

Types of granite cavities and associated speleothems: genesis and evolution

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Abstract

Fabric and foliation that affect granite bodies develop in the later stages of emplacement/cooling, so generating three main types of discontinuities: the first is formed when magma changes from viscous to plastic-rigid; the second, when magma is almost consolidated and is strained in a fragile regime; and the third, in an elastic regime when magma is wholly consolidated. With the rock close to the Earth's surface, the groundwater uses the discontinuities previously formed to weather the rock massif in depth, resulting in a network of planes infilled with regolith. Later, the water circulation through the said network washes out the regolith and produces physical erosion, dissolution and precipitation (speleothems). Biogenic opal-A is the most frequent composition of speleothems, whose morphology is defined by the type of water dynamics: dripping, evaporation or capillarity. Three types of cavities may be distinguished: (1) fissure cavities, when the in-situ rock structure prevails in the definition of the cavity, (2) tafone of tectonic origin and (3) caves among moved blocks (earthquakes, gravity, creep, etc).

Key words

Pseudokarst, granitic cavities, speleothems, tafone, opal-A.