



## **Water repellency of high altitude soils in the Ecuadorian Páramo : measurements, origin and consequences on soil erosion.**

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Water repellency of organic-rich volcanic ash soil from the high-altitude grasslands of Ecuador was studied by a combination of extraction and analysis of water repellent products, Molarity Ethanol Droplet (MED) values, water contact-angle measurements by capillary rise. The undried samples studied are hydrophilic, but exhibit water repellency after moderate drying (48h at 30°C). The advancing water contact-angle measured by capillary rise varies from 78° to 89°. These water contact-angles decrease strongly after extraction of organic materials by an isopropanol-water mixture. Elemental analysis, IR spectra and CG-MS analyses were carried out to characterize the extracts. The results show that long-chain fatty acids and more complex non-polar alkyl components (waxes) are the main water repellent materials.

A drastic erosion of dried soils (bare fallow and burned) is measured in this environment. The main process of erosion is the floatation of water-repellent aggregates. Thus, in this environment, currently submitted to intense change of land use, the development of water repellency of dry topsoils can have a major impact on the erosive and hydrodynamic behaviour of the soil. The degree of drying, controlling the intensity of water repellency, can be an other key point for the erosion intensity by floatation

on former-cultivated páramos Andisols. This relationship between water repellency development and erosion process may affect other organic-rich dried soils particularly in mountain areas : histosols, rendzic leptosols. . . .