

New records of alien species on the Levantine coast of Turkey

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Abstract

Zoobenthic investigations carried out along the Turkish Levantine coast resulted in identification of nine previously unrecorded alien species: *Macrorhynchia philippina* (Hydrozoa), *Oculina patagonica* (Anthozoa), *Branchiommma luctuosum* (Polychaeta), *Aplysia dactylomela* (Gastropoda), *Synaptula reciprocans* (Echinodermata), *Phallusia nigra*, *Pyura* (= *Herdmania*) *momus*, *Symplegma brakenhielmi* (Tunicata) and *Parupeneus forsskali* (Osteichthyes). Except for the shipping-transported *O. patagonica*, which originated in the Atlantic Ocean, the species are recognized as Erythrean aliens that entered the Mediterranean through the Suez Canal. Some ecological and distributional details are briefly discussed.

Key words: Levantine Sea, Turkey, alien species, Erythrean invasion

Introduction

According to a recently prepared inventory of alien species along the Turkish coasts (Çınar et al. 2006), 202, of a total of 263 alien species identified, were reported solely from the Levantine coast of Turkey. Due to the hydrographic features of the Levantine Sea, the southeastern coast of Turkey is more accessible to alien species that entered the Mediterranean through the Suez Canal. The Erythrean alien fishes, molluscs and decapods are better documented whereas the Porifera, Cnidaria, Polychaeta and Tunicata have been poorly studied. A project funded by TUBITAK (The Scientific and Technological Research Council of Turkey, Project No: 104Y065) has been undertaken in the summer of 2005 to investigate zoobenthic communities, and the alien species therein, along the Turkish Levantine coast. In the course of the project, nine alien species, previously unknown from the Turkish coast, were photographed and identified.

Material and Methods

The material was collected and photographed at 9 shallow water stations (0-5 m) located along the Levantine coast of Turkey (Figure 1). At stations, qualitative and quantitative samplings were performed in attempt to document the biodiversity and zoobenthic community structures of the area. Except for *Pyura* (= *Herdmania*) *momus* and *Parupeneus forsskali*, the species were sampled during a cruise held in September and October 2005. *Pyura* (= *Herdmania*) *momus* was photographed at station K45 on August 28, 2001 and *P. forsskali* at station K19 in August 13, 2004. The temperature and salinity values at 1.5 m depth were measured in situ. The sampling dates, coordinates, depths, and salinity and temperature values of stations are indicated in Annex. Specimens photographed were fixed in 4% formaldehyde and deposited at the Museum of Faculty of Fisheries, Ege University, Turkey (ESFM).

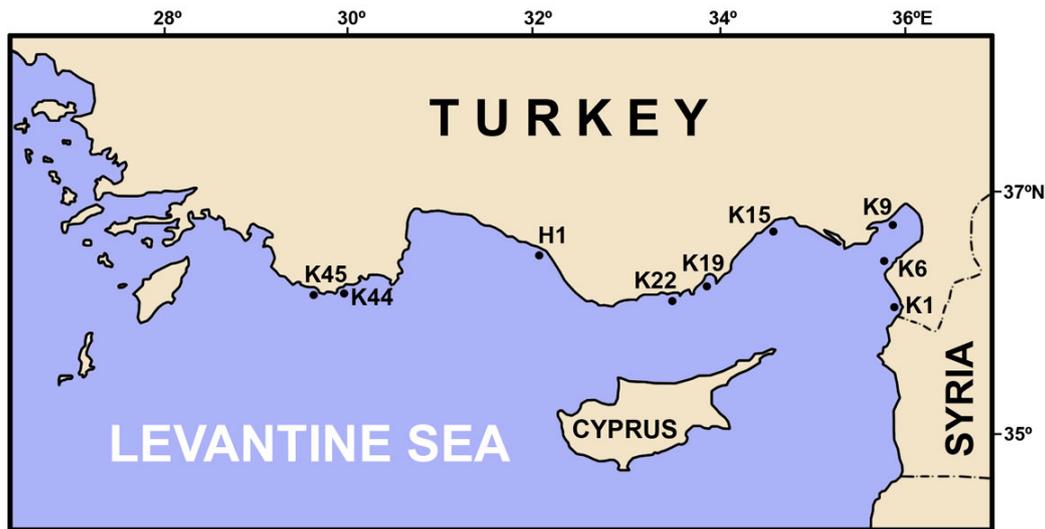


Figure 1. Map of the investigated area with the location of sampling sites

Results and Discussion

Hydrozoa, Cnidaria

Macrorhynchia philippina (Kirchenpauer, 1872)

The species is very abundant at station K6 and less abundant at station K22 (Figure 2). Colonies of 10-15 cm height were frequently found at 1-2 m depth, on rocks. *Macrorhynchia philippina* is a common circumtropical species (Watson 2002), known along the coast of Lebanon in 0-40 depths (Bitar and Bitar-Kouli 1995, Zibrowius and Bitar 2003). Dense populations of this species in shallow waters may pose a risk for tourism, as it causes a painful, itching sting.

