



## **Extreme summer conditions caused structural and specific functional changes of microbial communities in soil**

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The mineralization of the herbicide isoproturon was reduced after the dry and hot summer 2003 in a soil profile. A different isoproturon mineralization pattern remained in soil material taken at two different soil depths although soil material was re-equilibrated at adequate climatic conditions. Special soil microcosms were designed to determine if the changes in this special soil function “isoproturon mineralization” were related to the climatic scenario of summer 2003. These microcosms were filled with lysimeter soil from the 15-20 cm depth and the temperature and dryness of the summer 2003 were simulated. Afterwards, soil samples were taken from the microcosms and re-equilibrated under controlled conditions for four weeks. Subsequently, isoproturon mineralization was investigated. The soil microbial community reduced drastically its original capability of isoproturon mineralization in the course of the model experiments.

Analysis of 16S-rRNA by Denaturing Gel Gradient Electrophoresis (DGGE) revealed substantial differences in the band patterns of the bacterial communities from both depths of the field lysimeter soil and from the soil incubated in microcosms. The different soil microbial biomass determined by microcalorimetry reinforced these results. In conclusion, the factors higher temperature and smaller soil moisture content generated important and enduring changes in the microbial community structure and therefore in specific soil functions of the community, as shown here by the function of isoproturon degradation.