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New Mediterranean Biodiversity Records (July 2018)

CHARTOSIA NIKI	Department of Biological Sciences, University of Cyprus, 1 Panepistimiou Str., 2109 Aglantzia, Nicosia
ANASTASIADIS DIMITRIS	Institute of Marine Biological Resources and Inland waters, Hellenic Centre for Marine Research, 46.7 km Athens Sounio, GR19013, Anavyssos, Attiki
BAZAIRI HOCEIN	BioBio Research Center, Faculty of Sciences, University Mohammed V in Rabat, 4 Avenue Ibn Battouta, B.P. 1014 RP, Rabat
CROCETTA FABIO	Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, Villa Comunale, I-80121 Naples
DEIDUN ALAN	Department of Geosciences, University of Malta, Msida MSD 2080
DESPALATOVIĆ MARIJA	Institute of Oceanography and Fisheries, Šetalište Ivana Meštrovića 63, 21000 Split
DI MARTINO VINCENZO	Institute for Agricultural and Forestry System, National Research Council of Italy (CNR), via Empedocle, 58, 95125
DIMITRIOU NIKOS	Institute of Marine Biological Resources and Inland waters, Hellenic Centre for Marine Research, 46.7 km Athens Sounio, GR19013, Anavyssos, Attiki
DRAGIČEVIĆ BRANKO	Institute of Oceanography and Fisheries, Šetalište Ivana Meštrovića 63, 21000 Split
DULČIĆ JAKOV	Institute of Oceanography and Fisheries, Šetalište

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	Ivana Meštrovića 63, 21000 Split
DURUCAN FURKAN	Işıklar Caddesi No 16,17 TR-07100 Antalya
HASBEK DENIZ	Directorate of Provincial Food Agriculture and Livestock, Hatay
KETSILIS-RINIS VLASIOS	Institute of Marine Biological Resources and Inland waters, Hellenic Centre for Marine Research, 46.7 km Athens Sounio, GR19013, Anavyssos, Attiki
KLEITOU PERIKLIS	Marine and Environmental Research (MER) Lab Ltd., 202 Amathountos Av., Marina Gardens, Block B, Offices #13-14, Parekklisia, Limassol
LIPEJ LOVRENC	Marine Biology Station, National Institute of Biology, Fornače 41, Piran, SI-6330
MACALI ARMANDO	Department of Ecological and Biological Sciences, Tuscia University, Ichthyogenic Experimental Marine Centre (CISMAR), Tarquinia (VT)
MARCHINI AGNESE	Department of Earth and Environmental Sciences, University of Pavia
OUSSELAM MARIAM	Institut National de Recherche Halieutique, Centre Régional de Nador, 13 Bd Zerktouni. BP 493, Nador
PIRAINO STEFANO	Dipartimento di Scienze e Tecnologie, Biologiche ed Ambientali, Università del Salento-73100 Lecce
STANCANELLI BESSY	Aqua Stories; via Vampolieri, 25/31 int. 27, 95022 Aci Catena, Catania
THEODOSIOU MARILENA	Department of Biological Sciences, University of Cyprus, 1 Panepistimiou Str., 2109 Aglantzia, Nicosia
TIRALONGO FRANCESCO	Ente Fauna Marina Mediterranea, Avola, Siracusa
TODOROVA VALENTINA	Institute of Oceanology, Varna, Bulgarian Academy of Sciences, P.O. Box 152, 9000 Varna
TRKOV DOMEN	Marine Biology Station, National Institute of Biology, Fornače 41, Piran, SI-6330
YAPICI SERCAN	Faculty of Fisheries, Muğla Sıtkı Koçman University, 48000, Kötekli, Muğla

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New Mediterranean Biodiversity Records (July 2018)

NIKI CHARTOSIA[1], DIMITRIS ANASTASIADIS[2], HOCEIN BAZAIRI[3], FABIO CROCETTA[4], ALAN DEIDUN[5], MARIJA DESPALATOVIĆ[6], VINCENZO DI MARTINO[7], NIKOS DIMITRIOU[2], BRANKO DRAGIČEVIĆ[6], JAKOV DULČIĆ[6], FURKAN DURUCAN[8], DENIZ HASBEK[9], VLASIOS KETSILIS-RINIS[2], PERIKLIS KLEITOU[10], LOVRENC LIPEJ[11], ARMANDO MACALI[12], AGNESE MARCHINI[13], MARIAM OUSSELAM[14], STEFANO PIRAINO[15], BESSY STANCANELLI[16], MARILENA THEODOSIOU[1], FRANCESCO TIRALONGO[17], VALENTINA TODOROVA[18], DOMEN TRKOV[11] and SERCAN YAPICI[19]

[1] Department of Biological Sciences, University of Cyprus, 1 Panepistimiou Str., 2109 Aglantzia, Nicosia, Cyprus
[2] Institute of Marine Biological Resources and Inland waters, Hellenic Centre for Marine Research, 46.7 km Athens Sounio, GR19013, Anavyssos, Attiki, Greece
[3] BioBio Research Center, Faculty of Sciences, University Mohammed V in Rabat, 4 Avenue Ibn Battouta, B.P. 1014 RP, Rabat, Morocco
[4] Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, Villa Comunale, I-80121 Naples, Italy
[5] Department of Geosciences, University of Malta, Msida MSD 2080, Malta
[6] Institute of Oceanography and Fisheries, Šetalište Ivana Meštrovića 63, 21000 Split, Croatia
[7] Institute for Agricultural and Forestry System, National Research Council of Italy (CNR), via Empedocle, 58, 95125, Italy
[8] Işıklar Caddesi No 16,17 TR-07100 Antalya, Turkey
[9] Directorate of Provincial Food Agriculture and Livestock, Hatay, Turkey
[10] Marine and Environmental Research (MER) Lab Ltd., 202 Amathountos Av., Marina Gardens, Block B, Offices #13-14, Parekklisia, Limassol, Cyprus
[11] Marine Biology Station, National Institute of Biology, Fornače 41, Piran, SI-6330, Slovenia
[12] Department of Ecological and Biological Sciences, Tuscia University, Ichthyogenic Experimental Marine Centre (CISMAR), Tarquinia (VT), Italy
[13] Department of Earth and Environmental Sciences, University of Pavia, Italy
[14] Institut National de Recherche Halieutique, Centre Régional de Nador, 13 Bd Zerktouni. BP 493, Nador, Morocco
[15] Dipartimento di Scienze e Tecnologie Biologiche ed Ambientali, Università del Salento, 73100 Lecce, Italy
[16] Aqua Stories; via Vampolieri, 25/31 int. 27, 95022 Aci Catena, Catania, Italy
[17] Ente Fauna Marina Mediterranea, Avola, Siracusa, Italy
[18] Institute of Oceanology, Varna, Bulgarian Academy of Sciences, P.O. Box 152, 9000 Varna, Bulgaria
[19] Faculty of Fisheries, Muğla Sıtkı Koçman University, 48000, Kötekli, Muğla, Turkey

Abstract

In the present article, new records are given for 15 species (4 native and 9 alien and 2 cryptogenic), belonging to 6 Phyla (i.e. Chlorophyta, Ctenophora, Cnidaria, Mollusca, Arthropoda, and Chordata), from 10 Mediterranean countries: **Morocco**: the finding of the crab *Callinectes sapidus* represents the westernmost one of the species in the Mediterranean; **Italy:** first records of the nudibranch *Polycera hedgpethi* from the harbour of La Spezia, and first finding of the invasive ctenophore *Mnemiopsis leidyi* in the Fiora River; **Tunisia:** *Caulerpa taxifolia* var. *distichophylla* is recorded for the first time, showing an even wider distribution in the Mediterranean; **Greece:** the finding of the jellyfish *Pelagia benovici* represents the first record of the species in the Ionian Sea, while the finding of the smallscale codlet *Bregmaceros nectabanus* in the Ionian Sea is another interesting first report for the area; **Malta:** the cryptogenic scleractinian coral *Oculina patagonica* was recorded; **Slovenia:** the parasitic copepod *Demoleus heptapus* was recorded from a sixgill bluntnose shark, *Hexanchus griseus*; **Croatia**: the Lessepsian cephalaspidean mollusc *Haminoea cyanomarginata* is recorded for the first time from the area; **Bulgaria:** the Asian date mussel *Arcuatula senhousia* was recorded from the Black Sea; **Cyprus:** the Lessepsian gastropod *Viriola* sp. [cf. *corrugata*) was recorded for the first time from the area, while two decapod species were recorded also for the first time from Cyprus, i.e. the caridean shrimp *Pasiphaea sivado* and the anomuran *Munida curvimana*; **Turkey:** the acari *Lohmannella falcata* is recorded for the first time from Antalya and the Lessepsian fish *Priacanthus sagittarius* in the Levantine coasts of Turkey (off Hatay/Arsuz) showing that this species has extended its range in a very short time.

