

CONCLUSIONS

Results of the *Papers 1* and *2* summarizing *Mallomonas* distribution rather support the “moderate endemicity model” of Foissner. The most of *Mallomonas* species were cosmopolitan or widely distributed, but we also found several species with geographically restricted occurrence contradicting the “ubiquity model”. Besides two Asian endemics there are three *Mallomonas* species (*M. multiunca*, *M. oviformis*, and *M. punctifera* var. *punctifera*) not conforming to ubiquity model due to their highly nonrandom distribution in subtropic to subarctic zones of the Northern Hemisphere. Several others examples of *Mallomonas* species with restricted distribution are given in literature.

Mallomonas kalinae was isolated and described from a peaty pool in North Bohemia (*Paper 3*). This strain together with the *Synura curtispina* strain was used for investigation of scale and bristle plasticity under different temperatures (*Paper 4*). Changes in morphology of silicate structures in relation to temperature were significant, although the large part of variability was caused by different position on the cell. Bristles become significantly shorter with increasing temperature. An inverse relationship between size of scales and temperature corresponding to the temperature-size rule was found. The main scale characters were stable under all temperatures.

A combination of morphological and molecular approaches for clarification of the *Synura petersenii* species concept was used in *Paper 5*. Three investigated characteristics (ITS rDNA phylogeny, compensatory base changes occurring in the secondary structure transcript of ITS rRNA (CBCs), and scale morphology) shown congruent results, and the hidden diversity in the *S. petersenii* species concept was demonstrated. It is now obvious, that there are genetic pattern behind the many forms and varieties previously described in *S. petersenii*. Although some scale variability may be caused by ecological parameters, the main scale characters are stable. *S. petersenii* clones were divided into six groups, representing separate species – *S. petersenii* s.str., *S. glabra*, *S. americana* spec. nov., *S. macropora* spec. nov., *S. reticulata* spec. nov. and *S. oculea* spec. nov. Many other described forms in *S. petersenii* distributed all over the world will probably represent separate species, but further gene sequences and morphological studies are necessary for understanding their status.

