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VABILO

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ECOLOGY OF THE GENUS BURKHOLDERIA IN THE SOIL

Nejc Stopnišek, PhD

**University of Washington, Civil and Environmental Engineering,
Seattle, WA, ZDA**

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Abstract

ECOLOGY OF THE GENUS BURKHOLDERIA IN THE SOIL

The genus *Burkholderia* consists of approx. 90 phylogenetically closely related species that are metabolically highly versatile. This enables them to be ubiquitously present in the environment as free-living bacteria as well as in antagonistic, mutualistic or symbiotic associations with plants, fungi and animals. Soil is the environment that contains the largest pool of *Burkholderia* diversity however only little is known about their ecological role in this environment. To better understand the environmental parameters affecting *Burkholderia* distribution and abundance in the soil we investigated their relative abundance in the soil and correlate it with the environmental parameters. The results showed that *Burkholderia* relative abundance but not diversity was significantly influenced by soil pH. Moreover, in vitro growth experiments and microcosm studies revealed importance of acidity on the genus *Burkholderia*. Additionally, results also suggest that biological interactions contribute to *Burkholderia* abundance and diversity. For that we investigated the interactions of *Burkholderia* with fungi. We used a proteomic approach to gain first insight into the physiological changes occurring in *Burkholderia glathei*, a common soil bacterium, while interacting with two fungi. Interestingly, the proteome of *B.glathei* underwent similar changes with both fungi, and these changes revealed a highly beneficial effect for the bacterium, which apparently derived much of its carbon, nitrogen and phosphate from the fungi. Additionally, co-occurrence network analysis and growth experiments revealed that these associations between *Burkholderia* and fungi are very common in soils and occur with a broad range of fungal partners.