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POLYGENETIC EVOLUTION AND BIOTURBATION. MICROMORPHOLOGICAL STUDY OF A TERRA ROSSA SOIL IN A TRADITIONAL OLIVE CROP (SARDINIA, ITALY)

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The origin of Mediterranean red soils has been the subject of numerous studies. Complex genetic processes, and massive inputs of allochthonous materials such as wind-blown Saharan dust and volcanic ashes, have been advocated to interpret their genesis. Furthermore, in the Mediterranean Basin Terra Rossa soils have been allocated to traditional permanent crops such as the olive groves, which had a profound influence on the development of the soil features especially in the root-zone. The present study was carried out in a traditional olive grove nearby Sassari (Sardinia, Italy), where the land use remained unchanged for the last 150 years, on Terra Rossa developed on Miocene marine limestone. Chemical, physical and mineralogical analyses were carried out on the bulk samples along with thin section and SEM observations undertaken on the undisturbed aggregates collected from the rhizosphere horizons of the olive tree. The results obtained highlighted the poly-genetic character of soil formation, which included Saharan dust input, together with the effects of vigorous bioturbation and stress phenomena.