I. A. D.

Internationale Arbeitsgemeinschaft Donauforschung

der Societas Internationalis Limnologiae

S.I.L.

Limnologische Berichte Donau 1994

Band I

Wissenschaftliche Kurzreferate

Dübendorf - 1994

Comparative algological studies on the periphyton in the branch-system of the River Danube at Ásványráró (Hungary)

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Abstract: The algal composition of periphyton was studied in the branch-system of the River Danube at Ásványráró on different submersed substrates. The samples were collected from running and almost standing water points, too. It seems that the most important factor in the composition of periphyton is the current condition.

Introduction

The River Danube entering the Carpathian Basin divides into many smaller branches. The Hungarian region is called Szigetköz. Most of the small branches are separated by dams causing different current conditions depending on the water discharge in the main branch.

The phytoplankton of this region was investigated mainly by Bartalis (1978, 1982) and Kiss (1987) and the periphyton by Buczkó & Ács (1992, in press).

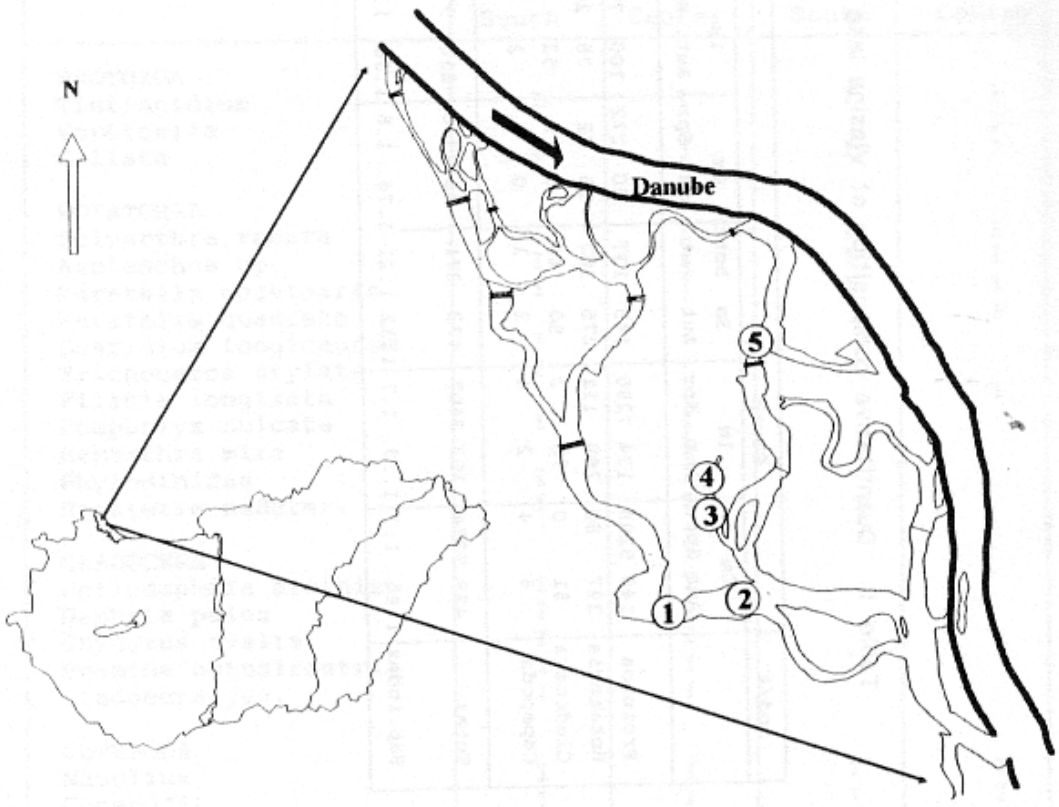

Fig. 1. Location of the sampling points

Materials and methods

The samples were collected on 26th June 1992 in the biggest branch-system of Szigetköz (Fig. 1). Sampling points 1, 2 and 5 were in running water, 3 and 4 were almost in standing water. 