



Microbial biomass activation induced by glucose added at different concentrations

Aliia Gilmullina (1,2)

(1) UMR P3F, INRA, Lusignan, France, (2) UMR ECOSYS, INRA, Thiverval-Grignon, France

Microbial activation is induced by different physical and chemical changes in the environment. One of the activation way is an input of simple and easily available substrate that can appear during plant residues degradation or through plant exudation. Similarly, plants are also sensible to any change in the environment. They may increase exudation because of clipping in mowing systems or if there are not enough nutrients in the soil. In the last case plants produce more exudates to stimulate microbial community and by the way force them to capture nutrients from SOM. Although, exudates are C-rich and elevated exudation additionally promotes nutrient limitation for soil microorganisms. So, we aimed to investigate the effect of increasing concentrations of glucose on the portion of active microorganisms. Glucose was added at 10 concentrations: 22.3, 44.6, 111.5, 223, 446, 669, 892, 1115, 1338 and 1785 $\mu\text{g C g}^{-1}$. After addition of glucose we incubated soils for 2 days and measured basal respiration. The size of active microbial biomass was estimated by substrate-induced growth response method.

The percentage of active microbial biomass rose by the increase of glucose concentrations. This increase was not linear – the addition of glucose at rate higher than 892 $\mu\text{g C g}^{-1}$ did not result in the further increase of the portion of active microbial biomass. Maximal activation of microbial biomass was 22% of total microbial biomass demonstrating glucose oversaturation and limitation by other nutrients. We conclude that excess input in the rhizosphere does not allow to activate all microbial biomass.