



## **The Middle Pleistocene evolution of the Molise intermontane basins: revision of the chrono-stratigraphic framework and new results inferred from a deep core of the Isernia - Le Piane basin**

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The Molise sector of the Apennine chain includes several Quaternary intermontane basins of tectonic origin (Venafro, Isernia-Le Piane, Carpino, Sessano, Boiano and Sepino basins). Since the Middle Pleistocene, the palaeoenvironmental evolution of these basins has been strongly conditioned by extensional tectonics, dominated by fault systems with a general NW-SE trend. This tectonics has produced important vertical displacements which are testified by the elevated thickness of basin fillings and the presence of several generations of palaeosurfaces, gentle erosion glacis and hanging valleys, the latter being generally located along the borders of the basins. Our research has focused, in the last years, on clarifying the infilling nature and the Quaternary evolution of the Boiano and Sessano basins and, more recently, of the Venafro and Isernia basins, the latter being investigated also by a new deep drilling.

The present paper aims at presenting the results of the detailed, integrated analysis of the palaeoenvironmental and geomorphological evolution of these basins, that allowed for constraining the chronology of the basin infillings and for clarifying the significance and age of the ancient gentle surfaces, now hanging up to hundreds of meters above the basins floors. Furthermore, the main palaeoenvironmental changes and the tectonic phases are highlighted. The dating of several tephra layers interbedded within the investigated fluvial-marshy and lacustrine-palustrine successions, allowed to correlate different basin successions, and to refer the main sedimentary facies and some of the palaeosurface generations to the Middle Pleistocene.

The obtained results confirm that the Middle Pleistocene evolution of the Molise Apennine was controlled by a polyphasic extensional tectonics, with periods of relative landscape stability alternating with periods of major landscape fragmentation, due to the variable interplay of tectonic and climate. They allow, furthermore, to better decipher the Middle Pleistocene tectonic evolution providing new data on the number of phases and their differences in length, intensity and related accommodation rates.