1 and 2 were strongly disturbed by ships. We collected from different substrates in five replicates: 1st sampling point – reed stem (r), twig (t), *Rorippa amphibia* (L.) Bess. stem (R), *Solidago gigantea* Ait. stem (S), 2nd sampling point – reed stem (r), 3rd sampling point – *Myriophyllum verticillatum* L. stem (M), *Ranunculus aquatilis* L. stem (Ra), 4th sampling point – reed stem (r), twig (t), *Rorippa amphibia* stem (R), *Najas sp.* stem, 5th sampling point reed stem (r), twig (t). The detailed collection and lab methods are available in Buczkó and Ács (1992). For cluster analysis the SYN-TAX III. program was used (Podani, 1988) with WPGMA fusion algorithm.

Results and discussion

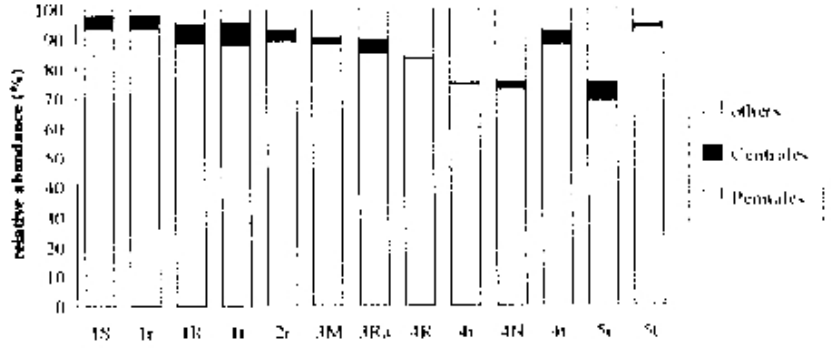

Fig. 2. Proportion of Pennales, Centrales and other algae in samples See abbreviations in text

Altogether 139 taxa were identified:

Cyanophyta	7
Euglenophyta	2
Dinophyta	1
Cryptophyta	2
Xanthophyceae	2
Bacillariophyceae	76
Chlorophyta	49

Mainly diatoms dominated the periphyton especially in running water points. The proportion of Centrales was higher and the proportion of "others" was lower in these points than in the other points (Fig. 2). In some aspects the reed periphyton from the 5th point represented a transitional state from the running to standing water points.

The result of cluster analysis (using Jaccard's resemblance measure) shows two separated groups representing the running and standing water points (Fig. 3). The samples from running water points can be characterised by lower diversity and species count than the samples from standing water points (Fig. 4). The separations correspond to the result of cluster analysis.

The periphyton of standing water points had higher evenness, there were not so dominant species than in the

