ARCHITECTURE AND DEVELOPMENT OF PERIPHYTON ON REED - STEMS IN LAKE MAARSSEVEEN

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SUMMARY

This study forms part of investigations on the importance of periphyton in the lake ecosystem. The substratum consists of submerged parts of *Phragmites australis* in their growing season as well as older ones. Significant differences in occurrence of several species of algae were found between lakeside and bankside of the stems, peripheral stems and central stems in the reed stand, stems of the current year and stems of the previous year, as well as between upper, middle and lower parts of the submerged stems.

There are differences in *Achnanthes/Gomphonema* ratio at various localities. This is most evident in early winter, being obscured in spring and summer by an overall rise in number of *Achnanthes*.

In the month of May the young sprouts are rapidly colonised by green algae and diatoms. The green algae offer an additional substratum, and therefore enlarge the available substratum for diatom growth. It appears that the green algae are better colonisers than the diatoms. During the summer the green algae *Oedogonium* and *Bulbochaete* become covered by a layer of lime, which becomes densely packed with diatoms. A significant rise in the number of diatoms is also due to the additional substratum offered by stalks and tubes of *Cymbella* species. In December the lime disappears as do nearly all green algae. *Cymbella lanceolata* and *C. prostrata* then begin an explosive bloom, which continues to the end of the winter. The total number of diatoms can rise to nearly 2,000,000/cm², the half of which is situated on stalks and tubes of *Cymbella*. When in April most *Cymbella* disappears, the total number of diatoms decreases also abruptly. The stem, now nearly one year old, is then barely grown over with periphyton. Soon the development of the periphyton on this stem corresponds to the settlement of epiphytes on the new sprouts.

The presence of the periphyton itself offers a considerable temporal additional substratum. Great numbers of diatoms may occur on *Cymbella* stalks. Multitudes of diatoms may be present on *Bulbochaete* and *Oedogonium*. The winter situation reveals a storied growth, depending on the stalk length of the various diatoms. There also is a zonation in diatom growth on large stalks, *Achnanthes* growing near the reed surface, and *Synedra* preferring the free space. In between the sessile algae the chains and guirlandes of the araphid genera are woven.

In this way the periphyton forms a firm unity, not only functional, but structural as well.