



## **The southernmost Andean Mountain soils: a toposequence from Nothofagus Forest to Sub Antarctic Tundra at Ushuaia, Tierra del Fuego**

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Located at the southern tip of the Fuegian Andes Cordilhera, the Martial glacier witnessed a rapid process of retreat in the last century. Up to now little is known about the development and genesis of soils of this region. A toposequence of six soils, ranging from 430-925 m a.s.l, was investigated, with emphasis on genesis, chemical and mineralogical properties. The highest, youngest soil is located just below the Martial Glacier Martial Sur sector, and the lowest soils occur on sloping moraines under *Nothofagus pumilio* forests. Based on chemical, physical and mineralogical characteristics, the soils were classified according to the Soil taxonomy, being keyed out as Inceptisols and Entisols. Soil parent material of the soil is basically moraines, in which the predominant lithic components dominated by metamorphic rocks, with allochthonous contributions of wind-blown materials (very small fragments of volcanic glass) observed by hand lens in all horizons, except the highest profile under Tundra. In *Nothofagus* Deciduous Forests at the lowest part of the toposequence, poorly developed Inceptisols occur with Folistic horizons, with mixed "andic" and "spodic" characters, but with a predominance of andosolization (Andic Dystrrocrypts). Under Tundra vegetation, Inceptisols are formed under hydromorphism and andosolization processes (Oxiaquic Dystrocrepts and Typic Dystrocrepts). On highland periglacial environments, soils without B horizon with strong evidence of cryoturbation and cryogenesis occur, without present-day permafrost down to 2 meters (Typic Cryorthents and Lithic Haploturbels). The mountain soils of Martial glacier generalize young, stony and rich in organic matter, with the exception of barely vegetated Tundra soils at higher altitudes. The forest soils are more acidic and have higher Al<sup>3+</sup> activity. All soils are dystrophic, except for the highest profile of the local periglacial environment. The organic carbon amounts are higher in forest soils and decrease with altitude. Clay content is low and varies little along the toposequence, indicating an overall low chemical weathering. The clay mineralogy indicates predominance of primary minerals and high proportion of low crystalline Fe and Al minerals, bound to organic matter.