

5.4 The HIRES-SOM Project: Soil organic matter and microbial communities in volcanic materials from La Palma Island assessed by high-resolution techniques: implications for pedogenesis and sustainability

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Abstract

The HIRES-SOM project is a multidisciplinary project funded by the Ministry of Science and Innovation of Spain, aimed at generating knowledge on soil organic matter (SOM) and microbiota to guide novel strategies for the sustainable management of volcanic soils. The investigation will be conducted within the framework of the recent Tajogaite eruption in La Palma Island, which constitutes an optimal benchmark both for scientific research on freshly erupted materials and for the management of affected soils of high added value. Insights into the generation and resilience of SOM and of the associated microbiota will be explored with advanced biogeochemical, microbiological, mineralogy and modelling techniques [1,2]. The main goals of the project are twofold. On the one hand, it intends to assess the state and evolution of the SOM and microbiota in soils calcined by the lava flows and covered by the pyroclastic ashes. On the other hand, fundamental understanding will be sought about the initial stages of pedogenesis and consolidation of organic matter on the eruptive materials. The project intends to identify primary microbial communities and molecular precursors of organic matter in volcanic ash, lava flows and eruption-affected soils. Moreover, accelerated microbial colonization of volcanic substrates under laboratory conditions will allow monitoring photoautotrophic microorganisms that colonize natural volcanic materials, with the ultimate innovative goal of devising methods for the rapid fertilization of porous pyroclastic ashes by indigenous microorganisms for sustainable soil regeneration.

Acknowledgements:

The HIRES-SOM project is funded by the Ecological and Digital Transition Programme of the Ministry of Science and Innovation of Spain (grants TED2021-130683B-C21/C22).

References:

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