Introduction

Biological records are one of the most important sources of data for a large number of research areas (Powney & Isaac, 2015). They can tell us what species and habitats are present where, and so to take informed decisions especially regarding management measures. They can also answer large scale questions regarding subjects such as biogeography, for identifying biodiversity hotspots etc. If non-indigenous species are also considered, the importance of recording biodiversity is getting even more significant (Powney & Isaac, 2015). Non-indigenous species can remain undetected for years after the initial colonization (Crooks, 2005), especially regarding poorly

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studied taxa and understudied areas. Until recently, 821 alien species were recorded in the Mediterranean (Zenetos *et al*., 2017).

In order to contribute significantly to the challenge of recording marine biodiversity in the Mediterranean Sea, the Mediterranean Marine Science Journal, gives the opportunity to experts to publish their biodiversity records, concerning either native or alien species, through its Collective Article 'New Mediterranean Biodiversity Records'. Taxonomy follows the World Register of Marine Species (WoRMS Editorial Board, 2018).

In the specific collective article, the new records are presented according to the major biogeographical zones of the Mediterranean Sea, from west to east, into relevant subchapters. The location of new records is approximately illustrated on a map (Fig. 1) and the related information in Table 1.

In the present article, new records are given for 15 species (4 native and 9 alien and 2 cryptogenic), belonging to 6 Phyla (i.e. Chlorophyta, Ctenophora, Cnidaria, Mollusca, Arthropoda, and Chordata), from 10 Mediterranean countries (Table 1). Starting from the Western Mediterranean basin, the record of the crab *Callinectes sapidus* in Morocco represents the westernmost one of the species in the Mediterranean. The finding of the nudibranch *Polycera hedgpethi* from the harbour of La Spezia, Italy lead to the hypothesis that an interaction of vectors (aquacultures and shipping/boating) is involved in the rapid and successful spread of this species along the Italian coasts. Further, the first finding of the invasive ctenophore *Mnemiopsis leidyi* in the Fiora River (Italy), might imply that if the species has the ability to be present in high numbers during the dry season and due its omnivorous feeding habits, this will pose concerns about the future impacts on freshwater native species. The first record of *Caulerpa taxifolia* var. *distichophylla* from Tunisia is showing an even wider distribution of the species in the Mediterranean. Concerning the Adriatic Sea, the parasitic copepod *Demoleus heptapus* was recorded from a sixgill bluntnose shark, *Hexanchus griseus*, found off Slovenia. In Adriatic, it was also found for the first time from Croatia, the Lessepsian cephalaspidean mollusc *Haminoea cyanomarginata.* It is worth noticing that this record consists the northernmost record of this species worldwide. Concerning the Central Mediterranean, the cryptogenic scleractinian coral *Oculina patagonica* was recorded for the first time from Malta. The finding of the jellyfish *Pelagia benovici* represents the first record of the species in the Ionian Sea and, in the Mediterranean Sea outside the Adriatic basin. Another interesting first finding is that of the smallscale codlet *Bregmaceros nectabanus* from the Ionian Sea, together with some general information concerning its diet. The Asian date mussel *Arcuatula senhousia* was recorded from Bulgaria, Black Sea and this rises concern regarding the growing number of sightings of alien species which at some point, could proliferate and become invasive in the Black Sea. Regarding the Eastern Mediterranean, the Lessepsian gastropod *Viriola* sp. [cf. *corrugata*) is recorded for the first time from Cyprus, confirming the establishment of this alien molluscan species in the Mediterranean Sea, while two common decapod species were also recorded for the first time from Cyprus, i.e. the caridean shrimp *Pasiphaea sivado* and the anomuran *Munida curvimana* indicating that the marine environment of Cyprus is still much undiscovered. The acari *Lohmannella falcata* is recorded for the first time from the Mediterranean coasts of Turkey (Antalya) and constitutes the second record of this species from Turkey after the Black Sea. Lastly, another sighting of the Lessepsian fish *Priacanthus sagittarius* in the Levantine coasts of Turkey (off Hatay/Arsuz) showing that this species has extended its range in a very short time.

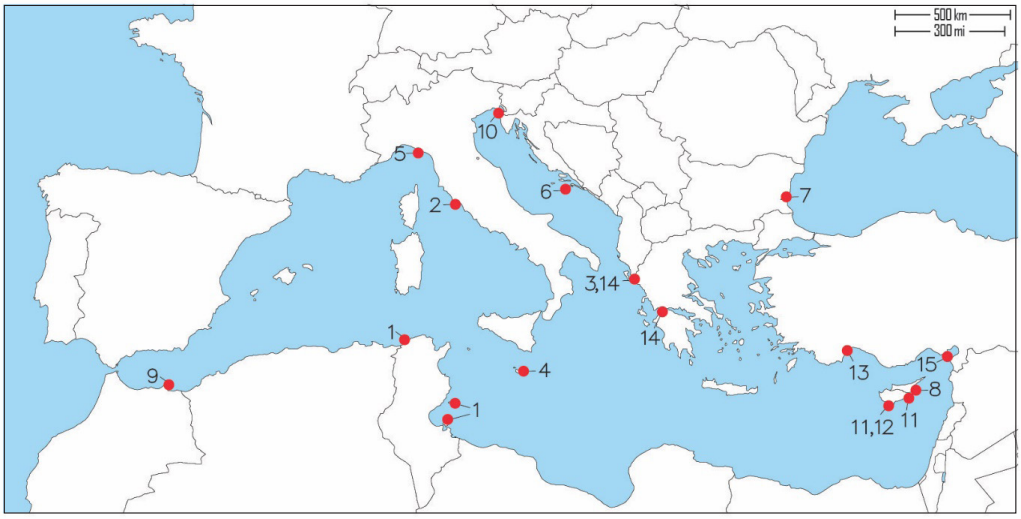

Fig. 1: Locations of records of new species in the Mediterranean Sea presented in "New Mediterranean Biodiversity Records (July 2018)". Numbers of locations are given in Table 1.

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Table 1. Species included in "New Mediterranean Biodiversity Records (July 2018)". SS = species status (A, alien; C, cryptogenic, N, native), species subchapter, location/ area and country of records. LN - numbers as in Figure 1.

