



Karst processes and stability: experiences in the carbonate Apennine of the Campania Region (Southern Italy)

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This work tries to investigate the relationship between karst processes and stability. At first, it deals with the problems originated by sinkholes, that are the most hazardous karst phenomenon. Secondly, the influence of karst processes on situations of slope instability is investigated.

In the carbonate Apennines of the Campania Region more than 50 breakdown dolines (sinkholes) are known, and they are generally located in the areas surrounding important mineralised springs, but in most cases they have never been studied in detail. Significant examples could be the ones located near the Telese and Solopaca villages, in the Benevento province, opening both along carbonate slopes and on alluvial fan deposits, or the “Pianelle doline” near Contursi, with a depth of 100 meters and a diameter of about 600 meters, which formed suddenly in May 1981.

In some cases wide (2-3m) traction joints can be associated with sinkholes: it is the case, for instance, of the “Spacco della Jala” in the Lattari Mts which is 100 meters deep and 600 meters long and has become wider in the last 3 centuries as testified by U/Th datings of broken speleothems.

Regarding (o in regard to) the influence of karst processes on slope stability, it was possible to observe that in many case-studies the solution and enlargement of faults and joints aided the starting of planar slides; the best examples come from some of the cases studied in the area of the Surrentine Peninsula (near Positano and Castellammare

di Stabia villages).

Moreover, the presence of peculiar karst morphologies, like pinnacles, natural arcs or little caves developing along bedding or in coincidence of cataclastic zones, can influence the starting of rock falls phenomena. Such situations are frequent in the Lattari Mts. and Bulgheria Mt. and often produced considerable damage to important roads.

A particular context is given by detrital talus made up by cemented carbonate *breccia*: in this case (i.e. near Marina di Camerota) karst solution can isolate singular blocks that, due to their dipping, can start moving downvalley.

Other situations in which karst processes can increase the instability of rocky masses can occur during tunnel excavations in highly fractured carbonate complexes, when mineralised waters are present. It was the case of the Vico Equense area, in the Sorrentine Peninsula, where both the road and railway tunnels had important stability problems during excavations.

All these situations will be exposed in this paper and their different stages of evolution will be discussed.