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New Mediterranean Marine biodiversity records (December, 2013)

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New Mediterranean Marine biodiversity records (December, 2013)

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Abstract

Based on recent biodiversity studies carried out in different parts of the Mediterranean, the following 19 species are included as new records on the floral or faunal lists of the relevant ecosystems: the green algae *Penicillus capitatus* (Maltese waters); the nemertean *Amphiporus allucens* (Iberian Peninsula, Spain); the salp *Salpa maxima* (Syria); the opistobranchs *Felimida britoi* and *Berghia coerulescens* (Aegean Sea, Greece); the dusky shark *Carcharhinus obscurus* (central-west Mediterranean and Ionian Sea, Italy); Randall's threadfin bream *Nemipterus randalli*, the broadbanded cardinalfish *Apogon fasciatus* and the goby *Gobius kolombatovici* (Aegean Sea, Turkey); the reticulated leatherjack *Stephanolepis diaspros* and the halacarid *Agaue chevreuxi* (Sea of Marmara, Turkey); the slimy liagora *Ganonema farinosum*, the yellowstripe barracuda *Sphyraena chrysotaenia*, the rayed pearl oyster *Pinctada imbricata radiata* and the Persian conch *Conomurex persicus* (south-eastern Kriti, Greece); the blenny *Microlipophrys dalmatinus* and the bastard grunt *Pomadasys incisus* (Ionian Sea, Italy); the brown shrimp *Farfantepenaeus aztecus* (north-eastern Levant, Turkey); the blue-crab *Callinectes sapidus* (Corfu, Ionian Sea, Greece). In addition, the findings of the following rare species improve currently available biogeographical knowledge: the oceanic pufferfish *Lagocephalus lagocephalus* (Malta); the yellow sea chub *Kyphosus incisor* (Almuñécar coast of Spain); the basking shark *Cetorhinus maximus* and the shortfin mako *Isurus oxyrinchus* (north-eastern Levant, Turkey).

Introduction

As part of its policy, Mediterranean Marine Science publishes a collective article, twice a year, with new records of marine species in the Mediterranean Sea and/or information on the spatial distribution of already known species of particular interest. The contributors are co-authors in this collective article, their names appearing in alphabetical order. Reports of plant and animal species are presented in each section according to the order of submission. The contributing authors are cited at the beginning of each record.

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1. Plants

1.1. First record of *Penicillus capitatus* from Maltese waters

By A. Deidun, E. Lanfranco and P. Vella

Within the Mediterranean, populations of *Penicillus capitatus* are considered to belong to a distinct form – the *mediterraneus* one. The species has to date been recorded by Gallardo *et al*. (1993) from vast areas of the basin, including north-western areas such as the Gulf of Lyon and the Spanish coastline, Tunisia, the Adriatic, the Tyrrhenian coastline of Italy and Sicily, Greece and even the coastlines in the Levantine Sea. The species was also recorded in 2007 from the Antalyan coast (Turkey – Turna *et al*., 2010). However, the species was never formally recorded from the Maltese Islands nor Libya. The type habitat in the Mediterranean for the species is described as being *Posidonia oceanica* matte at depths ranging between 0.5 m and 2.0 m (Boudouresque *et al*., 2006), although it has been recorded at a maximum depth of 15.0 m from the island of Elba (Boudouresque *et al*., 2006).

Penicillus capitatus is a rhizotypic, calcified, paintbrush-shaped green macroalga that is nearly indistinguishable in the field and which is synonymised with *Corallina penicillus*. The species is native to temperate and sub-tropical areas of the Atlantic, including eastern areas of the Caribbean (e.g. Bermuda and Florida) and the north-east Atlantic (e.g. Cadiz). The alga is composed of interwoven coenocytic filaments forming a rhizoidal base, a thin, rigid stripe, and a brush-like capitulum of free and dichotomously branched filaments (Friedman *et al*., 1977), the so-called "*espera*" stage. The *"espera"* stage is very rare in the Atlantic populations (Friedmann *et al*., 1977) while it is commonly found throughout the year in the Mediterranean Sea (Huve & Huve, 1964; Meinesz, 1972). The capitula of *P. capitatus* support large communities of macrofauna dominated numerically by small Crustaceans, mostly amphipods, tanaidaceans and large harpacticoid copepods (Stoner, 1985).

Within the Hofra z-Zghira embayment, located along the south-eastern extremity of the island of Malta (35°50'13.03" N, 14°33'40.31" E), a 0.3 km^2 area of shallow seabed (3.0 - 5.0 m), was colonised by *P. capitatus* in the "*espera*" stage (Fig. 1), present at low densities (maximum of 10 stipes/m^2). The same seabed was characterised by superficial coarse sediment and gravel, with finer, muddy sediment a few centimetres below the surface, with accompanying vegetative species including the phanerogam *Cymodocea nodosa* and the green macroalgal species *Dictyopteris polypodiodes*. A second colony of *P. capitatus* was also observed in the adjacent Hofra l-Kbira embayment (35°50'26.84" N, 14°33'52.24" E), on a similar seabed typology, although the spatial extent of this colony was not quantified. One of the two electrical power stations in the Maltese Islands discharges thermal effluent within the Hofra z-Zghira embayment, whilst the two surveyed embayments are in close proximity to intense aquaculture activity (blue-fin tuna pens and sea bream and seabass fish farms).



Fig. 1: A colony of the espera form of *Penicillus capitatus*, reported for the first time from Maltese waters.

2. Animals

2.1. First record of *Amphiporus allucens* (Nemertea: Enopla: Hoplonemertea) from the Iberian Peninsula

By F.Á. Fernández-Álvarez and J.E.F. Alfaya

Although nemertean species are commonly found in benthic environments, publications of this group are scarce in the literature. As a consequence, the original records and descriptions on nemertean species could fall into oblivion for decades or centuries between its original description and the following records and/or re-description (Uz *et al*., 2010; Fernández-Álvarez & Anadón, 2013).

A specimen of *Amphiporus allucens* Bürger, 1895 was collected in a sample of coralline red algae (La Isleta, 36º48'N, 02º03'W, Cabo de Gata National Park, Spain; 12 m depth). The specimen was observed and photographed alive. Observation of internal morphology was made using the squeezing method described by Kirsteuer (1967). Total body length and maximum width were 48 mm and 3.5 mm respectively. The colour along its length was uniform, pinkish cream (Fig. 2a). The nervous system was visible throughout the body surface (Fig. 2a). Intestinal diverticula and the mid-dorsal and lateral vessels were observed by transparency (Figs. 2b and 2c). Blood colour was an intense bright red (Fig. 2b and 2c) and the internal fluid movement was observed throughout the body surface. The head was not demarked from the body. Using the squeezing method it was possible to observe epidermal white dots in the intestinal region (Fig. 2c). The eyes were organized in a double continuous row, counting 35 in total (Fig. 2a and 2b). The last pair of eyes was located just in front of the cerebral ganglia (Figs. 2a and 2b). Only one cephalic

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groove was observed communicating with two conspicuous cerebral sensory organs; brownish yellow in colour and nearly triangular in shape (Figs. 2a and 2b). The cephalic canal was revealed using the squeezing method (Fig. 2b). The rhynchocoel was extended to almost the total body length. Reverted proboscis was approximately as large as total body length and more than 1/3 of body width, and was covered with very prominent papillae in the anterior chamber (Fig. 2d). The bulb region (Fig. 2d) contained central armature consisting of the central stylet and basis and two reserve stylet pouches containing four and five stylets, respectively.

