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Microbial control on stability of soil organic matter in drought manipulation experiment

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Extending drought periods as a consequence of global warming affect both the amount and the activity of heterotrophic microorganisms in soil. The studies of drought effect on the decomposition of soil organic matter (SOM) which is microbially mediated still show controversial results mainly due to separated research approaches which do not consider the soil – plant system as a whole.

We would like to discuss the results obtained within the QuaSOM experiment (Max Planck Institute for Biogeochemistry Jena, Germany) where continues ^{13}C- CO_2–labeling was applied during vegetation of peppermint (*Mentha piperita* L.) under deficit and optimal moisture regimes. The partitioning of plant-originated and SOM-originated carbon in heterotrophic respiration and in microbial biomass will be related to the changes in the microbial growth parameters and enzymes kinetics. The drought effect on temperature sensitivity of the enzymes responsible for the decomposition of SOM-compounds of different availability will be compared in the rhizosphere of peppermint versus bulk soil. The effect of vegetation on cycling of organic matter in soil will be considered for the contrasting moisture regimes. The changes in carbon sequestration potential due to priming effects caused by repeated drying – rewetting events will be evaluated for the short term time scale.