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## Thema
Kommission III: Bodenbiologie und Bodenökologie

Umwelteinflüsse auf Funktion und Diversität von Bodenorganismen

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## Titel
Microbial growth response to substrate complexity under different temperature regimes

## Abstract
Soil microbial communities mediate soil feedbacks to climate change and a thorough understanding of their response to increasing temperatures is central for predicting climate-induced changes in carbon fluxes. However, it is still unclear how microbial communities will change their structure and functions in response to temperature change and availability of organic carbon of varying complexity. Here, we present results from a lab-based study where soil microbial communities were exposed to different temperatures and organic C of different stability. Soil samples were collected from vegetated and bare fallow plots located in two regions in southwest Germany varying in climatic and edaphic conditions. Soils amended with cellobiose (CB), xylan or coniferyl alcohol (CA, lignin precursor) were incubated at 5, 15 and 25 °C. We generally found highest cumulative respiration ($CO_2$-C) at 25 °C in all substrate treatments even though total microbial growth (measured as total extracted DNA) was higher at 15 °C. Fungal biomass (measured from ergosterol content and fungal PLFAs) responded significantly to added substrate and incubation temperature, with higher fungal biomass at 5 or 15 °C than 25 °C in all substrate amendments. Xylan addition resulted in significantly higher ergosterol contents than for CB and CA. Within region, land-use significantly affected fungal biomass response to added substrate; however, the temperature response was similar between fallow and vegetated plots. Bacterial community response was also significantly affected by substrate quality. In contrast to fungi, the growth response of Gram+ and Gram- bacteria declined in the order CB > xylan > CA. Currently, we are analyzing the qPCR data understand the response of different bacterial taxa to temperature and substrate complexity. Our results demonstrate the importance of the interaction between soil temperature and substrate quality for soil microbial community functions and growth strategies.