The external morphological characters registered in this work agreed with those mentioned by Wynhoff (1912), who recognized *A. allucens* as a valid species. Although the external morphology is well-known, anatomical studies are necessary to confirm the taxonomic status of this species, as suggested by Gibson & Crandall (1989). This is the first record of *A. allucens* for the Iberian Peninsula and a new addition to the Iberian nemertean fauna. Two previous records come from two Mediterranean localities near Naples (Bürger, 1895; Strand & Sundberg, 2005), and one from the English Channel (Wynhoff, 1912). Although Bürger (1985) has indicated that *A. allucens* is a commonly found species, all the other records were based on only one (Strand & Sundberg, 2005; present study) or two specimens (Wynhoff, 1912).

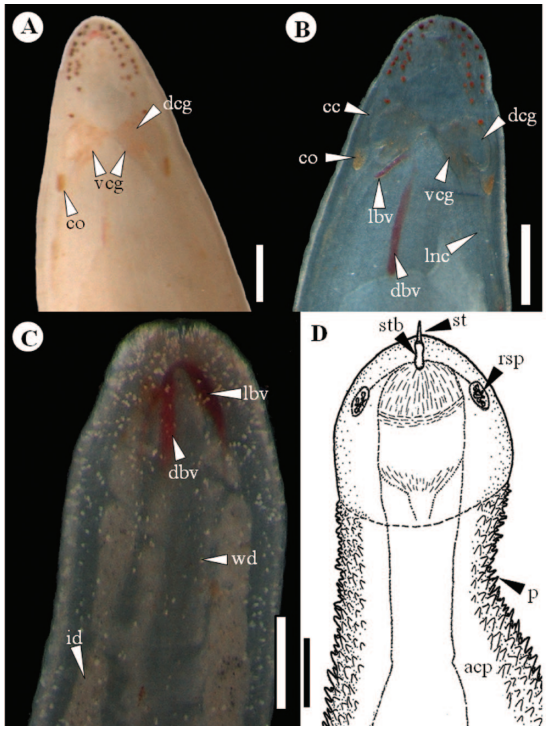


Fig. 2: *Amphiporus allucens* (Bürguer 1895). A. Cephalic region; the cerebral organs (co) and the dorsal (dcg) and ventral cerebral ganglia (vcg) are arrowed, B. Cephalic region by squeezing method, the cerebral canal (cc); blood vessels (dbv = mid dorsal blood vessel; lbv = lateral blood vessel) and lateral nerve cord (lnc) are pointed, C. Posterior intestinal region showing the intestinal diverticula (id) and the epidermal white dots (wd), D. Diagram of the proboscis in everted state, showing the papillae (p) on the anterior proboscis chamber´s (apc) surface; the reserve stylet pouches (rsp), the stylet basis (stb) and the central stylet (st) are pointed. Scale bars: a-c = 2 mm; d = 0.4 mm.

2.2. First record for the Turkish Marmara Sea Fauna: *Agaue chevreuxi* Trouessart, 1889 (Halacaridae: Acari)

By Y.Ö. Boyacı and F. Durucan

The genus *Agaue* Lohmann, 1889 is represented by more than 40 species worldwide, but only three species are known in the Mediterranean Sea. *Agaue* specimens live as endo and epifauna: amongst debris in sediments and macrofauna burrows, algal turf and fronds and colonial organisms (e.g. bryozoans, hydrozoans, barnacles, serpulids) (Bartsch, 2004; 2006). Halacarid specimens were sampled in September 2012, near the beach of Bostancı Coast (Marmara sea, Istanbul) (40° 58' 89″ N, 29° 03' 37″ E). They were collected by hand netting from sublittoral sandy habitats with *Ulva lactuca* at 3-4 m, and later sorted at the laboratory with the aid of a stereo microscope. The sorted specimens were cleared in lactic acid and mounted in glycerin jelly, and then fixed and stored in 80% ethanol.

Four specimens (one male, three nymphs) of *Agaue chevreuxi* Trouessart, 1889 (Fig. 3a, 3b) were identified following the description of André (1946). The species was first described in 1889 from specimens found in "Corsican Moss" *Fucus helminthocorton* (Schwendimann) Tourrette (Trouessart, 1889).

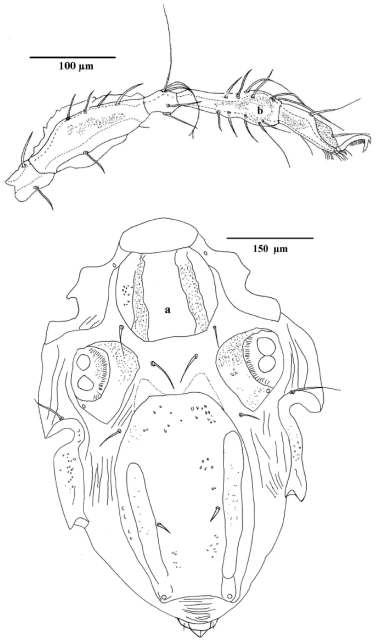


Fig. 3: a) *Agaue chevreuxi*, adult, male, Idiosoma, dorsal; b) *Agaue chevreuxi*, adult, male, leg I.

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2.3. *Lagocephalus lagocephalus* individual caught in Malta 50 years ago

By A. Deidun, B. Zava, J. Saliba and P. Gianguzza

The oceanic puffer (*Lagocephalus lagocephalus*) is a circumglobal species, distributed in tropical and sub-tropical waters of the Atlantic, Pacific and Indian Oceans. Although the species has long been known from the Mediterranean (Dulčić & Pallaoro, 2006), it is infrequently encountered or caught. Saoudi *et al*. (2008) claimed that the species is often collected along the Tunisian coast but, on the contrary, the species is quite rare in Maltese waters and, in fact, the only published record of the oceanic puffer from Maltese waters is that by Lanfranco (1993); Lanfranco (1993) does not, however, specify any details concerning the caught specimens and lists the species as being infrequent in Maltese waters. In addition, Sciberras & Schembri (2007) do not list *L. lagocephalus* in their inventory of confirmed non-indigenous marine species for Maltese waters, which has long been known from around Sicily (Doderlein 1878-79; Bini, 1968) and, within those waters, Zava *et al*. (2005) mention that the number of specimens has been increasing since 1999. Nicolaidou *et al*. (2012) report on the expanding distribution of the species within the Central Mediterranean by listing records for the species along the Calabrian (south Italy) coast between 2007 and 2012.

During an interview with a fishermen, one of us (A. Deidun) came across a preserved (dry) specimen of *L. lagocephalus*, which, according to the anecdotal account, was fished in the mid-1960's, ca. 5 miles off the north-western extremity of the island of Gozo, in the Maltese archipelago (Central Mediterranean) at a depth ranging between 150 m and 200 m, using bottom long-lining and Cory's Shearwater (*Calonectris diomedea*) feathers as lure/bait. The individual had a total and standard length of 575 mm and 455 mm, respectively, with a greatest body depth of 130 mm (Fig. 4). Such a total length falls within the range of the total length values reported by Zava *et al*. (2005) for the nine oceanic puffer species they examined from Sicilian coastal waters, i.e. 480 mm to 659 mm. The head length was 120 mm, whilst the snout length was 45 mm. Since the preserved oceanic puffer specimen was affixed to a wooden board, it could not be weighed.

2.4. First record of *Salpa maxima* Forskål, 1775 (Thaliacea: Salpidae) from the Mediterranean Coast of Lattakia (Syria)

By H. Durgham and S. Ikhtiyar

In 2012, five gelatinous species (*Geryonia proboscidalis, Aequorea forskalea, Phyllorhiza punctata*, *Aequorea globosa* and *Cassiopea andromeda)* were recorded for the first time in Syrian coastal waters, most of them found near the Lattakia Port (Durgham, 2011; Mamish *et al.,* 2012; Siokou *et al.,* 2013).

