast of Turkey (Turan *et al.,* 2011). The species commonly prefers coralligenous formations, reefs and rocks, and occasionally may form large aggregations (Yokes & Galil, 2006; Nader & Indary, 2011). This cryptic and nocturnal species is omnivorous and feeds mainly on detritus (James & Pearse, 1971).

On 13 April and 28 July 2014, two specimens of *D. setosum* were observed by SCUBA divers in Gökova Bay (36.91972ºN, 28.17111ºE and 37.04166ºN, 28.25666ºE), Turkey at a depth of 4 m. The specimens were photographed and video recorded on rock covered by algae patches and sandy bottom. The videos were uploaded as an electronic reference and evidence for SeaLifeBase (Palomares & Pauly, 2014) and can be viewed online at http://www.youtube.com/watch?v= jvVc0bEkGMY and http://www.youtube.com/watch?v=bpF4mTvQAWg. The identification of the species was based on the description provided by Coppard & Campbell (2006), using high quality photos and video recording.

The specimens had the five evident white iridophores on the mid-lines of the interambulacral and an orange ring around the periproctal cone, which are characteristic of the species (Coppard & Campbell, 2006) (Fig. 10). One of the observed specimens had only dark spines but no gray ones, while the other specimen had both dark and gray spines. This could be due to water depth, limited light penetration and technical limitations.

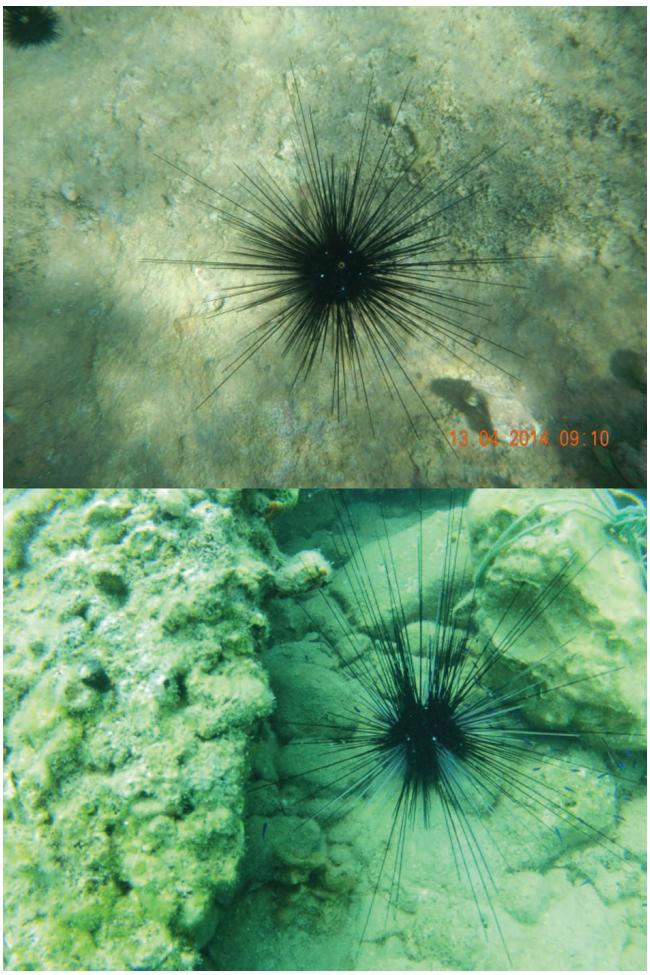

Fig. 10: Specimens of *Diadema setosum* from the Aegean Sea (photo by A. Türker).

The species may aggregate dramatically forming massive colonies and its larvae can travel via water circulation, and then potentially invade western and/or northern sectors of the Mediterranean Sea. It is harmful for swimmers, fishermen and divers due to its venom released from the long and slender spines (Yokes & Galil, 2006; Nader & Indary, 2011).

In conclusion, the occurrence of *D. setosum* is expected in the Aegean Sea, a marine area affected by the introduction of non-native species due to lessepsian migration, introductions by humans, water circulation patterns and present-day sea warming. Due to these potential reasons, distribution and colonization features of *D. setosum* should be investigated and monitored urgently.

1.8. New records of alien Mollusca in Syria

By I. Ammar

Mollusca is the phylum with most alien species in European Seas (Katsanevakis *et al*., 2013b), particularly so in the eastern Mediterranean (Nunes *et al.*, 2014). However, relevant literature is scarce for some countries such as Syria (Ammar, 2004; Bitar *et al*., 2003).

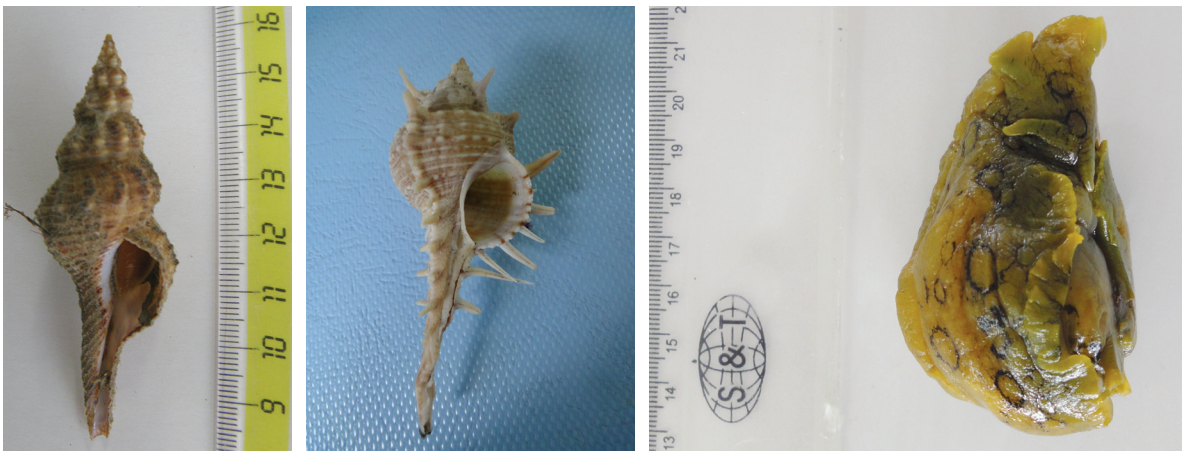

Fig. 11: *Fusinus verrucosus* (left), *Murex forskoehlii* (middle), and *Aplysia dactylomela* (right) from Syria.

