



Structural control in sinkhole development and speleogenesis: a case study from the High Murge karst landscape (Apulia, Italy)

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The Murge plateau is the main karst sector of Apulia, an almost entirely carbonate region of SE Italy. It can be, in turn, subdivided into two sectors: High Murge, the inland plateau, where remnants of an ancient tropical karst are still recognizable; and Low Murge, closer to the Adriatic Sea, with smoother karst morphologies and landforms, but, at the same time, hosting some of the longest underground karst system in the region (Parise, 1998, 2006). Even though showing low energy relief, the landscape of High Murge is very articulated when examined at greater detail, with several interesting karst features. Among these, sinkholes are definitely the most significant, showing a variety of typologies and, at the same time, a high frequency, both as individual features and as coalescent landforms, giving origin to more complex depressions (Parise, 2011). Previous studies carried out in the High Murge through morphometric analysis of the main sinkholes identified on the 1:25,000 scale topographic maps from the Italian Army Geographical Institute indicated their likely genesis in a low relief cockpit karst (Sauro, 1991). Over such landscape, developed in Upper Tertiary, a hydrographic pattern was superimposed, that partly opened some of the depressions, also dismantling sectors of the karst relief and producing talus deposits (Caldara & Ciaranfi, 1988).

In the present work we take into consideration the southern countryside of Ruvo di Puglia. Choice of the area, which extends over 15 km², was dictated by presence of a high number of sinkholes, and of several important caves with prevailing vertical development, including the deepest pit ever explored in Apulia (Grave della Ferratella, depth - 320 m). The cave is nowadays not accessible, due to clogging caused by land use changes during the 80's.

Based upon extensive field surveys and interpretation of multi-year aerial photographs (time range 1955-2003), integrated by surveying in selected caves, the main hydro-geomorphological and karst features of the area have been outlined. Structural data have been collected at both the outcrop and within caves, in order to assess the likely connections between the karst drainage pattern and the main tectonic features. Eventually, a karst geomorphological map has been produced to describe the karst character of the landforms in the area, with a distinction of the recognized sinkholes in different categories in function of their genesis. In addition to the strictly geomorphological theme, outcomes of this study may be of interest to cavers for planning future activities in this and nearby areas, in the attempt to identify new caves, or extend the present development of those already known.

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