

## **DOM biogeochemistry in agricultural soils as a major driver of trace metal bioavailability to soil organisms**

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Dissolved organic matter (DOM) is only a small part of total organic matter in soil. Nevertheless, DOM biogeochemistry affects many processes in soils and their relationships with soil living organisms. DOM notably has binding properties towards trace metals that drive their speciation in soils and their bioavailability to soil organisms. DOM binding properties and trace metal speciation in soils can be studied analytically, but also by using dedicated geochemical models such as the Nica-Donan and the Windermere humic aqueous model (Wham). In the past two decades, such models were used to evaluate the variability in DOM binding properties. Based on few studies, the literature concluded to a relative homogeneity of DOM binding properties. Accordingly, it was suggested to parameterize DOM binding properties in geochemical models with a unique, default parameters, i.e. the so-called percentage of DOM reactivity. Further works however challenged this conclusion by suggesting that DOM binding properties would be more heterogeneous than expected in soils, notably when they were receiving organic amendments, and in the peculiar environment of the rhizosphere.

In this context, the present communication sums up my research that aims at evaluating (i) how substantial is the variability of DOM binding properties in the soil either amended or not and in the rhizosphere from the lab to the field and (ii) the significance of this variability on trace metal speciation in soil solution and their bioavailability and toxicity to soil organisms.