

# **Alien Mollusca in the Levantine Sea - an update. Occurrence of *Ervilia scaliola* Issel, 1869 along the Levantine coast of Turkey**

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**Abstract:** The present work updates the number of alien molluscs reported in the eastern Mediterranean since 2012 and brings the total to more than 100 species in the Levantine Turkish Coast. *Ervilia scaliola* Issel, 1869, widespread in the Red Sea, was collected in August 2013 from Taşucu Harbour, Levantine coast of Turkey. This is the first record of *E. scaliola* in the Mediterranean Sea. Although shipping appears to be the most probable vector of its introduction, Lessepsian migration cannot be ruled out as a pathway.

**Key words:** alien mollusca, Turkey, Levantine Sea, *Ervilia scaliola*

## **Introduction**

The Eastern Mediterranean Sea, and especially the Levantine coast, hosts the majority of alien species of Indo-Pacific origin, dominated by molluscs (Gofas & Zenetos 2003; Nunes et al., in press), with the Turkish Levantine coast (southern coast of Turkey) being one of the regions deeply affected (Bitlis Bakır et al., 2012). Iskenderun Bay in particular, is one of the areas most susceptible to invasions due to its proximity to the Suez Canal and intensive maritime traffic (Çeviker & Albayrak, 2006; Çınar et al., 2006). According to the most recent review from Turkey (Çınar et al., 2011) among the 400 alien species known to be distributed along the Turkish coasts, 105 species are molluscs, of which 98 species are distributed along the Turkish Levantine coast. This work reports another introduced mollusc in the Levantine Sea and updates the published information on alien molluscs in the area by May 2014.

## **Methodology**

In August 2013, one freshly dead specimen of *Ervilia scaliola* Issel, 1869 was collected while free diving in Taşucu Harbour (36°19'00.00"N - 33°52'60.00"E). It was found at a depth of 8-12 m on muddy sand and some gravel.

### **Systematics**

Phylum: Mollusca

Class: Bivalvia

Subclass: Heterodonta Neumayr, 1884

Order: Veneroida Gray, 1854

Superfamily: Tellinoidea Blainville, 1814

Family: Semelidae Stoliczka, 1870 (1825)

Genus: *Ervilia* Turton, 1822

### ***Ervilia scaliola* Issel, 1869**

#### **Description**

Shell small, moderately solid, suboval, almost equilateral, narrower in anterior than in the posterior, sharply rounded at the posterior end, with two or three whitish rays, two down the middle of the valves. Valves sculptured with fine concentric ridges and radial striae at the anterior end (Figure 1). Dimensions: 5.34mm length x 3.55 mm height.

There are several nominal species of *Ervilia*, some regarded by different authors as synonyms, and indeed a modern taxonomic revision of the species of this genus is deeply required. As an example, Oliver (1992) reported both *E. purpurea* Deshayes (ms) and *E. scaliola* Issel from the Gulf of Suez (Oliver, 1992). Dekker & Orlin (2000), on the contrary, reported *E. biscalpta* Gould, 1861 as a senior synonym of *E. scaliola* (Issel, 1869) and listed it together with *E. purpurea* (Lamy, 1914). Huber (2010) listed five species of the genus *Ervilia* as valid, with *E. biscalpta* Gould, 1861 and *E. purpurea* ("Deshayes" Smith 1906) occurring in the Indo-Pacific. Bouchet & Gofas (2014), on the contrary, list eight species as valid, including *E. scaliola* Issel, 1869, that Huber (2010) previously considered synonym of *E. biscalpta* as in Dekker & Orlin (2000). Pending this revision, the material reported here is assigned to *Ervilia scaliola* Issel, 1869.



Figure 1. *Ervilia scaliola* Issel from Taşucu Harbour: outside view of the right valve (on the left) and inside views of both valves (on the right).