Taxon	SS	Subchapter	Location	Country	LN
Phylum Chlorophyta					
Caulerpa taxifolia var. *distichophylla*	A	1.4	Alataya Harbour Djerba Tabarka	Tunisia	1
Z					
Mnemiopsis leidy	A	1.3	Fiora River	Italy	2
Phylum Cnidaria					
Pelagia benovici	C	3.2	Igoumenitsa Harbour	Greece	3
Oculina patagonica	C	3.1	Marsaxlokk Bay	Malta	4
Phylum Mollusca					
Polycera hedgepethi	A	1.2	La Spezia	Italy	5
Haminoea cyanomarginata	A	2.2	Island of Mljet, Greben Štit	Croatia	6
Arcuatula senhousia	A	5.1	Burgas bay	Bulgaria	7
Viriola corrugata	A	4.1	Off Protaras Bay	Cyprus	8
Phylum Arthopoda					
Callinectes sapidus	A	1.1	Marchica lagoon	Morocco	9
Demoleus heptapus	N	2.1	Cape Ronek near Izola	Slovenia	10
Munida curvimana	N	4.2	Avdimou Limassol	Cyprus	11
Pasiphaea sivado	N	4.2	Kavo Pyla Larnaca	Cyprus	12
Lohmannella falcata	N	4.3	Antalya	Turkey	13
Phylum Chordata					
Bregmaceros nectabanus	A	3.3	Patraikos Gulf Kerkyraikos Gulf	Greece	14
Priacanthus sagittarius	A	4.4	off Hatay/Arsuz	Turkey	15

1. WESTERN MEDITERRANEAN

1.1 Occurrence of the American blue crab *Callinectes sapidus* on the Mediterranean coast of Morocco

Mariam Oussellam and Bazairi Hocein

The portunid blue crab *Callinectes sapidus* Rathbun, 1896, a species originating from the Western Atlantic, was introduced to Europe at the beginning of the 20th century. It is currently recorded almost ubiquitously in the Mediterranean and in the Black Sea (Mancinelli *et al*., 2017). Transport in ballast water is considered the most probable vector of its introduction (Nehring, 2011).

A single female specimen of *Callinectes sapidus* was captured on the 17 of August 2017, by commercial gill-net fishery in the Marchica lagoon (35.15694444 ^{0}N, -2.84527778 ^{0}W) at 5-7m depth. This specimen, photographed but not preserved, constitutes the first actually recorded occurrence of *Callinectes sapidus* from the Mediterranean coast of Morocco. Consequently, between November 2017 and July 2018, other specimens of *C. sapidus* were caught by fishermen in the Marchica lagoon. They were photographed and deposited at the Biological Reference Collections of the Institut National de Recherche Halieutique (INRH – Nador) (Fig. 2).

The distribution range of *C. sapidus* has progressively extended throughout the Mediterranean Sea and neighbouring waters (Nehring, 2011). The overall Mediterranean records revealed that the species is now confirmed from 16 out of 23 countries surrounding the Mediterranean Sea. Our record represents the westernmost record of the species in the Mediterranean.

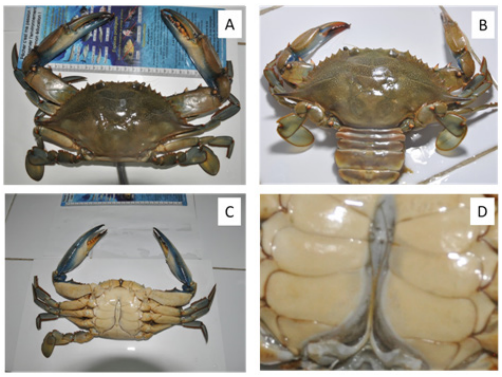

***Fig. 2*:** *Callinectes sapidus* specimens collected at the Marchica lagoon, Mediterranean coast of Morocco. (A) male, dorsal view; (B) female, dorsal view; (C) male, ventral view; (D) male, detail of gonopods.

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1.2 Sighting of *Polycera hedgpethi* in the Ligurian Sea (northwestern Italy)

Agnese Marchini

Polycera hedgpethi Er. Marcus, 1964 is a nudibranch originally described from California but reported from various geographic regions including the western and eastern Atlantic, the Mediterranean Sea, the Indian Ocean, and the northwestern and southwestern Pacific (Keppel *et al*., 2012 and references therein).

In the Mediterranean Sea, it was reported from two coastal lakes of the Tyrrhenian Sea, the Thau lagoon in France and from four localities in the northern Adriatic Sea (Keppel *et al.*, 2012; Dailianis *et al.*, 2016; Furfaro *et al.*, 2018 and references therein). Additionally, an unpublished record from Portovenere (Ligurian Sea), was posted in 2016 on a website dedicated to opistobranchs (Ballesteros *et al*., 2012-2018).

Here a further finding of this species from the Ligurian Sea, namely from the harbour of La Spezia (Ligurian Sea, northwestern Italy) is reported.

On June 13th 2018, during a fieldtrip with students of Marine Ecology, the harbour of La Spezia (44.103333° N 9.826667°E) was visited where some fouling samples were collected for didactic purpose from the "A. De Benedetti" marina. Samples were collected by the students from the mooring lines of leisure craft, which were covered with huge colonies of the spaghetti bryozoan *Amathia verticillata* (delle Chiaje, 1822), forming clumps of 1-2 m diameter, as well as from the lateral margin of a floating pontoon, covered with mussels, tunicates and dense colonies of the cheilostome bryozoan *Bugula neritina* (Linnaeus, 1758).

Amongst the numerous associated organisms, two nudibranchs of about 2 cm long were observed, photographed (Fig. 3), and one of them was put in ethanol for preservation. Afterwards, the comparison of the photographs with literature revealed that they were two specimens of the non-indigenous species *P. hedgpethi*. In fact, the body shape and the peculiar colour pattern, with whitish background pointed by dense dark-grey dots, and with yellow-orange tips of branchial plumes, tentacles and rhinophores, is in accordance to the descriptions and pictures provided by Keppel *et al.* (2012).

This casual sighting of two individuals is not far from the first finding of the species at Portovenere (Ballesteros *et al.*, 2012-2018), which is only around 3 nautical miles from La Spezia and is intensively connected to the latter by recreational boats and frequent ferries that transport tourists to the highly attended "Cinque Terre" area. Hence, it would be interesting to further investigate the Ligurian marinas in order to verify the population status of this nudibranch, particularly on *A. verticillata* and *B. neritina*, which are very common in harbours and marinas and to which *P. hedgepethi* is often found associated with (Furfaro *et al*., 2018). The findings of *P. hedgepethi* in marina habitats located nearby a large harbour area, obviously points to shipping or boating as introduction vector, likely as hull fouling and possibly together with the two aforementioned bryozoans. However, the hypothesis of aquaculture cannot be ruled out. The Gulf of La Spezia hosts mussel farms, and mussel stocks are known to be imported from the northern Adriatic Sea (Prioli, 2001), a region where the non-indigenous nudibranch has been reported repeatedly. Findings of *P. hedgepethi* in other mussel-farming sites (e.g. Fusaro Lake and Faro Lake; Furfaro *et al.*, 2018) further support this hypothesis. Probably, an interaction of vectors is involved in the rapid and successful spread of this species along the Italian coasts.

Fig. 3: Two individuals of *Polycera hedgepethi* from La Spezia (Ligurian Sea, Italy). Photo by J. Ferrario.

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1.3 On the occurrence of the sea walnut, *Mnemiopsis leidyi* Agassiz, 1865, in the Fiora river (Italy)

Armando Macali and Francesco Tiralongo

The ctenophore *Mnemiopsis leidyi* A. Agassiz, 1865 is a successful marine invasive species. It is native in the West Atlantic coast, from Argentina to New England (USA). Its highest abundance is reached at temperate latitudes on both hemispheres (Costello *et al*., 2012). In dry season, it conquers estuarine and riverine environment (Reaugh *et al.*, 2007), showing a strong adaptability to a wide range of temperature and salinity. In the last two decades, it spread into the Ponto-Caspian (Reusch *et al*., 2010) and Mediterranean region (Ghabooli *et al*., 2011), including landlocked saline lakes (Shabrawy & Dumont, 2016). Here, the first occurrence of *M. leidyi* (Fig. 4) in the Fiora River (Latium, Italy), is reported where it was recorded from June to October 2017. On 5th September 2017, a total of 35 specimens (length range 11–45 mm; average=17.5 mm) were collected by a plankton net (D = 55 cm, 8 mm mesh) trawled over a linear transect of 25 m (centered in 42.345600° N - 11.582649° E). Environmental parameters were recorded: T = 28.9 C°; pH = 6.74; salinity = 185 mg/l at 1 m depth; flow = 0.44 m/sec; average depth = 1,75 m. DNA analysis, with the use of the COI mitochondrial marker (see Ghabooli *et al*., 2013 for methods), unambiguously confirmed its identification (100 % homologous to the GenBank sequence with accession number KF435107). The stream flow of the river varies between 0.02–0.08 m/sec in spring-summer and 3.57 m/sec in autumn-winter (personal observation). The presence of *M. leidyi* in two tributaries of Chesapeake Bay (native area of the species) was positively correlated with low stream flow during the drier seasons (Reaugh *et al.*, 2007). It seems therefore that the establishment of a self-sustained population of the species in Fiora River is not probable due to the severe seasonal change of the stream flow, in combination with the scarce swimming ability of *M. leidyi*. However, the perspective of species presence in high numbers during the dry season and its omnivorous feeding habits may pose concerns about the future impacts on freshwater native species. Further surveys will be conducted in Fiora River for an early assessment of a potential increase in species abundance in the area.

