



Sea level and karst morphologies correlations as a tool in the assessment of the karst hazard

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The evolution of karst phenomena from the surface towards the inner part of the karst massif depends on many factors; among them a very important role is played by the groundwater, its flow conditions and finally the distance between the topographic surface and the water table.

In similar lithological and tectonic conditions, a stable over long time periods water table enhances the development of karstified levels, well widespread along horizontal planes. More particularly, we mean polje, when the water table is very near the topographic surface, and other karst systems such as underground conduits and caves, when the water table develops well below the field level.

Another typical form of the karst environment of Apulia, the canyons, in local language named “gravine”, are, sometimes, the evolution up to the surface of cave systems.

In the coastal karst systems, the groundwater level is controlled by the sea level, its variations and its stay. A relevant fact is that such a control is exerted on very large areas; so it may happen that the elevation of a long stay of the sea level can produce a wide kind of karstic accidents, either over the surface or in the underground. If this statement could be confirmed, the knowledge of such preferred levels of karst activity would be of great aid in the foresee of the karst hazard.

In the central part of the Murgian plateau (Puglia, southern Italy), the karst morphology of the “Canale di Pirro” polje is of relevant interest ; ancient cartography of the area reports in this place a river with the mouth towards the Adriatic sea. The elon-

gated form of the karst valley and some temporary lake might allow the interpretation of the structure as fluvial valley. But the morphological features of the system are not compatible with a river, for the presence of a well developed threshold towards the sea direction, that confirms the endoreic nature of the polje. Other features of the karstic system have been detected as very important. The polje has an apparent elongation of ten km and develops in direction W-E on two marked elevations: about 305 m asl and about 270 m asl.; but the upper level is connected with another system ranging at elevation of about 305 ± 5 m asl about 12 km long, still in W direction. The lower level of the polje (about 270 m asl) has been recognized to develop at the same elevation of the two major cave systems of this part of the Murgia, the Castellana caves and the cave of "pozzo cucù".

So the elevations of 305 and 270 m above the present sea level are both related with a number of surface and underground karst systems and can be related to an old elevation of the Adriatic sea.

A similar two levels surface karst system with the same elevations, about 305 and 270 m asl has been detected in another part of the Murgia plateau, a few km North of the Castel del Monte hill. The Authors obviously think this not a coincidence, but a further strengthen of the hypothesis of a long stay of the sea around the above mentioned elevations.

Recognise the levels of the preferred diffusion of karst phenomena therefore is a very important aid in foresee karst hazard.