

***Fulvia fragilis* (Forsskål in Niebuhr, 1775) (Bivalvia: Cardiidae), an alien species new to the Maltese malacofauna**

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Abstract

This short note reports the presence of the lessepsian bivalve *Fulvia fragilis* (Forsskål in Niebuhr, 1775) in Maltese waters at the central Mediterranean. The first occurrence here at the SE of Malta, in the bay behind the Freeport terminal, with much recent shipping activities, strongly suggests that the mode of transportation is through ballast water.

Key words: Mollusca, Laevicardiinae, *Fulvia fragilis*, lessepsian species, ship transported, ballast, Maltese Islands

Fulvia fragilis (Forsskål in Niebuhr, 1775) is a very thin shelled bivalve belonging to the cardiid subfamily Laevicardiinae Keen, 1936 (Schneider 1995). The species is distributed throughout the Indian Ocean, from the Red Sea and the Persian Gulf to Mozambique and Madagascar (Vidal 1994). A different subspecies occurs along the Atlantic coast of Africa. Von Cosel recently described *Fulvia fragilis congoensis* (1995) from Point Noire, Congo. *Fulvia fragilis fragilis* has penetrated the Mediterranean Sea, from the Indian Ocean through the Suez Canal at least since 1939 when it was first collected in Port Said and Port Fouad (Moazzo 1939). By 1955 the species had reached Israel (Barash and Danin 1973), and soon spread throughout the eastern Mediterranean Sea (Gofas and Zenetos 2003), and presumably via shipping, in the central Mediterranean (Passamonti 1996) reaching as far west as the Ligurian Sea (Crocetta 2005) and Valencia (Gofas and Zenetos 2003) where it was collected already in 1991. Zenetos et al, 2004 summarized the recent distribution.

Abbreviations used: RMNH - National Museum of Natural History Naturalis, Leiden, NMNH - National Museum of Natural History Mdina, Malta.

During the first week of December (2008) the first author while on a short visit to the Maltese Islands, brought to the attention of the second author the finding of a few specimens and valve fragments of the bivalve *Fulvia fragilis* on the beach at Marsaxlokk Bay on the SE coast of Malta (35°50'20"N, 14°32'53"E). Despite earlier visits by the second author to most of the local beaches after every storm, no trace of this species had been found at these islands before.

Two days after the second author received the message, there occurred an extraordinary storm with a force 8 wind blowing from S-SE which wreaked havoc at these localities, especially the fishing village of Marsaxlokk.

An early visit the following day to these beaches produced no shells at the Marsaxlokk beach. However, at the Birzebbugia beach (35°49'56"N, 14°31'51"E) there was a large number of stranded *Bursatella leachii* de

Blainville, 1817, most of them still alive. Also present were 32 complete specimens, a few broken ones and many loose valves of the bivalve *F. fragilis* (Figure 1) and a single specimen of *Pinctada radiata* (Leach, 1814). Although a few *Fulvia* shells were chipped or

holed, due to the stranding action, all the specimens still had the live animal inside. Ironically, these mollusc species together with the seaweed washed ashore (*Halophila stipulacea* (Forsskål) Ascherson, 1867) are all alien species to the islands!