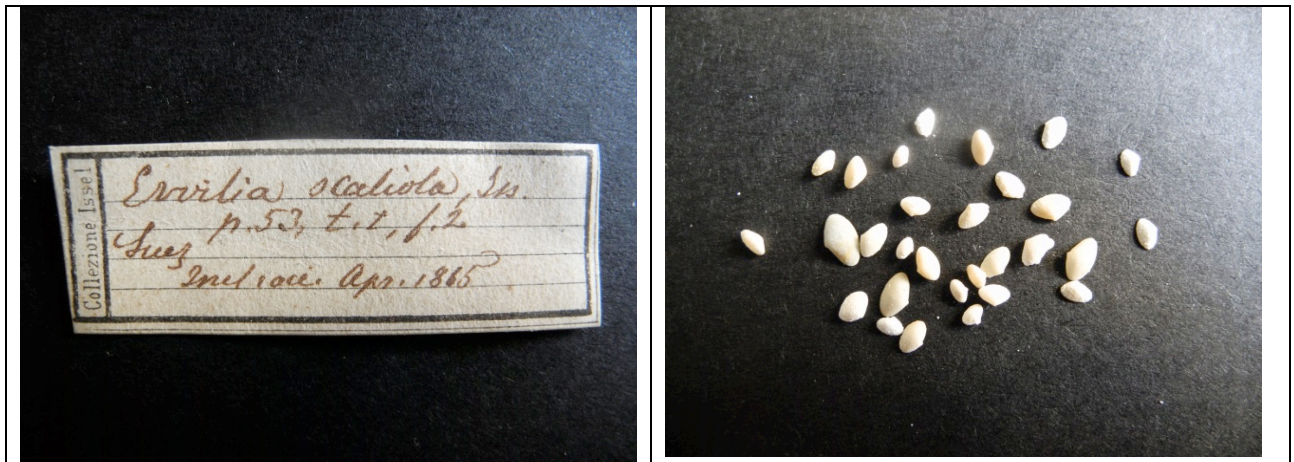


Figure 2. Syntypes of *Ervilia scaliola* Issel from the Melvin-Tomlin collection kept in the Museo Civico di Storia Naturale Giacomo Doria, Genova (photo credit: Dr Maria Tavano).

## Discussion

Since the early eighties, a steadily increasing number of Indo-Pacific molluscan species have been reported from the Mediterranean Sea with more than 40 species collected for the first time after 2001 (Zenetos et al., 2012).

To these alien molluscs we should add the recent reports from:

a) Levantine coast of Turkey: *Teredothyra dominicensis* (Bartsch, 1921); *Plocamopherus tilesii* Bergh, 1877; *Nudiscintilla* cf. *glabra* Lützen & Nielsen, 2005; *Eunaticina papilla* Gmelin, 1791; *Gouldiopa consternans* (Oliver & Zuschin, 2001); *Teredo bartschi* Clapp, 1923 and

*Caecum sepimentum* de Folin, 1868 [Müller, 2011, Yokeş et al., 2012; Mifsud & Ovalis, 2012; Öztürk & Bitlis Bakır, 2013; Ovalis & Mifsud, 2013; Borges et al., 2014; Ovalis & Mifsud, 2014];

b) Lebanon coast: the bivalve *Lioberus ligneus* (Reeve, 1858) (Crocetta et al., 2013b); and

c) Israel coast: *Monotygma watsoni* (Hornung & Mermod, 1927) (Bogi & Galil, 2013).

Thus, the number of alien molluscs reported in the Mediterranean to date from 215 species reported in 2012 (Zenetos et al., 2012) increases to more than 220 species including the present record. The vast majority of them (200 species) occurs in the eastern part and in particular in the Levantine basin. Bitlis Bakır et al. (2012) reported a total of 424 molluscan species from Iskenderun Bay of which the alien molluscs constitute an important part (18%) of the molluscan fauna in the region. This percentage is in agreement with the range of 10-20% commonly estimated for the entire Levantine fauna (Zenetos et al., 2010). However, within some groups (e.g. "opisthobranchs"), this number may be even higher. Crocetta et al. (2013a) found it to be 34% for the Lebanese shores.

