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SOILS WITH HIGH ORGANIC CARBON STORAGE CAPACITY IN DEPTH

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Most studies about soil organic carbon (OC) stock focus on the topsoil storage capacity, however, it has been proved that OC can reach relatively high values also in depth. The aim of this work was a preliminary investigation of the soil types with a high OC content in depth and the relationship with the main pedogenetic factors. The dataset was the 1,414 Italian National Soil Typologies (STU). The selected attributes were: mean value of OC in the superficial functional horizon (L1); weighted average value between 50 and 100 cm (L2) and under 100 cm (L3); WRB classification; main lithology, morphology and land-use. About 92% of typologies had more than 0.58% of OC in L1, about 30% in L2, and 10% in L3. The highest OC contents were in L2 of Histosols, Umbrisols, Podzols, Vertisols, Andosols, and in L3 of Vertisols, Andosols, Fluvisols. STU on volcanic rocks, slope and residual deposits showed relatively higher accumulation in L2; soils on delta plane, lacustrine and alluvial deposits, both in L2 and L3. STU on upland plains, transitional areas with plateau in the mountain, high gradient mountains and low plains, showed higher OC content. Land-use was not significantly connected with OC content in depth. About 65% of the studied territory (47% of Italian surface) had a relatively high CO content in L2, and about 2% in L3. The main processes connected to soil CO storage capacity in depth were morphological, namely colluvium and alluvium, as well as pedological, in particular, podzolization and andisolization.