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Research article

First record of the Red Sea immigrant *Chrysallida fischeri* (Hornung and Mermod, 1925) (Gastropoda: Pyramidellidae) from Greek waters♣

Paraskevi Louizidou[1], Maria Thessalou-Legaki[1] and Argyro Zenetos[2*]
[1]*Department of Zoology - Marine Biology, School of Biology, University of Athens Panepistimiopolis, GR 15784, Athens, Greece*
[2]*Hellenic Centre for Marine Research, Institute of Oceanography, Anavissos 19013, Attica, Greece*
[*]*Corresponding author*
E-mail: zenetos@ath.hcmr.gr

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Abstract

The Red Sea mollusc *Chrysallida fischeri* (Hornung and Mermod, 1925) was collected in 2005 off Makri, Rhodes, Greece. This is the first record of the species in the Aegean Sea. The presence of both live specimens and shells suggest that *C. fischeri* is well established in the area.

Key words: *Chrysallida fischeri*, Mollusca, alien species, Lessepsian immigrant, Rhodes, Aegean Sea, Greece

♣ See Corrigendum, Aquatic Invasions 2(3):278

Introduction

The genus *Chrysallida* is represented by 48 species in European waters (CLEMAM website), seven of which, namely *C. brusinai* (Cossmann 1921), *C. suturalis* (Philippi 1844), *C. terebellum* (Philippi 1844), *C. pirinthella* (Melvill 1910), *C. maiae* (Hornung and Mermod 1924), *C. micronana* (Hornung and Mermod 1924) and *C. fischeri* (Hornung and Mermod 1925), occur in the Mediterreanean (Mienis and Zaslow 2004, Öztürk and van Aartsen 2006). The last four originated from the Red Sea and were introduced in the 20th century via the Suez Canal (Gofas and Zenetos 2003, Öztürk and van Aartsen 2006).

The first record of *C. fischeri* in the Mediterranean was from Haifa Bay, Israel (van Aartsen and Carrozza 1979). The species is well established in Israel (Barash and Danin 1986, Bogi and Galil 1999, Mienis and Zaslow 2004). Later, the species was found in south Turkey in the Gulf of Iskenderun (Micali and Palazzi 1992) and in Tasucu (Buzzurro and Greppi 1995). The latest record in the south Adriatic (Mazziotti et al. 2002) reveals that the species has expanded westwards. The present work reports its presence in the SE Aegean Sea.

Methods

Chrysallida fischeri was collected in the framework of a benthic survey in July-August 2005 around the islet Makri (W Rhodes Isl.). Sampling was conducted by scuba diving along nine transects (stations) at 1, 10, 15, and 30 m depth (Figure 1, Annex) using a 15x15 cm quadrat equipped with a net of 0.5 mm opening, on both hard (shallower) and sandy (deeper) bottom. Stations 2 and 3 (at 30 m depth) are located under floating aquaculture fish cages.

The material was preserved in 4% formaldehyde with Rose Bengal, and after sorting in 75% alcohol. The specimens are deposited in the University of Athens (collection number ZMUA 4053) and the Hellenic Centre for Marine Research.

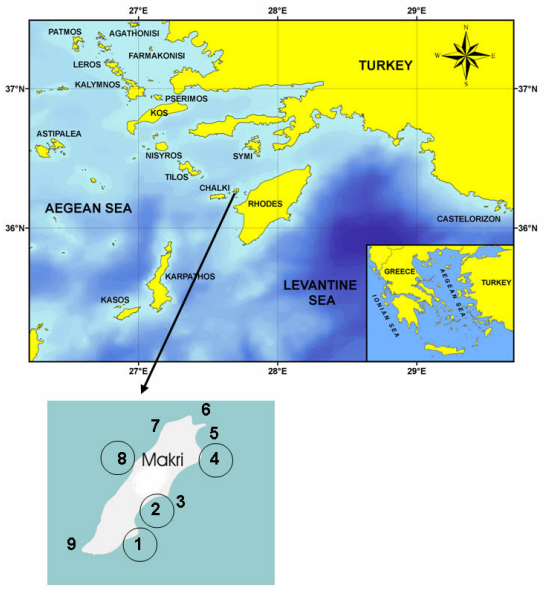

Figure 1. Geographical location and stations of *Chrysallida fischeri* occurrence (in circles)

