



Morphological evidence of Late Quaternary thrusting in the Bradanic Foredeep (Southern Italy)

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The recognition, mapping and morphotectonic analysis of Late Quaternary marine and fluvial terraces can provide useful information about the recent geodynamics of large areas. Moreover, the correlation of the terrace inner edges with interglacial sub-stages (OIS) of the glacio-eustatic curve can also contribute to date the sequence of morphological surfaces, therefore allowing uplift-rates to be estimated. We investigated the western coastal sector of the Bradanic Foredeep, Basilicata, Southern Italy. From a geodynamic point of view, this sector of the Ionian coast represents a key area because i) it is located on the western side of the Apennines foredeep, where Pliocene-Pleistocene clastic deposits are accumulated, ii) it is close to the outcropping front of the Apennines mountain chain and iii) it stands directly above the more external segment of the active blind frontal thrust of the orogenic belt (*e.g.* Pieri *et al.*, 1997).

The occurrence of several orders of marine terraces and the morphological correlation of the three youngest marine terraces to as many orders of fluvial terraces confirm: i) that the regional geodynamic process was mainly governed by the interaction between eustasy and Late Quaternary tectonics; ii) that we are certainly dealing with different orders of marine terraces, so neglecting the suggested hypothesis of an old, single marine terrace vertically displaced by an array of normal faults parallel to the present coastline, along with the occurrence of a prevailing extensional regime affecting the region. The present research is devoted to recognise, separate and possibly quantify the tectonic effects within the area.

Following, firstly a new statistical approach, based on the sums of residuals between measured elevations of palaeoshorelines and theoretical elevations obtained by deforming the eustatic curve with a constant uplift rate and, secondly, on two absolute

ages obtained from the epimerization of the amino acids, the chronology of the terraces has been inferred. The best fits obtained for different transects perpendicular to the coast line, allow correlating the palaeoshorelines with OIS 3.1 (40 ka) to 7.5 (240 ka), while the estimated uplift-rates vary from 1.5-1.6 to ca. 2.0 mm/a, in the northern and southern sectors, respectively, therefore documenting a NNE-ward tilting of the coastal sector. However, in order to obtain the real direction of tilting by vector summation, we also considered the possible occurrence of a perpendicular gradient. Accordingly, we analysed the fluvial terraces along the lower sectors of the major valleys that outlet in this coastal sector, which trend about NW-SE. Based on the lack of any marked convergence or tilting of the fluvial inner edges (Bianca and Caputo, 2003), we conclude that the investigated region has undergone a tectonic tilting whose real direction is towards NNE, roughly perpendicular to the frontal blind thrust affecting the Bradanic Foredeep. This tectonic structure mainly propagated during Quaternary and due to its geometrical setting, the frontal part of the hanging-wall block necessarily generated a typical large-scale ramp anticline. The differential uplift rates inferred in the present research and the associated NNE-wards tilting of the Middle-Late Quaternary terraces observed in the investigated area document the effects at the surface of this deep-seated structure. According to the above datings, the contractional tectonics seems to have occurred in the time interval between the oldest and youngest marine terraces (*i.e.* 240-40 ka BP).

Bianca M. & Caputo R. (2003): Analisi morfotettonica ed evoluzione quaternaria della Val d'Agri, Appennino meridionale. *Il Quaternario*, **16** (2), 158-170.

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