Two specimens of *Salpa maxima* (Forsskål, 1775) (solitary forms) were caught by hand net very close to the Lattakia Port on 9 and 29 February 2013. The specimens were collected at two monitoring sites (35˚33'07.54" N, 35˚42'17.46" E and 35˚31'42" N, 35˚42'18.9" E) at a depth of 7-8 m. Sea water temperature and salinity at the sampling sites were 15-16°C and 38 respectively. The specimens were transported to the laboratory for further investigation, they were photographed (Fig. 5), fixed in 4% formaldehyde and stored at the zooplankton laboratory, High Institute of Marine Research. The description by Fraser (1947) and Van Soest (1974) was used for their taxonomy: "Solitary forms, 18 cm length; body entirely smooth with shallow longitudinal depressions; not very transparent because of its extreme thickness. All nine body muscles run parallel across the dorsal side".

Salpa maxima is commonly found in the western



Fig. 4: The dry preserved *Lagocephalus lagocephalus* individual caught off the north-west coast of the island of Gozo in the Maltese archipelago circa 50 years ago.

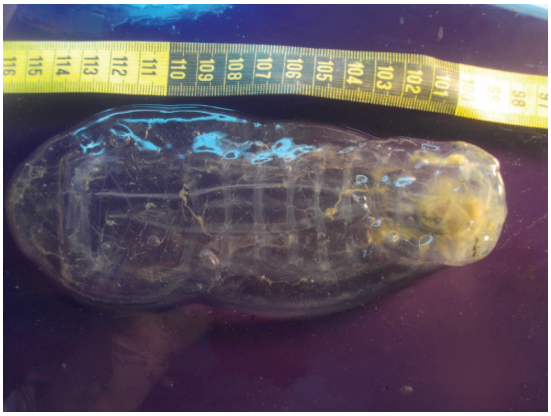


Fig. 5: *Salpa maxima* collected from Lattakia coastal water, near Lattakia Port, Syria on 9 February 2013, from a depth of 8 m (anterior view) (Photo by: H. Durgham).

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Mediterranean Sea since the 1970's (Peinert & Miquel, 1994; Fernandez de Puelles *et al*., 2007). In the eastern Mediterranean Sea, *S. maxima* has been reported from the coastal waters of Egypt (Abdel-Aziz & Aboul-Ezz, 2003) and the north Levantine Sea (Mutlu, 2005). The species was not collected at three sites of the Levantine Sea (south of Kriti and Cyprus) in June 1993 (Weikert & Godeaux, 2008) and its presence is hitherto unknown in other regions of the eastern Mediterranean Sea.

2.5. First record of *Felimida britoi* (Ortea & Perez, 1983) and *Berghia coerulescens* (Laurillard, 1830) (Gastropoda, Opisthobranchia) from the Aegean Sea

By D. Poursanidis and D. Koutsogiannopoulos

The genus *Felimida* Ev. Marcus, 1971 is comprised of 28 species worldwide (Bouchet & Caballer, 2013), 8 of which are known from the Mediterranean Sea (CLEMAM, 2013). The species of this genus, before the molecular phylogeny approach adopted by Johnson & Gosliner (2012), belonged to the bulk genus *Chromodoris* Alder & Hancock, 1855 under the family Chromodorididae Bergh, 1891. *Felimida britoi* has been documented from the western (e.g. Spain: Cervera *et al.,* 2004, the central (e.g. Italy: Cattaneo-Vietti *et al*., 1990) and the eastern Mediterranean Sea (e.g. Lebanon and Israel: Cattaneo-Vietti *et al*., 1990; Crocetta *et al.*, 2013) but records from the Aegean Sea were lacking; Koutsoubas *et al.* (1993) have only listed 3 species for the area [*F. krohni* (Vérany, 1846), *F. luteorosea* (Rapp, 1827) and *F. purpurea* (Risso in Guérin, 1831)].

Felimida britoi (Fig. 6) was found in summer 2010 in Anissaras (Chersonissos, Irakleion, Kriti, 35,3385 N, 25,3844 E). The habitat comprised of medium coarse sand with patches of dense *Posidonia* meadows and big rocks with photophilous vegetation (*Cystoseira* spp.). The specimen was found at 4 meters depth, crawling on the rocky areas, in the shady part. The specimen was collected and is deposited in the Invertebrate collection of the Natural History Museum of Kriti (www.nhmc.uoc.gr) in 96% alcohol (NHMC 52.117).



Fig. 6: *Felimida britoi* (Ortea & Perez, 1983) from Anissaras (Chersonissos, Irakleion, Kriti).

The genus *Berghia* Trinchese, 1877 is composed of 11 species worldwide (Gofas, 2013), 4 of which are known from the Mediterranean Sea (CLEMAM, 2013). *Berghia coerulescens* has been documented from the western (e.g. Spain: Cervera *et al.,* 2004) and the central Mediterranean Sea (e.g. Monaco: Cattaneo-Vietti *et al*., 1990), including the Adriatic Sea (Lipej *et al*., 2008).

Berghia coerulescens (Fig. 7) was found in the southern Evvoikos Gulf, in the area of Plaka (Dilesi, Voiotia, 38,3506 N, 23,6661 E) during spring 2013 by the second author. The specimen has not been collected but many underwater photographs have been taken, using a CANON G10 compact camera with the associated underwater housing.



Fig. 7: *Berghia coerulescens* (Laurillard, 1830) from Plaka (Dilesi, Voiotia).

2.6. On the occurrence of the dusky shark *Carcharhinus obscurus* in Calabria (Central Mediterranean, Southern Italy)

By E. Sperone, F. Coppola, G. Giglio, V. Circosta, P. Micarelli, S. Tripepi and L.J.V. Compagno

The dusky shark (*Carcharhinus obscurus*) is a large apex predator (3.65 m, total length, TL) with a cosmopolitan distribution (Compagno *et al*., 2005). The life history of this shark is characterized by a long life-span (55 yr), slow growth (k = 0.037), late maturity (29.6 yr) and low fecundity (two female offspring per year), which renders populations particularly slow to recover from additional mortality, such as that induced by fisheries (McAuley *et al*., 2007; Romine *et al*., 2009; Rogers *et al*., 2013).

This species has been rarely found in the Mediterranean (Serena, 2005; Sperone *et al*., 2012): most records are from the western and central-southern regions, along

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the North African coasts and the Strait of Sicily. It is likely that this species ranges further east in the Ionian Sea and Levantine Basin (Fergusson & Compagno, 2000).

Two records of the dusky shark (Fig. 8) were obtained during an opportunistic field survey along the Calabrian coasts (Southern Italy, Central Mediterranean): one from

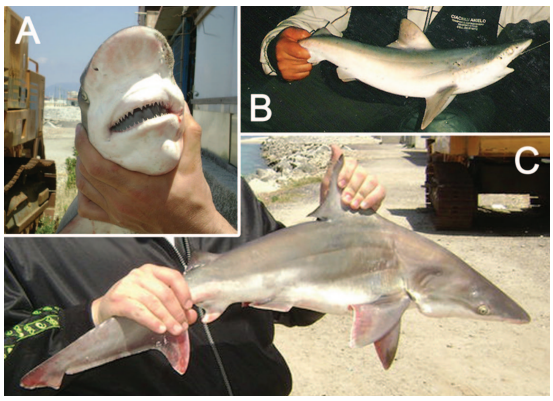


Fig. 8: Specimens of *Carcharhinus obscurus* from Calabria. A and C: specimen from Vibo Marina; B: specimen from Trebisacce.

