

SITUATION IN SHALLOW-WATER *CYSTOSEIRA* SETTLEMENTS ON THE EASTERN ADRIATIC COAST

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Abstract

In this paper is given the review of conditions of shallow-water *Cystoseira* settlements at 5 stations under different influence of pollutions along the eastern Adriatic coast.

Keywords: pollution, *Cystoseira* settlements, Adriatic coast

Introduction

The *Cystoseira* settlements are the climax vegetation on the hard bottom in the Mediterranean Sea. Together with *Posidonia oceanica* meadows, they are the main carrier of biodiversity in the infralittoral zone. Since these settlements are best developed between the surface and 10m depth, they are often exposed to marine pollution. In this paper, the analysis of influence of pollution on the epilithic part of shallow-water *Cystoseira* settlements on eastern Adriatic coast are given.

Material and methods

The investigations were performed between 1995 and 1999 on 5 areas of the eastern Adriatic coast (Zadra, Šibenik, Split, Pelješac peninsula, Dubrovnik) (Fig. 1). The samples were collected by SCUBA diving on 400 cm² squares from surface to 2m depth. The epilithic algal taxa with a presence higher than 1% were considered. The investigations covered the settlements of *Cystoseira adriatica* Sauvageau, *Cystoseira barbata* (Stackhouse) C. Agardh, *C. compressa* (Esper) Gerloff et Nizamudin, *C. crinitophylla* Ercegović, *C. humilis* Kützinger and *C. spicata* Ercegović subsp. *crassa* Ercegović, which are the leading components of the benthic algal vegetation on the hard bottom of the eastern Adriatic coast (1). Special attention was paid to algal taxa from ecological supergroup ETNsl (including the eutrophic and tionitrophilic algae in a large sense) (2). The structure of *Cystoseira* settlements was studied by some phyto-sociological parameters: mean total cover of the whole sample (Rt%), mean total cover of the individual epilithic algal taxa (RMi%), qualitative (DN%) and quantitative (DR%) dominance of ecological supergroups (Phsl, Ssl, RMsl, ETNsl) and groups (ISR, D) (3).

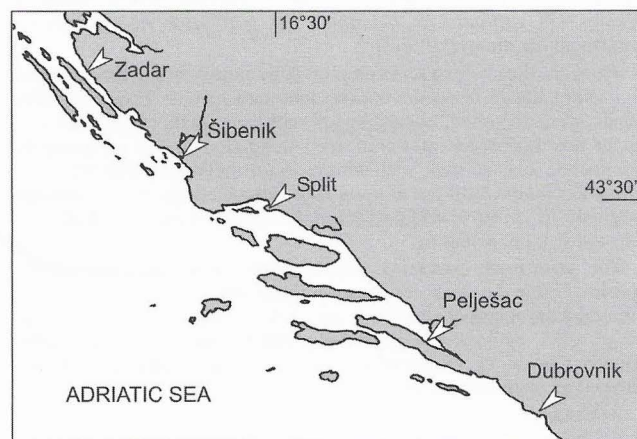


Fig. 1. Investigated area.

Results and discussion

The total number of epilithic algal taxa varied between 44 (*C. adriatica*; Šibenik) and 67 (*C. barbata*; Zadar), while the mean total cover of sample (Rt%) varied from 183.91% (*C. spicata* subsp. *crassa*; Dubrovnik) to 217.90% (*C. crinitophylla*; Split). Mean total covering of investigated *Cystoseira* (RMi%) varied between 66.60% (*C. crinitophylla*; Split) and 85.00% (*C. barbata*; Pelješac). The quantitative dominance (DR%) varied between 30.6% (*C. crinitophylla*; Split) and 45.0% (*C. spicata* subsp. *crassa*; Dubrovnik) (Figure 2). The algal taxa of Ssl ecological supergroup showed qualitative dominance (DN%) in the structure of the *Cystoseira* settlement. They were followed by the taxa of the Phsl ecological supergroup, with some lower values of DN%. In the Ssl

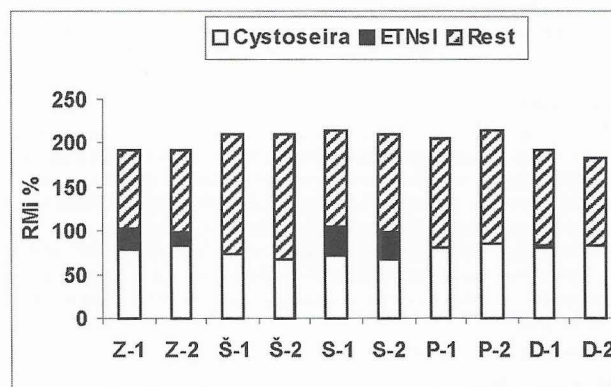


Fig. 2. Structure of epilithic part of *Cystoseira* settlements on the eastern Adriatic coast.

(Z-1, Zadar-*C. compressa*; Z-2, Zadar-*C. barbata*; Š-1, Šibenik-*C. crinitophylla*, S-2, Šibenik-*C. adriatica*; S-1, Split-*C. compressa*; S-2, Split-*C. crinitophylla*; P-1, Ploče-*C. crinitophylla*; P-2, Ploče-*C. barbata*; D-1, Dubrovnik-*C. humilis*; D-2, Dubrovnik-*C. spicata* subsp. *crassa*)

ecological supergroup, the DN% values varied between 37.0% (*C. compressa*; Split) and 50.0% (*C. crinitophylla*; Pelješac), and in the Phsl ecological supergroup the values varied from 32.8% (*C. humilis*; Dubrovnik) to 45.5% (*C. adriatica*; Šibenik). The algal taxa of the Phsl ecological supergroup predominated by quantitative dominance (DR%). These values varied from 62.2% (*C. compressa*; Zadar) to 71.6% (*C. spicata* subsp. *crassa*).

The analysis of *Cystoseira* settlements regarding the N, DN%, Rt%, DR% and RMi% of individual algal taxa of ETNsl showed relatively large fluctuations. The highest values (8 and 9) were recorded in the Zadar and Split areas, much lower in the Pelješac and Dubrovnik areas (1, 2 or 3). In the Šibenik area these algal taxa were not observed. In areas with the best representation of this ecological supergroup (Zadar, Split), the DN% values varied between 11.3% (*C. compressa*; Zadar) and 13.0% (*C. compressa*; Split), than the DR% values varied from 8.8% (*C. barbata*; Zadar) to 15.1% (*C. compressa*; Split). The algal taxa that mostly contributed to the ETNsl quantitative dominance by their individual mean total covering (RMi%) in Zadar area in *C. compressa* settlement were: *Ulva rigida* (12.50%), *Chondracanthus acicularis* (6.47%), *Dictyopteris polypodioides* (3.38%) and *Dictyota dichotoma* var. *intricata* (2.21%); whereas, in *C. barbata* settlement were: *U. rigida* (7.08%), *Ch. acicularis* (4.00%), *D. polypodioides* (3.67%) and *D. dichotoma* var. *intricata* (1.33%). Within the Split area, the *C. compressa* settlement consisted of *U. rigida* (14.33%), *Ch. acicularis* (8.67%), *D. polypodioides* (5.33%), *Hypnea musciformis* (1.67%) and *Gastroclonium reflexum* (1.33%), whereas in the *C. crinitophylla* settlement *Ch. acicularis* (13.60%), *U. rigida* (9.70%), *D. polypodioides* (2.60%), *H. musciformis* (2.20%), *G. reflexum* (1.60%) and *D. dichotoma* var. *intricata* (1.20%) were present.

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