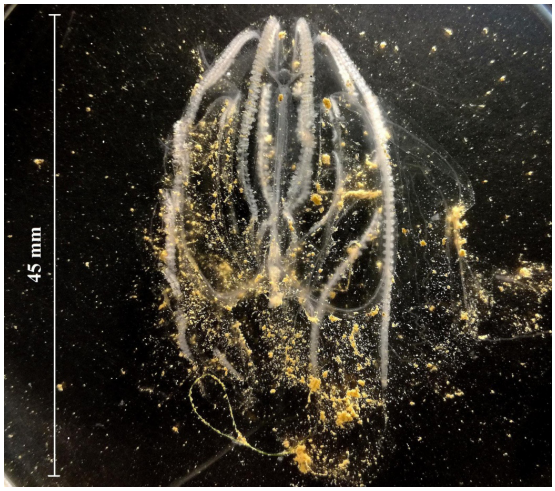

Fig.4: Specimen of *M. leidyi* from Fiora River (Latium, Italy).

1.4 First record of *Caulerpa taxifolia* (M. Vahl) C. Agardh var. *distichophylla* (Sonder) Verlaque, Huisman and Procaccini along Tunisia coastline

Vincenzo Di Martino and Bessy Stancanelli

In the Mediterranean basin, the green algal genus *Caulerpa* J.V. Lamouroux is represented by 8 taxa: *C. prolifera* (Forsskål) J.V. Lamouroux (Syn.: *Caulerpa ollivieri* Dostál), *C. chemnitzia* (Esper) J.V. Lamouroux [Syn.: *C. racemosa* var. *occidentalis* (J.Agardh) Børgesen, *C. racemosa* var. *turbinata* (J.Agardh) Eubank], *C. mexicana* Sonder *ex* Kützing, *C. scalpelliformis* (R. Brown *ex* Turner) C. Agardh, *C. taxifolia* (M. Vahl) C. Agardh, *C. taxifolia* (M. Vahl) C. Agardh var. *distichophylla* (Sonder) Verlaque, Huisman and Procaccini, *C. cylindracea* Sonder, and *C. racemosa* var. *lamourouxii* f. *requienii* (Montagne) Weber-van Bosse. Only the species *C. prolifera* is considered indigenous while the others are considered alien species (Aplikioti *et al.*, 2016 and other references cited therein).

Caulerpa taxifolia var. *distichophylla* was reported for the first time in the Mediterranean Sea in 2007 from the south coast of Turkey (Cevik *et al.*, 2012, as *C. taxifolia*) and later was reported from the Mediterranean shoreline of Sicily, Cyprus, Malta, Rhodes (Aplikioti *et al*., 2016 and other references cited therein) and Libya (Shakman *et al*., 2017).

In the current paper the data showing the first record of *Caulerpa taxifolia* var. *distichophylla* in Tunisia are presented.

The samples were collected between autumn 2015 and spring 2016 in three Tunisian sites: Alataya Harbour, Djerba and Tabarka (Table 2). All the samples were collected by snorkeling at depth of between 0,20 and 2 m and *in situ* preserved in a solution of seawater and formaldehyde at 4%. After washing in sea water, the samples were frozen and stored in the CNR/ISAFOM algal herbarium in Catania.

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The samples collected in all places were assessed for the morphological identification of taxon through measurement of the diagnostic structural features used by Jongma *et al.* (2013) to characterize specimens from Sicily: stolon width, shape, width and length of fronds and pinnules, number of rhizoidal pillars and pinnules, and morphology and width of the midrib.

The first sample of *C. taxifolia* var *distichophylla* was collected in the fall of 2015 in a dive site near Tabarka, north of Tunisia. Later, more samples were collected/observed in the fall of 2016 and spring 2017 along the coast of Djerba and near Alataya Harbour. All the Tunisian specimens were identical to those described previously in the Mediterranean Sea (Aplikioti *et al.*, 2016, Shakman *et al.,* 2017) (Fig. 5). In the three places of the Tunisian coastline *C. taxifolia* var *distichophylla* was found along the margins of *Posidonia* meadows and /or on sandy bottoms with large tufts spread to "patchy". All the *C. taxifolia* var *distichophylla* meadows investigated were present in shallow waters and formed non-continuous cords running parallel to the coastline; Near these sites the pleasure boating is very developed or there are tourist ports or small fishing ports.

Generally, *C. taxifolia* var *distichophylla* appeared more abundant and with longer branches (ca 14-16 cm) in areas sheltered from the waves, the dead "*matte*" of *Posidonia oceanica* and the borders of *P. oceanica* meadows where it was less dense.

Description with certainty what are the factors that are driving the spread of *C. taxifolia* var. *distichophylla* in the Mediterranean is still premature. From what can be observed yet, it seems that this species is now following the same migration routes of most Lessepsian species. From this it appears very likely that the mechanisms of this species are the same of the many Lessepsian taxa that have penetrated into the Mediterranean.

With regards to the interactions of this species with species and benthic assemblages of the invaded areas it must be said that the data in the bibliography are in conflict with each other. In fact, according to Musco *et al.* (2015) the presence of *C. taxifolia* var. *distichophylla* in the Sicilian seabed colonized by this species has greatly influenced the taxonomic composition and the average abundance of taxa of macro- and meiobenthos; while, according to Cevik *et al.* (2012) the presence of this species would have a structuring function for pre-existing assemblages ensuring, even, an increase of biodiversity with the creation of a new habitat where there are seabeds devoid of structuring species such as *P. oceanica*.

In the sites invaded by *C. taxifolia* var. *distichophylla* we observed that the diversity of plant and animal species appeared to be changed but further studies are necessary to confirm it.

Fig. 5: Photograph of *C. taxifolia* var. *distichophylla* at 2 metres depth on sandy bottoms in Djerba (Tunisia).

Table 2: Sampling sites with geographical coordinates and indication of the depth and type of habitat on which *Caulerpa taxifolia* var. *distichophylla* has settled.

	SITES in TUNISIA			
		Alataya Harbour	Djerba	Tabarka
	Latitude	34.726975°N	33.830769°N	36.960669°N
	Longitude	11.30173°E	11.026272°E	8.752208°E
Habitat	*Posidonia* beds	*	*	*
	Rocky shores	*	*	
	Sand bottoms	*	*	*
	"Dead *Posidonia* mattes"			*

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2. ADRIATIC SEA

2.1 First report of *Demoleus heptapus* (Otto, 1821) (Copepoda: Pandaridae) from Sixgill bluntnose shark, *Hexanchus griseus* caught in the north Adriatic waters off Slovenia

Lovrenc Lipej and Domen Trkov

A specimen of a sixgill bluntnose shark, *Hexanchus griseus* (Bonnaterre, 1788) was caught in a fishing net used for large sized flatfish fishing at 28th January 2018, 1.5 Nm northward Cape Ronek near Izola (GPS 45.565006° N, 13.615689° E; Slovenia, northern Adriatic Sea). The specimen was 217 cm in total length and weighed app. 52 kg (Fig. 6). Body surface and the branchial region of the shark were carefully examined for the presence of ectoparasites. Species of a parasitic copepod was found on the skin of the chin. It was carefully removed from the host. The parasitic copepod was examined in detail and photographed under the Olympus SZX16 stereomicroscope equipped with a digital camera. The species identification was performed according to Kabata (1979) (Fig. 7).

