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Kieler Meeresforschungen	Sonderheft 4	Kiel 1978
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Short Communication

Structure and development of a *Chara* community (SW Archipelago of Finland)

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During eight years (1970–1977) from May through September attention has been paid to a *Chara* community growing in a nearly landlocked bay.

Every year three *Chara* species, *C. aspera* Deth. ex Willd., *C. hispida* L., and *C. tomentosa* L. were observed. – Other important species in the community are *Phragmites communis* surrounding the bay, *Potamogeton pectinatus*, and *Najas marina*. Besides, *C. fragilis* Desv. grow in a bay close to the research area. It was seen there already in 1965 by the author. The bay was then landlocked but in 1970 was connected with the sea.

The dominant and the largest species is the reddishbrown *C. tomentosa*. It is perennial so that new shoots develop in spring from the starch-containing nodal cells of the old partly decaying plants. Most of the plants are males. Female plants seem to be extremely rare. Only in July (1977) some female plants were seen.

Another important and nearly as big, more or less green species grows abundantly mainly in the middle part of the bay surrounded by *C. tomentosa*. This variable plant referable to the species complex *C. hispida* L. is perennial, too, starch accumulating in the lowest nodes as well as in subterranean rhizoids. *C. hispida* is monoecious.

The small sized *C. aspera* occurring in shallow water as small patches is at least partly perennial because the rhizoids of some of the plants have one-celled starch nodules. Both female and male plants occur but the studies during 1976–1977 show that the sex ratio may vary from year to year and/or the male sex may precede the female in development.

All four *Chara* species have been observed to form sperm cells but environmental factors, such as temperature, have great affect upon the development of the antheridial filaments. – All four species have been noticed to form female gametangia (*C. tomentosa* in only few plants). *C. aspera*, *C. fragilis*, and especially *C. hispida* form great masses of oospores but it is not known whether they are a result of fertilization.

In the summer of 1976 and 1977 male gametangia were collected and fixed for cytological studies. Several pretreatment techniques were used to reveal the morphology of the chromosomes. Hitherto colchicine and monobromnaphthalene have turned out to be most successive.

C. aspera and *C. tomentosa* have $n = 14$ as is commonly known from literature. Both species have mainly metacentric chromosomes. The latter feature concerns also *C. hispida*, though the chromosome number of that entity seems to be variable. Some mitotic metaphase plates have clearly shown 42 chromosomes. Only scanty material of *C. fragilis* has been analyzed. It probably has 42 small chromosomes.

In September 1976 oospores of *C. hispida* were collected and after stratifying them germination experiments were carried out with about 200 oospores. They were sterilized and put to germinate either in agar or in mud and water (from the research bay). The experiments were performed at ca. 22° C (continuous light, dark, and 8 hours light + 6 hours dark). The conditions were made as anaerobic as possible. – None of the oospores germinated.

The community seems to offer good possibilities to study the role of sexual and asexual reproduction and their dependence on environmental factors in the various taxa. Karyotype studies are also quite possible because of the relatively large size of the chromosomes and morphological differences between them. It seems thus possible to obtain more knowledge about the natural relationships of the three taxa. Culture studies in controlled conditions would promote the research but it seems impossible to start uncontaminated cultures from vegetative parts of the plants.

Acknowledgements

For many fruitful discussions concerning this research I am grateful to Professor ARNE ROUSI.