

Soil organic matter, a key factor in soil productivity

Soil organic matter (SOM) is particularly important for maintaining soil fertility and potentially contributes to climate change mitigation. SOM represents all organic materials found in soil. The content of SOM varied from 1 to 6 % and is represented by both humic and non-humic fractions. Humic substances (HS) are the major fraction of SOM (85%). The HS humic are differentiated based on their extractability-precipitation in alkali-acid solutions yielding three fractions (i) HA (Humic acid), the fraction of SOM that coagulates when the alkaline extract is acidified; (ii) FA (Fulvic acid), both acid and alkaline soluble fraction; and (iii) Humin, insoluble in both acid and alkali. These materials originate from decomposition and have a greater influence on soil chemistry, nutrients regime, biological entity, thermal and physical characteristics of soil, and water retention capacity.

Currently, for SOM quality estimation VisNIR, IR and DRIFT spectroscopy, fluorescence spectroscopy, and ^{13}C NMR are applied. Furthermore, thermostability and paramagnetic properties of soil humic substances are studied.

Results from long-term field experiments will be presented aimed at spectral characteristics of HS in different soil types. Furthermore, the changes in the chemical composition of HS after amending soil with different exogenous organic materials.

Keywords: soil types, humic substances, spectral properties