Total body length of the parasite was 13.4 mm and was identified as female of *Demoleus heptapus* (Otto, 1821) (Pandaridae, Copepoda Poecilostomatoida) due to the diagnostic features such as dorsal plates on fourth pedigerous somite and a long, subrectangular genital complex with prominent lobes on posterolateral corners (Kabata, 1979). Subsequently, the specimen was fixed in 70% alcohol solution and deposited in the collection of the Marine Biology Station (MBS) of the National Institute of Biology.

Sixgilled bluntnose shark is present mainly in middle and southern Adriatic. Only three records exist on the sixgilled bluntshark occurrence in waters off Slovenia. In the shallow waters of the Gulf of Trieste such deep-water sharks visit only in very rare occasions. All captured sharks were juvenile specimens with total lengths from 150 to 320 cm in total length. The pandarid copepods are known to infest different species of elasmobranchs. *Demoleus heptapus* specimens have been reported as ectoparasites of *Hexanchus griseus* in North Atlantic, off the coast of California and in Hawaiian archipelago (Lewis, 1966) and especially in the Mediterranean Sea (Laubier *et al*., 1966; Raibaut *et al*., 1998; Mariniello, 2010). In the Mediterranean Sea, three other parasitic copepods are known to infest bluntnose sixgilled shark such as *Caligus lessonianus, Nemesis robusta* and *Protodactylina pamelae* (Raibaut *et al.,* 1998).

Up to date, no published data exist regarding neither the presence of *Demoleus heptapus*, nor of any other parasitic copepods in Slovenian waters. Since the species was not reported in any of the specialized works on parasites (e.g. Mariniello, 2010 and references therein), it should be considered also as the first record in the whole Adriatic Sea.

Fig. 6: A juvenile specimen of bluntnose sixgill shark *Hexanchus griseus,* entangled in fishermen net in waters off Izola (Slovenia, northern Adriatic Sea) on 28th January 2018.

Fig. 7: The parasitic copepod *Demoleus heptapus* (female; dorsal - a) and ventral side - b), found on a bluntnose sixgill shark *Hexanchus griseus.*

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2.2 First record of *Haminoea cyanomarginata* from the Adriatic Sea

Branko Dragičević, Marija Despalatović and Jakov Dulčić

Haminoea cyanomarginata Heller & Thompson, 1983, is a cephalaspidean mollusc (family Haminoeidae) first recorded in the Mediterranean waters in 2001 in Korinthiakos in Greece (Zenetos *et al.,* 2004). It is considered as a recent Lessepsian migrant whose distribution has not been extensively published in the literature (Crocetta & Vazzana, 2009). According to CIESM Atlas of exotic species, this species is also recorded from Izmir and Antalaya in Turkey (Zenetos *et al*., 2004). In 2006 Misfud (2007) recorded this species along the Maltese coast, and in 2007 it was recorded from southern Italy (Reggio Calabria, Ionian Sea) (Crocetta & Vazzana, 2009) while later it was detected in the Tyrrhenian Sea and Sicily Strait (Stasolla *et al.*, 2014). The absence of records from Egypt, Israel, Lebanon, Syria, and Cyprus suggests a local introduction by transport-stowaway (Crocetta *et al.*, 2017). On 21st September 2016, two specimens of *H. cyanomarginata* have been observed in the vicinity of Island of Mljet, Croatian coast (Greben Štit, southern side; 42.77166ºN, 17.33250ºE), closely leaning on each other on the bottom covered with vegetation. Upon observation, these were photographed in vivo. Scuba divers managed to record sea temperature at 24°C, and the depth was between 30 and 35 meters. The divers approximated length of the specimens at 2 cm. Unique coloration of this species makes it easily identifiable and leaves little room for misidentification. Photos clearly show bubble shaped body indicating the shape of the shell (Fig. 8). Body colour is whitish with purple-blue margins of the mantle.

This record represents the first record of this species in the Adriatic Sea, but also the northernmost record of this species worldwide.

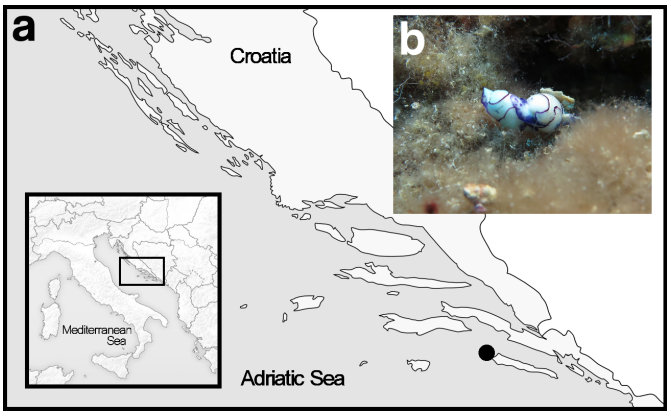

Fig. 8: Location of the record and *in situ* photo of *Haminoea cyanomarginata* from the Adriatic Sea.

3. CENTRAL MEDITERRANEAN

3.1 A record of *Oculina patagonica* de Angelis, 1908 from Maltese waters

Alan Deidun and Stefano Piraino

The scleractinian coral *Oculina patagonica* de Angelis, 1908 is typically found in shallow waters (0m-10m), preferring rocky shores, caves and sandstone reefs as a natural habitat, but also known from artificial boulders, submerged metal objects, jetties and wharves, being generally resistant to a wide range of marine environmental parameters (Fine *et al.*, 2001). It was originally described from fossils recovered off the south-eastern coast of South America and thought to be introduced in the Mediterranean by shipping (Zibrowius, 1974), where living colonies were first recorded from the port of Savona in Italy in 1966.

The anthropogenic introduction of *O. patagonica* from the western South Atlantic waters, where living specimens have been never recorded from both open water or biofouling harbour communities, has been recently questioned by a genetic study on different *Oculina* spp. from the western North Atlantic and the Mediterranean (Leydet & Hellbert, 2015). Based on the divergence time of western North Atlantic and Mediterranean populations of different *Oculina* spp., the occurrence of *Oculina* spp. fossils in the eastern North Atlantic, and the lack of *Oculina* spp. fossils in the Mediterranean, Leydet & Hellbert (2015) hypothesized NE Atlantic populations as a

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possible source of *O. patagonica* in the Mediterranean. The same authors also pointed out the need for additional genetic work to verify whether *Schizoculina africana* from the Cape Verde archipelago, off the coast of Western Africa, and *O. patagonica* may be conspecific. The existing level of uncertainty about the biogeographic origin of *O. patagonica* justified its current assignment as a *cryptogenic* species within the European Alien Species Information Network (EASIN) database.

Nowadays this species is known from widely-disparate areas within the Mediterranean basin, including the Gulf of Lyon, south-eastern Spain, Croatian waters, Greek waters, Turkey, Israel, Egypt, Tunisia and Algeria. The species was also recently (November 2017) recorded from Maltese waters within online news portals (University of Malta Newspoint, 2017; Times of Malta, 2017). At least a number of Mediterranean populations of the species, especially those in Israel, Egypt and Spain, are considered to be expanding, leading the IUCN to recently re-assess the species' status and re-classify it as 'Least Concern'.

In August 2017, a single large (diameter approximated at 30 cm) colony of *O. patagonica* (Fig. 9) was observed at a depth of 2m, on a near-horizontal ledge situated on one of the concrete pylons supporting a re-fuelling dolphin known as the 'Has Saptan facility', located within the Birzebbuga side of Marsaxlokk Bay (35.825413°N, 14.534217°E). The ledge was dominated by heavily-silted vegetation of the marine algal species *Corallina elongata* and *Dicyota dichotoma.*

It is indeed puzzling how this highly conspicuous macrobenthic species has largely escaped detection within Maltese waters to date, also given the dense presence of SCUBA divers and snorkelers within the same waters. The bay from where *Oculina patagonica* was recorded hosts a major cargo-handling facility (Freeport) and is characterised by intense maritime traffic.