Vibo Marina (1 specimen, Tyrrhenian side of Calabria, coordinates: 38°40' N, 16°03' E, total length: 77 cm) and one from Trebisacce (4 specimens, Ionian side of Calabria, coordinates: 39°52' N, 16°32' E; total lengths: from a minimum of about 68 cm to a maximum of about 82 cm). According to Compagno *et al*. (2005), all captured specimens can be considered newborns, since their total lengths are included in the range 69-100 cm. Both records are the first evidence for the presence of the species in the Calabrian seas. The record from Vibo Marina (Fig. 8A, 8C) confirms the presence of the dusky shark in the Central-Western Mediterranean, while that from Trebisacce (Fig. 8B) represents the first record of the species in the Ionian Sea, and the confirmation of the presence of the dusky shark in the Eastern Mediterranean, as suggested by Fergusson & Compagno (2000). Furthermore, the presence of newborns makes us assume that some characteristics of the Calabrian coast could be considered as favouring the concentration of young individuals. These records confirm the role played by the Central Mediterranean as regards the monitoring and conservation of marine biodiversity, since this area represents a strategic site for monitoring biological exchanges between the W and E Mediterranean (Nicolaidou *et al*., 2012; Sperone *et al*., 2012; Thessalou *et al*., 2012).

It is also critical to identify and to assess the status of the main nursery areas for most of the coastal elasmobranches, to guide future conservation efforts and underline the importance of shark protection.

2.7. Two young basking sharks, *Cetorhinus maximus* (Gunnerus, 1765), caught in the Levantine basin off the Turkish coast (eastern Mediterranean Sea)

By H. Kabasakal

The presence of the basking shark, *Cetorhinus maximus* (Gunnerus, 1765), in the Mediterranean basin has been recorded since 1795 (Mancusi *et al*., 2005). According to Serena (2005), basking shark presence in the eastern Mediterranean is rare. Although the first documented record of *C. maximus* off the Turkish coast has been reported by Kıdeyş (1997), based on incidental captures of two individuals in May 1995, a recent survey revealed that historical occurrence of this species in the mentioned region dates back to the 1950's (Kabasakal, 2004). Recent surveys confirmed the current presence of *C. maximus* along the Turkish coastline (Kabasakal, 2004; 2009). In this note, the author reports on two young basking sharks caught off the eastern Mediterranean Turkish coast. Species identification is based on the following descriptive characters (Compagno, 1984; Serena, 2005): 5 extremely long gill slits nearly encircling the head; moderately long, pointed and conical snout; presence of minute hooked teeth on both jaws; presence of gill rakers on internal gill slits; caudal peduncle with strong lateral keels.

On 30 December 2006, a basking shark was incidentally caught by a stationary net set in the coastal waters of İskenderun Bay (36º26'22" N, 34º10'43" E). Total length of the basking shark was approximately 300 cm. Weight and sex of the individual is not known. After landing, the basking shark was delivered to the fish market for displaying to the public before an auction. According to statement made by the fisherman who caught the basking shark and intended to sell it, the specimen might have been eviscerated and sold.

On 7 April 2012, a male basking shark (Fig. 9) has been incidentally caught by a coastal gill-netter just 50 m off Erdemli coast (36º37'17" N, 36º03'52" E), at depth



Fig. 9: Specimen of *Cetorhinus maximus* caught on 7 April 2012.

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of 1,5 m. Total length of the individual was 236 cm and weight was ca. 70 kg. The claspers of the basking shark were shorter than the pelvic fins, not reaching the fin tips, and not calcified. Based on clasper observations and size of the specimen, the author concluded that the basking shark was a juvenile male.

Extremely low number of records off the Turkish coast from the 1950's to date (9 specimens) confirm the rarity of *C. maximus* in Turkish waters; however, the scarcity of information on incidental captures and sightings of basking sharks in the seas of Turkey can be explained by the lack of dedicated specific scientific monitoring in this area, Since the records of basking sharks in Turkish waters concentrate in certain areas (Bay of Edremit and periphery, north-eastern Aegean Sea; bays of Antalya, Mersin and İskenderun, eastern Mediterranean Sea), a specific scientific monitoring program should be implemented as soon as possible to study seasonal movements of *C. maximus* off the Turkish coast and answer the question of whether the occurrence of basking sharks in the mentioned region exhibits seasonality, as well as site fidelity, or not?

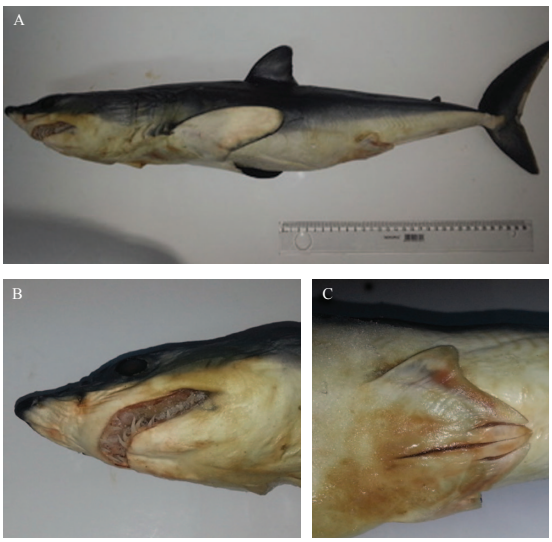


Fig. 10: (A) *Isurus oxyrinchus*, 69.8 cm total length young male from Iskenderun Bay, Turkey; (B) ventral view of mouth and teeth; (C) claspers.

2.8. A young *Isurus oxyrinchus* Rafinesque, 1810 (Chondrichthyes: Lamnidae) individual captured from Iskenderun Bay, Turkey

By D. Ergüden, M. Gürlek and C. Turan

The shortfin mako, *Isurus oxyrinchus* Rafinesque, 1810, is a solitary and cosmopolitan species distributing in the tropical and warm temperate waters of the Atlantic, Pacific and Indian oceans, including the entire Mediterranean Sea (Compagno, 2002). This species has occasionally been sighted along the Aegean and Levant coasts of Turkey (Bilecenoglu *et al*., 2002), where individuals of up to 585 cm TL were recorded (Kabasakal & De Maddelena, 2011). In this study, we report on the smallest individual of *I. oxyrinchus* ever captured from Turkey.
On 25 March 2010, a 69.8 cm TL and 2285 g total weight young male specimen of *I. oxyrinchus* was caught by a purse seine boat, from 54 m depth off the Samandag coast of Iskenderun Bay (36º02'557" N, 35º42'441" E). All measurements, diagnostic characteristics and colour pattern agree with the descriptions of Compagno (2002). The specimen (Fig. 10) was preserved at the Marine Sciences and Technology Faculty, Museum of Mustafa Kemal University (MSM-PIS/2010-4).

According to Compagno (2002), size at birth of shortfin mako ranges between 60 and 70 cm TL. However, following the maturity stage scale of cartilaginous fish proposed by Stehmann (2002), the captured individual is at late immature/early maturing phase, with reference to somewhat enlarged claspers slightly longer than tips of posterior pelvic fin lobes (Figure 10C). Occurrence of a young individual of *I. oxyrinchus* at Iskenderun Bay does not necessarily indicate a nursery area; yet, the bay should be monitored regarding its potential as a mating region. The shortfin mako is a critically endangered species in the Mediterranean Sea, and is listed in Appendix III of the Bern Convention and Annex III of the Barcelona Convention (Abdul Malak *et al*., 2011). Thus, further studies on the population structure and reproductive traits of the species should be carried out, especially at data-poor localities, such as the eastern Mediterranean basin.