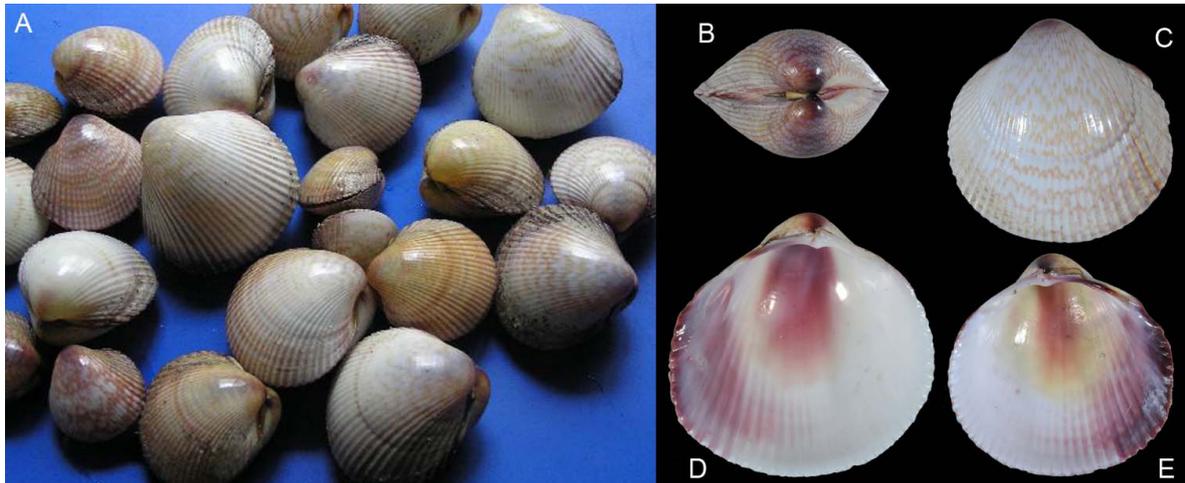


Figure 1. A. Part of the collected material of *Fulvia fragilis* from Birzebbugia beach, Malta, after heavy S-SE storm on 12.xii.2008, B. apical view of a complete specimen (H x L x W = 28.7 x 29.7 x 19.6 mm) C. anterior side on the right, D. left valve interior (40.3 x 39.9 mm), E. right valve, interior (34.5 x 34.3 mm). Photographs by C.Mifsud (A) and J.Goud (B-E)

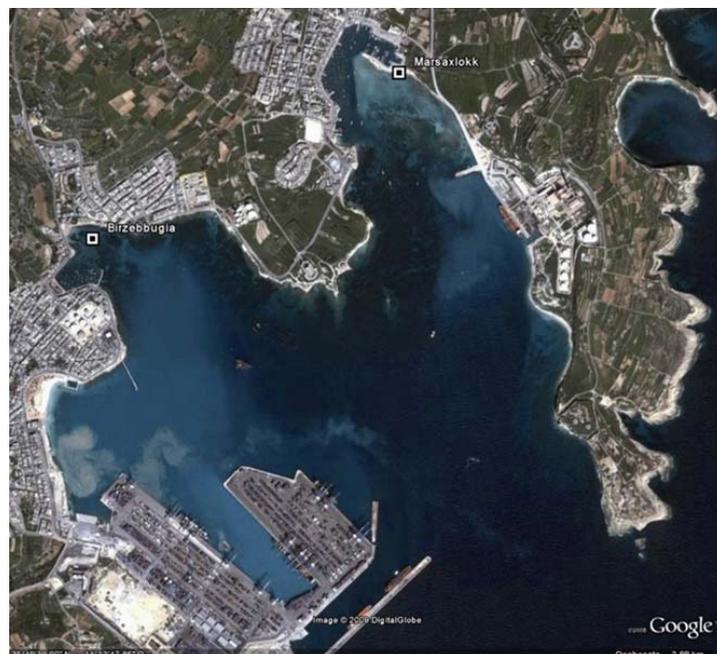


Figure 2. SE part of Malta; map in satellite view, copied from Google maps; indicated are the sampling localities at Marsaxlokk Bay and at Birzebbugia beach. At the bottom the Freeport terminal can be seen with murky water turbulence due to harbour activities and presumably also the outlet of ballast water

In the knowledge that the beach cleaners will start work early and that they will dump everything in the rubbish bins, about 50 specimens of the *B. leachii* which seemed alive were collected and put back into the sea which had by now substantially calmed down. Eight specimens which seemed lifeless and a few smaller specimens and animals of the bivalves were retained and preserved in alcohol for any future anatomical or molecular research. Token specimens are deposited at RMNH (MOL. 113330-113331) and NMNH.

The discovery of *Fulvia fragilis* living at these islands is no surprise, having also recently been found abundant in the nearby Sicilian waters (Crocetta et al. 2008) and even as far west as Valencia and more recently, in July 2004, again near the entrance of the Ebro river, Spain (G. Mulder pers. comm.). The species has a fragile shell and lives in shallow waters preferably with a substratum of soft muddy sands. The small beach at Birzebbugia Bay, consists of a reclaimed area and is about 200 meters in length. The substratum at this bay consists mainly of fine muddy sand with a few surviving patches of the seaweeds *Posidonia oceanica* (Linnaeus) M. Delile and *Halophila stipulacea* (Forsskål) Ascherson, the latter also an introduced Indo-Pacific species (Lanfranco 1970). Part of the bay is sheltered by an artificial breakwater, housing the Freeport container transit station and is also the main fuel unloading station for these islands. It is therefore quite probable that all these species have been introduced here through the shipping ballast tanks. Due to all this activity the water at this locality is sometimes very murky (Figure 2). Although for these islands no trace of *F. fragilis* had been found before, the species seems to have been here for a few years because some of the specimens and loose valves measured c. 40 x 40 mm, whereas the maximum adult size is 75 mm (Vidal 1994). It also seems that there is a well established colony living here

because the sizes of specimens varied and also included a few (12 x 12 mm) smaller ones.

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