EGU2020-4178
https://doi.org/10.5194/egusphere-egu2020-4178
EGU General Assembly 2020

Soils and relief relationships in subalpine grasslands in the Central Pyrenees (NE, Spain)

David Badía-Villas[1], Lucía Buendía-García[1], Luis Alberto Longares-Aladrén[2], José Luis Peña-Monné[2], and Clara Martí-Dalmau[1]

[1]University of Zaragoza, IUCA, Escuela Politécnica Superior, 22071Huesca, Spain

[2]University of Zaragoza, IUCA, Dept. of Geography and Land Management, 50005 Zaragoza, Spain

On two accumulation levels, separated by an unevenness up to 2 m, two contrasted plant communities can be differentiated in subalpine stage of the Pyrenees: the dense tussock-forming grass *Nardus stricta*, at the upper level (L1), and the open chalk grasslands at the lower level (L2). In order to confirm the soil-relief-grasslands relationships, we analyzed and compared soil pedogenesis and properties in both accumulation levels. In addition, we classify the soils following WRB and ST systems and we discuss the finesse of both taxonomies in these high mountain environments. The work has been carried out at 1900 masl, in the Ordesa and Monte Perdido National Park (PNOMP), in the summer grasslands site of La Estiva (Fanlo, Central Pyrenees, NE Spain). Five soil pits were studied in every accumulation level (L1 and L2) for a side-by-side comparison.

The study of soils in the two levels of accumulation reveals a series of differences in their genesis, properties and soil classification. The accumulation of organic matter and lixiviation are the dominant edafogenetic processes in L1, to which we must add the rejuvenation by gully erosion in L2. Soils at L1 and L2 shared many physical properties as a fine granulometry, with a homogeneous particle-size distribution with depth. In both levels, the soils lack carbonates, even though limestones are the parental material. The soils in L1 have a greater thickness and, thus, a higher water holding capacity than in L2. In relation to chemical properties, soils in L1 have a significantly lower pH, a lower base saturation, and lower available calcium content than in L2, reflecting a more intense leaching process, consistent with a longer period of slope stability. Over L1 with *Nardus* mat-grasslands, the main soil is classified as Orthoeutric Cambisols (Clayic, Humic), and the soil over L2, with chalk-grasslands, as Hypereutric Leptosols (Loamic, Ochric). Soil taxonomy System (USDA), giving more weight to the temperature regime, classify both soils as Haplocryept, at the level of great group, separating them at the subgroup level as Typic Haplocryept (L1) and Lithic Haplocryept (L2), according to the depth at which limestone appears (lithic contact). Definitely, the microtopograhy and geomorphologic context, is linked to the pedodiversity, which goes hand in hand with plant diversity in this subalpine environment.