2.9. New Lessepsian fish records from the Aegean and Marmara Seas

By M. Bilecenoglu and M.B. Yokeş

In this paper, we present two Lessepsian fish species, *Nemipterus randalli* Russell, 1986 and *Apogon fasciatus* (White, 1790), which were previously unrecorded from the southern Aegean coasts. An extreme occurrence of an established population of *Stephanolepis diaspros* Fraser-Brunner, 1940 from the easternmost part of the Sea of Marmara is also reported.

On 15 July 2011, two specimens of *N. randalli* with standard lengths ranging from 12 to 15 cm were captured by a bottom longline (at a depth of 45 - 50 m) in Ekincik Bay, southern Aegean Sea (36°49'01" N – 28°32'57" E). An additional specimen of ca. 16 cm SL was observed in a catch of the artisanal fishermen of the Kusadasi region on 01 January 2013, but the fish was not sampled. The threadfin bream, *N. randalli*, of Indo-West Pacific origin was first reported from the Mediterranean Sea by Golani & Sonin (2006), based on a single specimen

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collected off Haifa Bay. The species was later encountered at Iskenderun Bay in 2007 and has rapidly reached Antalya Bay (Bilecenoglu, 2010). According to the results of trawl surveys conducted at Iskenderun Bay, the species constituted 0.01% of the total biomass in 2008, which increased to almost 50.00% in 2011 (M. Bilecenoglu, unpublished), clearly indicating a rapid and enormous change in the population. The recent record from the southern Aegean Sea has prominently advanced the known distribution range of the threadfin bream, proving that the species is one of the most successful Lessepsian migrants. It is noteworthy that local fishermen also pointed out the invasion of Yumurtalık Lagoon Nature Reserve (Adana, Turkey) by *N. randalli*, especially during the past three years, which should be considered as an indication of the highly adaptive nature of the species. The species has rapidly become a commercially exploited fish, marketed fresh in several fishing ports and large cities (including the capital city, Ankara) remarkably at a low price (equivalent to 5 - 8 Euros).

We collected *A. fasciatus* from numerous localities throughout southern Turkey, including a single specimen of 5.6 cm SL from Marmaris/Aegean Sea (36°49'35" N – 28°15'38" E). The species reached Akinci Cape (the entrance to Iskenderun Bay) by December 2009 (Akamca *et al*., 2010). Our recent observations reveal that *A. fasciatus* is now widespread throughout the entire northern Levantine coasts (such as Iskenderun, Antalya and Fethiye Bays) and has currently reached the southern Aegean Sea. An advance of over 1000 nautical miles (from Ashdod to Marmaris) within just 3 years clearly proves rapid zoogeographical expansion, giving clues of a potential spread much further to northern and/or western parts of the Mediterranean.

Two individuals of *S. diaspros* with total lengths of ca. 20 cm were observed on 28/29 November 2012 during a night time scuba dive (between 23:30 and 00:30) at Karamürsel on the coast of Izmit Bay, Sea of Marmara (40°41'36" N – 29°36'26" E). The observation depth was 10 m, with a water temperature of 14°C. Ten more underwater sightings (both during day and night time) of the species were also made at the same locality between December 2012 and June 2013. The observed *S. diaspros* individuals were not captured, but high resolution photographs (Fig. 11) were taken *in situ* enabling us to make a precise species identification based on their unmistakable unique morphology (i.e. first dorsal fin comprising a single spine above head, pelvic fins absent, slit-like small gill openings, etc.) and coloration (Tortonese, 1986). Since the species is sexually dimorphic especially with respect to the series of horny patches on the sides of the caudal peduncle of adult males (Hutchins, 1984; Tortonese, 1986), we were also able to determine the sex of the individuals from underwater photographs (Fig. 11). *Stephanolepis diaspros* is of western Indian Ocean origin, whose native distribution range is confined to the Arabian peninsula (from the Persian Gulf to the Red Sea). The species is one of the earliest and most widespread Lessepsian immigrants in the Mediterranean Sea, distributed in the Levantine basin, the Aegean Sea, the southern Adriatic, Sicily and



Fig. 11: Male individual of *Stephanolepis diaspros* from Izmit Bay, Sea of Marmara (Photo by: Recep Şen).

Tunisia (Tortonese, 1986). According to recent underwater observations, *S. diaspros* has now reached as far as the eastern part of the Sea of Marmara, representing one the most extreme occurrences ever reported for a Lessepsian fish. Several observations of male and female individuals at the site suggest the presence of an established population. The Sea of Marmara is characterized by a two-layer flow regime; the cooler and lower salinity (≈18‰) surface layer originates from the Black Sea, flowing in a south/southeast direction across the Istanbul strait, while warmer and higher salinity (≈38.5‰) Mediterranean waters appear below 25 m, flowing north/northeast, across the Çanakkale strait (Beşiktepe *et al*., 1994). Such an oceanographical structure seems to support penetration of *S. diaspros* in the Sea of Marmara, via available low layer currents from the north Aegean Sea. A similar distribution has already been observed for *Lagocephalus spadiceus* (Richardson, 1845), the first Lessepsian fish captured from the region (Tuncer *et al*., 2008).

2.10. Alien megabiota in the shallow coastal waters of Kriti

By S. Katsanevakis

The shallow seabed of 12 sites in Kriti was surveyed for the presence of alien megabiota by snorkelling during standardized one-hour transects along the coastline, at depths ranging from 0 to 10 m. Ten alien marine species were recorded: the coarse sea grape *Caulerpa racemosa* var. *cylindracea* (macroalga), the slimy liagora *Ganonema farinosum* (macroalga), the sally lightfoot crab *Percnon gibbesi*, the Persian conch *Conomurex persicus* (gastro-

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pod), the spotted sea hare *Aplysia dactylomela*, the rayed pearl oyster *Pinctada imbricata radiata* (bivalve), and four fish species, namely, the dusky spinefoot *Siganus luridus*, the marbled spinefoot *Siganus rivulatus*, the bluespotted cornetfish *Fistularia commersonii*, and the yellowstripe barracuda *Sphyraena chrysotaenia* (Table 1).

S. luridus and *S. rivulatus* were the dominant herbivore fish at all sites. They are considered as high-impact invasive species in the eastern Mediterranean Sea, altering the community structure and native food web of the rocky infralittoral zone. By overgrazing, they are able to create and maintain barrens (rocky areas almost devoid of erect algae) and contribute to the transformation of the ecosystem from one dominated by lush and diverse brown algal forests to another dominated by bare rock (Sala *et al*., 2011). Such extensive barrens were observed at all study sites in Kriti.

P. gibbesi was also found at all sites, and was quite abundant in most cases. Since its first record in the Mediterranean Sea in 1999, *P. gibbesi* has expanded rapidly (Katsanevakis *et al*., 2011). In Greece, the species was first observed along the Ionian coast in 2004 (Thessalou-Legaki *et al*., 2006), and subsequently has spread widely, becoming very abundant locally (Katsanevakis *et al*., 2011). The magnitude of its impact is yet unknown; nevertheless, the invasion of yet another herbivore species in the shallow rocky infralittoral zone of Kriti may add further stress to the already degraded rocky infralittoral ecosystem.

C. racemosa var. *cylinracea* is one of the most invasive marine species in the Mediterranean with a high rate of expansion and documented impact on biodiversity (Klein & Verlaque, 2008). However, in the study area only small patches with low stolon size were found at two sites, and thus there was no sign of invasiveness. It is quite possible that the species is controlled by the very abundant *Siganus* spp. that overgraze the shallow rocky bottoms of Kriti.