Table 3. New records of alien molluscs in Syria.

Species	area	substratum	depth	abundance
Smaragdia souverbiana (Montrouzier, 1863)	Al- Bassit /2003	mud - gravel	5 -35 m	few
Murex forskoehlii (Röding, 1798)	Lattakia/ 2005	mud-sand	>30m	few
Fusinus verrucosus (Gmelin, 1791)	Lattakia/ 2004	mud	70 m	common
Circenita callipyga (Born, 1778)	Lattakia&Tartous/ 2003	mud	25 m	rare
Aplysia dactylomela(Rang, 1828)	Lattakia/2013	Rocky	littoral	2 ind

The present work reports on the finding of four alien molluscs, which are widespread in the Levantine basin, yet have not been recorded from the Syrian coast to the present day (Fig. 11). They were collected between 2003 and 2005, at various depths, either by hand or with a benthic sampling device (grab, dredge) within the framework of various research projects. To these, we should add the spotted sea hare *Aplysia dactylomela* (Fig. 11), a species of Atlantic origin whose pathway of introduction in the Mediterranean is debatable (Valdes *et al*., 2013). Table 3 lists the species with details on their first finding location, substratum and depth. Nomenclature follows WoRMS Editorial Board (2014).

1.9. Going north: *Haminoea cyanomarginata* (Gastropoda: Cephalaspidea: Haminoeidae) reaches Massa Lubrense (Naples, southern Italy)

By F. Russo

Haminoea cyanomarginata Heller & Thompson, 1983 is a cephalaspidean mollusc native to the Red Sea, from where it is only known from the original description. Its morphological identification is fairly easy, having a mantle bordered with purple or dark-blue and scattered vivid-yellow blotches all over. Since 2001, it spread to the Mediterranean Sea, where it soon established viable populations in Greece (2001: Zenetos *et al.*, 2009), Turkey (2002: Çinar *et al.*, 2011), Malta (2006: Sciberras & Schembri, 2007) and Italy (2007: Crocetta, 2012). Despite the absence of records from the far eastern Mediterranean, it has presumably reached its new distributional area through the Suez Canal.

During a field survey at Baia di Puolo (Massa Lubrense, Campania, southern Italy - 40.62666ºN, 14.34194ºE) on 08/09/2014, around thirty specimens of *H. cyanomarginata* (both solitary and in couples, showing trailing behaviour) were noted at 24-26 m of depth, mostly on a sandy bottom with filamentous algae (Fig. 12). A few days after, on 15/09/2014, two specimens were noted at 10 m depth. On 28/09/2014, around ten scattered specimens were noted at a depth of 12 to 24 m in the same area, predominantly on a rocky bottom.

So far, *H. cyanomarginata* was only known in Italy from the Calabrian shores of the Messina Strait area and

Fig. 12: *Haminoea cyanomarginata* from Massa Lubrense (Campania, southern Italy).

several sites all around Sicily (review in Stasolla *et al.*, 2014). Therefore, the present records considerably expand its known Italian distribution by >200 km to the north, up to Campania. Secondary natural dispersal from the previously known areas seems to be the most probable pathway, additionally suggesting an overlooked presence all around the southern Tyrrhenian shores.

1.10. The presence of *Pseudorasbora parva* (Temminck & Schlegel, 1846) in marine waters: a record in the Tyrrhenian Sea

By F. Tiralongo and V. Gnisci

Pseudorasbora parva, commonly known as topmouth gudgeon or stone moroko, is a small cyprinid species native to the East Asia (Japan, China, Korea and River Amur catchment). Common size range is between 5 and 8 cm (TL). It is a freshwater fish that occurs in rivers, lakes and well vegetated small channels. This species feeds mainly on zooplankton. In Europe, *P. parva* was recorded for the first time in Romania, 1960-1961 (Banarescu, 1999), where it was accidentally introduced. After this first introduction, this invasive species is now present in many European and Asian countries. In some countries, such as France and Albania, however, the species was intentionally introduced as food for predatory fisheries reared in hatcheries. In Italy, the first records come from 1988 (Sala & Spampanato, 1991) and concern mainly the basin of the Po river and Tuscany (Vanni *et al.*, 1997). *P. parva* is considered a very invasive species mainly because of its life history characteristics (reproductive behaviour, early sexual maturity, ability to spawn on any smooth surfaced object) (Gozlan *et al.*, 2002). This species is furthermore considered an alimentary competitor for some populations of European indigenous species. In summer 2014 (June 24), during hand-net sampling in the Tyrrhenian Sea (Civitavecchia), we caught this freshwater fish in marine waters (42.14720 N, 11.74397 E), near the mouth of a small stream (42.14740 N, 11.74451 E). A school of fishes were swimming close to the sea surface, at about 0.5 m depth, over a *Cymodocea nodosa* bed. Salinity and temperature was 33.8 and 25.1°C in marine waters and 0.6 and 21.3°C in stream waters, respectively. Several small specimens were collected in both shallow marine waters (Fig. 13a) and the stream (Fig. 13b) and preserved in alcohol. The bed of the small stream was covered by remains of seagrasses. In this work we recorded for the first time the presence of the species (Fig. 14) in marine waters. However, although in the past this species was considered to be a strictly stenohaline freshwater fish, it has been demonstrated that this cyprinid can tolerate the low salinity level of brackish waters and is probably able to disperse into new river systems via low salinity coastal regions (Scott *et al.*, 2007). In conclusion, this invasive species could also spread from a river to another river through coastal areas, especially in those areas where there are several rivers along short coastal stretches, as in the case of this study (the nearest small stream was at only 281 m from the stream indicated in Fig.13b, i.e. 42.14987 N, 11.74297 E). However, further studies are necessary to better assess the ability of this species to tolerate marine waters (in terms of time and salinity) close to river mouths and potential movements along these coastlines.

