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Variations of organic carbon and phosphorus in ARID-semiarid soils of Argentina

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Organic carbon (OC) and phosphorus (OP) are key elements of soil quality and health. Both are influenced by the input of organic material to the soil. The aim of this research was explored variations of OC and OP to different depth in natural soils of the Patagonian. Six sites were selected, from satellite images, with different type cover vegetation, of northeast Argentina (Lat. 40^o-41^o S; Long. 62^o-63^o O). The climate is arid- semiarid, with average precipitation and temperature of 400 mm and 14,5 °C respectively, and frequent winds. The vegetation that characterizes this area is of the typical Monte, with xerophyte species; shrub steppes with dominance of *Larrea spp.* (Zygophyllaceae) are the most common landscapes. The main soil orders are Aridisols and Entisols. Each site was classified in: forest (F), shrub (S) and shrub-forest (SF) according to their physiognomy, in all of them three plots of 10x10 m were delimited. Five soil samples were taken in each plot to different depths: 0-0.01; 0.01-0.05; 0.05-0.10; 0.10-0.30 and 0.30-0.60 m. All samples were wet sieving, obtaining two particle size fractions: between 2000-53, and lower than 53 µm. In each fraction the concentration of OC by humid combustion and OP by Saunders and Williams method was determined. The type of vegetation influenced on relationship between the most labile fractions (OC₂₀₀₀₋₅₃) with respect to most stabilized ones (OC_{<53}); this relationship in general was higher in the S, and in deeper layers these ratios were significantly different. In F were obtained 9.10 and 9.08 mg OC gr⁻¹ soil for the 0.30 and 0.60 m. of depth; F presented a 75.5 and 123% more OC_{<53} that S in those depths, and SF an 8.5 and 48% less. Whereas, OC₂₀₀₀₋₅₃ not showed significant different. The OP was strongly influenced by the particle size, the particles less than 53 µm (OP_{<53}) presented the highest concentration of OP. The average concentration of OP_{<53}, was of 140.7 mg OP gr⁻¹ soil for entire profile, whereas to OP₂₀₀₀₋₅₃ was of 37.4 mg OP gr⁻¹ soil. These results indicate that the variations of OC and OP respond differently in environments according to place characteristics: vegetation type, soil and climate variations, uses different, etc.

Keywords: litter; soil fraction, fertility; land conservation; patagonia soil

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