The distribution range of the species recorded in this study was checked against the data included in the European Alien Species Information Network (EASIN; Katsanevakis *et al*., 2012), which for Kriti is mainly based on CIESM and ELNAIS (Katsanevakis *et al*., 2013) data. The distribution range of some of the species reported here (specifically: *G. farinosum*, *S. chrysotaenia*, and *P. imbricata radiata*), as appearing in EASIN (accessed on 13/8/2013), did not include Kriti (however, *P. imbricata radiata* was recently reported from another site in Crete by Zenetos *et al*., 2013). Surprisingly, the very abundant *S. rivulatus* had previously been reported only from a single site in southern Kriti (and recently from a second site by Zenetos *et al*., 2013). *C. persicus* has been reported

Table 1. Locations of the ten alien species recorded in Kriti. All sites were surveyed in July 2013. Numbers in parentheses indicate the number of observed individuals (or patches for algae); *: > 10 observed individuals; **: >100 observed individuals (very abundant, dominant in related assemblages).

Site	Geographic coordinates (WGS84)		Species
	Latitude, N	Longitude, E	
Southern Souda bay	35.470	24.129	*Siganus luridus*, Siganus rivulatus*, Percnon gibbesi*, Ganonema farinosum* (1)
Marathi	35.503	24.174	*Siganus luridus*, Siganus rivulatus*, Percnon gibbesi*, Ganonema farinosum**, Fistularia commersonii* (3)*, Sphyraena chrysotaenia**
Stavros	35.591	24.097	*Siganus luridus*, Siganus rivulatus*, Percnon gibbesi*, Fistularia commersonii* (2)*, Pinctada imbricata radiata* (1)*, Conomurex persicus* (2)
Kalathas	35.556	24.085	*Siganus luridus*, Siganus rivulatus* (4)*, Percnon gibbesi* (1), *Caulerpa racemosa* var. *cylindracea* (1)
Lazareta	35.519	23.999	*Siganus luridus**, Siganus rivulatus**, Percnon gibbesi*, Ganonema farinosum*, Conomurex persicus* (4)
Gramvousa	35.610	23.581	*Siganus luridus*, Siganus rivulatus*, Percnon gibbesi*, Caulerpa racemosa var. cylindracea* (3)*, Aplysia dactylomela* (1)
Falasarna	35.505	23.575	*Siganus luridus**, Siganus rivulatus**, Percnon gibbesi**
Iligas	35.202	24.123	*Siganus luridus**, Siganus rivulatus*, Percnon gibbesi**, Ganonema farinosum* (2)*, Sphyraena chrysotaenia**
Ammoudi (Makrys Gialos)	35.021	26.015	*Siganus luridus**, Siganus rivulatus**, Percnon gibbesi*, Sphyraena chrysotaenia**
Staousa (Makrys Gialos)	35.018	26.033	*Siganus luridus**, Siganus rivulatus**, Percnon gibbesi***
Achlia	35.025	25.890	*Siganus luridus*, Siganus rivulatus*, Percnon gibbesi**, Pinctada imbricata radiata* (2)*, Sphyraena chrysotaenia*, Conomurex persicus**

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previously from the entire northern and western coastline of Kriti but not from south-eastern Kriti as reported herein. For all other species, this study verifies previous records at the same or nearby locations (see EASIN and Zenetos *et al*., 2013).

2.11. First record of *Gobius kolombatovici* Kovačić & Miller, 2000 (Actinopterygii: Gobiidae) from the eastern Mediterranean Sea

By M. Bilecenoğlu

Scuba diving observations have proved to be quite efficient in assessing the actual distribution ranges of certain goby species that were previously considered as rare. Although identification of gobiids is mainly based on meticulous examination of head canal pores and papillae rows of the lateral line system (Kovacic, 2008), an accurate *in situ* determination to species level is also possible based on the unique colour patterns of some gobies (Francour & Mangialajo, 2007; Francour *et al*., 2007). *Gobius kolombatovici* Kovačić & Miller, 2000 represents a good example for this fact; the species was first described from eleven specimens collected off the eastern coast of the Island of Krk (northern Adriatic Sea), whose distribution range was significantly expanded by underwater observations to the Ligurian Sea (Monaco, Corsica, southern coast of France) and to the Columbretes Islands (Iberian coasts) (Kovačić & Miller, 2000; Francour & Mangialajo, 2007; Kersting & Ballesteros, 2010). On 22.08.2009, a single specimen of *G. kolombatovici* was observed during a scuba dive at a depth of 18 to 21 m and photographed (Fig. 12) on the southern shore of Saros Bay (northern Aegean Sea, Turkey; conjectural coordinates as 40°27'27" N, 26°30'14" E), representing a first record of the species both from the eastern Mediterranean basin and the Aegean Sea. The species can be distinguished from its Mediterranean and north-eastern Atlantic congenerics by the following combination of colour characteristics (Kovačić & Miller, 2000), which are perfectly in agreement with the Saros Bay specimen: (i) the body and head having orange irregular spots and blotches arranged in longitudinal rows; (ii) nine dark orange blotches longer than deep along the lateral midline, including two blotches below D1, five below D2, and two on the caudal peduncle; (iii) D1 with a black blotch in the upper posterior corner (on D1 IV and D1 V); (iv) C with five to six vertical rows of yellow to orange spots; and (v) P with orange mark in upper fin origin. The Saros Bay individual was observed in a coralligenous biocoenosis and, in line with the statements of Francour & Mangialajo (2007), exploration of suitable habitats (as described in detail by Kovačić & Miller, 2000) might reveal a wider occurrence range for *G. kolombatovici* in both Mediterranean Sea basins.



Fig. 12: *Gobius kolombatovici* Kovačić & Miller, 2000 individual observed at Saros Bay, Turkey (north-eastern Aegean Sea) (Photograph courtesy of Ufuk Dönmez).

2.12. First record of *Microlipophrys dalmatinus* (Steindachner & Kolombatovic, 1883), (Pisces: Blenniidae) in the Ionian Sea

By F. Tiralongo, D. Tibullo and R. Baldacconi

Microlipophrys dalmatinus (Kolombatovic & Steindachner, 1883) is one of the 19 species of blennies found in the Italian seas. Seven species belong to this genus (Almada *et al*., 2005), four of which are present in Italian seas: *M. adriaticus* (Kolombatovic & Steindachner, 1883), *M. canevae* (Vinciguerra, 1880), *M. dalmatinus* (Kolombatovic & Steindachner, 1883) and *M. nigriceps* (Vinciguerra, 1883). *Microlipophrys dalmatinus* is present in the north-eastern Atlantic and Mediterranean Sea (Almada *et al.*, 2001). It has an anguilliform feature and a small-sized body, rarely exceeding 4 cm in total length (Zander, 1986); therefore, it is one of the smallest fish in the Mediterranean Sea. Its habitat consists of rocky bottom with holes serving as shelter and reproduction sites. *Microlipophrys dalmatinus* is generally observed on horizontal or subhorizontal rocky bottom, in areas well exposed to sunlight and in shallow water of about 1.5 meters deep. In its habitat, algal vegetation may be more or less abundant and tolerates brackish waters. The species is omnivorous, feeding on small crustaceans, especially harpacticoid copepods and to a lesser extent on algae (Goldschmid *et al*., 1984). The male of this species exhibits a particular "spawning head mask" during the breeding season when the cheeks are coloured deep yellow and the rest of the head becomes darker and darker, until it becomes uniformly black. Parental care is present and the parental male protects the eggs until they hatch. This species was considered common in the waters of the Adriatic Sea and along the Tyrrhenian coast (Relini & Lanteri, 2010), especially in the northern area of these seas. Other reports are available from the Central Mediterranean Sea (Falzon, 2009), but there is no record for the

