

# BayCEER Kolloquium

Lectures in Ecology and  
Environmental Research

Winter 2021/22



UNIVERSITÄT  
BAYREUTH

Donnerstag/Thursday

**25.11.2021**

**12:15 in Zoom**

**online only**



## Dr. Jan Jansa

Fungal Biology, Institute of Microbiology  
of the Czech Academy of Sciences, Prague

### Arbuscular mycorrhizal hyphosphere as a soil nutrient turnover hotspot

Arbuscular mycorrhizal fungi (AMF) efficiently take up mineral nutrients such as phosphorus and nitrogen (N) from the soil solution, and trade them for organic carbon with their host plants. Acquisition of nutrients bound in organic forms by the AMF under unsterile soil conditions has previously been reported, assuming an important role of soil prokaryotes, yet without proper mechanical understanding. Here a synthetic approach to study involvement of such inter-kingdom interactions in utilization of organic nutrients is presented, employing  $^{15}\text{N}$ -labelled chitin (an organic N source) added to AM fungal (*Rhizophagus irregularis*) hyphosphere under *in vitro* conditions, with or without other microorganisms. Upon presence of *Paenibacillus* sp., the AMF and their associated host plant obtained several-fold larger quantities of N from the chitin than they did with other bacteria, whether chitinolytic or not. Moreover, upon adding a protist *Polysphondylium pallidum* to the hyphosphere with *Paenibacillus* sp., the gain of N from chitin by the AMF and the associated plant further and significantly increased, pointing to soil microbial loop as the underlying mechanism.

