

“Microdiversity and habitat specificity of flagellates”

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Distribution pattern and intraspecific ecophysiological variation is one of the main research questions in microbial ecology. The discussion on geographical restriction versus cosmopolitan distribution of protist taxa took considerable research effort in the past years but still is controversial. This question of geographical distribution of species is strongly linked to the basic concept (definition) of species and to the importance of molecular and ecophysiological variation. Independent on whether such variation is considered as species character or as intraspecific, the importance of molecular and ecophysiological variation became a main component of the current discussion. The degree of generalisability of the ecology within flagellate morphospecies and flagellate phylotypes is an important objective for an ecological interpretation of cultivation-independent field surveys on flagellate diversity. I propose to investigate the molecular and ecophysiological diversity for different dominant flagellate morphospecies, i.e., for flagellate taxa with an ubiquitous and cosmopolitan distribution. To tackle this question I propose to combine cultivation dependent approaches, i.e., controlled laboratory experiments on various strains of flagellates originating from contrasting habitats, with cultivation independent surveys, i.e. molecular screening of the field distribution of the respective phylotypes. The project therefore is composed of a part focussing on ecophysiological differentiation and the ecological meaning of microdiversity, and a part focussing on habitat specificity of certain phylotypes belonging to the same morphospecies. This combination of field and laboratory studies and of molecular with ecophysiological surveys will eventually allow to estimate the ecophysiological significance of molecular microdiversity and its meaning for the field population, i.e., identifying ecophysiological reasons for habitat specificity of phylotypes belonging to the same morphospecies. The methods needed for the project have already successfully been tested in a pilot study on one flagellate taxa, i.e. *Spumella*. In the proposed project these studies will be extended to a higher number of strains for statistical analyses and to several dominant flagellate taxa to test the generalisability of the hypotheses.