

FIRST RECORDS OF *CLADOPSAMMIA ROLANDI* (CNIDARIA: ANTHOZOA) IN THE ADRIATIC SEA

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The known geographical distribution of the colonial scleractinian coral *Cladopsammia rolandi* Lacaze-Duthiers, 1897 has been extended with new records from the Adriatic Sea. This Mediterranean endemic scleractinian coral was found in spring 2002 on the cliff at the south of Lastovo Island and in summer 2005 on the two locations at the south-west of Mljet Island (South Adriatic). The new records reported here are the first confirmation of *C. rolandi* presently living in the Adriatic Sea.

Key words: *Cladopsammia rolandi*, coral, Adriatic Sea

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Poznata geografska rasprostranjenost kolonijalnog kamenog koralja *Cladopsammia rolandi* Lacaze-Duthiers, 1897 proširena je novim nalazima u Jadranskom moru. Ovaj endemski kameni koralj Sredozemnog mora pronađen je u proljeće 2002. na strmcima južnog dijela otoka Lastova i u ljeto 2005. na dvije postaje na jugo-zapadnom dijelu otoka Mljet (južni Jadran). Novi nalazi, opisani u ovom radu, prvi su dokaz rasprostranjenosti ove vrste koralja u Jadranskom moru.

Ključne riječi: *Cladopsammia rolandi*, koralj, Jadransko more

INTRODUCTION

Recent investigations of the benthos in the Croatian part of the Adriatic Sea have resulted in the discovery of scleractinian species that proved to be new to the area (*Cladocora debilis*, *Coenocyathus cylindricus*, *Sphenotrochus andrewianus* and *Balanophyllia regia*) and the previously uncertain occurrences of *Astroides calycularis* and *Dendrophyllia ramea* are now also confirmed (KRUŽIĆ *et al.*, 2002; GRUBELIĆ *et al.*, 2004). These species also help to provide the Adriatic fauna with a more »western look«.

The presence in the Adriatic of most of these corals suggests a closer affinity than previously thought with the southwestern Mediterranean (PÉRÈS & PICARD, 1964; FREDJ, 1974). The presence of the coral *Cladopsammia rolandi* Lacaze-Duthiers, 1897, which is recorded for the first time in the Adriatic Sea, is the northernmost finding in the Mediterranean Sea.

The inflow of the sea surface currents in the eastern side of the Adriatic Sea suggests an explanation for the presence of this species in the southern Croatian waters. These new findings should not be considered evidence of recent colonization, possibly connected to the warming of the Mediterranean Sea, but records of previously overlooked coral populations. There is, unfortunately, no real historical series of detailed surveys in this area and the older data are often scattered, incomplete and for some species imprecise.

According to ZIBROWIUS (1980) the occurrence of *C. rolandi* was previously confirmed in the southwestern (coasts of Algeria and Tunisia) and central Mediterranean (eastern coast of Sicily, Gulf of Naples and Gulf of Taranto). VAFIDIS *et al.* (1997) described the finding of *C. rolandi* from the island of Chios in the eastern Aegean Sea (Fig. 1).