Fig. 13: A: marine waters where the species was sampled (close to the mouth of the small stream); B: the small stream between the remains of seagrasses (photo by F. Tiralongo)

Fig. 14: A specimen of *Pseudorasbora parva* sampled in marine waters. Total length: 31 mm (photo by F. Tiralongo).

1.11 New record of the fangtooth moray *Enchelycore anatina* (Lowe, 1838) from Sicilian waters (Central Mediterranean Sea)

By P. Consoli and G. Mazza

During May 2012 a specimen of the subtropical eastern Atlantic fangtooth moray *Enchelycore anatina* (Lowe, 1839) was photographed (only the head was visible; Fig. 15) during an underwater visual census aimed to evaluate the effects of protection measures on fish assemblage in the Plemmirio marine reserve (37.01103°N, 15.30629°E; Fig. 16). The habitat of the sighting, a rocky bottom rich in crevices at about 5 m depth, was covered mainly by a sciaphilous assemblage of benthic macroalgae and sessile animals. Species identification was easy since important diagnostic features were clearly visible: pointed head and arched jaw with many conical and sharp fanglike teeth.

E. anatina was first recorded in 1980 in Israeli Mediterranean waters (Ben-Tuvia and Golani, 1984). Since then, more than 20 specimens have been caught by fishermen or recorded by scuba divers at many locations of the eastern and central Mediterranean (Kapiris *et al*., 2014 and references therein). In Italy, the first sighting of this species took place in the Northern Ionian Sea (Otranto Channel, southeastern Apulia) on August 2011 (Guidetti *et al*., 2012). The present record of *E. anatina* can be considered as the second published report from Italian territorial waters (the first for Sicilian waters) and actually represents a further step westwards, and also the most western record in the Mediterranean Sea. In the new alien species list compiled by Zenetos *et al*. (2012), 26 species, including *E. anatina*, of tropical Atlantic origin have been removed because their presence can be explained by a natural range expansion via Gibraltar rather than as human mediated introductions. In spite of this, it remains unknown why this species, entered via Gibraltar, was firstly reported from the eastern Mediterranean and is expanding westwards, with no records until now from the western sector of the basin (Guidetti *et al*., 2012). Considering that the fangtooth moray is an active predator and can, thus, potentially heavily affect native communities, it is important to keep monitoring its presence and geographical expansion in the Mediterranean basin. Continuous monitoring and in situ observations are extremely important for understanding ecosystem functioning and changes in fish community structure. In this context, marine protected areas, generally located far from human disturbance, may represent an observation network for the study of biodiversity changes (Consoli *et al*., 2013).

Fig. 15: Frontal view of the Eastern Mediterranean specimen of *Enchelycore anatina* (Lowe, 1839) (photo by Gianfranco Mazza).

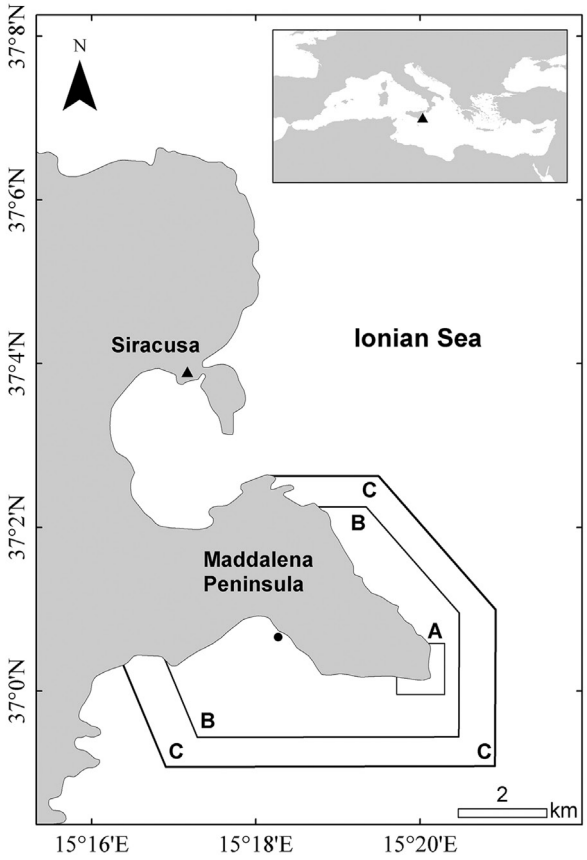

Fig. 16: Map reporting the present record of the fangtooth moray (black dot) within the Plemmirio Marine Protected Area (Southern Ionian Sea, Sicily, Italy).

