Geophysical Research Abstracts
Vol. 13, EGU2011-3750, 2011
EGU General Assembly 2011

Tectonic geomorphology and landscape evolution processes of the eastern central Apennines chain (Italy).

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The relief features of the Apennine chain have been developed in a complex geomorphological and geological setting from Neogene to Quaternary. Growth of topography has been driven by active tectonics (thrust-related crustal shortening and high-angle normal faulting related to crustal extension), regional rock uplift, and surface processes, starting from Upper Miocene(?) – Lower Pliocene.
At present a high-relief landscape is dominated by several morphostructures including high-standing, resistant Mesozoic and early Tertiary carbonates ridges (i.e. thrust ridges, faulted homocline ridges), intervening erodible Tertiary siliciclastics valleys (i.e. fault line valleys), and Quaternary continental deposits filled basins (i.e. tectonic valleys, tectonic basins). This study tries to identify paleo-uplands that may be linked to paleo-base levels and aims at the reconstruction of ancient landscapes that followed one another since the incipient phases of morphogenesis. It analyzes the role of tectonics and morphogenic processes in the long term temporal scale landscape evolution (i.e. Mio?-Pliocene to Quaternary). It is focused on the marsicano-peligna region, located along the main drainage divide between Adriatic side and Tyrrhenian side of Central Apennines, one of the highest average elevation area of the whole chain.
The work incorporates GIS-based geomorphologic field mapping of morphostructures and Quaternary continental deposits, and plano-altimetric analysis and morphometry (DEM-, map-based) of the drainage network (i.e. patterns, hypsometry, knick points, Ks) and results in a morphotectonic map, scale 1:50.000, of the Marsica-Peligna region (Central Apennines).
Field mapping give clues on the definition of paleo-landscapes related to different paleo-morpho-climatic environments (i.e. karst, glacial, slope, fluvial). Geomorphological evidence of tectonics and their cross-cutting relationships with morphostructures, continental deposits and faults, provide clues on the deciphering of the reciprocal relationship of antecedence of the paleo-landscapes and on the timing of morphotectonics. Morphotectonic features are related to Neogene thrusts, reactivated or displaced by complex kinematic strike slip and followed by extensional tectonic features (present surface evidence given by fault line scarps, fault line valleys, fault scarps, fault slopes, wind gaps, etc.).
Geomorphic evidence of faults is provided also by morphometry of the drainage network: highest long slope of the main streams (knick points and Ks) are located where the streams cut across or run along recent faults.
Correlation of tectonic elements, paleosurfaces, Quaternary continental deposits, by means of morphotectonic cross sections, lead to the identification, in the marsicano-peligna region, of areas in which morphotectonics acted in the same period, becoming younger moving from West to East.
In conclusion, recognition of different morphotectonic features, identification of different paleo-landscapes, and reconstruction of their migration history, contribute to define the main phases of syn and post orogenic, Apennine chain landscape evolution: it results from the link of alternating morphotectonics and surface processes, due to migrating fault activity, rock uplift processes and alternating karst, glacial, slope, and fluvial processes.