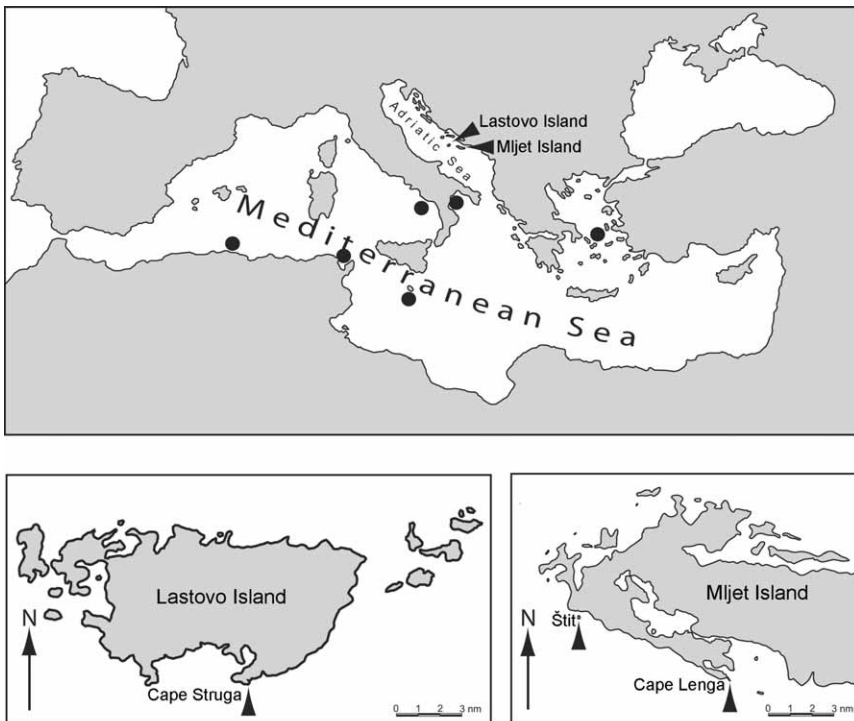


Fig. 1. Locations of the *Cladopsammia rolandi* records in the Mediterranean Sea (black dots) and locations of the new Adriatic records on Lastovo and Mljet Islands (black arrows).

MATERIALS AND METHODS

In spring 2002, colonies of the coral *C. rolandi* were observed and collected on the cliff at the Cape Struga (42°43.4'N–16°53.4'E), located on the south side of Lastovo Island (South Adriatic) (Fig. 1). In summer 2005, numerous colonies were found at two locations on the cliffs in the south-west of Mljet National Park, near Štit Islet (42°46.16'N–17°19.56'E) and Cape Lenga (42°45.19'N–17°23.15'E) (Fig. 1). Samples from Lastovo and Mljet Islands were collected by Scuba diving. The colonies were first preserved in 4 % formalin and later transferred to 70 % ethanol. The calices were deprived of the tissue with 30 % peroxide solution. Specimens here reported were identified according to ZIBROWIUS (1980). Specimens are deposited in the Faculty of Science, University of Zagreb.

RESULTS AND DISCUSSION

The area around both islands is oligotrophic and not affected by human activities. The seawater temperatures during sampling ranged between 12 and 14 °C.

At Lastovo Island (Cape Struga) samples were collected from the wall of an overhang at a depth of 32 m. Only a few colonies were observed. All colonies were encrusted by calcareous algae and bryozoans. At Mljet Island, near Štit Islet samples were collected from the roof of a small cave at a depth of 37 m. The density of the population was about 15 colonies / m². The colonies were mixed with solitary stony coral *Leptopsammia pruvoti* Lacaze-Duthiers, 1897. Since these two corals are quite similar in shape and color (although *Leptopsammia pruvoti* is not a colonial species), the coral *C. rolandi* could easily be overlooked. At Cape Lenga, samples were collected from a shaded cliff at a depth of 44 m. The density of the population was greater than 20 colonies / m². These colonies were also mixed with the solitary stony coral *Leptopsammia pruvoti* and the colonial coral *Phyllangia mouchezi* (Lacaze-Duthiers, 1897).

The investigated colonies of *C. rolandi* were found with considerable variability in colony and corallite shape. Colonies were mostly obtained like irregular clusters, not bigger than 5 cm in diameter. Corallites were circular (mostly in younger ones) or polygonal when densely crowded. Budding was noticed primarily from the side of the corallites which had a rather narrow base. The corallites grow irregularly in various directions. The Adriatic specimens here reported had individual corallites up to 36 mm high and 12 mm in diameter (Fig. 2A, B). The corallum wall was porous and fragile. There were from 44 to 48 septa, arranged in three cycles in smaller and four cycles in bigger calyces. The central columella was very variable in size and quite spongy in texture. There was no distinct pali. Upper margins of septa were often dentate. Theca was thick with fairly distinct costae. Fully expanded yellow to orange polyps stood high up from the calyces, and showed long tentacles.

The lack of intensive studies of the eastern Adriatic Sea is a possible reason why its scleractinian fauna seems to be poor in species number in comparison with other Mediterranean areas. Another problem in understanding the Adriatic sclerac-