1.12 Further range expansion of the silver-cheeked toadfish, *Lagocephalus sceleratus* (Teleostei: Tetraodontidae), in Turkish waters

By S. Tunçer and U. Önal

The silver-cheeked toadfish, *Lagocephalus sceleratus* (Gmelin, 1789), belongs to the family Tetraodontidae and is native to the Indo-West Pacific Ocean. It generally inhabits tropical and subtropical reefs and is found between 18-100 m (May & Maxwell, 1986). The silver-cheeked toadfish is now considered as a Lessepsian migrant after its first reported record from the Mediterranean in 2004 (Filiz & Er, 2004). While the adults of *L. sceleratus* have been found to reside in seagrass, *Posidonia oceanica* beds, earlier life stages inhabit sandy bot-

toms in the Mediterranean Sea (Kalogirou *et al*., 2012). The presence and range expansion of the silver-cheeked toadfish in the Mediterranean Sea have received significant attention due to the presence of tetrodotoxin, a potent neurotoxin that paralyses the nervous and respiratory system. In addition, *L. sceleratus* has potential negative effects on local fish and squid populations due to its ability of rapid colonization (Kalogirou, 2013) and is, therefore, considered as one of the most invasive species in the Mediterranean Sea (Katsanevakis *et al*., in press).

In this study, we report the existence of *L. sceleratus* in Saros Bay (40.36833ºN, 26.32111ºE) located in north-western Turkey, northern Aegean Sea. A single specimen of *L. sceleratus* was captured by a commercial fisherman, using a lift net, a traditional method for catching pelagic fish such as mullets, sardines as well as pelagic squids from shallow waters (Fig. 17). The specimen was deposited at Çanakkale Onsekiz Mart University, Piri Reis Marine Museum, #PRM-PIS 2014-0075); it had a total length of 55.6 cm and a total weight of 2067 g. The fork and standard lengths were 52.70 and 50.10 cm, respectively. Other meristic characteristics of the obtained specimen were as follows: head length 22.8% of standard length; prepectoral length 28.8%, predorsal length 62.2% and preanal length 64.7% of standard length. Eye diameters were 2.99/1.95 cm corresponding to 26.2/17.1 of the head length. The body is elongated and laterally compressed. There are no scales on the body but small spinules on the dorsal and ventral areas with limited distribution. There are no pelvic fins and the relatively small-sized, narrow dorsal and anal fins are located posteriorly. Dorsal and anal fin ray counts were 12 and 9, respectively. The caudal fin is small-medium sized, dark-grey coloured and lunate in shape. The caudal and pectoral fin ray counts were 35 and 20, respectively. The dorsal side is brownish-grey with scattered dark brown/black dots and the ventral side is white. Laterally, a prominent, wide silver band behind the pectoral fins separates the dorsal and ventral sides.

The present record and earlier studies during the last decade establish the presence of *L. sceleratus* in the Turkish waters of the Mediterranean from the Bay of Antalya in the south to Saros Bay, Çanakkale in the north. This rapid expansion of *L. sceleratus* in the eastern Mediterranean has raised ecological and social concerns not only in the coastal areas of Turkey but also in other countries such as Israel, Greece, Cyprus, Egypt and Lebanon. Despite bans on fishing and sale of this species, reports exist on sales of *L. sceleratus* on local fish markets. In north-western Turkey in particular, where only two *L. sceleratus* specimens have been reported so far, the threat of silver-cheeked toadfish is exacerbated due to low levels of awareness of both fishermen and consumers, and due to the weak control of fish markets. Therefore, immediate actions should be considered by governmental organizations to raise public awareness on the potential threats posed by this species.

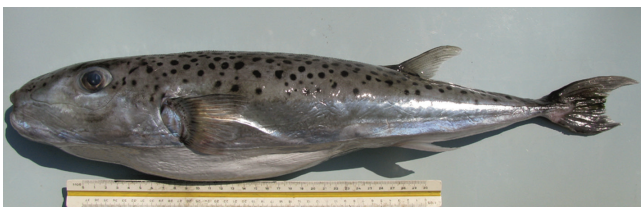

Fig. 17: The obtained specimen of *Lagocephalus sceleratus* from Saroz Bay, Northern Aegean Sea, north-western Turkey.

1.13. First record of *Lagocephalus sceleratus* (Gmelin, 1789) (Actinopterygii, Tetraodontidae) on the Mediterranean Spanish coast

By A. Izquierdo-Muñoz and D. Izquierdo-Gomez

On the 31th of July 2014, an individual of the Indo-Pacific species *Lagocephalus sceleratus* (Fig. 18) was captured by deep bottom trawling in the North-western Mediterranean over muddy bottoms in the Ibiza channel (approx. 39.06666ºN, 0.31666ºE) between 350-400m depth. The individual showed a total length of 580 mm weighting 2.295 kg, and the morphometric measures are shown in Table 4; after dissection, the ovaries showed fully developed ovules.

Fig. 18*:* Specimen of *Lagocephalus sceleratus* from Denia (Alicante, Western Mediterranean).

Table 4: Morphometric measurements of the *Lagocephalus sceleratus* captured in Denia (Western Mediterranean), July 2014. (*) caudal fin was incomplete.

Measurements	mm	Proportion %
Total Length (TL)	580	-
Fork Length (FL)	557	-
Standard Length (SL)	505	-
Body Depth (BD)	120	21,7 TL
Head Length (HL)	125	21,6 TL
Eye diameter (ED)	30/14	24 HL
Caudal peduncle Length (CpL)	125	21,6 TL
Preorbital Length (PoL)	78	62,4 HL
Prepectoral Length (PpL)	155	26,7 TL
Predorsal Length (PdL)	345	59,5 TL
Preanal Length (PaL)	327	56,4 TL
Dorsal finrays	12	-
Anal finrays	11	-
Pectoral finrays	20	-
Caudal finrays	*Half=10	-