The present finding increases the number of alien molluscs (including the cryptogenic ones) in the Levantine Turkish coasts to more than 100. Molluscs remain the most species-rich group, in terms of alien species, even ignoring many records based on single shells collected a long time ago and not qualified as aliens (Gofas & Zenetos, 2003). The fact that they are easily collected and the contribution of citizen scientists in reporting them should not be ignored (Zenetos et al., 2013). Citizen scientists and in particular amateur shell collectors are an invaluable source of information when it comes to reporting newly introduced species.

*Ervilia scaliola* originates in the Gulf of Suez and its distribution extends to the Red Sea (Grill & Zuschin, 2001). This is its first record from the Mediterranean Sea. Considering the absence of records along the south Levantine coast, the most plausible vector of its introduction to the Mediterranean appears to be shipping via the Suez Canal at its larval stage. However, future findings in the area between Suez and Taşucu may reveal unintentional introduction of the species via the Suez Canal (step by step introduction). Since in the Mediterranean was found a single specimen only, we consider the species among the non established alien molluscs.

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## References

- Bitlis Bakir B., Öztürk B., Doğan A. & Önen M. 2012.** Mollusc fauna of Iskenderun Bay with a checklist of the region. *Turkish Journal of Fisheries and Aquatic Sciences*, **12**: 171-184.
- Bogi C. & Galil B.S. 2013.** *Monotygma watsoni*, an Erythrean alien pyramidellid (Mollusca Gastropoda: Heterobranchia) newly recorded in the Mediterranean Sea. *Marine Biodiversity Records*, vol **6**, e80.
- Borges L.M.S., Sivrikaya H. & Cragg S M. 2014.** First records of the warm water shipworm *Teredo bartschi* Clapp, 1923 (Bivalvia, Teredinidae) in Mersin, southern Turkey and in Olhão, Portugal. *Bioinvasions Records*, **3 (1)**: 25-28.
- Bouchet P.& Gofas S. 2014.** *Ervilia Turton*, 1822. Accessed through: World Register of Marine Species at <http://www.marinespecies.org/aphia.php?p=taxdetails&id=138475> on 2014-06-05
- Çeviker D. & Albayrak S. 2006.** Three alien molluscs from Iskenderun Bay (SE Turkey). *Aquatic Invasions*, **1(2)**: 76-79.
- Çinar M. E., Bilecenoglu M., Öztürk B. & Can A. 2006.** New records of alien species on the Levantine coast of Turkey. *Aquatic Invasions*, **1(2)**: 84-90.
- Çinar M.E., Bilecenoglu M., Öztürk B., Katağan T., Yokeş M.B., Aysel V., Dağlı E., Açık S., Özcan T. & Erdoğan H. 2011.** An updated review of alien species on the coasts of Turkey. *Mediterranean Marine Science*, **12 (2)**: 257-315.
- Crocetta F., Zibrowius H., Bitar G. Templado, J. & Oliverio M. 2013a.** Biogeographical homogeneity in the eastern Mediterranean Sea. I: the opisthobranchs (Mollusca: Gastropoda) from Lebanon. *Mediterranean Marine Science*, **14(2)**: 403-408.
- Crocetta F., Bitar G., Zibrowius H. & Oliverio M. 2013b.** Biogeographical homogeneity in the eastern Mediterranean Sea. II. Temporal variation in Lebanese bivalve biota. *Aquatic Biology*, **19**: 75-84.
- Dekker H. & Orlin Z. 2000.** Check list of Red Sea Mollusca. *Spirula* **47** (Suppl.): 1–46
- Gofas S. & Zenetos A. 2003.** Exotic molluscs in the Mediterranean basin: current status and perspectives. *Oceanography and Marine Biology: An Annual Review*, **41**: 237-277.

**Grill B. & Zuschin M. 2001.** Modern shallow-to deep-water bivalve death assemblages in the Red Sea—ecology and biogeography. *Palaeogeography, Palaeoclimatology, Palaeoecology*, **168(1)**: 75-96.

