

PERIODISM OF *CYSTOSEIRA SPINOSA* SAUV. (FUCALES) FROND SIZE ON THE MONTENEGRIN COAST

Vesna Macic^{1*}

¹ Institute of marine biology - vmacic@ibmk.org

Abstract

Cystoseira spinosa periodism and size structure were studied on three locations of the Montenegrin coast (Adriatic Sea). Samples were taken from Orahovac, Perast and cape Kocište in different seasons between autumn 2005 and spring 2007, at 5m depth. The analysis were made on obtained data for total wet biomass, *C. spinosa* wet biomass, maximum length, length of the main axes and length of ten randomly selected primary branches. For better understanding of *C. spinosa* periodism and monitoring further analysis of deeper populations are needed.

Keywords: *Adriatic Sea, Algae, Endemism, Phytobenthos*

Introduction

According to published data *Cystoseira* species are very sensitive to antropogenic impacts and there are tendencies of their regresions from urban areas. In recent years many scientific efforts has been dedicated to research of the genus *Cystoseira* as bioindicator species for evaluating environmental state and some antropogenic impacts. In these activities historical data are of great importance, but unfortunately they are very scarce for the Montenegrin coast ([1], [2], [3]). Therefore the aim of this work was to contribute to the better knowledge of endangered, endemic Mediterranean brown algae, *Cystoseira spinosa* Sauv., its periodism and size structure and to provide better base information for further monitoring.

Materials and Methods

The field research was done by seasonal SCUBA diving, on 3 locations: Orahovac, Perast and cape Kocište (Fig. 1), between autumn 2005 and spring 2007 (excluding winter 2006). Sampling was done in 3 replicates scraping off all organisms within quadrates 25cm x 25cm at 5m depth. Following parameters were measured: total wet biomass, *Cystoseira* wet biomass, maximum length, length of the main axes and length of ten randomly selected primary branches. Measured *Cystoseira spinosa* specimens are conserved in 4% formaldehyde solution.



Fig. 1. Locations of the study

Results and Discussion

Seasonal variation of total biomass, with maximum in spring were clearly evident, contrary to biomass of *Cystoseira*. Differences in wet weights of *C. spinosa* between selected locations were significant (F-test and Duncan test, $p < 0,05$) and the highest between Perast (66.7g/m^2) and Kocište (759.9g/m^2). The biggest variability of maximum length, length of main axes and primary branches were noted in the spring (Fig. 2).

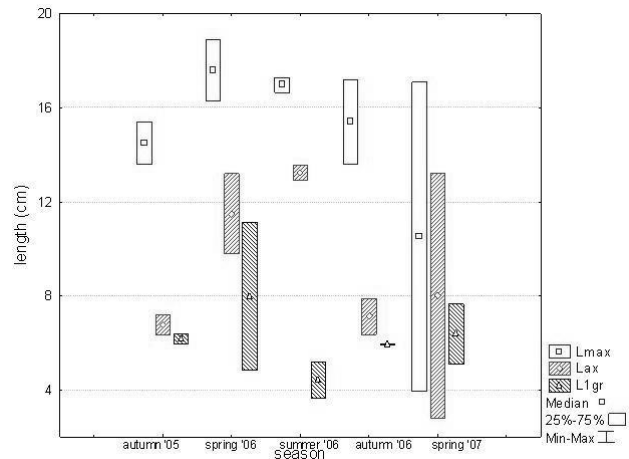


Fig. 2. Values of length for different seasons (Lmax-maximum length; Lax-length of axes and L1gr-length of primary branches)

Some authors ([4], [5]) acknowledge weak seasonal variation of length for main axes and its independence of the phenological state of plants. In this study the lengths of main axes were different significantly (F-test and Duncan test, $p < 0,05$) between locations. Furthermore, as for wet biomass, also for the length of main axes, location Orahovac was with highest variability (6.35-13.2cm) and location Perast with highest values (13.55cm). Conceptacles were apical and present only in the spring.

With scope to improve knowledge of phytobenthos of the Montenegrin coast two new locations for the distribution of *Cystoseira spinosa* are presented (Orahovac and cape Kocište). For this part of the south-east Adriatic Sea presented data of periodism and size structure for this algae are the first one and more or less are similar to data from other parts of Mediterranean Sea. However, because of great polymorphism of *Cystoseira spinosa* further analysis of deeper populations are needed, as well as further monitoring of differences found in this study.

References

- 1 - Ercegovic, A., 1952. Jadranske Cistozire. Njihova morfologija ekologija I razvitatk. *Fauna et flora Adriatica, IOR, Split*, 2: 1-212.
- 2 - Antolic, B., Span, A., 1992. The inventory of benthic flora of the Baz Boka Kotorska (southern Adriatic). *Acta Adriatica*, 33 (1/2):75-84.
- 3 - Span, A., Antolic, B., 1983. Prilog poznavanju fitobentosa Crnogorskog primorja (južni Jadran). *Studia Marina*, 13-14: 87-110.
- 4 - Ballesteros, E., Sala, E., Garrabou, J. and Zabala, M., 1998. Community structure and frond size distribution of a deep water stand of *Cystoseira spinosa* (Phaeophyta) in the Northwestern Mediterranean. *Eur. J. Phycol.*, 33: 121-128.
- 5 - Serio, D., 1995. Fenologia morfologica e riproduttiva di *Cystoseira spinosa* Sauvageau v. *compressa* (Ercegovic) Cormaci et al., (Fuciales, Fucophyceae). *Boll. Acc. Gioenia Sci. Nat.*, Vol. 28., n. 349: 5-22.