Within the boundaries of the Mediterranean Sea, *L. sceleratus* was first recorded in February 2003 (Filiz & Er, 2004) in Gökova Bay (Turkey). Subsequently, the species spread quickly along the Levantine Basin to the Adriatic Sea. Near the transition zone, between the Eastern and Western Mediterranean basins, Ben Soussi *et al*. (2014) reported two individuals caught in September 2011 and 2012 in the region of Bizerte (Tunisia). Nowadays, *L. sceleratus* and *Fistularia commersonii* are the only lessepsian fish species reported in Spanish Mediterranean waters, both demonstrating to be very fast colonizers as only eleven (present work) and seven years were needed to cross the Western Mediterranean after their first citation in the Eastern basin. Consistently, both are considered two of the 100 "worst invasives" in the Mediterranean (Streftaris & Zenetos, 2006), and there are concerns about potential impacts on local fisheries resources (Kalogirou, 2013). Tetrodotoxine is present in the liver of *L. sceleratus* and special attention should be paid in order to prevent intoxication and protect public health (Bentur *et al.*, 2008).

This is the deepest catch of *L. sceleratus* in the Mediterranean, as so far the species has not been captured deeper than 70-100 m. Baranes and Golani (1993) reported that *L. sceleratus* has been caught at a depth of up to 250m in the Gulf of Eilat where water temperature is around 21-22°C. In this study, the water temperature where the individual was captured ranged between 12-13°C indicating that the species can tolerate colder temperatures than those in the areas of normal distribution.

Summarizing, this work provides new information on the distribution of the hazardous lessepsian migrant *L. sceleratus* in the Western Mediterranean Sea. From now on, special attention should be paid for early detection of new individuals in the Western Mediterranean.

1.14 First record of the Indo-Pacific ascidian *Herdmania momus* (Savigny, 1816) in Greek waters

By V. Gerovasileiou and Y. Issaris

Seventeen non-indigenous ascidians have been recorded in the Mediterranean Sea up to date (Zenetos *et al*., 2012). Among them, the solitary Indo-Pacific species *Herdmania momus* (Savigny, 1816) is considered established in the south-eastern Mediterranean basin, where it has been recorded in Egypt, Israel, Lebanon, Cyprus and Turkey (Shenkar & Loya, 2008 and references therein). More recently, a considerable westwards expansion of its distribution range was documented by Evans *et al.* (2013), who reported it from Malta. In most cases, the species was found attached on artificial hard substrates, such as concrete wharves and shipwrecks (Shenkar & Loya, 2008), but recent studies showed successful establishment on both shallow and lower sublittotal rocky surfaces (Çinar *et al*., 2006; Gewing *et al*., 2014).

This is the first record of *H. momus* from Greek territorial waters. It was observed during SCUBA diving in the semi-submerged "Blue Cave" in Kastelorizo Island (36.12571°N, 29.57889°E - WGS84) in October 2010. More than 10 individuals were observed (Fig. 19) on a sciaphilic assemblage of the semi-dark cave dominated by encrusting calcareous rhodophytes, sponges, and scleractinians. The species has been previously reported as a cave-dweller from other eastern Mediterranean lo-

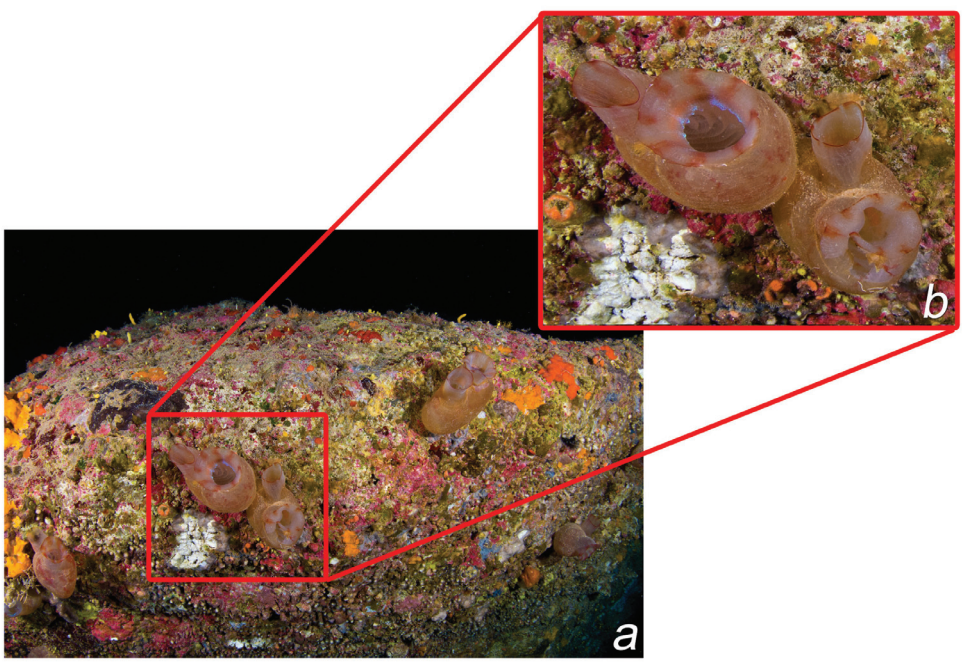

Fig. 19*:* a) A general view of the site with the ascidian *H. momus* in the semi-submerged "Blue cave" of Kastelorizo Island, and b) close-up view of the ascidians in the same photo.

cations (Gewing *et al*., 2014). Another alien species of Indo-Pacific origin was also recorded in "Blue Cave"; the red squirrelfish *Sargocentron rubrum*.

