



The role of natural and anthropogenic processes on the morphogenetic evolution of collapse sinkholes

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Sinkholes may be defined as a cut conical, hemispherical or irregular closed depression in the land surface of areas characterised by outcrops of limestones and other soluble rocks. They are classified into six types, each of these with its own discrete mechanism of formation: dissolution sinkholes, collapse sinkholes, caprock sinkholes, dropout sinkholes, suffosion sinkholes, buried sinkholes.

The Apulia region (southern Italy) represents the emerged south-eastern part of the Adria microplate and is characterised, mainly, by inner platform carbonate rocks. It consists, in fact, of a Mesozoic carbonate sequence, some thousands of metres thick, of regularly stratified calcilutites and dololutites overlain by thin deposits of Terziary and Quaternary periods, that are formed by calcarenites and subordinate sands and clays. From north to south of Apulia, karstic landforms such as ground cavities and conduits related to efficient underground drainage, typify three main karst sub-regions: the Gargano Promontory, the Murge Plateau and the Salento Peninsula. Several sinkholes, also of great size, characterise both the inland Murge Plateau and the area closer to the coast where such landforms are known with the local terms of *pulo* or *gurgo*. These depressions show a high density of karst hollows, some of which are large caves, that suggest a morphogenesis connected with the development of an underground karst system. In the Murge Plateau, the origin of sinkholes, generally, is related with the collapse of cave roofs, even if the morphologic evolution is various and complex in the different areas. Although sinkhole enlargement and degradation are, mainly, associated to natural processes, the role exerted by human activities, in the course of the time, has to be considered.

Starting from medium-term in situ observations, detailed surface surveys, historic and bibliographic data (archival terrestrial photographs and scientific papers), and aerial

photograph analysis, this study provides a description of the main factors influencing the geomorphologic processes affecting sinkholes including hydrological, geological and anthropogenic control on sinkhole development.