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Effect of Ph and vegetation cover in soil organic matter structure at a high-mountain ecosystem (Sierra Nevada National Park, Granada, Spain)

José A. González-Pérez[1], Gael Bárcenas.Moreno[2], Nicasio T Jiménez-Morillo[3,4], María Colchero-Asensio[2], Layla M. San Emeterio[1], and José M. de la Rosa[1]

[1]IRNAS-CSIC, MOSS Group, Av. Reina Mercedes 10, 41012-Seville, Spain (jag@irnase.csic.es)
[2]University of Seville, MED Soil Group. C/Prof Garcia Gonzalez 1, 41012-Seville, Spain
[3]University of Evoral, CAAM, Núcleo da Mitra, Ap. 94, 7006-554 Évora, Portugal
[4]University of Evora, HERCULES Laboratory, Palácio do Vimioso, 7000-089 Évora, Portugal

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During the last decade, soil organic matter dynamics and its determining factors have received increased attention, mainly due to the evident implication of these parameters in climate change understanding, predictions and possible management. High-mountain soil could be considered as hotspot of climate change dynamic since its high carbon accumulation and low organic matter degradation rates could be seriously altered by slight changes in temperature and rainfall regimes associated to climate change effects. In the particular case of Sierra Nevada National Park, this threat could be even stronger due to its Southern character, although its elevated biodiversity could shed some light on how could we predict and manage climate change in the future.

In this study, a quantitative and qualitative organic matter characterization was performed and soil microbial activity measured to evaluate the implication of pH and vegetation in soil organic matter dynamics.

The sampling areas were selected according to vegetation and soil pH; with distinct soil pH (area A with pH<7 and area B with pH>7) and vegetation (high-mountain shrubs and pine reforested area). Soil samples were collected under the influence of several plant species representatives of each vegetation series. Six samples were finally obtained (five replicates each); three were collected in area A under *Juniperus communis* ssp. Nana (ENE), *Genista versicolor* (PIO) and *Pinus sylvestris* (PSI) and other three were collected in area B under *Juniperus Sabina* (SAB), *Astragalus nevadensis* (AST) and *Pinus sylvestris* (PCA).

Qualitative and quantitative analyses of soil organic matter were made to establish a possible relationship with microbial activity estimated by respiration rate (alkali trap) and fungi-to-bacteria ratio using a plate count method. Soil easily oxidizable organic carbon content was determined by the Walkley-Black method (SOC %) and organic matter amount was estimated by weight loss on ignition (LOI %). Analytical pyrolysis (Py-GC/MS) was used to analyse in detail the soil organic

carbon composition.

Our results showed that the microbial and therefore the dynamics of organic matter is influenced by both, soil pH and soil of organic matter. So that the pH in acidic media prevail as a determining factor of microbial growth over soil organic matter composition conditioned by vegetation.

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