PLANT NITROGEN STATUS DRIVING SOIL ORGANIC MATTER MINERALIZATION IN THE RHIZOSPHERE

COLOCHO HURTARTE, LUIS CARLOS[1]; SOARES,G. [1], SOUZA, I[1].; VERGUTZ, L. [1]; RIBEIRO SILVA, I.[1]

[1]Universidade Federal de Vicosa. Av. P.H. Rolfs S/N Departamento de Solos CEP 37560-000 Vicosa – MG (luis.colocho@wzw.tum.de)

The factors that regulate the dynamics of soil Carbon (C) and Nitrogen (N) in the rhizosphere are still poorly understood. The soil C mineralization in the rhizosphere can be heavily influenced by plant's nutritional status, atmospheric CO_2 concentration and temperature, among others. In this study, we assess the influence of *Eucalyptus spp.* N status on the C and N dynamics in the rhizosphere. We performed an experiment using a two compartment rhizobox. In the upper compartment, plants were cultivated in washed sand and supplied with either solution containing all nutrients or all nutrients but N. The lower compartment limited the contact of the roots with the soil thorugh a 5 μm mesh nylon membrane. We observed a higher root-shoot ratio for the N deficient plants and an increase in its soil CO_2 concentration. A metabolic profile of the roots showed that, the –N planted treatment had higher concentrations of citrate and tallose and lower concentration of sucrose and aminoacids, when compared to the +N planted treatment. The C and N analysis of the mineral associated organic matter fraction, showed an increase in C mineralization in both planted treatments and changes in N dynamic. As the roots had no physical contact with the soil due to the nylon membrane, the changes in the soil must have been consequence of root exudation. The contrasting sugar and aminoacid root content, together with the citrate concentration in soil solution extract and the C mineralization data, indicate that exudate composition changed due to the plants N status. The data indicates that the plants in the –N treatment exudated more organic acids than the plants of the +N treatment. Still the exudate composition of the plants with the +N treatment may had a higher energetic content and thus affected differently the soil microbial communities. The δ13C data indicate that the N deficient plants affected a higher volume of soil than the plants of the +N treatment. All this together shows different priming mechanisms were dominant due to the plants N status. This work demonstrates, too our knowledge, by the first time using the same plants, different priming mechanisms due to the plants N status. Thus highlighting, the importance of plants nutrient management in the rhizosphere C dynamics.