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Ionian Sea. These recent records confirm the expansion of the distribution of *M. dalmatinus* all along the Italian sea. Our last record is from south-eastern Sicily, Ionian Sea. During snorkelling sessions, covering a period of 6 years, from 2008 to 2013, *M. dalmatinus* was found in several areas of the Italian Ionian Sea (north and south). The first report dates back to the summer of 2008 in the Campomarino village (40.29694 N, 17.55111 E), east of Taranto, where several specimens were reported at depths of less than one meter, on rocks covered with seaweed. In the Mar Piccolo of Taranto (July 2009) the first specimen was reported in water depths of less than one meter (40.48083 N, 17.26666 E and 40.47222 N, 17.27500 E), followed by another report near Marina di Pulsano (Taranto) in June 2011 (40.33888 N, 17.38500 E). In south-eastern Sicily, on 6th August 2013, the first specimens was photographed in Avola, a city south of Siracusa (36.88708 N, 15.14029 E). Two days later, on 8th August 2013, two other specimens were filmed and photographed, a breeding male and a juvenile. On 9th August the same breeding male was observed again in the same hole. All specimens observed in south-eastern Sicily, were observed in the same area at a depth of about one meter, on hard bottom well exposed to light and with low algae coverage. These records show that *M. dalmatinus* is now present in all national coastal waters. However, in the Ionian waters of oriental Sicily, the species is not yet plentiful and its distribution is limited to a restricted area.

Furthermore, since *M. dalmatinus* is small in size (3-4 cm), it is not easy to sight and, thus, its abundance may be underestimated. During all snorkelling sessions, the species was reported at depths of about a meter, on hard substrates and well exposed to sunlight. We wish to emphasize the report of the species in Maltese waters, in the area of Marsaxlokk bay, for the first time in 2005 and again in 2008. In this work (Falzon, 2009), four specimens including three breeding males and one free swimming female were observed and photographed. In Maltese waters, just like along the Sicilian coast, it was found that the presence of the species was restricted to a very small area, where it probably found the best conditions suitable for reproduction. In fact, *M. dalmatinus* was never observed during other snorkelling sessions in areas with similar characteristics in eastern Sicily, located to the south and north of our site of discovery. The situation is totally different in the northern Ionian Sea (Puglia) where the species has now formed stable populations. Based on our observations, the species shows similar habitat preferences to that of the Ionian Sea. The specimens live on rocky substrates where the algal vegetation is usually well represented and adherent to hard substrate (Fig. 13). Instead, in the Mar Piccolo area, the blenny preferably inhabits artificial substrates, such as the submerged part of the breakwater and docks, or poles used for mussel culture (Fig. 14). In this small inland sea, the eggs are laid preferably in the empty shell of mussels. Unlike the observations of Duci *et al.* (2009) for the Adriatic Sea, where the blennies were found in the intertidal zone especially, we have always observed *M. dalmatinus* in the very shallow waters of the subtidal zone, at a depth of about one meter. Further studies may help to improve knowledge about the real abundance of this species in national waters and to understand what factors are important for the growth and stability of the population.



Fig. 13: Specimen from south-eastern Sicily.



Fig. 14: Specimen from Mar Piccolo, Taranto.

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2.13. First record of *Pomadasys incisus* (Bowdich, 1825), (*Pisces: Haemulidae*) for the Italian Ionian Sea and consideration about its fast spread

By F. Tiralongo and D. Tibullo

Pomadasys incisus, commonly known as the bastard grunt, is a native species of the eastern Atlantic and Mediterranean Sea. In the Canary Islands, it represents the most abundant species in demersal fishery. It is a small to medium size fish (usually not exceeding 30 cm of total length) characterized by quick growth in their first year of life. *Pomadasys incisus* is easily distinguishable from *P. stridens* thanks to a series of chromatic and meristic features. The most quickly and easily countable meristic features are the soft rays of the dorsal and anal fins, 16 in *P. incisus* versus 13-14 in *P. stridens* and 11-13 in *P. incisus* versus 8-10 in *P. stridens*. The species have naturally entered the Mediterranean Sea through the Strait of Gibraltar in the first half of the nineteenth century. The first record for the Italian seas dates back to 1991 (Gavignin *et al.,* 1994), from the western Ligurian Sea where, in particular, three specimens were caught at a depth of between 7 and 20 m. Then the species was recorded in the northern Tyrrhenian Sea in 1992 (Serena & Silvestri, 1996); one specimen was caught at a depth of 8 m. In 1996 (De Pirro *et al*., 1997), another specimen was caught with a gillnet near Cala Grande (Tyrrhenian Sea) over a bottom covered with seagrass meadows at a depth of 15 m. Two specimens of *P. incisus* were caught by fishermen, between 1995 and 1996, with a gillnet in the Gulf of Palermo (Catalano *et al.*, 1998) in the southern Tyrrhenian Sea. The species was reported in 2001 from the central Tyrrhenian Sea (Psomadakis *et al.,* 2006). There are no reports from the Adriatic and Italian Ionian Seas, but our recent records clearly show the presence of the species in the Italian Ionian Sea (Sicily) (Fig. 15). Until last year, *P. incisus* was absent along the eastern coast of Sicily. Scuba diving activity and catches of professional fisheries have never showed the presence of the species. Nevertheless, since summer 2013, the species has suddenly become common. In about two months time (from mid-June to mid-August 2013), we registered catches of several specimens within zone C of the Marine Protected Area of Plemmirio (Siracusa) and all along the south-eastern coast up to Porto Palo di Capo Passero (extreme south-eastern Sicily). Furthermore, some specimens were observed during snorkelling activity along the coast of Avola (Siracusa), a town located between Siracusa and Porto Palo di Capo Passero, in about 1 m of depth. At this location, *P. incisus* was observed swimming among sparids (*Diplodus* spp.).

Two specimens (Fig. 16) were caught with a gillnet in the shallow coastal waters of Avola (36.88998 N, 15.14163 E) by fishermen, both in about 3 m of depth (11th August 2013 and 15th August 2013). The size of the two specimens suggest their immature state (Specimen A: standard length



Fig. 15: All records of *Pomadasys incisus* (Bowdich, 1825) for Italian and Maltese waters.

100 mm, head length 32 mm, pre-anal length 63 mm, dorsal fin length 49 mm, anal fin length 18 mm, D = XII + 16, A = III + 12, weight 27 g; Specimen B: total length 131 mm, fork length 123 mm, standard length 109 mm, head length 35 mm, pre-anal length 69 mm, dorsal fin length 56 mm, anal fin length 20 mm, D = XII + 16, A = III + 13, weight 34 g). In addition, on 24th August, another fisherman from Avola fished an additional five specimens at the depth of



Fig. 16: Two specimens of *Pomadasys incisus* (Bowdich, 1825) caught in the Ionian Sea, Sicily (Photo by: F. Tiralongo).

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4 m using a gillnet on a sandy bottom with seagrass (*Posidonia oceanica*) coverage. The specimens had similar sizes and weight ranged between 28 and 38 g; total length was between 131 and 140 mm. It is surprising to see how this species has established itself successfully in the Italian Ionian Sea, where it now forms schools and is fished regularly. The spread of this species is certainly due to good availability of food and also the presence of ideal environmental conditions. The future effects of the spread of this species on the relevant marine ecosystem and the fish community is yet to be understood. Further investigations are required to gain better understanding of the diffusion and the population dynamics of this subtropical species in our seas and its probable correlation with circulation and climate change in the Mediterranean Sea.

