

Long-Term Changes in the Northern Adriatic Marine Phanerogam Beds

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In the Adriatic Sea, due to a lack of comparable information on distribution, abundance of species population, long-term fluctuations in benthic communities and seldom be appropriately explained. The previous thorough research of Benacchio (1938) and our recent studies have made possible an evaluation of the changes in distributional patterns of northern Adriatic marine phanerogam species which have occurred in this area over a half century span.

Research was done along the Istrian coast, and in a part of the Quarneripelago, i.e. around the Cres, Losinj, Susak and Uniže islands. At more than a hundred coastal transects and some peculiar stations skin and SCUBA diving methods employed. In addition, the material sampled by dredge was also considered.

Sufficient comparable data are available only for the following three phanerogam species: *Posidonia oceanica* (L.) Del., *Cymodocea nodosa* (Ucr.) Asch., and *Zostera noltii* Hornem.

Fifty years ago *Posidonia oceanica* was a common species of many localities of the area explored (Fig. 1). Nowadays, the western Istria *Posidonia* beds have almost completely been made extinct, except for poor remains in the environs of Umag and Rijeka. Around the south Istrian promontory and islands studied the beds are still well developed although local decrease processes have been noted.

Cymodocea nodosa is at present well distributed in the entire area, except in the steep sloping bottom of the Quarner area. The plants are growing well, especially at sites characterized by oozy sand and enlarged input of particulate materials.

Zostera noltii is at present limited only to a few sheltered and shallow areas characterized by sandy-oozy sediment and lower salinity conditions. Its beds are still not dense, and in some places, during the low tide, are exposed to desiccation.

In comparison with the old data of Benacchio (1938) it becomes evident that in the past 50 years *Posidonia oceanica* beds have drastically declined in Istria, *Zostera marina* has been largely made extinct. On the other hand, *Zostera noltii* beds have mostly remained unaffected, while the area of *Cymodocea nodosa* has greatly extended. At some sites, this species has definitely occupied areas long ago deserted by *Posidonia oceanica* (Zavodnik, 1983).

The reasons for the alterations described are no doubt manifold: direct pollution effects, however, could be attributed only locally. A more important factor lies perhaps in an increased siltation, and changed light conditions affected by enlarged water turbidity as suggested by Ghirardelli et al. (1973).

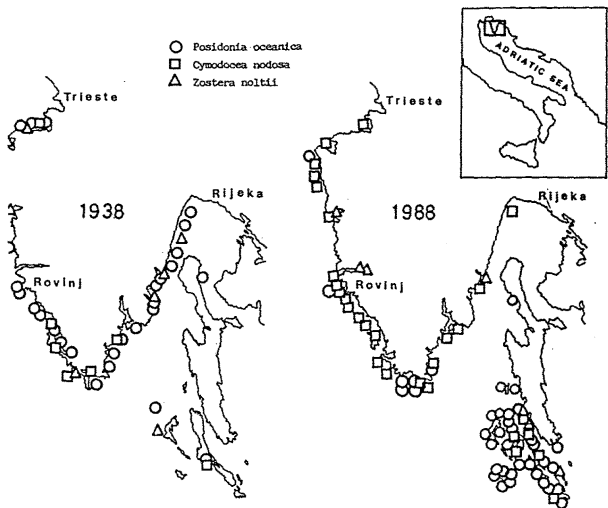


Fig. 1. Occurrences of marine phanerogams.

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