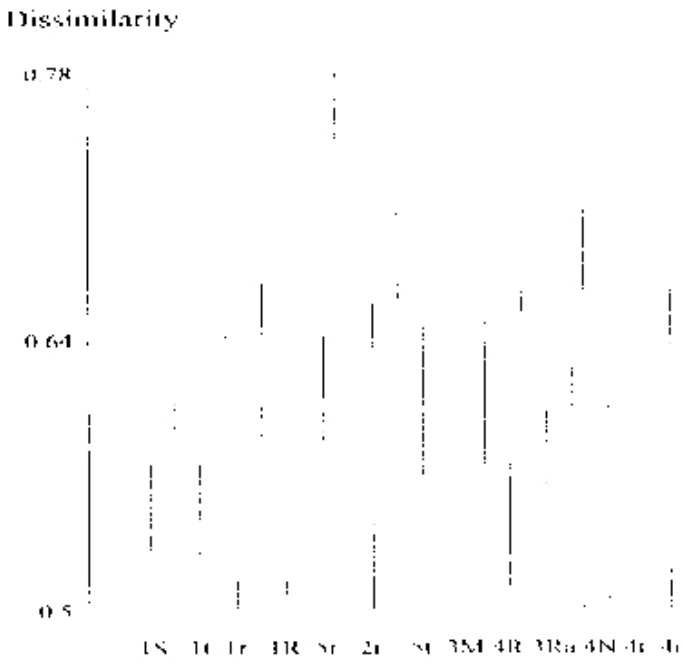

Fig. 3. Dendrogram of cluster analysis. See abbreviations in text

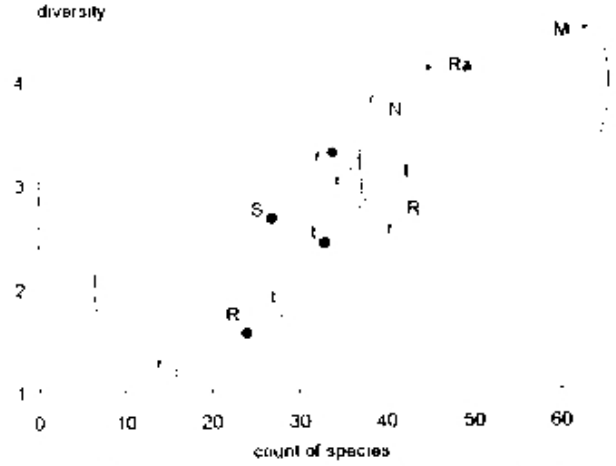

Fig. 4. The two groups of the cluster analysis on the diversity / species count plot. (full circle= 1st point, square= 2nd point, star= 3rd point, open circle= 4th point, cross= 5th point; see other abbreviations in text

periphyton of running water points. The high relative abundance of *Characium ensiforme* Hem. (CHAENS) in the 4th sampling point is remarklable and it seems to be independent of host type (except twig). Except in the 3M sample in every point the *Achnanthes minutissima* Kg. (ACHMIN) had the highest relative abundance (Fig. 5. CHLREI= *Chlamydomonas reinhardtii* Dang., COCPLA= *Cocconeis placentula* Ehr.)

Samples taken from the same sampling points resemble each other more than samples collected from the same substrates. This result was also found by Stevenson & Hashim (1989). It seems that the most important factor in the development of periphyton is the current condition. We found the same result in an earlier investigation in the Szigetköz at Cikolasziget (Buczkó & Ács, 1992).

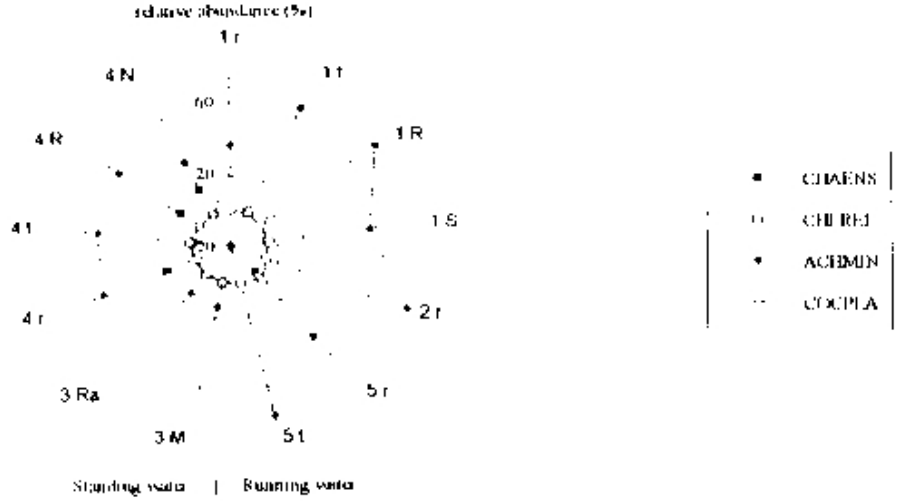

Fig. 5 Some dominant species (relative abundance >5% at least in one sample) in the samples. See abbreviations in text

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