Geophysical Research Abstracts,
Vol. 11, EGU2009-1474, 2009
EGU General Assembly 2009

Stratified soils under stone pavements as tools for palaeoenvironment reconstruction

M. Dietze and A. Kleber

Technische Universität Dresden, Chair of Physical Geography/ Regional Geography of Central Europe, Dresden, Germany (micha.dietze@mailbox.tu-dresden.de)

Stone pavements in climate-sensitive arid environments are often genetically associated with their underlying soil. Such soils are in general accretionary but also show features of stratification, resulting from changing environmental conditions, as well as alteration by pedogenesis. We thus regard soil-sediment profiles under stone pavements as distinctive archives of past geomorphic and pedologic processes. Deciphering the evolution allows reconstruction of landscape dynamics.

Cima Volcanic Field, eastern Mojave Desert, California, has been in the focus of several studies. However, a detailed stratigraphic investigation of soils developed on basaltic lava flows of known age has not been conducted. We present descriptions of pedologic, stratigraphic and mineralogic properties of a sequence of soil profiles situated on a basaltic lava flow of middle Pleistocene age. We infer several phases of aeolian, fluvial, mass movement and pedologic activity of different nature.

The archive reveals a complex evolution that can be attributed to specific environmental conditions in this climate-sensitive region, though numerical dating is preliminary. However, stratified, cumulic soils associated with desert pavements can be regarded as a unique type of archive, recording processes not traced in any other proxy record.