



Paleosol sequences in Mexican volcanic landscapes: multiscale proxy of Quaternary environmental change

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Volcanic activity strongly affects landscapes, modifying biota, water regimes and soil formation. Soils buried by volcanic deposits have demonstrated to be informative records of landscape evolution. In fact, many works have extensively used soil development to establish age and history of landscape evolution. However, soils derived from volcanic materials are known to differ considerably when formed under different environmental conditions. Thus their use as paleoclimate proxy has brought forward some methodological questions, concerning: first, the pedogenetic speciality predetermined by specific parent material; second, the necessity to distinguish between the effects of the environmental change and those of the soil evolution related to the duration of pedogenesis (soil-forming factor time); and finally, of volcanism, that tends to mask climatic signal. In Mexico, an extensive research has been conducted in order to understand landscape evolution during Late Quaternary in different time scales. In central Mexico, there are extraordinary well preserved paleosols intercalated with different kind of volcanic deposits originated by eruptive activity that cover a time span of 800,000 years, indicating major trends of environmental changes. A more detail record, in Nevado de Toluca volcano, gives the opportunity to reconstruct paleoenvironmental changes during last 50,000 years. Teotihuacan valley integrates information from different paleosols covering a record of high spatial resolution for the last 20,000 years of landscape evolution, including the time of human occupation in the area. Finally, paleosols found in the Chichon volcano in the southern part of Mexico, represent a register of environmental change at centennial scale. Therefore tephra-paleosol sequences provide information of climatic changes at time scales of 10^2 to 10^6 years independent and complementary to lacustrine and glacial proxies.