

ALIEN INVASIVE SPECIES ESTABLISHED IN FOULING COMMUNITIES FROM CONSTANTA HARBOR, ROMANIA - A PILOT STUDY

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Abstract

In this pilot study, we monitored alien invasive species established in benthic communities from artificial hard substrata in Constanta Harbor, Romania. Aspects regarding the biodiversity of fouling communities are presented as well as the situation of different invasive species in Constanta Harbor. The study was performed as part of the MODSIS project (MONitoring and Detection System for Invasive Species) financed within IDEI program of the National Research, Development and Innovation Plan - PN II.

Keywords: Black Sea, Monitoring, Alien species, Biodiversity

Introduction

Constanta Harbor is the largest port at the Black Sea, with a handling capacity of over 100 million tones per year. The total traffic increased from 43200 thousands tones in 2003 to 61800 in 2008 therefore increasing the risks of new alien species becoming established at the Romanian coast. The aim of this pilot study was to identify alien invasive species (AIS) "hot spots" in Constanta Harbor. We hypothesized that Constanta Harbor acts not only as a major gateway but also as an AIS reservoir.

Material and Methods

Three study sites in Constanta Harbor were selected taking in consideration the distance from the harbor entrance. First study site (S1) is closest to the entrance while the second (S2) and third (S3) are located inside the harbor (Figure 1). We collected monthly random samples from artificial substrata at 1 – 1,5 m depth from January till October 2009. Samples from ships hulls were collected occasionally in order to observe the community structure.



Fig. 1. Study sites in Constanta Harbor

Results and Discussion

We identified 67 macroinvertebrate species from fouling communities on artificial hard substrata, dominated by *Mytilus galloprovincialis* and *Brachydontes lineatus*. Of these species, 44 are present in all sampling sites, 15 are current in two sites while 7 species occur only in one of the sites. Minor differences were reported between the qualitative structure of artificial and natural hard substrata communities [1] and also between the three sampling sites. AIS represent about 9%, all of them previously mentioned from the Romanian Black Sea Coast [2]. However, samples from ship hulls contain more alien species that represent a permanent source of potential settlers as is the case of other areas in the north-western Black Sea [3] (Table 1).

Tab. 1. AIS identified in samples

Species	Origin	Year of the first mention	Presence in fouling communities	Situation
<i>Blackfordia virginica</i>	North Atlantic	1940	S1	Established
<i>Haliplanella lineata</i>	North Atlantic	1960	S1,S2,S3	Established
<i>Hydroides elegans</i>	Indo Pacific	?	Ships fouling	Accidental
<i>Hydroides norvegicus</i>	North Atlantic	?	Ships fouling	Accidental
<i>Ficopomatus enigmaticus</i>	North Atlantic	1954	S2	Accidental
<i>Doridella obscura</i>	North Atlantic	1997	S1,S2,S3	Established
<i>Mya arenaria</i>	North Atlantic	1968	S2,S3	Established
<i>Musculista senhousia</i>	Indo Pacific	2004	Ships fouling	Accidental
<i>Balanus improvisus</i>	North Atlantic	1844	S1,S2,S3	Established
<i>Balanus amphitrite</i>	North Atlantic	1954	Ships fouling	Accidental
<i>Sphaeroma walkeri</i>	Indo Pacific	2004	Ships fouling	Accidental
<i>Lepas</i> sp.	Atlanto-mediterranean	?	Ships fouling	Accidental
<i>Rhithropanopeus harrisi</i>	Indo Pacific	1950	S1,S2,S3	Established

Conclusion

The AIS identified in our samples are well integrated in the fouling communities therefore the harbor acts as an AIS reservoir for neighboring areas.

References

- 1 - Micu D. and Micu S., 2004. A new type of macrozoobenthic community from the rocky bottoms of the Black Sea. International Workshop On the Black Sea Benthos, 18-23 April 2004, Istanbul-Turkey.
- 2 - Alexandrov B., Zaitsev Y. and Ozturk B., 2001. The Black Sea. In: Zaitsev Y. and Ozturk B. (ed), Exotic Species in the Aegean, Marmara, Black, Azov and Caspian Seas. Turkish Marine Research Foundation, Istanbul, pp 73-138.
- 3 - Alexandrov B., Boltachev A., Kharchenko T., Lyashenko A., Son M., Tsarenko P. and Zhukinsky V., 2007. Trends of aquatic alien species invasions in Ukraine. *Aquatic Invasions*, 2(3): 215-242.