DOES TROPICAL ALGA *CAULERPA TAXIFOLIA* (VAHL) C. AGARDH INFLUENCE THE MACROZOOBENTHOS COMPOSITION ?

Grubelic I.*, Antolic B., Bartulovic M., Zuljevic A. and Simunovic A.
Institute of Oceanography and Fisheries, Split, Croatia - grubelic@izor.hr

Abstract
Relationship between macrozoobenthos species in the autochthonous vegetation settlements and in the settlements infested and prevailed by tropical alga *Caulerpa taxifolia*, have been observed in the summer of 1998 (Starigrad Bay, Hvar Island, Adriatic Sea). Preliminary results indicate that the number of macrozoobenthic species is higher in the samples of autochthonous vegetation with *C. taxifolia* than in the samples without it, which is not in accordance with data from the researches in the Mediterranean, where the negative influence of *C. taxifolia* to biological diversity was recorded. In order to give precise answers to the question in the title, the research has been carried on.

Key-words: macrozoobenthos, Caulerpa taxifolia, Adriatic Sea

Introduction

The tropical alga *C. taxifolia* was observed for the first time in the Adriatic Sea in Starigrad Bay in the summer of 1994. The alga was found at depths between 0.5 and 20 m, on the hard bottom with photophilic and sciaphilic biocoenoses and on the sandy and muddy bottoms with seagrass beds of *Posidonia oceanica, Cymodocea nodosa* and *Zostera noltii* (1, 2). The influence of *C. taxifolia* on the composition of the Adriatic macrozoobenthos hasn't been researched so far. There are only data about the influence of this alga on the composition of epibionthic meiofauna in the North Adriatic (3). Its impact on ecological events (4), on invertebrate composition (5), epiphytic fauna and fish (6) and particularly on the behavior of the sea-urchin *Paracentrotus lividus* (7, 8, 9) has been researched in the Mediterranean. In this paper the preliminary data upon macrozoobenthos composition in the settlements of autochthonous vegetation and settlements attacked by *C. taxifolia* and the settlements of *C. taxifolia* have been given.

Material and methods

The investigations were performed by SCUBA diving in Starigrad area between 2 and 8,8 m depth in the summer of 1998. The material was collected from surface of 1/4 m^2, in the settlements of autochthonous vegetation and in the settlements where *C. taxifolia* spreads. The samples were collected: at 2 m depth on the hard bottom in shadow part of inclined (600) rock where *C. taxifolia* hasn't been introduced yet and the part where it has completely covered the rock; at 5 m depth in the settlement of *Cystoseira adriatica* and in the mixed one with *C. taxifolia* (approx. 50%); at 3 m depth on muddy-sandy bottom where the settlement is composed of *Cymodocea nodosa* and the mixed one; at 6,6 and 8,8 m depth on sandy-muddy bottom in the settlement of *C. nodosa* and the mixed one. All specimens of the dominant groups of macrozoobenthos living in each sample were sorted, identified and counted.

Results and discussion

The results of the preliminary research indicate that in the sample taken at 2 m depth on inclined rock (sciaphilic) in the settlement of *C. taxifolia* there were more macrozoobenthic species (34 species) than in the settlement of sciaphilic algae (17 species); superior in number are sponges and molluscs. The number of species at 5 m depth in mixed settlement of *C. adriatica* and *C. taxifolia* is higher (16 species) than in *C. adriatica* settlement (14 species); the number of molluscs was the same in both samples (7 species); the sponges (3 species) were found only in *C. adriatica* settlement, while echinodermata (2 species) were found only in the mixed sample (Fig. 1).

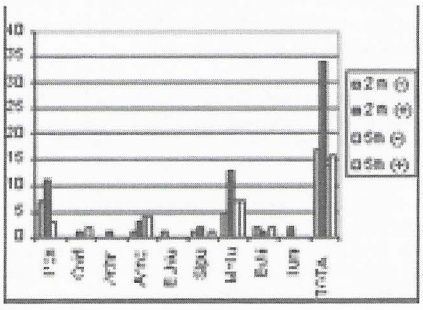

Fig.1. Number of macrozoobenthic species in samples without (-) and with *C. taxifolia* (+).