Results and Discussion

Among 481 molluscs identified to 38 species, three live specimens of *C. fischeri* were found in Makri. Following this finding, the shell grit of the samples was sorted, and additional 11 shells were found (see Annex). The species was found only on sandy bottom with or without *Posidonia oceanica* (Linnaeus) Delile, in July and August 2005, at depths of 10 and 30 m, in four of the nine transects.

Our shells have 6-7 whorls and measure approximately 1.6-2.7 mm in length and 0.76-1.13 mm in width. Their color is white or creamy with yellow or brown stripes parallel to the whorls (Figure 2).

Biological invasions have been recognized as a serious threat in the Mediterranean (EEA 2006). The main vector of introduction is the progressive penetration via the Suez Canal (Lessepsian migration), and thus the area mostly affected by Lessepsian species is the Levantine Sea (Por 1990, Galil and Zenetos 2002).

Figure 2. *Chrysallida fischeri* from Makri islet (W Rhodes, S Aegean Sea). Size: 2.7x1.13 mm (Photo by P. Louizidou)

Pancucci-Papadopoulou et al. (2005) have shown an increasing trend in the introduction of alien species in Greece, which is proportionate to the trend of alien species recorded in the Mediterranean (UNEP/MAP 2004) as well as in European Seas (Gollasch 2006). Zoobenthos and particularly Mollusca is a taxonomic group with most representatives among aliens (Streftaris et al. 2005, Zenetos et al. 2005).

Including the present species, the number of alien marine species recorded from Greece (Pancucci-Papadopoulou et al. 2005), rises to 129, 29 of which belong to molluscs. Other findings of alien molluscs (Daskos, unpublished information) support further the statement of molluscan susceptibility to invade and spread in other seas.

The finding of a significant number of *C. fischeri* specimens, both alive and dead, reveals that the species is well established around Rhodes. This is expected considering a) the geographic position of the area, b) the environmental conditions such as higher temperature and salinity that are more favorable for the alien species arriving via the Suez Canal (Zenetos et al. 2004) and c) the hydrography of the Eastern Mediterranean which is characterized by near-shore sea currents running anticlockwise from the coasts of Egypt south of the Turkey coasts, up to Rhodes island and then to the South Aegean (Poulos et al. 1997). The susceptibility of the wider Rhodes area (Dodecanese) to receive invaders has been demonstrated by Pancucci-Papadopoulou et al. (2005).

The finding of *C. fischeri* in Rhodes fills the geographical gap between the easternmost parts of the Mediterranean and Pescara region in the Adriatic Sea where it was recently found (Mazziotti at al. 2002), and further documents the species westward expansion following the route of many other Lessepsian immigrants.

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Annex

Location and characteristics of the stations in Makri islet (W. Rhodes, S Aegean Sea) where *Chrysallida fischeri* was present in July-August 2005

Stations	Latitude N	Longitude E	Depth (m)	Description of the biotope	Number of specimens	Collector
1	36°15.198'	27°46.986'	30	sandy bottom	8 shells	S. Hatzinikolaou P. Louizidou
2	36°15.345'	27°46.217'	30	sandy bottom, under the fish cages	1 alive	S. Hatzinikolaou P. Louizidou
4	36°15.885'	27°46.475'	10	sand among *Posidonia oceanica*	1 alive	S. Hatzinikolaou P. Louizidou
8	36°15.244'	27°45.608'	10	sandy bottom	2 shells	S. Hatzinikolaou P. Louizidou
8	36°15.244'	27°45.608'	30	sandy bottom	1alive, 1 shell	S. Hatzinikolaou P. Louizidou