Anthozoa, Cnidaria

Oculina patagonica De Angelis, 1908

A large colony of *O. patagonica* (1.5 m diameter) was found in the crevices of a rock at 1 m depth, at station K22 (Figure 3). In the Levantine Sea, it has been previously recorded from Egypt, Israel and Lebanon (Bitar and Zibrowius 1997). Large colonies of this species were previously reported from the coast of Spain, France and Italy (Zibrowius 1991). It is a species of temperate Atlantic-South American origin and was presumably introduced into the Mediterranean by shipping.



Figure 2. General views of colonies of *Macrorhynchia philippina* at station K6. Approximate colony height of this species at the station is about 12 cm. Photographed by Alp CAN



Figure 3. General views of the colony of *Oculina patagonica* at station K22. Diameter of the colony is about 1.5 m and corallites are 2.5 mm in diameter. Photographed by Melih Ertan ÇINAR

Sabellidae, Polychaeta

Branchiomma luctuosum Grube, 1869

Branchiomma luctuosum, an Erythrean sabellid, known from the Italian (Giangrande 1989) and Cypriot coasts (Çinar 2005), was abundant at station K15 where 12 specimens were found on a 12 x 15 cm rock surface (Figure 4). This area was polluted by sewage. Maximum body length measured was ca. 9 mm. This filter-feeder species was previously encountered in lagoons and sea bottoms with *Cymodocea nodosa* (Ucria) Ascherson (Giangrande 1989), and among algae and hard substrate at 0-30 m (Çinar 2005).

Opisthobranchiata, Gastropoda

Aplysia dactylomela Rang, 1828

A single large specimen (18 cm in length) was collected at station K1 on rocks covered with

algae (Figure 5). It released a purple ink when handled. *Aplysia dactylomela*, a circumtropical species, is characterized by a pattern of black rings on its body. Several recent records in the Mediterranean (Greece, Turkey and Cyprus, and a somewhat older record from the Sicilian Channel) were posted on www.seaslugforum.net (Online publication of the Australian Museum, Sydney). Rudman (2005) suggested that this species may have originated from the Atlantic, based on the similarity in colour pattern between Mediterranean and Atlantic specimens. However, this species is also distributed in the Red Sea (Dekker and Orlin 2000), and as it had not been recorded in the western Mediterranean, it may have been introduced to the Mediterranean via the Suez Canal (H. Mienis, pers. comm.).



Figure 4. Specimens of *Branchiomma luctuosum* attached to underside of a stone (12x15 cm in area) (upper) at station K15 and a live specimen on the stone (lower). Photographed by Melih Ertan ÇINAR

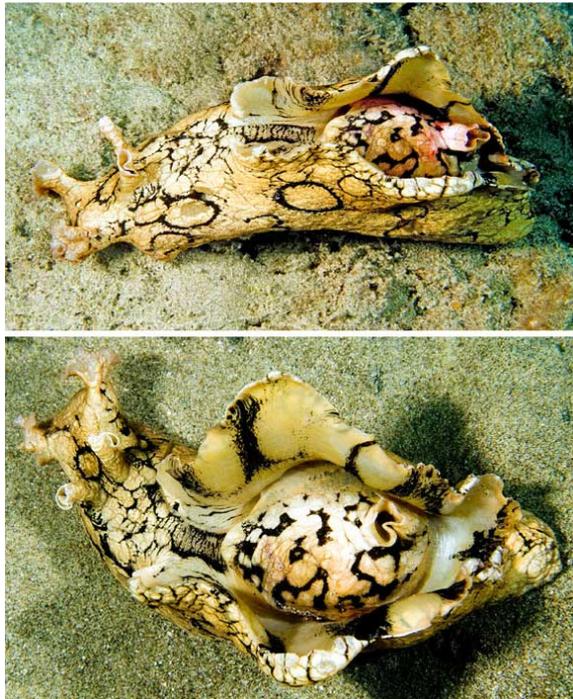


Figure 5. Lateral (upper) and dorsal (lower) views of *Aplysia dactylomela* at station K1. Body length of the specimen is 18 cm. Photographed by Alp CAN



Figure 6. Whole body (upper) and anterior part (lower) of *Synaptula reciprocans* at station K45. Body length of the specimen is about 40 cm. Photographed by Melih Ertan ÇINAR

Holothuridea, Echinodermata

Synaptula reciprocans (Forsskål, 1775)

Synaptula reciprocans was frequently found at all shallow water stations, on soft and hard substrates between 0-7 m (Figure 6). Maximum body length was ca. 40 cm; that's difficult to determine in such an elastic species. It was reported from the Israel (Cherbonnier 1986), Lebanon (Zibrowius and Bitar 2003) and southern Aegean Sea (Zaitsev and Öztürk 2001).

