SHORT COMMUNICATION

On the occurrence of Coralligenous algae in the Johnston Bank (Aegean Sea)

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Abstract

Coralligenous formations, referred to as Maërl beds, are important habitats for some fishes, molluscs, crustaceans and act as nursery areas for the juvenile stages of these commercial species, analogous to kelp forests in the oceans and sea grass beds in the coastal Mediterranean waters. Despite their ecologic and economic importance, there is no sufficient data on the distribution of coralligenous substrata in the high sea areas of the Mediterranean Sea. This study provides contribution to presence of Coralline algae which are the major coralligenous builders in the high sea areas in the Aegean Sea.

Keywords: Maërl beds, Coralligenous algae, high sea areas, Johnston Bank, Aegean Sea.

Introduction

Coralligenous formations, referred to as Maërl beds, are important habitat for commercially valuable molluscs, crustaceans and act as nursery areas for the juvenile stages of commercial species of fish, crabs and scallops (Kamenos *et al.* 2004; Hall-Spencer *et al.* 2010), analogous to kelp forests in the oceans and seagrass beds in the coastal Mediterranean waters.

Coralline algae are the main coralligenous builders (SAP BIO 2003). There are many abiotic and biotic factors affecting algal growth. However, the main physical factors regulating life in marine systems, such as light, water movement, temperature, sedimentation and nutrient availability are depth-related. Depth can be given as one of the main limiting factor in vertical distribution of marine organisms, especially photosynthetic organisms. Algae, both encrusting corallines and green algae, usually dominate in horizontal to subhorizontal surfaces, although its abundance decreases with depth or dim light condition (SAP BIO 2003).

Banks and their coralligenous formations are important ecosystems in the Mediterranean due to their high biodiversity and productivity. However, unfortunately, these areas as well as coastal areas are also threatened by environmental stress due to climate change and anthropogenic factors (anchoring, trawling, eutrophication, marine accident, etc.). Despite the ecological and economical importance of coralligenous assemblages in the Mediterranean ecosystem, there is no sufficient information about the distribution and diversity of coralligenous habitats in the Eastern Mediterranean Sea. Studies are focused mostly on the northeastern coast of the Mediterranean (Italy, Spain and France) (e.g. Ferdeghini et al. 2000; Casellato and Stefanon 2008; Gerovasileiou et al. 2009; Sciberras et al. 2009). Little data exists in the Adriatic, Aegean and Levantine regions, where Coralligenous communities have been recorded from Tunisia. Israel and Algeria (UNEP-MAP RAC/SPA 2010 and references therein). The first data on the benthos at some banks in the Aegean Sea were published by Kisseleva (1983). In this study the macrobenthos at three banks in the Aegean Sea and their comparative characteristics were studied. Apart from this, some floral and faunal benthic communities have been the subject in the subsequent studies (Topaloğlu et al. 2010 and references therein). However, coralligene algae have been also a relatively poorly studied group of marine organisms (Maneveldt et al. 2008) and those studies are very limited due to the difficulty of working and identification.

A large number of study in order to determine algal flora of the Aegean coasts of Turkey have been made by many researchers, but there is no algological record on Aegean banks located in high sea areas. The aim of this study was to make a contribution to the knowledge on Coralline algae which are the major coralligenous builders in the Johnson Bank (Aegean Sea).

Materials and Methods

This study was carried out in high sea areas of the Aegean Sea. Sampling was conducted in November 2008 by dredging on the Johnston Bank by R/V YUNUS-S. The Johnston Bank (Figure 1) at 41 m depth surrounded by depths of 200-500 m is a high sea bank in the North Aegean Sea and is located between N39°18.199′ and E25°23.482′. During the study period, the main environmental parameters at the sampling area were temperature 16.6°C, salinity 39.2 ‰ and dissolved oxygen 6.5 mgl⁻¹.

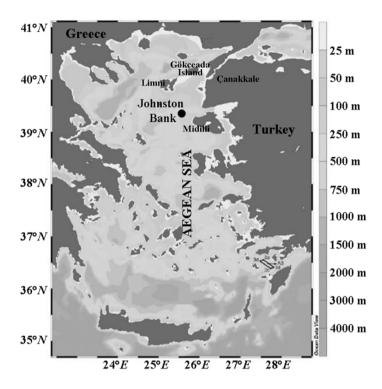


Figure 1. Geographical position of sampling area (Johnston Bank) in the Aegean Sea

Results and Discussion

The field observation revealed that main habitat of this area was coralligenous. In the coralligenous beds of the Johnston Bank, six coralligenous algae were found: Lithophyllum racemus (Lamarck) Foslie, Lithophyllum stictaeforme (Areschoug) Hauck, Lithothamnion corallioides (P.L. Crouan & H.M. Crouan) P.L. Crouan & H.M. Crouan, Lithothamnion minervae Basso, Neogoniolithon sp., Spongites sp. Although L. stictaeforme and a Spongites species (S. fruticulosus Kutzing) (from the coast of Bozcaada by Aysel et al. 2005) and a Neogoniolithon species (from the coast of Mersin by Aysel et al. 2006) were listed for the Turkish coasts, the occurrence of above mentioned six coralligenous algae were recorded first time from high sea part of the Aegean Sea. There are many records on distribution of these species (L. racemus, L. stictaeforme, L. corallioides, L. minervaeare) in the Western Mediterranean (Guiry and Guiry 2012) and it is well known from previous study that these species are the major maërl-forming species in these habitats (UNEP/MAP 2007).

Coralligenous communities constitute the second most important 'hot spot' of species diversity in the Mediterranean, after the *Posidonia oceanica* meadows (Boudouresque 2004; Ballesteros 2006) compared to other habitats substrate. In the study done by Topaloğlu et al. (2010) the macrozoobenthic invertebrate fauna of two banks (Johnson and Sinaya Bank, North Aegean Sea) were compared in the same geographic areas. The results of this study showed that Johnson Bank (51 taxa and 2288 organisms in total density) with coralligenous habitat has highly diversified macrozoobenthic invertebrates when compared to the Sinaya Bank (17 taxa and 490 organisms in total density) with mud-sand substrate. Öztürk (2009) have presented some proposals on marine protected areas in the high seas of the Eastern Mediterranean including the Johnston Bank in the Aegean Sea to ensure protection of the marine biodiversity according to criteria in the Convention of Biological Diversity. This unique habitat with high biodiversity (coralligenous habitats and mäerl beds) is protected by EU Fishing Legislation EC 1967/2006 for the sustainable exploitation of fishery resources in the Mediterranean Sea. However, unfortunately, the location of coralligenous substrata in the high sea areas of Mediterranean is mostly unknown and so these conventions are not being enforced. In addressing this shortcoming, intergovernmental agencies such as Regional Activity Center for Specially Protected Areas (RAC/SPA) can take the initiative for regional surveys and monitoring.

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Johnston Bank' ta (Ege Denizi) Korallijen alglerin varlığı

Özet

Maerl yatakları olarakta bilinen Korallijen oluşumlar, okyanuslardaki kelp ormanları veya Akdeniz'in kıyısal sularındaki, deniz çayırları yatakları gibi bazı balık, yumuşakça ve kabuklular için önemli habitattır ve birçok ticari türün juvenil dönemleri için büyüme alanı olarak rol oynar. Bu alanların ekolojik ve ekonomik önemlerine rağmen, Akdeniz'in açık deniz alanlarındaki korallijen substratlar hakkında yeterli veri yoktur. Bu çalışma Ege Denizi'nin açık deniz alanlarında başlıca korallijen üreticileri olan Coralline alglerin varlığına katkı sağlamaktadır.

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