Targeted session: S 10.1. Plant soil interactions from the rhizosphere to the field scale

Title: Root-induced decrease in metal binding capacity of dissolved organic matters in the rhizosphere: evidences from two convergent studies

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The parallel understanding of dissolved organic matters (DOM) impact on trace metal speciation in soil and root ability to change DOM concentration and composition in the rhizosphere strongly suggests a substantial alteration of metal binding capacity of DOM in the rhizosphere, with consequent impacts on metal phytoavailability. This hypothesis is investigated in the present communication on the basis of two independent sets of experiment.
Both experiments used the RHIZOtest experimental set-up, which enables an easy and fast recovery of both plants (i.e. shoots and roots) and rhizosphere, to grown either lettuce (*Lactuca sativa*) or durum wheat (*Triticum turgidum durum*) on two different soil samples notably varying in pH, organic matter content and geographical origin (tropical vs. temperate area). Usual chemical properties (i.e. pH, concentration of DOM, major cations/anions and metals) and free copper activity were measured in the rhizosphere solution. Copper speciation was then modelled in the rhizosphere solution with the humic ion-binding model VI (Model VI) by adjusting the metal binding capacity of DOM to fit experimental data.
Compared with bulk soil measurements, a large increase in both pH and DOM concentration was observed in durum wheat rhizosphere while these two parameters did not change significantly in lettuce rhizosphere. Alternatively, the fraction of DOM involved in copper binding decreased similarly by 40 % in both durum wheat and lettuce rhizosphere. These very convergent pictures of a decrease in metal binding capacity of DOM in both experiments lead to discuss the hypothetical governing mechanisms and the genericity of this finding.