Geophysical Research Abstracts
Vol. 16, EGU2014-206, 2014
EGU General Assembly 2014

Assessing parent material uniformity of Phaeozems in the Azul Sierras landscape: preliminary studies

Núria Roca (1), Javier Rodríguez (2), and Mabel Susana Pazos (3)

(1) Universidad Nacional del Centro de la Provincia de Buenos Aires, Azul, Argentina (nuria@faa.unicen.edu.ar), (2) Universitat de Barcelona, Barcelona, Spain, (3) Programa de Suelos – EPG – Facultad de Agronomía Universidad de Buenos Aires, Buenos Aires, Argentina –retired

South of Azul Co. (Argentina) there is an area with Precambrian and Paleozoic gneiss and migmatite outcrops that conform the wider system of Pampian Sierras, with slopes and intermountain areas covered by loess. The Phaeozems distribution in the Azul Sierras is complex and their genesis either being derived from a uniform parent material or a lithologic discontinuity is not known. The objective of this study was to confirm whether pedological processes or a lithologic discontinuity may be responsible for the textural contrast within soil profiles. X-ray fluorescence (XRF) analysis was used to determine elemental concentrations in various soil fractions. Three landscape units were defined: a) rocky, b) side slope and c) intermountain plain. Rocky area: 8-10 % slope, soils develop in between rock outcrops, are rather shallow with high organic matter content, coarse texture and gravely. They include: Endoleptic Phaeozems, Haplic Phaeozems (Pachic) and (Pachic Arenic). Sideslope: coarse textured soils with abundant gravels and lime free close to the rocky area; OC is high up to 50 cm depth; incipient clay illuviation is observed as coatings on pebbles. Half slope a petrocalcic horizon (tosca) appears at variable depth, coarse fragments diminish with increasing distance from the rock outcrops, OC remains high in the first 50 cm. All soil profiles have mollic horizon and argic horizon less than 20 cm thick. The petrocalcic horizon has a minimum depth of 50 cm. Soils classify as Luvic Phaeozem (Skeletic), Luvic Petrocalcic Phaeozem (Endoskeletic) and Luvic Petrocalcic Phaeozem. Intermountain plains: soils are deep, with clay accumulation, no coarse fragments nor rock outcrops, and gentle sloping. The mollic horizon reaches 53 cm thick and there is a well developed argic horizon. These soils classify as Luvic Phaeozems. Results showed that all indicators of parent material uniformity, i.e. depth distribution curves of Zr and Y in various fractions and Y:Zr ratio showed clear inflection and variation in side slope soils, indicanting soils developed from contrasting materials, so different trends in particle size fractions between 0-34 cm compared to the underlying layers are due to parent material differences and not pedogenesis. While Pampian soils are mainly developed from loess, the influence of gneiss and migmatites on soils in this landscape appears as an important conclusion.