1.15 *Clavulina* cf. *C. multicamerata* in Saronikos Gulf, Greece

By M. Triantaphyllou and M. Dimiza

Clavulina multicamerata Chapman is a tropical Indo-Pacific benthic foraminiferal species. It bears an elongated coarsely arenaceous test with an initial trihedral section with sharp periphery, later becoming cylindrical. The chambers are uniform in size and separated by distinct, depressed sutures and a rounded aperture with a tooth on the last formed chamber. Hottinger *et al*. (1993) reported its presence in the gulf of Eilat, Red Sea, whereas recently Meriç *et al*. (2008) have described *Clavulina* cf. *C. multicamerata* from the eastern Mediterranean (south-western coast of Turkey).

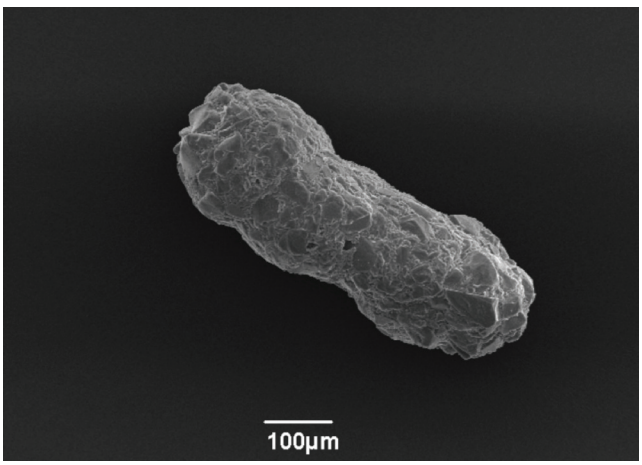

Fig. 20: *Clavulina* cf. *C. multicamerata* from Saronikos Gulf.

We report the very rare presence of *Clavulina* cf. *C. multicamerata* in station S8 from Saronikos gulf (37.88333°N, 23.53333°E), sampled on January 2012 at the depth of 90 m, in the framework the EU FP7 PERSEUS: Policy-Oriented Marine Environmental Research for the Southern European Seas. Sediments at the sampling site are characterized by relatively high mud percentages and high occurrence of *Bolivina* spp. and *Nonion fabum*. Several other opportunistic foraminiferal species such as *Cassidulina carinata*, *Rectuvigerina phlegeri, Bulimina elongta*, with epiphytic *Rosalina* spp., and *Elphidium* spp. are also relatively abundant, indicating a moderately stressed environment.

2. Native species

2.1 The first record of *Cestum veneris* Lesueur, 1813 from Turkish marine waters

By N. Gülşahin, A.N.Tarkan and C. Turan

The ctenophore *Cestum veneris* Lesueur, 1813 is a comb jelly of the family Cestidae (Harbison *et al*., 1978). This species has an Atlantic, Pacific and Mediterranean distribution (Madin, 1991). The present paper reports on the first record of *C. veneris* from Turkish coastal waters.

C. veneris was firstly seen in Akbük, Gökova Bay, Southern Aegean Sea, Turkey (37.01510°N, 28.11988°E) on 25 September 2011 (Fig. 21). Five individuals were observed at 2 m depth by scuba diving in the sampling area (Fig. 22). Surface temperature at this station was 22.8°C. It is thought that this species aggregated because of the prevailing currents, which, coming from the open sea, enter Gökova Bay from the north, turn and exit along the mid-line of the bay.

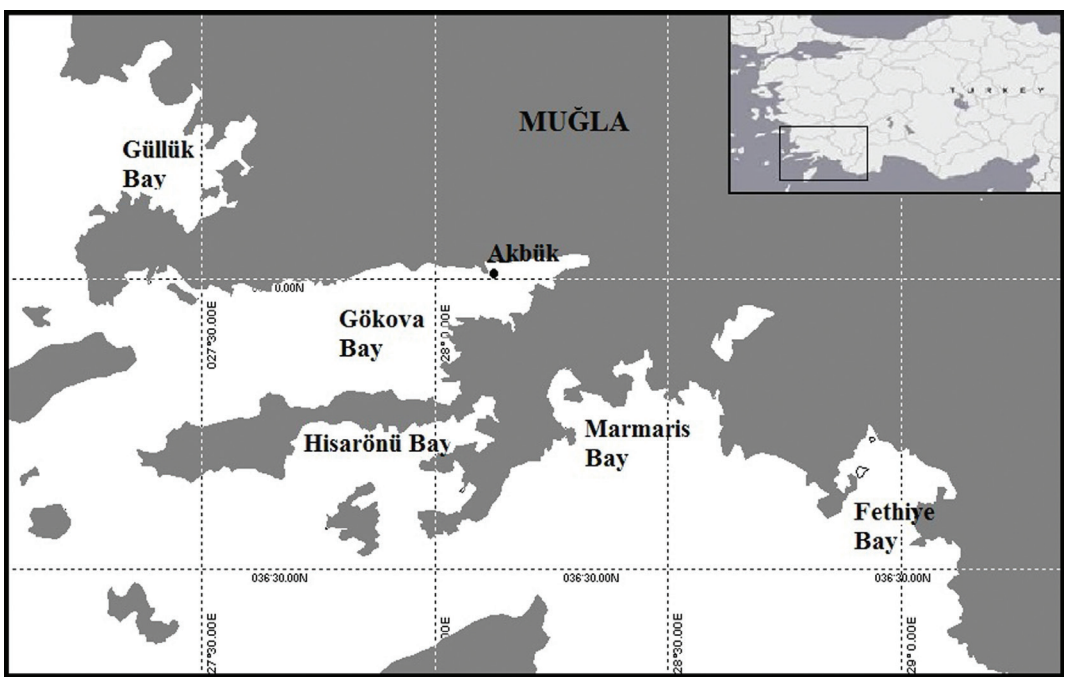

Fig. 21: Sampling location of *C. veneris* (37.01510°N, 28.11988°E).

Fig. 22: *Cestum veneris* from Gökova Bay. (photo by Anıl Gülşahin and Halit Filiz).