Fig. 9: Single *Oculina patagonica* colony observed on an artificial metal structure within Marsaxlokk Bay, along the south-eastern coast of Malta.

3.2 First record of *Pelagia benovici* (Scyphozoa, Cnidaria) in the Ionian Sea

Dimitris Anastasiadis and Stefano Piraino

Pelagia benovici is a semeostome jellyfish first described a few years ago (Piraino *et al.*, 2014), when high numbers of mature specimens were found in the North Adriatic, from Trieste to Chioggia (Venice). It was quickly recognized as a new species to science by morphological and molecular analyses and as non-indigenous of the Mediterranean Sea, most probably introduced by ballast waters of ships. Avian *et al.* (2016) suggested it previously reached the same area in 2005, but at that time it remained unnoticed. The large population in the North Adriatic rapidly disappeared by spring 2014, with few specimens still recorded in the Chioggia area in August 2014, and in December 2016 in Central Adriatic (near Numana, Ancona) (https://goo.gl/Ep2b4k). More recently, Bayha *et al.* (2017) provided molecular evidence (COI and 28S sequences) of two specimens near Dakar, from the Western coast of Africa. The absence of additional records between Gibraltar and the Adriatic Sea corroborates the hypothesis of a recent introduction in the Mediterranean Sea by shipping. Further, there is no additional information regarding the potential establishment of *P. benovici* in the Adriatic Sea and, more generally, in the Mediterranean basin.

Over the weekend of June 2018 (June 29th - July, 1st), a dense jellyfish population emerged at the entrance of

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the Igoumenitsa Bay (Ionian Sea), near Drepanos beach (39.51611° N, 20.19917° E), at short distance (3 nautical miles) from the Igoumenitsa harbor. Jellyfish specimens ranging 2 to 8 cm in diameter were identified as representatives of *P. benovici* by distinctive morphological features, i.e. flat exumbrella, faint and delicate oral arms, eight white tentacles, horse-shoe shaped gonads with peripheral convexity, and densely and uniformly packed, dark orange nematocyst warts, also present on the gonad foldings (Fig. 10 a, b). The umbrella was transparent to orange colored, due to the color of nematocyst warts and gonads (Fig. 10c). One to two jellyfish per square meter were observed near the surface or at shallow depth (<0.5m) drifted by currents to the coast, opposite to the prevailing north-western wind direction (3-4 Beaufort scale). The swimming ability of jellyfish appeared very limited. Interestingly, stings from *P. benovici* were reported without serious consequences (light tingling without marks) only by few people among hundreds of bathers populating the Drepanos beach in those days. The jellyfish reappeared again along the Drepanos beach on July, 8th 2018. Fishermen working in the area declared the same jellyfish was spotted earlier in June on the northwest coast of Corfu, but confirmatory evidence is missing.

This finding represents the first record of the species in the Ionian Sea and, more generally, in the Mediterranean Sea outside the Adriatic basin. The harbor of Igoumenitsa is the closest Greek harbor to the Adriatic, where ferries arrive from/depart to Trieste, Venice and also Ancona, the last locality where *P. benovici* was recorded in the Adriatic Sea. This supports the hypothesis that the introduction of *P. benovici* is a result of shipping activities. If this is true, we may expect to find this species soon along the Southern Italian coasts due to the multiple ferry companies crossing from Igoumenitsa to Bari and Brindisi. It still remains unknown whether its life cycle includes a polyp stage, like *Chrysaora* spp. and *Sanderia* spp, which may represent a remarkable difference from the holopelagic congeneric species, *P. noctiluca* (Canepa *et al.*, 2014). Remarkably, *P. benovici* medusa can undergo fission, a common way of asexual reproduction in cnidarians (Fig. 10b).

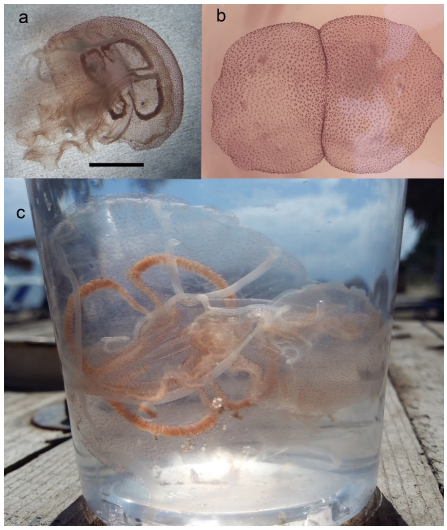

Fig. 10: *Pelagia benovici* from the Igoumenitsa Bay. a) oral view; b) top view, showing the ongoing process of fission; c) two specimens of different size, shortly after collection. Note the transparency of the umbrella, the nematocyst warts on the horse shoe-shaped gonadal foldings, the milky appearance of the eight marginal tentacles. Scale bar (a): 2 cm.

3.3 First record of Smallscale codlet *Bregmaceros nectabanus* Whitley, 1941 in the Ionian Sea

Vlasios Ketsilis-Rinis and Nikos Dimitriou

The monogeneric, circumtropical family Bregmacerotidae comprises 14 valid species according to Fishbase (Froese & Pauly, 2017); however, the number of species of the genus *Bregmaceros* is controversial. Until recently, *Bregmaceros atlanticus* Goode & Bean (1886) was considered as the only representative in the Mediterranean Sea. According to Harold & Golani (2016) all the records of *Bregmaceros atlanticus* from the Mediterranean Sea have been misidentifications of the smallscale codlet *Bregmaceros nectabanus* Whitley (1941). In the Mediterranean, the species was first mentioned from the Straits of Sicily, a record considered rather uncertain. The first widely accepted report was from Antalya Bay in 2002. Subsequently, it has been recorded from the Kusadasi Bay (2005), the coast of Israel (2006), the Bay of Iskenderum (2011), the Izmir Bay (Aydin & Akyol, 2013 and references therein) and the Saronikos Gulf, the latter being the first record in the Hellenic waters of the Aegean Sea (Dogrammatzi & Karachle, 2015).

In 2016, during samplings in the frame of the National Data Collection Framework Project for fisheries data, conducted in the area of the Ionian Sea (GSA 20), one individual of *Bregmaceros nectabanus* was collected in the Patraikos Gulf and five individuals in the Kerkyraikos Gulf. Measurements of five out of six individuals (as one individual was damaged) such as total and standard length (in mm; TL and SL, respectively), total and gonad weight (in g; TW and GW, respectively), sex and gonadal maturity stage according to Nikolsky (1976) were made (Table 3, Fig. 11). The mean values along with the standard deviation for TL and TW were 62.6±15.5 mm and 1.49±1.15 g, respectively. The sex ratio "male:female: undetermined" was 1 : 3 : 1.

The stomach contents of four out of six individuals (as two individuals were damaged) were examined based on the numerical method with the aid of a stereoscope. The

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number of items in each food category was recorded and expressed as a percentage of the total number of items in all food categories. The most abundant food items were Copepoda, constituting 52%, followed by Chaetognatha (16%), bivalve larvae (13%), Heteropoda (10%), Decapoda larvae (6%) and Cladocera (3%).

Table 3. Individual collection information and morphometric parameters of *Bregmaceros nectabanus* (length measurements are given in mm and weights in g).

