

Note on the marine flora of the Banjole islet (North Adriatic)

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The small islet Banjole, located at 1 Nm off Rovinj, is wide known as a traditional training area of students in biology from many European universities. The islet is famous for its two underwater caves, excellent communities zonation related to the exposure to wind and waves and richness of habitats. It is strange enough that the islet's marine flora has never been studied in detail. According to previous notes, mostly occasional, of which some were recorded more than a century ago, the Banjole islet is extraordinarily rich in dense brown algae assemblages which distribution reflect influences from coastal and offshore waters.

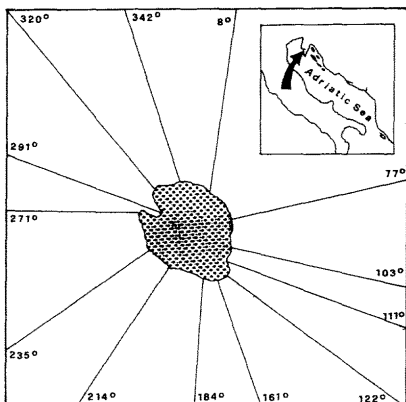


Fig. 1.- Islet Banjole: sampling sites

Some 20 years ago, dense *Cystoseira* and *Sargassum* settlements covered completely the islet's rocky slopes, and on the detritic sandy bottom a *Cymodocea nodosa* meadow was mapped (ZAVODNIK, 1967, SENES, 1988). Around that time already a decrease in algal abundance was noted in the Rovinj city area which was obviously caused by a complex industrial and urban pollution (GOLUBIC, 1968, KATZMANN, 1972, MUNDA, 1974). In the past decennium, basic alterations occurred in the islet's benthic communities, too. In the upper infralittoral zone, algal forests decreased to a stage of a ground carpet, and the *Cymodocea* bed disappeared. Our research performed along 13 SCUBA transects (Fig. 1) revealed only 145 algal taxa: Rhodophyta 98, Phaeophyta 27 and Chlorophyta 20 (Fig. 2).

To day, in the islet's mediolittoral zone in the winter-spring period the mostly common annual species are *Ulva rigida*, some *Enteromorpha*, *Cladophora* and *Ceramium* species.

In the summer period they are substituted by diverse *Gelidium*, *Gelidiella*, *Polysiphonia* species and others. At some sheltered sites low quantities of the perennial brown alga *Fucus virsoides* occurred, while on the exposed rocks a worm-like *Nemalion helminthoides* was noted. The infralittoral habitats are covered by dense settlements of *Padina pavonica* mixed with *Acetabularia cetabulum*. *Cystoseira* species were mostly substituted by *Stypocaulon scoparia* and *Dictyota* species. At the depth of 10-20 m, at a distance of about 30 m from the shore line, dense assemblages of *Pseudolithophyllum expansum* occurred, while *Peyssonnelia polymorpha* and *Peyssonnelia rubra* indicate a typical infracoralligene in the sense of SENES (1988). On calcareous algae were rarely attached solitary thalli of *Cystoseira corniculata* ssp. *laxior*, *Dictyota linearis*, *Codium bursa*, *Halimeda tuna* and *Ulodea petiolata*. Changes in the Banjole marine flora, conspicuous to all divers, in all probability were instigated by complex pollution agents.

But recently also several eutrophication phenomena are perhaps involved in the decrease of some algal and seaweed assemblages in the entire area, which remind as the consequences of anoxic conditions on the marine fauna.

Consequently, one can point out the following facts:

1.- In the near past, dense settlements of fucoids and *Cymodocea nodosa* have disappeared in the Banjole islet area.

2.- Perennial fucoid species were mostly substituted by settlements of annual Chlorophyceae, Sphacellariaceae, Dictyotaceae and especially by red algae i.e. Corallinaceae and Gelidiaceae.

3.- The total flora at the thirteen sites studied consisted of 98 taxa pertaining to Rhodophyta, 27 to Phaeophyta and 20 to Chlorophyta. The R/P ratio was 3.6.

4.- It seems that reiterated short-time coverings of organic mucous materials did not have harmful effects to seaweeds as they had to sessile animals at the same habitats.

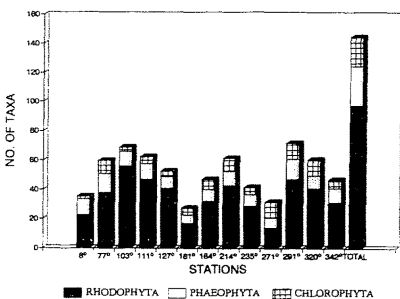


Fig. 2.- Total taxa and number of Rhodophyta, Phaeophyta and Chlorophyta at each study site

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