On muddy-sandy bottom (3 m depth) in the sample of *C. nodosa* we have recorded more species (10 species) than in the mixed sample (6 species). In both samples the most numerous are molluscs. On sandy-muddy bottom (6,6 m depth) in the sample of *C. nodosa* there haven't been recorded any macrozoobenthic species, while in the mixed settlements 5 species were recorded. At 8,8 m depth in *C. nodosa* settlement 11 species were observed and 13 species in mixed one. In the mixed settlement there were defined the single species of cnidarians and crustaceans and 3 species of echinoderms which weren't recorded in the settlements without *C. taxifolia*. However, the number of molluscs is higher in *C. nodosa* settlement (9 species) than in the mixed one (7 species) (Fig. 2).

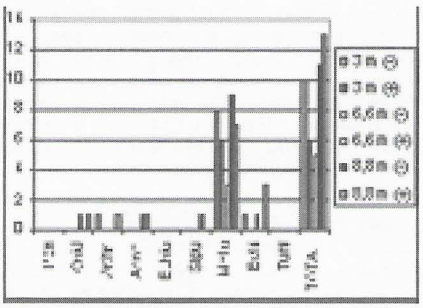

Fig. 2. Number of macrozoobenthic species in settlements without (-) and with *C. taxifolia* (+).

Analysing the results of the preliminary research the question was raised : Does the tropical alga *C. taxifolia* influence the macrozoobenthos composition and to what extent? The final answer should be found in more complex researches that are in the course.

References

1 - Zuljevic A., Antolic B., Span A. 1998 a. Spread of the introduced tropical green alga *Caulerpa taxifolia* in the Starigrad bay (island Hvar, Croatia). Third Internatonal Workshop on *Caulerpa taxifolia*. Boudouresque C.F., Gravez V., Meinesz A., Palluy F. (eds), *GIS Posidonie publ.*: 51-59.
2 - Zuljevic A., Antolic B., Span A. 1998 b. The genus *Caulerpa* (Caulerpales, Chlorophyta) in the Adriatic. *Rapp. Comm. int. Mer Médit.*, 35: 584-585.
3 - Zavodnik N., Travizi A., Jaklin A., Labura Z. 1998. *Caulerpa taxifolia* (Chlorophyta) in the north Adriatic Sea at Malinska (Krk Island, Croatia). Third Internatonal Workshop on *Caulerpa taxifolia*. Boudouresque C.F., Gravez V., Meinesz A., Palluy F. (eds), *GIS Posidonie publ.*: 175-184.
4 - Boudouresque C.F., Meinesz A., Ribera M.A., Ballesteros E. 1995. Spread of the green alga *Caulerpa taxifolia* (Caulerpales, Chlorophyta) in the Mediterranean: possible consequences of the major ecological event. *Sci. Mar.* (Supl.1): 21-29.
5 - Bellan-Santini D. 1995. Faune d'invertébres du peuplement à *Caulerpa taxifolia*. Données préliminaires pour les côtes de Provence (Méditerranée). *Biol. Mar. Medit.*, 2 (2): 635-643.
6 - Relini G., Relini M., Torchia G. 1998. Fish and epiphytic fauna on *Caulerpa taxifolia* and *Cymodocea nodosa* at Imperia (Ligurian Sea). Third Internatonal Workshop on Caulerpa taxifolia Boudouresque C.F., Gravez V., Meinesz A., Palluy F. (eds), *GIS Posidonie publ.*: 185-195.
7 - Ruitton S., Boudouresque C.F. 1994. Impact de *Caulerpa taxifolia* sur une population de l'oursin *Paracentrotus lividus* à Roquebrune-cap Martin (France). First Internatonal Workshop on Caulerpa taxifolia. Boudouresque C.F., Meinesz A., Gravez V. (eds), *GIS Posidonie publ.*: 371-378.
8 - Bellan-Santini D., Arnaud P., Bellan G. 1996. Affinites entre peuplements Mediterraneens benthiques avec et sans *Caulerpa taxifolia*. Second Internatonal Workshop on *Caulerpa taxifolia*. Ribera M.A., Ballesteros E., Boudouresque C.F., Gomez A., Gravez V. (eds) Publicacions Universitat - Barcelona: 387-390.
9 - Lemée R., Boudouresque C.F., Gobert J., Malestroit P., Mari X., Meinesz A., Menager V., Ruitton S. 1996. Feeding behaviour of *Paracentrotus lividus* in the presence of *Caulerpa taxifolia* introduced in the Mediterranean Sea. *Oceanol. Acta*, 19 (3-4): 245-253.