

SEASONAL FOULING OF BENTHIC ALGAE ON GLASS PLATES

I.M. MUNDA

Slovence Academy of Science, Biological Institute, Ljubljana,
Yugoslavia and Biologische Anstalt Helgoland, Germany

ABSTRACT

Seasonal variations in the settlement intensity of algae were studied by means of glass plates, immersed each month for 1 month period near the town of Rovinj. The settlement succession was observed on separate plates exposed for unequal periods of time in order to obtain data on the progressive fouling and fouling competition.

RÉSUMÉE

Les variations saisonnières de la salissure par les algues ont été étudiée par l'aide des plaques de verre immergées chaque mois pour la période d'un mois, au voisinage du Rovinj. La succession des peuplements a été observée sur des plaques séparées, exposées en des périodes différentes en vue d'obtenir des détails sur la progression et les phases de la salissure par les algues.

Fouling investigations were made by means of glass plates (30 x 7 cm) placed vertically and fixed on wooden rafts, at 1m depth. The initial settlements in January was represented by *Ulothrix flacca* and Diatoms (*Navicula* species, *Plagiogramma minor*, *Fragilaria* species). A dominance of Diatoms in fouling was evident during February and March, when the species diversity, was increased by *Licmophora flabellata*, *Amphipleura rutilans*, *Synedra tabulata*, *Grammatophora undulata*, *Achnantes brevipes* and others, beside juvenile *Enteromorpha* spp., *Ectocarpus siliculosus* and *Giffordia hincksiae*. During April, the Diatom component in fouling was somewhat decreased and the same green and brown algae were found. Later, in May and June, green algae became prominent, represented by *Enteromorpha intestinalis*, *E. prolifera*, *E. ramulosa*, *Ulothrix* species and *Derbesia tenuissima*. The Diatoms decreased in quantity in summer. During July, a decrease in species diversity was found, but with the addition of *Enteromorpha multiramosa*, *E. jugoslavica* and red algae (*Polysiphonia elongata*, *P. furcellariae*,

Goniotrichium elegans). During August, fouling was on its minimum and *Oscillatoria miniata* joined the green algae. During autumn, Cyanophyceae became predominant and occupied the main fouling surface (*Oscillatoria* sp., *Lyngbya lutea*, *L. subsalsa*, *L. gracilis*, *Pleurocapsa fuliginosa*, *Microcoleus chthonoplastes*, *Spirulina thuretii*, *S. subtilissima*. *Enteromorpha* and *Blidingia* species were also found along with some Diatoms. The Cyanophycean component seems, however, to prevent the settlements of *Ulothrix* species. During November, *Enteromorpha* species settled together with Diatoms, while in December, there was again found a predominance of the Cyanophycean component, joined by *Phormidium* species.

The seasonal studies of fouling by benthic algae indicate, however, that *Ulothrix* species were successful from January to autumn, when the Cyanophyceae became to dominate. During spring, the Diatoms dominate in fouling, and green algae in summer.

Observations on the fouling succession, done monthly on permanently exposed plates during one year, revealed no distinct rules. The initial settlements was done by Diatoms, according to observations in April, and was followed during the next two months by *Ulothrix* and *Enteromorpha* species as well as by *Ectocarpus siliculosus*. The green algae component became outstanding in June, while in August, Cyanophyceae started to predominate in fouling. The species diversity and abundance of the Cyanophycean component was even increased during the next month of immersion, up to January, indicating a strong organic pollution (presence of *Spirulina* species). The green algae component was in regress. After 10 month of immersion, observations revealed a decreased fouling by Cyanophyceae and reappearance of the green algae.

Hydrographic data during immersion (January to December)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
T(°C)	9,2-9,9	9,9-10,8	13,7-16,8	19,2-24,1	23,8-21,6	18,0-16,9	12,8					
Sal.(‰)	37,1-36,8	37,1-37,3	37,5-36,3	36,8-37,5	36,9-36,3	35,5-37,7						