Asciacea, Tunicata

Phallusia nigra Savignyi, 1816

Phallusia nigra is characterized by its black-coloured tunic lacking epibiota (Figure 7). It was found at stations K9 and K44 at 1-4 m depth. The maximum length was almost 8 cm. It was abundant also at H1 (Alanya Harbour), where a number of specimens were attached to ropes and concrete walls. It was reported from the Israel (Pérès 1958) and Lebanon (Zibrowius and Bitar 2003).



Figure 7. A number of specimens of *Phallusia nigra* attached to a rope at Alanya harbour (H1) (Left). Specimens on natural habitats; on rocks at station K44 (right, upper) and K10 (right lower). Photographed by Murat BILECENOGLU (left picture), Melih Ertan ÇINAR (right, upper picture) and Alp CAN (right, lower picture)

Pyura (=Herdmania) momus (Savignyi, 1816)

Pyura momus is characterized by the presence of large spine spicules inside the branchial sac. It was found at K45 (Kas), at 1 m depth on rocks with algae (Figure 8). It is known from the Red Sea, Australia, Atlantic Ocean and the Mediterranean (Koukouras et al. 1995). In the Levantine Sea, it was recorded from Egypt, Israel and Lebanon (Pérès 1958, Zibrowius and Bitar 2003).



Figure 8. Anterior part of *Pyura (=Herdmania) momus* at station K45. Body length of the specimen is about 8 cm. Photographed by Alp CAN

Symplegma brakenhielmi (Michaelsen, 1904)

This reddish-colored colonial ascidian was abundant on a concrete pile of a small port at 3 m at station K9 (Figure 9). The colony was about 7 cm in diameter. It is distributed worldwide in warmer seas, especially in harbours, where it grows on man-made structures (Lambert and Lambert 1998). In the Levantine Sea, it was reported from the Lebanon coast (Bitar and Kouli-Bitar 2001).

Mullidae, Osteichthyes

Parupeneus forsskali (Fourmanoir and Guézé, 1976)

The Red Sea goatfish is characterized by the black stripe (its width less than the eye diameter) running from tip of snout through eye and along lateral line to below penultimate ray of second dorsal fin. There is also a black spot on each side of caudal peduncle, with lateral line touching its lower edge. It is distributed in the Red Sea and Gulf of Aden (Ben-Tuvia and Kissil 1988), where it is the most abundant mullid; it inhabits both sandy bottoms and coral reefs (Golani 1999,

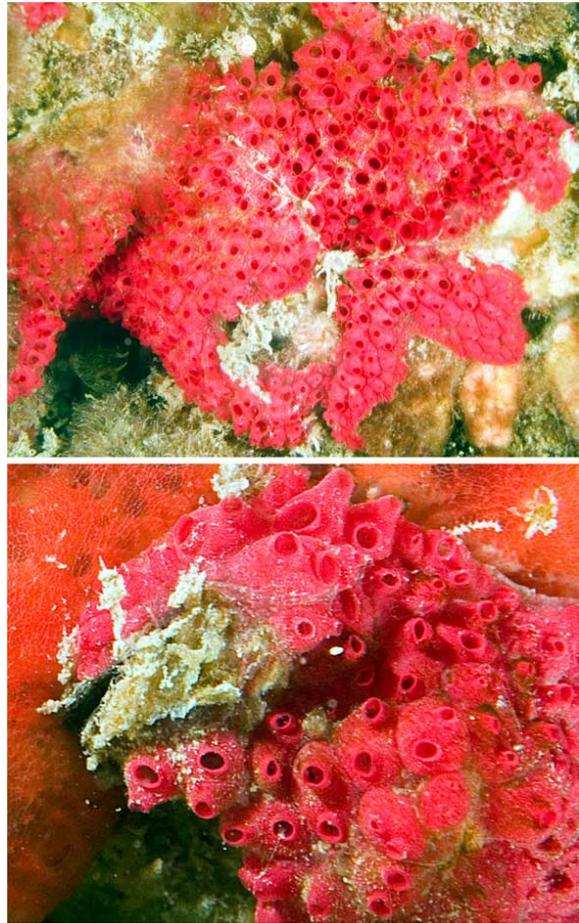


Figure 9. General views of the colony of *Symplegma brakenhielmi* at station K10. Diameter of the colony is about 7 cm. Photographed by Alp CAN



