

BayCEER Kolloquium

Lectures in Ecology and
Environmental Research

WS 2018/19



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12:00 in H6, GEO

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Microbial storage compounds in soil: a neglected dimension of the carbon cycle

Many microorganisms are able to produce storage compounds under conditions of carbon (C) surplus. Some soil-derived bacteria can accumulate polyhydroxybutyrate (PHB) to as much as 50% of their dry biomass, while the accumulation of neutral lipid fatty acids (NLFA) is well known in eukaryotes. C and energy storage likely plays a central role in microbial physiology and survival, community stoichiometry, and carbon use efficiency, yet its importance has been neglected in experimental and theoretical studies in soil. We have experimentally confirmed the presence of native PHB in soil, and demonstrated for the first time that indigenous soil microorganisms synthesize PHB when supplied with additional carbon. Our PHB method, coupled with isotopic labelling and parallel NLFA analysis, has enabled an investigation of storage compound accumulation and degradation. This focused particularly on the role of C and N stoichiometry and the implications for measures of microbial growth and carbon use efficiency. Our findings bring to light an exciting dimension of soil microbial capabilities, with broad implications for how carbon transformations and life histories in soil are conceptualized.