RESTITUTION OF ARTIFICIALLY DENUDED ROCKY SURFACES IN DIFFERENTLY POLLUTED HABITATS NEAR ROVINJ (NORTH ADRIATIC)

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ABSTRACT

Recolonization of cleared rocky surfaces was studied in differently polluted habitats near Rovinj, in the eulittoral and in some tide pools. A rapid restitution of green algae settlements of polluted sites was found, after initial colonization by Cyanophyceae. Colonization was delayed in heavily polluted habitats. Tide pool populations recovered rapidly, while Fucus virsoides and Cystoseira spp. stands reached their climax after two years.

RESUME :

La recolonisation des surfaces rocheuses après une destruction expérimentale a été étudiée près de Rovinj dans quelques endroits diversement pollués de l'étage médiolittoral et des cuvettes. Après une colonisation initiale par les Cyanophycées, la réinstallation des populations d'algues vertes dans les endroits pollués a été rapide. Dans le voisinage de l'hôpital, qui est très pollué, la recolonisation était assez lente. Les populations des cuvettes se sont réinstallées rapidement, tandis que celles de *Fucus virsoides* et des *Cystoseira* spp. ont atteint leur plein développement après deux années seulement.

In spite of world-wide experinece about algal recolonization on cleared rocky surfaces, there are few data for the Mediterranean (e.g. Bouderesque, 1973) and none for the Adriatic Sea.

Preliminary experiments were carried out in differently polluted sites near Rovinj. Quadrats of 1/4 m2 were scraped clean with a knife in April 1979. In the eulittoral they were additionally burned with benzine to remove the basal holdfasts and spores. Subsequent observations of the cleared rocky surfaces were carried out in April 1980 and April 1981, with intermediary observations made by N. Zavodnik, Rovinj (July, September 1979, February 1980). The quadrats were cleared in the polluted Val di Lone, on the island of Catarina and in the vicinity of the Rovinj hospital. As reference locality the undisturbed bay of Faborsa was chosen. The initial fresh weight biomass and floristic composition were determined in order to get information about the original stands. For the upper eulittoral of polluted sites scattered green algae mats are characteristic. In this level quadrats were cleared in Val di Lone within a settlement of Blidingia minima -Enteromorpha intestinalis(E) , on the island of Catarina (unialgal settlement of Enteromorpha intestinalis -E) and in the vicinity of the hospital: one quadrat in a settlement of Blidingia minima (B) and the other in a mixed population of Enteromorpha

intestinalis -Ulva rigida, undergrown by Gelidiella species (E). In July all the quadrats were clean. In Val di Lone the quadrat was covered by Cyanophyceae in September and fully recovered in February. The Enteromorpha quadrat on the island of Catarina was recovered already in September, while in the most polluted locality colonization was delayed. The quadrats were recoverd after one year. Colonization on the Enteromorpha-Ulva quadrat started in February, while the Blidingia one was still clean. Further eulittoral settlements were cleared within the Fucus virsoides zone (F) in Val di Lone and in the bay of Faborsa. In Val di Lone recolonization started by Cyanophyceae, Ulva and Enteromorpha species in July and September. The first Fucus plants reappeared in February and colonization started from the edges of the quadrat. The original pattern was restored after two years. In Faborsa the Fucus population was originally more prolific than in polluted sites. Recolonization of the quadrat started with Cyanophyceae and Fosliella sp. in July. In September the floristic diversity was increased on account of seasonal green algae. It declined again next spring, when the dominant species reappeared (April). The settlement was fully recovered and prolific after two years. Two quadrats were chosen in rock pools, one on the island of Catarina, dominated by Dictyota dichotoma-Dictyopteris membranacea (D) and the other in Faborsa, dominated by Cystoseira species (C). The floristic diversity in these pools was high and in the undergrowth crustaceous algae dominated (Hildenbrandia rubra, Ralfsia spp., Phymatolithon spp.). On Catarina the first seasonal colonizers appeared in July and the two dominants in September. The population was fully recovered in February, but with an altered floristic composition. The Cystoseira quadrat in Faborsa was firstly colonized by diverse seasonal red and green algae on an undergrowth of Rivularia species. The perennial dominants reappeared in February and extended their population in April. The original canopy was restored after two years, with the same crustaceous floristic elements in the undergrowth, but a somewhat altered floristic composition.

NUMBER OF SPECIES ON THE QUADRATS

	Val di Lone		Catarina		Hospital		Faborsa	
	E	F	E	D	B	E	F	C
Initial	2	3	1	18	1	8	3	28
July	o	2	o	9	o	o	2	7
September	1	4	1	13	o	o	1	4
February	3	5	1	8	o	1	4	3
April	5	7	1	12	1	5	4	7
April 1981	3	7	1	17	-	-	3	24
initial biomass(g)	130	240	715	298	233	150	450	782

Boudouresque C.F., 1973. Etude de la réinstallation d'un peuplement sciaphile de mode battu après sa destruction expérimentale en Méditerranée. Helgol. wiss. Meeresunt., 24 : 204-218.