Geophysical Research Abstracts
Vol. 15, EGU2013-2445, 2013
EGU General Assembly 2013

A late Quaternary loess-paleosol pedosedimentary sequence at Monte Netto (northern Italy): loess sedimentation, soil formation and tectonics in the central Po Plain.

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In the area of the Po Plain south of Brescia several isolated hills are present (Castenedolo hill, Ciliverghe hill, and Monte Netto), corresponding to the top of Late Quaternary anticlines. The Castenedolo and Ciliverghe area was widely explored in the last decades and thick sequences of pedosediments furnished detailed archives for the evolution of this part of the Po Plain. A new thick and complex loess-paleosol sequence, resting upon fluvial and fluvioglacial deposits exposed in a clay pit at the top of the Monte Netto hill is being studied in great detail. The Monte Netto is a large flat hill, gently undulated at its top, and the clay pit was opened close to the centre of the anticline, where fluvial and fluvioglacial deposits are deformed. This succession, probably of middle Pleistocene age, is buried by a loess-paleosol sequence 2 to 7 m thick; the depth of the loess is related to its physiographic position, i.e. it becomes thicker going away from the top of the anticline. Furthermore, the upper pedosediments are faulted by bending-moment structures, developed during fold amplification and allow to date some of the latest movements of the anticline. A geopedological, sedimentological and micropedological investigation of the whole extension of the quarry shows a distinctive difference between the loess-paleosol sequence at the top of the anticline and the one placed at its southern fringe (150 m away). On the top of the anticline a deeply weathered red paleosols developed in loess underneath a weakly weathered loess. In this soil also a small lithic assemblage dating to the Middle Palaeolithic was found.
The pedosedimentary sequence at the southern fringe of the anticline consists of several loess layers showing different degrees of weathering. According to OSL dating, the upper part of the sequence was formed in the Upper Pleistocene, when most of the loess at the margins of the Po Plain was deposited. A tentative model of the exposed profiles involves the burial of the anticline by loess layers since the Middle Pleistocene and their successive weathering (and probably truncation) during subsequent interglacials and interstadials. These events probably correspond to the number of loess-paleosol couplets identified in the outer part of the anticline. In this sense the light weathered horizons could represent buried paleosols. Furthermore, the highly rubfied paleosols at the top of the anticline should be regarded as a polygenetic soil or as a vetusol, developed near the surface for a long time since the Middle Pleistocene. The on-going geopedological, geoarchaeological and seismic analyses will permit to define the time and steps of development of the Monte Netto hill and help to clarify the climatic and tectonic context during which these sediments where deposited, deformed, and weathered.