2.14. A new record of *Kyphosus incisor* for the Mediterranean Sea

By L. Peña-Rivas and E. Azzurro

The yellow sea chub *Kyphosus incisor* (Cuvier, 1831) is an herbivorous fish, native of the Atlantic Ocean. So far it has been observed only twice in the Mediterranean Sea: in the vicinity of Almuñécar (Granada, Western Mediterranean Sea) in June 1998 (Azzurro *et al*., 2013) and along the Ligurian coast (Camogli) in 2009 (Orsi Relini *et al.,* 2011).

On May 28th 2013, a new specimen of *K. incisor* was recorded (Fig. 17) from Almuñécar (Granada, Spain) (36º44'31" N, 03º38'38" W). The specimen was captured by trammel net on a rocky bottom at 15 m of depth. It measured 46 cm total length (1.64 kg total weight) and was identified on the basis of characters used in other descriptions of sea chubs (e.g. Sakai & Nakabo, 2004; Orsi Relini *et al.,* 2011). Thereafter, the specimen was fixed in formalin and deposited in the Marine Fauna Collection of the Instituto Español de Oceanografía of Málaga (CFM_IEOMA) with access number IEOM2630. This record represents the third documented occurrence of *K. incisor* for the Mediterranean Sea.



Fig. 17: *Kyphosus incisor* captured on May 28th 2013 off Almuñécar (Granada, Western Mediterranean Sea).

2.15. Biogeographic expansion of *Farfantepenaeus aztecus* (Ives, 1891) (Decapoda: Penaeidae) in the Eastern Mediterranean Sea

By M. Gökoğlu and Y. Özvarol

Farfantepenaeus aztecus (Ives, 1891) is a penaeid shrimp of Atlantic origin, which was first recorded from the Mediterranean Sea by Deval *et al*. (2010), based on specimens collected from Antalya Bay. This species is naturally distributed along the east coasts of the USA and Mexico, at a depth of 0-200 m. It reaches sexual maturity at about 14 cm total length and can reach a maximum standard length of 22 cm. Eggs are demersal and 0.26 mm in diameter (Cook & Lindner, 1970).

During studies carried out between June 2011 and September 2013 along the Levant coasts of Turkey, a large number of *F. aztecus* was collected (Fig. 18). Bottom trawling (22 mm mesh size) operations were performed at depths of 25 m to 150 m, for a period of 1 to 3 hours in the Gulf of Finike, Antalya, Mersin, Adana and İskenderun by commercial fishing and research vessels (Nuh Kaptan, Ece, Hevesim 1 and Akdeniz Su). Trammel nets (22 - 24 mm mesh size) were used in the Gulf of Antalya and Finike. Trammel nets for shrimp were left at depths of 5 - 30 m for 12 hours, starting one hour before sunset and ending one hour after sunrise.

A total of 1553 *F. aztecus* individuals were caught by trawling and trammel nets along the Levant shores of Turkey (Table 2). The largest size was 30 cm for females and 20.7 cm for males. In 2010, only a few individuals of *F. aztecus* were collected from the Gulf of Antalya (Deval *et al*., 2010); but the range has expanded to the Gulf of Iskenderun to the east and Finike to the west, just within 3 years. According to these results, *F. aztecus* has completed a successful adaptation along the southern Turkish shores. Based on recent findings on the rapid range expansion of *F. aztecus*, a wider distribution of the species in the Mediterranean Sea can be expected.



Fig. 18: *Farfantepenaeus aztecus* (Ives, 1891).

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Table 2. Distribution details of *F. aztecus* along the Mediterranean coast of Turkey.

Studied Area	Coordinates		Collected Dates	Number of individuals	Depths
	Latitude	Longitude			
Gulf of Finike	36°13' N	33°49' E	16.09.2012 - 01.04.2013	287	5-50
Gulf of Antalya	36°50' N	30°34' E	21.09.2011 - 01.04.2013	1050	5-100
	36°45' N	30°55' E			5-100
Mersin Bay	36°10' N	33°55' E	16. 09.2012 - 30.09.2012	160	30-90
Yumurtalık/ Adana	36°28' N	35°23' E	16. 09.2013 - 17.09.2013	36	45-50
Gulf of İskenderun	36°45' N	35°53' E	17.09.2013 – 19.09.2013	20	38-50

2.16. *Callinectes sapidus* Rathbun, 1896: an established delicacy in Corfu Island

By P.K. Karachle

One of the most invasive alien species in the Mediterranean is *Callinectes sapidus* Rathbun, 1896 (Streftaris & Zenetos, 2006), with established populations in the Adriatic Sea, Central and East Mediterranean Sea (Zenetos *et al*., 2012). In Greece, the species is widely known in the Aegean Sea, whereas its latest reports from Greece are those of Perdicaris *et al*. (2012; in Thessalou-Legaki *et al*., 2012) in NW Greece and Zenetos *et al*. (2013) in the Aegean Sea. Here, the existence of *C. sapidus* in Corfu Island, N Ionian Sea is being reported.

On October 1st 2013, several individuals of *C. sapidus* (Fig. 19) were caught by small-scale fishers using a hand brailer, in Antinioti Lagoon (Fig. 19) a NATURA 2000 site (GR2230001), located in the N-NW part of Corfu Island [39°81'52"N 19°85'05"E (natura2000.eea.europa.eu/natura2000/SDFPublic.aspx?site=GR2230001)]. Antinioti lagoon is relatively small (area of 1.88 km^2), with two openings in the Ionian Sea and receives the influx of freshwater through six underground springs. According to local fishers that exploit the lagoon, the presence of the species dates back to the late 2000's, whereas its exploitation has a history of only a couple of years. The fisheries production of the species is rather low (approximately 5-7 kg per day). This production is being distributed to the local market, since the species has also "invaded" the local cuisine and is being used in the preparation of traditional fish-dishes (e.g. bourdeto, pastitsada). Fishers report that ovigerous females are found during August in the lagoon, while in autumn they tend to move towards the sea. Additionally, fishers report that they found several female individuals dead in the area of the lagoon (G. Boutikos, pers. comm.). Fishers observations, the number of individuals caught, as well as the fisheries exploitation of the species in the area, indicate a well-established population of *C. sapidus* in Corfu Island, as in the neighbouring areas of Albania (Beqiraj & Kashta, 2010) and south Italy (Mancinelli *et al*., 2013).

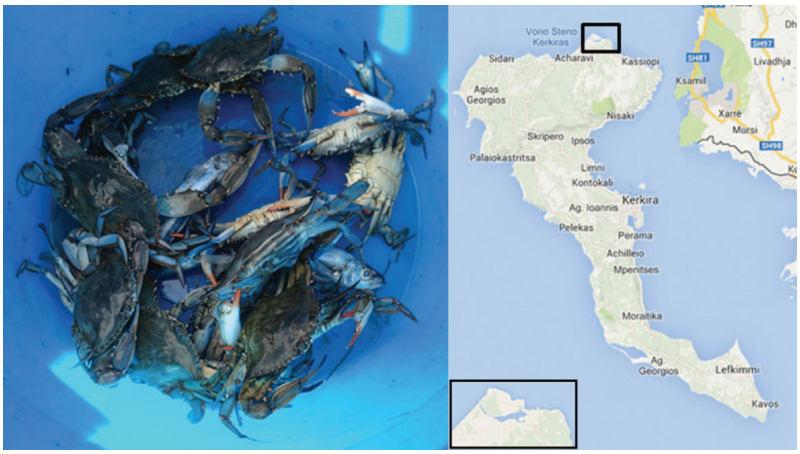


Fig. 19: Individuals from a small population of *Callinectes sapidus* (right) established in Antinioti lagoon (left), Corfu Island, NW Greece.

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