



Benthic Microbial community responses to pesticides in lake littoral zones

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The 12th Symposium on Aquatic Microbial Ecology

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from August 28th
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on Aquatic Microbial Ecology

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August 28 – September 02, 2011



Abstract Book

Editors: Klaus Jürgens and Matthias Labrenz



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The 12th Symposium on Aquatic Microbial Ecology

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BENTHIC MICROBIAL COMMUNITY RESPONSES TO PESTICIDES IN LAKE LITTORAL ZONES

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Herbicides contamination of lake ecosystems is characterized by mixture of several molecules at low concentration. Their effect on microorganisms, especially benthic communities, is not well known. With the view of assessing the ecological risk of herbicides for aquatic microorganisms, some models (Species sensitivity distribution-SSD, Independent Action, Concentration Addition) have been developed on phytoplanktonic species of the pelagic zone. They predict protective concentrations for a species or a community exposed to a substance or a mixture. Lacustrine littoral zones are often defined by higher concentrations and diversity of substances. Benthic microalgae (biofilm) are, in these areas, an essential element of food web (biomass, function). The specific biofilm structure may modify their exposition and their sensibility. Among biofilm communities, diatoms are mainly used as standardized bioindicators for trophic pressure (Biological Diatoms Index) and this could be used for prediction of ecotoxicological effect. To assess if SSD models remain valid for benthic diatoms, the first step is to build a data set of benchmarks (as NOEC: No Observed Effect Concentration). Few data are available in the literature for microphytobenthos and often for the same species. So, we have tested, in monospecific bioassays, a dozen of lacustrine diatoms and eight herbicides with different way of action. The adaptation of monospecific tests (normalized and firstly used on planktonic algae) to benthic algae provides a panel of benchmarks depending on the species sensibility. Dose-response bioassays were carried out, using specific growth rate as endpoint. Data such EC₅₀, NOEC or LOEC allow to assess the ecotoxicological response of each tested species and to elaborate adapted SSD models. Finally, these models should help to assess the phytobenthic diversity changes and to put forward reliable benchmarks for herbicide risk assessment on the littoral zone.