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Microbially mediated cycling of iron in flood plains and other wetlands

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Floodplains are subjected to alternating changes of flooding and partly drying of the soil systems and are therefore prominent examples of ecosystems undergoing dramatic changes in redox conditions.
During the last 5 years the flood plains and associated water systems of the National Park “Untere Oder” were examined for the presence and relevance of bacteria associated with the redox cycling of iron and manganese. Biofilms grown at different locations in the national park were used as source material for examinations on the diversity of iron bacteria. Besides classical microbiological cultivation techniques, culture independent methods were used to explore the phylogenetic diversity of bacteria in ochreous depositions.
The natural grown biofilms were intensely examined and documented by light and scanning electron microscopy. Many of the classical morphotypes of iron bacteria were observed and documented. Parallel the biofilms were used for cultivation of iron related bacteria under various conditions. The 16s rDNA of the isolated strains was sequenced and phylogenetically affiliated. In addition, these biofilms were used for establishing 16S rDNA clone libraries. In comparison of the results from direct microscopic examinations, cultivation and culture independent detection methods (FISH) certain of the morphotypes from the biofilms could be assigned to phylogenetic lineages.
Besides the biofilms from the Oder flood plains, ochreous depositing biofilms from Berlin drinking water wells, flood plains in Norway and various wetlands in terra de fuego were examined. The cultures and 16S rDNA-clones from the different sampling sites are being compared for biogeographic differences.