	Individuals					
Parameters	**1**	**2**	**3**	**4**	**5**	**6**
Catch date	6/11/2016	28/11/2016	29/11/2016	2/12/2016	4/12/2016	6/12/2016
Catch area	Patraikos Gulf			Kerkyraikos Gulf		
Latitude	38.2272° N	39.4878° N	39.4900° N	39.5664° N	39.4872° N	39.5025° N
Longtitude	21.6108° E	20.0392° E	20.0533° E	20.0778° E	19.9897° E	19.9647° E
Depth (m)	100	57	59	67	55	64
Fishing gear	Purse seine	Purse seine	Purse seine	Bottom trawl	Bottom trawl	Bottom trawl
Total Length	74	82	66	64	56	37
Fork Length	72	80	-	61	52	34
Standard Length	64	75	-	56	50	33
Prepectoral Length	11.34	14.24	-	10.01	8.85	6.72
Preanal Length	24.38	28.81	-	22.1	18.14	11.65
Predorsal Length	27.05	30.02	-	24.09	20.55	13.41
Prepelvic Length	27.19	30.99	-	24.98	20.73	13.75
Head Length	10.91	11.4	-	8.8	8.09	5.56
Preorbital Length	2.97	3.48	-	3.02	2.99	1.58
Eye Diameter	3.57	3.27	-	2.64	1.57	1.37
Interorbital Width	3.16	4.14	-	2.33	1.82	1.01
Upper Jaw Length	4.35	5.35	-	3.59	3.31	2.63
Maximum Body Depth	11.69	12.91	-	9.07	7.66	4.97
Minimum Body Depth	3.81	3.69	-	2.91	2.58	2.08
Dorsal Fin Base Length	11.35	13.82	-	10.27	8.41	4.95
Pelvic Fin Base Length	13.15	17.27	-	12.47	6.83	5.33
Dorsal Fin Length	11.47	12.99	-	8.37	7.73	6.69
Pectoral Fin Length	6.96	8.87	-	6.43	5.66	2.87
Total Weight	2.82	2.96	-	0.65	0.77	0.27
Gonad Weight	0.1423	0.2521	-	0.0256	0.0074	-
Sex	male	female	-	female	female	Undetermined
Stage	3	4	-	2	2	0

Fig. 11: Specimen of *Bregmaceros nectabanus* from Kerkyraikos Gulf, Ionian Sea, Greece, November 2016 (individual 2 from Table 1). The detail shows female gonads at maturity stage 4 according to the macroscopic maturity scale of teleost fish (Nikolsky, 1976).

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4. EASTERN MEDITERRANEAN

4.1 *Viriola* sp. [cf. *corrugata* (Hinds, 1843)] in Cyprus

Periklis Kleitou and Fabio Crocetta

Viriola corrugata (Hinds, 1843) (Mollusca: Gastropoda: Triphoridae) is a species originally described from New Guinea and Straits of Malacca. Marshall (1983) first pointed out that its wide variability inshell features may suggest the presence of a complex of species, a topic which was further discussed by Crocetta *et al.* (2017). Specimens belonging to this complex have a large Indo-Pacific distribution, which includes the Red Sea and the Persian Gulf, and since few years also colonized the Mediterranean Sea, with records from Greece (Micali *et al.*, 2017) and Turkey (Ovalis & Zenetos in Stamouli *et al.*, 2017).

During recent field samplings in Cyprus on July 2017, two live specimens of *Viriola* sp. [cf. *corrugata* (Hinds, 1843)] (shell sizes: 17.9×4.2; 14.6×3.3 mm) (Fig. 12) were recorded at a Natura 2000 site (Nisia) off Protaras village (35.00277° N, 34.07095° E) at the approximate depth of 21 m. The specimens were found on rocky substrate. Our finding confirms the presence of this alien molluscan species in the Mediterranean Sea and constitutes the first record from Cyprus.

Fig. 12: *Viriola* sp. [cf. *corrugate*] from Protaras area (17.9×4.2 mm).

4.2 Some new additions to the crustacean decapods of Cyprus

Niki Chartosia and Marilena Theodosiou

Cyprus is an island in the Levantine Sea (Eastern Mediterranean) which is characterized by higher salinities and temperatures comparing to the rest of the Mediterranean Sea. Although it is of high interest, the marine biodiversity of Cyprus is poorly known especially concerning marine invertebrates. The number of decapods recorded until recently from Cyprus reached 161 species (e.g., Gerovasileiou *et al*., 2017; Ulman *et al.*, 2017). As it was previously noted the low recorded number of species from Cyprus is primarily attributed to the fact that there is a lack of knowledge due to inadequacy in systematic sampling in a wide range of marine habitats. Strong evidence of this statement are the results of the current research which revealed, for the first time, the presence of relatively common decapod species from the marine area of Cyprus. These are the caridean shrimp *Pasiphaea sivado* (Risso, 1816) and the anomuran *Munida curvimana* A. Milne Edwards & Bouvier, 1894. This is the first record of the genus *Munida* from Cyprus. Thus, the number of Decapoda of Cyprus raises up to 163.

The specimens of *Munida curvimana* (1 female: CL = 14 mm excluding the rostral spine; Fig. 13) and *Pasiphaea sivado* (1 ovigerous female: CL = 19 mm; Fig. 14), were obtained by a bottom trawl deployed in Avdimou Limassol (34.63, 32.76) during March and April 2015 from 55 and 65 m respectively, over sandy-silt bottoms, while the male specimen of *M. curvimana* (CL = 19 mm excluding the rostral spine; Fig. 13) was taken out of the mouth parts of an *Octopus vulgaris* individual fished by longline from Kavo Pyla Larnaca (34.94 N, 33.70 E) from 100 m depth. The specimens were preserved in 80 % ethanol solution and deposited in the collection of the Department of Biological Sciences, University of Cyprus, Nicosia.

Pasiphaea sivado (Fig. 14) was previously recorded from the Atlantic Ocean, and from the Alboran, Adriatic, Ionian, Aegean and Levantine Seas (e.g., D'Udekem d'Acoz, 1999). *Munida curvimana* was previously reported from the Atlantic Ocean and from the western and central Mediterranean, the Aegean Sea and the Levantine Basin (e.g., D'Udekem d'Acoz, 1999; Corsini – Foka & Pancucci-Papadopoulou, 2012). The current finding consists the first one for Cyprus, not only for the species but also for the genus. Although the aforementioned Atlanto-Mediterranean species are well known from several areas of the Mediterranean Sea, the fact that this is the first time they are reported from Cyprus should be probably attributed to the scarcity of relevant studies in the area, enhancing the statement that the marine environment of Cyprus is still much undiscovered. An addition to this study is the finding of 10 individuals of the stomatopod *Squilla mantis* (Linnaeus,

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1758) which although it is very common even in the local fish-markets, after a thorough search in the literature it seems that it was not been recorded previously in the literature apart from the Fisheries Bulletin in 1969 (Demetropoulos & Neocleous, 1969).

Fig. 13: *Munida curvimana*: A. A female specimen from Avdimou, Cyprus; B. A male specimen from Cape Pyla, Cyprus

Fig. 14: An ovigerous female of *Pasiphaea sivado* from Avdimou, Cyprus.

4.3 First record of *Lohmannella falcata* (Hodge, 1863) (Acari: Halacaridae) from the Mediterranean Sea of Turkey, Antalya

Furkan Durucan

Lohmannella Trouessart, 1901 is distributed in all types of aquatic habitats including fresh, brackish, and saline waters (Bartsch, 2006). At present 30 marine species are known around the globe (WoRMS Editorial Board, 2018). *Lohmannella falcata* was described for the first time in the North Sea (Seaham, United Kingdom) and afterwards it was recorded from eastern and western North Atlantic, Baltic, Mediterranean and Black Sea (Bartsch, 2009).

Only one male specimen of *Lohmannella falcata* (Hodge, 1863) (Fig. 15) was collected from medium coarse sand, at a depth of 7 m (June, 2017) (Hamit Bey Plaji) close to the city centre of Antalya (36.875556°N, 30.707222°E). The specimen was cleared in lactic acid, mounted in Hoyers medium and deposited in the author's personal collection (FD-HAL/23). The colour of idiosoma is reddish brown. Gnathosoma is very long, with distinctly 4-segmented palps, palp length of the specimen (μm) P-1 to P-4: 25/100/7/32. Tibia I with three pairs of pectinate setae ventrally. Measurements as a μm are summarized in Table 4.