There are high numbers of small structured bays along the Muğla coastline that are suitable aggregation sites for gelatinous organisms. Furthermore, high temperature values are also suitable for this species. On the other hand, the lower trophic level of the Mediterranean limits the distribution of ctenophores.

Recently, Mediterranean jelly plankton that are warm water species of Ctenophora and Scyphozoa, began to invade the Black Sea (Shiganova *et al*., 2012). The process of penetration and expansion of gelatinous species to Turkish waters from the Mediterranean may be due to rising water temperature and thus temperature-related changing conditions (Turan *et al*., 2009).

The present study reports on the first record of *Cestum veneris* from Turkish coastal waters, which seems to be expanding from the western European waters.

2.2 The presence of *Holothuria tubulosa* and *Holothuria polii* in the Bay of Igoumenitsa (NW Greece)

By E. Konstantinidis, C. Perdikaris and B. Sicuro

Sea cucumbers are very common and well-known in Greece, being locally utilized as bait in long-line fisheries. Significant volumes are occasionally exported from Northern Greece to the Asian markets. However, their collection is practically uncontrolled and recently a few small processing units have been licensed. Although their distribution has not been reported extensively in the scientific literature, *H. tubulosa* has been recorded in the North and Central Aegean Sea (Koukouras & Sinis, 1981; Koukouras *et al*., 2007), in nine islands of the Dodekanesos (Vafeiadou *et al.,* 2010; Antoniadou & Vafidis, 2011), in the Pagasitikos Gulf (Kazanidis *et al.,* 2010), and both *H. tubulosa* and *H. polii* in the Saronikos Gulf (Pancucci-Papadopoulou, 1996). Similarly, both species have been recorded from the Ionian coasts of Greece (Kaspiris & Tortonese, 1982; Pancucci & Zenetos, 1989; Pancucci-Papadopoulou, 1996) and unidentified *Holothuria* spp. specimens are sporadically collected as bait during the summer period on the eastern coast of Lefkada Island (C. Perdikaris, pers. observ.). The current report aims to expand the published distribution range of *H. tubulosa* and *H. polii* to the northern part of the Ionian coast of Greece.

Sampling was carried out by scuba diving in the southern part of the Bay of Igoumenitsa (NW Greece) (39.49269°N, 20.23916°E), during March 2014. Seawater temperature was 16°C and the dissolved oxygen level was 7.6 mg l^{-1}. Both species were identified based on the morphology of the papillae on the body surface. *H. tubulosa* (Fig. 23a) is covered by numerous dark long conical papillae. The terminal tentacles are short and flattened. *H. polii* (Fig. 23b) is black coloured with characteristically white immaculate papillae. Population densities were visually estimated to approximately one individual per m^2 for both species. Specimens were collected in proximity to a sea bass/sea bream cage farm, at depths from 6 to 15 meters. The seabed was primarily sandy, mixed with mud and significant amounts of

Fig. 23: Adult (a) *Holothuria tubulosa* and (b) *Holothuria polii* specimens from the Bay of Igoumenitsa (NW Greece).

Mytilus galloprovincialis empty shells. The length of *H. tubulosa* specimens ranged from 23 to 26 cm and their weight ranged from 400 to 420 g, while *H. polii* specimens were smaller in size (12.5 to 14 cm and 150 to 180 g). The maximum size of both species was very close to those reported from Turkey (Gonzales-Wangüemert *et al.,* 2014).

Given that sea cucumbers are detritivorous invertebrates that feed on benthic microorganisms and organic particles (e.g. detritus and associated microorganisms), it is clear that both species take benefit from the organically-rich bottom and accordingly from the nutrient inputs of the nearby farm, which is operating since the early 1980s. These results partially confirm the observed increased density of *H. tubulosa* by Vafeiadou *et al*. (2010) in the vicinity of fish farms in the Dodecanese, suggesting a relationship of mutual benefit.

Concerning the commercial exploitation of sea cucumbers in the Mediterranean Sea, they have been sporadically consumed in some coastal villages of Apulia (southern Italy) since World War II (Sicuro & Levine, 2011). In Turkey, which is the leading Mediterranean country in sea cucumber trade, harvesting from the wild started in 1996 in the central part of the Eastern Aegean coast and it was mainly focused on *H. tubulosa* and *H. polii*. They are exported to the Asian (mainly Chinese) markets frozen, dried and salted reaching 555 tons in 2011 (Gonzáles-Wangüemert *et al.,* 2014), where they are considered a gastronomic delicacy (Sicuro *et al*., 2012). Given the high export-market demand for sea cucumbers mainly for consumption (the body wall that is edible, accounts for about 56% of the total weight), cosmetics, pharmaceutical and aquarium use, the opportunities for culture of these species should be thoroughly evaluated. Despite the progress made mainly on *Holothuria scabra* and *Apostichopus japonicus* culture in other countries/regions (e.g. in China, Japan, Vietnam, Canada and the Red Sea/Persian gulf; Lovatelli *et al*., 2004; Al Rashdi *et al*., 2012), culture efforts in the Mediterranean are currently limited to a research project in Greece that is focused on experimental bottom cage integrated culture for bioremediation (nutrient reduction) beneath sea bass and sea bream cage farms (University of Thessaly, project No 185363 funded by the EU Operational Programme 'Fisheries 2007-2013'). Accordingly, full control of the reproductive, settling and feeding cycle with appropriate hatchery and rearing techniques (e.g. integrated culture techniques and/or capture-based aquaculture) is necessary for successful culture of Mediterranean sea cucumber species.

