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ABSTRACT BOOK

a cura della Società Geologica Italiana



GEOSCIENCES FOR
A SUSTAINABLE FUTURE



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The hidden world of artificial cavities in the northern Campania Plain: architectural variability and cataloging challenge

Ruberti D. *, Fabozzi M.A. & Vigliotti M.

Dipartimento di Ingegneria, Università della Campania “Luigi Vanvitelli”, Aversa (CE).

Corresponding author e-mail: daniela.ruberti@unicampania.it

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In Campania (southern Italy), sinkholes phenomena induced by the widespread presence of anthropogenic cavities in the Neapolitan and Caserta provinces are frequent and well-known. Nevertheless in many urban centers of this area, cavities have been reported in specific geological investigations although their real extent is almost unknown. In these towns the underground mining activities were performed to extract volcanic tuffs for buildings. The urban development have sealed every signal of the presence of cavities, which thus represent a geological hazard and contribute to subsoil instability of many places.

The need to carry out a survey of underground quarries in urban centers has two reasons:

- a) The anthropic hypogea represent an absolute documentary value, still unduly neglected and little used for the purposes of a correct and sustainable management of the territory, natural resources and historical and artistic heritage. The enhancement and sustainable reuse of hypogea contributes to enhancing the cultural and tourist promotion of a territory.
- b) In a correct urban management, the knowledge of the city subsoil is a priority, as the presence of cavities may easily trigger the collapse of the shallow or deeper soils.

The difficulty of drawing up a univocal cataloging system lies in the definition of database framework that includes all the possible architectural, geological and geotechnical elements of the cavities. In fact, the type of extraction is not the same throughout the territory even over short distances as it was strongly conditioned by the lithological characteristics of the volcanoclastic material in the subsoil, as well as by the purpose of extraction.

The construction of a cavity system initially involved an excavation carried out as a “bottle” or a “bell” from the ground level up to the tuff unit, developing at depth according to its thickness. During excavation, access points were realized through the poorly lithified or loose deposits, with a square or pseudo-circular cross-section; sometimes they were supported by containment walls made of tuff bricks resting on the lower tuff bank. A single vertical excavation is sometimes added at certain distance, so as to determine in depth the coalescence of several chambers, also through the construction of narrow tunnels or wide passages, long connecting tunnels, multiple level chambers. Access shafts were often realized with a system of stairs with one or more ramps, with steps directly carved into the tuff.

This contribution will show the main cavity typologies recognized across an area north of Naples, although the study is still far from exhaustive. Data were managed into a GIS environment such as to provide a first proposal of a geological underground database framework.