The characteristics features of *L. falcata* are: three ventral pairs of pectinate setae on tibia I; palp segment P-2 over 10 times the length of P-3, and P-2 is not raised in *L. falcata* (P-2 is raised in *L. multisetosa*) (Bartsch, 1986; Green and MacQuitty, 1987).

This is the first record of this species from Mediterranean Sea of Turkey (Antalya) and constitutes the second record of this species from Turkey after the Black Sea (Sinop) one by (Bartsch, 2004) (not illustrated).

Table 4. Measurements of *Lohmannella falcata* (Hodge, 1863). AD, anterior dorsal plate; OC, ocular plate; PD, posterior dorsal plate; AE, anterior epimeral plate; GA, genitoanal plate; GO, Genital opening.

♂	Idiosoma	Gnathosoma	AD	OC	PD	AE	GA	GO
Length	375	218	113	87	150	120	150	36
Width	308	88	125	50	85	212	125	25

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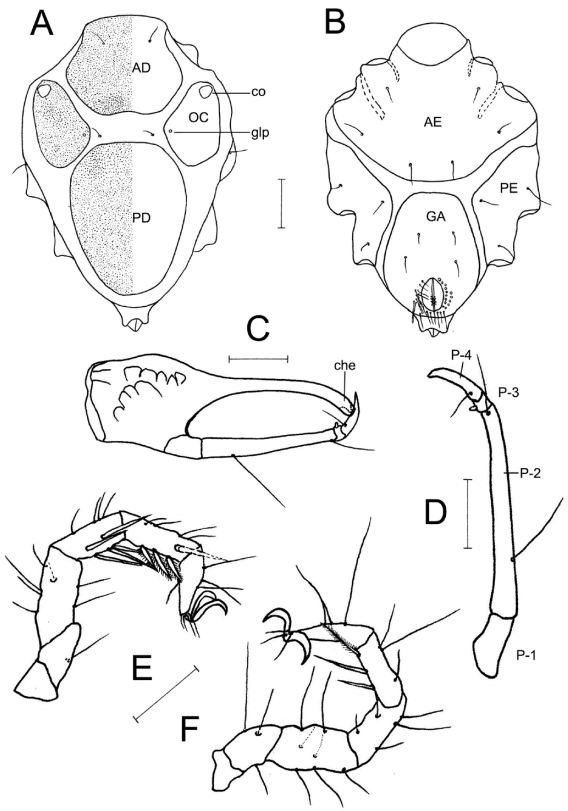

Fig. 15: *Lohmannella falcata* (Hodge, 1863), male: A-Idiosoma, dorsal; B-Idiosoma, ventral view; C-Gnathosoma, lateral view; D-Palp, lateral view; E-Leg I, lateral view; F-Leg-II, lateral view. AD, *anterior dorsal plate*, OC, ocular plate; PD, *posterior dorsal plate;* AE, *anterior epimeral plate*, *GA, genitoanal plate*, PE, posterior epimeral plate; co, cornea; glp, gland pore; che, chelicera; P-1 to P-4, first to fourth palpal segments; Scale bars: 50 µm.

4.4 Further sightings of *Priacanthus sagittarius* in the Levantine coasts of Turkey

Sercan Yapici and Deniz Hasbek

The genus *Priacanthus* consists of 12 valid species in the world and is represented by *Priacanthus proxilus* and *Priacanthus sagittarius* in the Mediterranean (Gürlek *et al.,* 2017). The first record of arrow bulleye, *P. sagittarius,* in the Mediterranean was given from Israeli coast by Goren *et al*. (2010). Consequently, the species was reported from Israel (Golani *et al.,* 2011) and Egypt (Farrag *et al.,* 2016). Its first observation in the Turkish coasts was reported from off the Taşucu, Mersin (Gökoğlu & Teker, 2018).

On the 5th March 2018, a single specimen of *P. sagittarius* was caught by bottom trawl, at a depth of 40 m on a sandy-mud bottom from off Hatay/Arsuz (36.2521° N, 35.4855° E), Levantine Sea. Fisherman declared that the specimen was 20 cm in total length approximately. The specimen was photographed and then threw at the sea by a commercial fisherman in case it could be dangerous. However, they provided species information as a picture to Directorate of Hatay Provincial Food Agriculture and Livestock (Fig. 16).

Priacanthus sagittarius was introduced in the Mediterranean only eight years ago, however, the present record is considered the fifth record for the Mediterranean Sea. Considering its initial and present occurrences in the Turkish coasts, it seems that *P. sagittarius* has extended its range in a short time. Generally, many of the invasive species are probably overlooked in various regions of the Mediterranean since they are considered as non-commercial species because of small size and cryptic behavior or they are usually thrown back in the water by amateur/commercial fishermen due to lack of knowledge. Most of the non-intentional invasions are likely to suffer from this kind of "detection lag" (Azzurro *et al.,* 2016). Therefore, the actual distribution of *P. sagittarius* in the Mediterranean could be wider than is known.

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Fig. 16: *Priacanthus sagittarius* from the Hatay/Arsuz coasts of Turkey (Photograph courtesy of Deniz Hasbek)

5. BLACK SEA

5.1 First record of *Arcuatula senhousia* in Bulgaria (western Black Sea)

Valentina Todorova

The Asian date mussel *Arcuatula senhousia* (Benson in Cantor, 1842) (Bivalvia: Mytiloida: Mytilidae) is a small thin-shelled mytilid with elongated modioliform shape, variable greenish-brown-purple colour, with radiating stripes from the center of growth and concentric zigzag lines. Native in the Western Pacific, it was recorded live for the first time in the Black Sea in 2002, in Constanta port area, Romania (Micu, 2004). Second finding of two live specimens took place in 2015 in the Kerch straight, the Russian Azov-Black Sea, on shelly sand at 2 m depth (Kovalev *et al.*, 2017). The appearance of *A. senhousia* in Bulgaria was expected based on its presence in adjacent areas and its environmental requirements (Karachle *et al.*, 2017).

A single juvenile specimen (Fig. 17) was caught in a Van Veen grab sediment sample, on the of 14th October 2017 from Burgas bay (42.5305^{o} N, 27.5457^{o} E) (the Bulgarian Black Sea), on sandy-shelly substrate, at 11.5 m depth. At the time of sampling, the temperature was 18^{o}C, the salinity 17.6 PSU and the dissolved oxygen 7.9 mg/l. The length and height of the specimen were measured with an electronic caliper and they were 3.64 mm and 2.19 mm, respectively. The absence of large-sized specimens and regular monitoring of the benthic macrofauna carried out by the author, suggest a very recent introduction. Despite already three verified records, A. *senhousia* remains casual in the Black Sea. It is uncertain whether the pathway of introduction in Bulgaria was unaided natural dispersal across borders from Romania, or if it was transported by ships. The growing number of sightings increases the concern that the alien species could proliferate and become invasive in the Black Sea. Regular observations shall be undertaken by on-going monitoring programs implemented under MSFD to follow the development and impact of A. *senhousia* in the Bulgarian Black Sea.

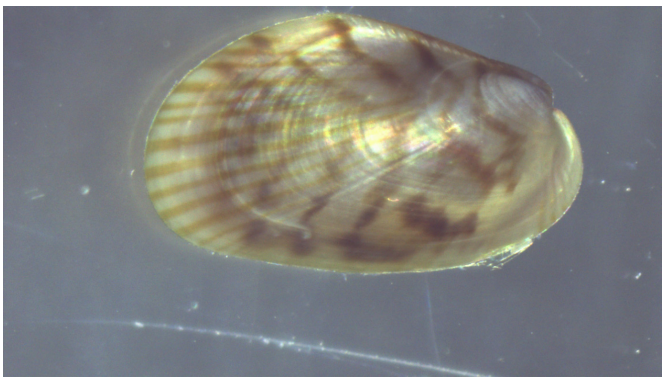

Fig. 17: The specimen of *Arcuatula senhousia* found in Burgas bay, the Bulgarian Black Sea.

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