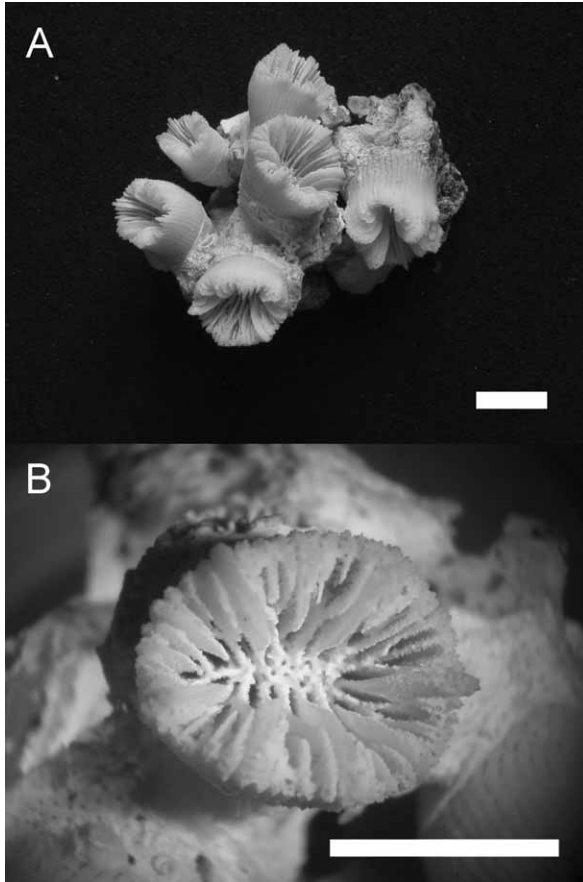


Fig. 2. Colonies of *Cladopsammia rolandi* from Lastovo Island (A). Corallum of the *C. rolandi*, showing septal arrangement and central columella (B). Scale bars = 10 mm.

tinian fauna is the sparseness of data from deeper water, for example, the Jabuka depression and the deep southern part. Scleractinian fauna from the Adriatic Sea comprises about 60 % of the known Mediterranean species (PAX & MÜLLER, 1962; ZIBROWIUS & GRIESHABER, 1977; ZIBROWIUS, 1980, KRUŽIĆ *et al.*, 2002).

Since the diversity of habitats (including caves and deep cliffs) is higher at the submergent coast of Croatia with its abundance of islands and peninsulas than on the Italian side of the Adriatic (widely characterized by soft bottoms), the scleractinian fauna is more diverse on the eastern Adriatic (OTT, 1992, BIANCHI, 2007). The reason for this absence of corals along the Italian coast of the Adriatic could inhere in the general cyclonic pattern of sea currents in the Adriatic Sea (DAMIANI *et al.*, 1988; POULAIN, 2001). The inflow on the eastern side of the Channel of Otranto raises a difficulty for an explanation of the presence of *C. rolandi* at the eastern

Adriatic, which takes place far away from the nearest occurrence of *C. rolandi* in the Gulf of Taranto. The Adriatic occurrence of this species could thus be explained by the current inflow in the Adriatic Sea from the eastern Aegean Sea through the Ionian Sea.

The new findings of the warm-water coral *Astroides calycularis* in the Adriatic Sea suggest that it would also be worth looking for the zooxanthellate coral *Oculina patagonica* (DE ANGELIS, 1908). This species, probably originating from the southwestern Atlantic, is especially abundant in western and eastern Mediterranean coasts and also in the cold Ligurian Sea and has not yet been found in the Adriatic. It can be expected that further research in deeper waters will confirm the occurrence of one or more species typical of those greater depths, such as *Dendrophyllia cornigera* or *Desmophyllum cristagalli*, both of which also occur in the Aegean Sea (ZIBROWIUS, 1979, 1980; VAFIDIS *et al.*, 1997). The latter two species were mentioned by PAX & MÜLLER (1962) for the Adriatic fauna, but as demonstrated by ZIBROWIUS & GRIESHABER (1977), the sources of information for these authors were not reliable. We may expect that the number of Adriatic cnidarian species will further increase in the future, especially with investigation of deeper southern part of Adriatic Sea.

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SAŽETAK

Prvi nalaz vrste *Cladopsammia rolandi* (Cnidaria, Anthozoa) u Jadranskom moru

P. Kružić

Prilikom nedavnih istraživanja bentosa istočnog dijela Jadranskog mora pronađeno je nekoliko novih vrsta koralja za Jadransko more (*Cladocora debilis*, *Coenocyathus cylindricus*, *Sphenotrochus andrewianus*, *Balanophyllia regia*, *Astroides calycularis* i *Dendrophyllia ramea*). Pronađene vrste u Jadranskom moru karakteristične su za zapadni dio Sredozemnog mora. Vrsta *Cladopsammia rolandi* Lacaze-Duthiers, 1897 pronađena je u proljeće 2002. na strmcima južnog dijela otoka Lastova i u ljeto 2005. na dvije postaje na jugo-zapadnom dijelu otoka Mljet (južni Jadran). Novi nalazi, opisani u ovom radu, prvi su dokaz rasprostranjenosti ove vrste koralja u Jadranskom moru. Nalaz ove vrste u Jadranskom moru je i najsjeverniji nalaz u Sredozemnom moru.