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Preliminary analysis of organic matter content variations in shallow soils of Tuscany (central Italy) and comparisons with hydrological, geotechnical and mineralogical characteristics

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Due to its structural, dimensional and chemical characteristics, organic matter affects soil properties such as its structure, erodibility, water infiltration rate and holding capacity. Considering this, in the framework of hydrological and geotechnical studies, the presence of soil organic matter (SOM) should not be overlooked, when parameterisation and analyses of soils spatial distribution characteristics are carried out.

In this study, organic matter contents in shallow soils (e.g. at a depth up to 0.5 m) have been determined by using a method based on LOI (Loss-on-ignition) in 26 different sites of Tuscany (central Italy). This method has been adapted to not neglect the contributions of roots fragments present in the soils when determining SOM contents. SOM values retrieved from the collected samples and their variations among the different sites were analysed, considering vegetation covers and soils features such as geotechnical parameters (shear strength, permeability, grain size components and dry unit weight) and mineralogical compositions.

Detected range of organic matter content (expressed as percentage of dried soil material) of samples suggests and confirms the importance of evaluating this component when soils are characterized, even in contexts of geotechnical modelling and slope stability analysis, just to mention a few. Moreover, some resulting correlations between SOM and the other examined parameters, make interest to go further insight the study.