**Huber M. 2014.** *Ervilia purpurea* (Smith, 1906). Accessed through: World Register of Marine Species at <http://www.marinespecies.org/aphia.php?p=taxdetails&id=216458> on 2014-01-13

**Mifsud C. & Ovalis P. 2012.** A Galeommatid bivalve new to the Mediterranean Sea. *Triton*, **26**: 6-8

**Müller J. 2011.** Holzarten im historischen Schiffbau und ihre Gefährdung durch Terediniden. *Skyllis*, **10(1)**: 90-94.

**Nunes A. L., Katsanevakis S. Zenetos A. & Cardoso, A. C. in press.** Gateways to alien invasions in the European seas. *Aquatic Invasions*, (2014) **9, 2**

**Oliver P.G. 1992.** *Bivalved seashells of the Red Sea*. Verlag Christa Hemmen & National Museum of Wales, Cardiff. 330 pp

**Ovalis P. & Mifsud C. 2013.** Another alien lessepsian bivalve in the eastern Mediterranean. *Triton*, **27**: 9

**Öztürk B. 2012.** A new alien gastropod *Pseudorhaphitoma* cf. *iodolabiata* (Hornung & Mermod, 1928) (Mangeliidae, Mollusca) in the Mediterranean Sea. *Mediterranean Marine Science*, **13 (1)**: 30-32.

**Öztürk B. & Bitlis Bakır B. 2013.** *Eunaticina papilla* Gmelin, 1791) (Naticidae, Gastropoda) a new alien in the eastern Mediterranean. *Triton*, **28**: 7-8.

**Ovalis P. & Mifsud C. 2014.** On the presence of *Caecum sepimentum* de Folin, 1868 (Gastropoda: Caecidae) in the Mediterranean Sea. *Triton*, **29**: 3-4.

**Yokeş M.B., Dalyan C., Ünsal Karhan S., Demir V., Tural U. & Kalkan E. 2012.** Alien Opisthobranchs from Turkish coasts: first record of *Plocamopherus tilesii* Bergh, 1877 from the Mediterranean. *Triton*, **25**: 3-5.

**Zenetos A., Gofas S., Verlaque M., Çinar ME, García Raso E., Azzurro E., Bilecenoğlu M., Froglija C., Siokou I., Bianchi CN, Morri C., Sfriso A., San Martin G., Giandgrande A., Katağan T., Ballesteros E., Ramos-Esplá A., Mastrototaro F., Ocaña O., Zingone A., Gambi MC. & Streftaris N., 2010.** Alien species in the Mediterranean Sea by 2010. A contribution to the application of European Union's Marine Strategy Framework Directive (MSFD). Part I. Spatial distribution. *Mediterranean Marine Science*, **11 (2)**: 381-493.

**Zenetos A., Gofas S., Morri C., Rosso A., Violanti D., Garcia Raso J.E., Çinar M.E., Almogi-Labin A., Ates A.S., Azzurro E., Ballesteros E., Bianchi C.N., Bilecenoğlu M.,**

**Gambi M.C., Giangrande A., Gravili C., Hyams-Kaphzan O., Karachle P.K., Katsanevakis S., Lipej L., Mastrototaro F., Mineur F., Pancucci-Papadopoulou M.A., Ramos-Esplà A., Salas C., San Martin G., Sfriso A., Streftaris N. & Verlaque M. 2012.** Alien species in the Mediterranean Sea by 2012. A contribution to the application of European Union's Marine Strategy Framework Directive (MSFD). Part 2. Introduction trends and pathways. *Mediterranean Marine Science*, **13 (2)**: 328-352.

**Zenetos A., Koutsogiannopoulos D., Ovalis P. & Poursanidis D. 2013.** The role played by citizen scientists in monitoring marine alien species in Greece. *Cahiers de Biologie Marine*, **54**: 419-426.