



## **Faulting in porous carbonate grainstones**

**E. Tondi**, M. Alessandrini, G. Cello

Department of Earth Sciences, University of Camerino, Via Gentile III da Varano, 62032  
Camerino MC, Italy.

Detailed field mapping and microstructural and textural analyses, carried out in various localities of the Majella Mountain area (in the central Apennines) and in the San Vito Lo Capo peninsula (in north-western Sicily), allowed us to document failure modes and fault development in porous carbonates.

In the Majella Mountain area, a composite multilayered sequence, including porous carbonate grainstones of Lower Cretaceous to Miocene age, crop out. In the San Vito lo Capo peninsula, a Mesozoic to Tertiary platform carbonates sequence, evolving upwards into deep-water marls, limestones and siliciclastic deposits, is unconformably overlain by terrigenous units consisting mostly of carbonate grainstones of Lower Pleistocene age. The latter have been investigated in detail because they are very nicely exposed in the coastal plain of Castelluzzo (Piana di Castelluzzo). Along the coast of the Piana di Castelluzzo, limited outcrops of Tyrrhenian conglomerates and biocalcarenes are also exposed.

The results of our study show that, in both areas, there occur several sets of deformation bands and stylolites, and that the latter systematically formed by pressure solution processes within previously developed deformation bands. We also document and discuss how shearing of these stylolites produces zones of intense deformation leading to the development of cataclastic fault rocks.

Finally, we attempt to relate the observed variations in the deformation processes: (i) to the evolving mechanical behaviour of the deforming rocks, and (ii) to the local structural framework imposed by the regional stress field conditions operating in central Italy during the emplacement of the Majella thrust sheet, and in north-western Sicily during the deformation of the Lower Pleistocene grainstones cropping out along in the coastal plain of Castelluzzo.