Figure 10. Lateral view of *Parupeneus forsskali* at station K19. Total length of the specimen is about 15 cm. Photographed by Tahsin CEYLAN

Al-Rousan et al. 2005). Occurrence of the species in the eastern Mediterranean was mentioned in Fishbase (Froese and Pauly 2006), but without a firm reference. The first observation of *P. forsskali* along the Turkish coast was made off Mersin in 2000 (Ceylan, pers.comm.), and recently (August 2004) an underwater photograph taken in the same area (Station K19, Tasucu) at a depth of 15 m, substantiated that record. It has most likely entered the Levantine Sea through the Suez Canal, like the other Erythrean mullid species, *Upeneus moluccensis* (Bleeker 1855) and *U. pori* Ben-Tuvia and Golani, 1989.

Conclusions

Like in other parts of the Levantine Sea, Erythrean species constitute the major proportion of alien species documented from the Turkish coasts. All the species presented herein, except for *Parupeneus forsskali*, seem to be established in the area. Of these, *Macrorhynchia philippina* formed dense populations on the eastern part of Turkish Levantine coast and *Phallusia nigra* in Alanya Harbour. Tunicates are known to be major components of fouling and alien tunicates found in this study may cause some economic losses if they foul ship hulls or openings of intake water pipes. *Macrorhynchia philippina* seems to be a species that is harmful to human health and thereby minimize tourism activities when it attains high populations. Even though only a single specimen of *P. forsskali* was encountered in the area, the species is another candidate that contributes to local fishing activities, as other commercially important Erythrean mullids do.

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Annex

Records of alien species from the Levantine coast of Turkey, Mediterranean Sea in 2001-2005*

Species	Location Name	Location coordinates		Record date	Salinity (psu)	Temperature (°C)	Collector
		Latitude, N	Longitude, E				
<i>Macrorhynchia philippina</i> (Kirchenpauer, 1872)	Station K6 (Akinci Burnu, Iskenderun Bay)	36°19'30"	35°47'00"	13.09.2005	39.2	28.5	104Y065 Tubitak Project
	Station K22 (Akkuyu)	36°08'17"	33°32'53"	20.09.2005	39.3	29.8	104Y065 Tubitak Project
<i>Oculina patagonica</i> De Angelis, 1908	Station K22 (Akkuyu)	36°08'17"	33°32'53"	20.09.2005	39.3	29.8	104Y065 Tubitak Project
<i>Branchiommata luctuosum</i> Grube, 1869	Davultepe, Mersin Bay	36°42'15"	34°28'00"	18.09.2005	37.8	29.8	104Y065 Tubitak Project
<i>Aplysia dactylomela</i> Rang, 1828	Station K1 (Meydanköy)	36°00'36"	35°58'34"	12.09.2005	38.8	28.9	104Y065 Tubitak Project
<i>Synaptula reciprocans</i> (Forsskål, 1775)	All stations in Figure 1						
<i>Phallusia nigra</i> Savignyi, 1816	Station K9 (Botas)	36°54'22"	35°58'05"	14.09.2005	39.2	30.0	104Y065 Tubitak Project
	Station K44 (Kekova)	36°11'26"	29°50'51"	03.10.2005	37.7	24.7	104Y065 Tubitak Project
	Station H1 (Alanya Harbour)	36°32'13"	31°59'54"	27.08.2005	*	*	104Y065 Tubitak Project
<i>Pyura (=Herdmania) momus</i> (Savignyi, 1816)	Station K45 (Kas, Uluburun)	36°08'51"	29°41'41"	29.08.2001	*	*	Alp Can
<i>Symplegma brakenhielmi</i> (Michaelsen, 1904)	Station K9 (Botas)	36°54'22"	35°58'05"	14.09.2005	39.2	30.0	104Y065 Tubitak Project
<i>Parupeneus forsskali</i> (Fourmanoir and Guézé, 1976)	Station K19 (Tasucu)	36°18'51"	33°51'47"	13.08.2004	*	*	Tahsin Ceylan

*Full reference to the data: Çınar ME, Bilecenoglu M, Öztürk B, Can A (2006) New records of alien species from the Levantine coast of Turkey. Aquatic Invasions 1 (2): 84-90