2.3 First recorded sighting of the bull ray, *Pteromylaeus bovinus* (Myliobatidae), in Maltese waters

By G. Nowell and L. Koehler

The Maltese Islands are located in the central Mediterranean Sea, 93 km south if Sicily and 290 km away from the north African cost of Tunisia. The total landmass of the Maltese Islands is about 320 km² and the coastline presents several bays and lagoons. Golden Bay, also known as Ir Ramla tal-Mixquqa, is located on the North Western side of the Island. The depth of the water from the water's edge to the mouth of the bay gradually reaches a maximum depth of 15 meters. An investigation on data for Elasmobranch species in Maltese waters by Schembri *et al*. (2003) stated that 38 species of Elasmobranches have been proven to exist in the surrounding waters; for the bull ray, however, the status was set as unconfirmed. The distribution described for the species ranges from the Eastern Atlantic, off the coast of Portugal, and Morocco and Angola, including the Canary Islands (Schwartz, 2005) and Madeira (Schwartz, 2005; Wirtz *et al*., 2008), from Saldanha Bay to Natal in South Africa to the waters of southern Mozambique (Compagno *et al*., 1989). In the Mediterranean Sea, the occurrence of *P. bovinus* was reported from Tunisian waters (Merji & Soussi, 2004; Capape, 1977) as well as in the Adriatic (Dulčić *et al*., 2008) and Tyrrhenian Sea (Feretti *et al*., 2005). Observations by Quignard & Capape (1975) state a higher abundance of bull rays in the southern areas of Tunisia. More recent studies in Tunisian waters showed that *P. bovinus* migrated northwards and entered brackish areas such as the Lagoon of Bizerte (Neifar *et al*., 1999; El Kamel *et al*., 2009) and Tunis Southern Lagoon (Mejri & Soussi, 2004).

The sighting of three *Pteromylaeus bovinus* (Geoffroy Saint-Hilaire, 1817) at Golden Bay, Malta, occurred at 8.39 am on Thursday 18th August 2011 during a snorkel activity organized by Sharklab-Malta. The depth at which the rays were seen was approximately 11 metres. Digital images were captured of two of the rays – the third one was not captured (Fig. 24).

According to the IUCN Red list Conservation Status of marine Fishes of the Mediterranean Sea, *Pteromylaeus bovinus* belongs to the native species, but remains categorized as "data deficient" for the regional and global red list (Abdul Malak *et al*., 2011). The population trend is

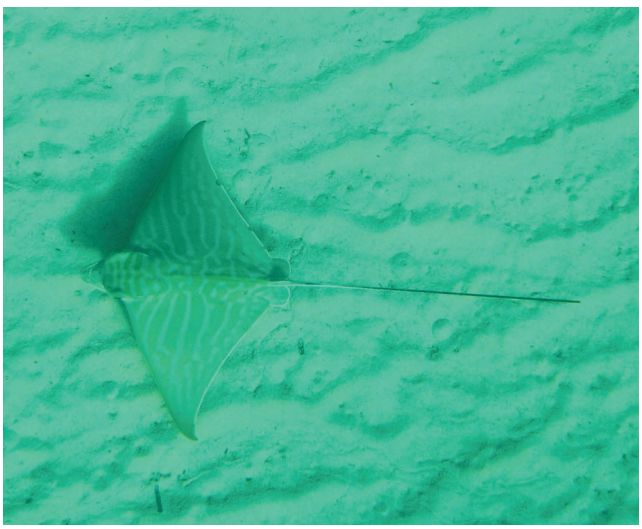

Fig. 24: Image of the first *Pteromylaeus bovinus* (Geoffroy Saint-Hilaire, 1817) observed at Golden Bay, Malta on 18th August 2011.

considered as unknown (Wintner, 2006). For the Mediterranean Sea, there is evidence of the occurrence of the bull ray at several locations, including Tunisia, where in some the places it is even considered as frequent (e.g. Capapé, 1977; Meriji & Soussi, 2004).

Pteromylaeus bovinus (Geoffroy Saint-Hilaire, 1817) has not yet, to our knowledge, been confirmed as being present in Maltese territorial waters. The observation of *Pteromylaeus bovinus* (Geoffroy Saint-Hilaire, 1817) in coastal Maltese waters is valuable as it adds to the list of confirmed species present, helps to identify an existing habitat of this species, and requires further research to ensure the possibility of a regular presence.

2.4 New record of *Lobotes surinamensis* (Bloch, 1790) from Maliakos Gulf (Central Aegean Sea, Greece)

By S. Kavadas and P. Bekas

A new record of *Lobotes surinamensis* (Bloch, 1790) in the Maliakos Gulf is reported (Fig. 25). The species is generally distributed in tropical and subtropical waters (Whitehead *et al*., 1986). It was caught by a professional fisherman on 11 September 2014 close to the Sperchios river estuary (38.86110°N, 22.57932°E) using static nets with a mesh size of 32mm at approximately 2 m depth. The total length was 409 mm and the total weight 1497 gr. According to the local fishermen, the species was unknown to them. A previous finding of a specimen caught by hand-line at a depth of 5 m in Chalkida (38.46643°N, 23.59213°E) was acknowledged to the authors in October 2011. Nowadays, the presence of *Lobotes surinamensis* has been sporadically reported in several areas in Greece (Athos, Thermaikos Gulf, Dodecanesos islands) (Papaconstantinou, 2014). In the Mediterranean Sea, the species has been reported in the southern part of Spain, eastern part of Morocco, Gulf of Lion, Tyrrhenian Sea, Sicily, Central Adriatic Sea and Israel (Froese & Pauly, 2014). The collected specimen is stored in a freezer at the Laboratory of the Institute of Marine Biological Resources and Inland Waters of HCMR.

Fig. 25: The specimen of *Lobotes surinamensis* from Maliakos Gulf (Central Aegean Sea, Greece).

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