

How fast is the growth of a man-induced travertine? An example from Canary Islands, Spain

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The Calabozo Carbonate Deposit, in northern Gran Canary, Spain is a small travertine building composed of a suite of pools and cascade terraces. At present the building is totally dry and there is no flowing water. The system was active only about forty years when the water was used for irrigation of banana fields, which is an evidence of the rapid growth of travertines in volcanic settings.

The carbonate building is composed of three main elements:

- 1) Relatively homogeneous slope situated containing the exit of the ancient irrigation plumber and showing an irregular thin coating of carbonate either with some macrophyte framestones and oncoliths.
- 2) Pools of about 1 to 2 m in diameter and 0.3 to 0.6 m deep. They are partially filled by debris of powdery carbonate, clays and vegetal fragments.
- 3) Cascade barriers limitate the pools. They are the more visible parts of the building and are the main carbonate constructions and formed by: a) vertical to oblique macrophyte coated stems, b) curtains formed by the coalescence of hanging coated stems, c) peaks (viseras) situated on the curtains and formed by network of thinner vegetation debris incrustated by carbonate.

These architectural elements are formed by: 1) Coarse crystalline coated stems that form the framestone of the cascade barriers. The mean diameter of coated stems is 4 cm and the length is highly variable from 6 to 30 cm. All have an empty nucleus. The crystalline coatings are palisadic and equigranular mosaics. 2) Fine crystalline coated stems/other plant structures. This facies consists on ellipsoidal to irregular pores (up to 1 cm) surrounded by irregularly laminated micrite including palisade-like laminae. Organic filaments and diatoms are very common. 3) Crusts of well defined laminae (up to 0.3 mm thick) of coarse palisade to fan-like calcite crystals alternating with finer (< 0.1 mm) micrite laminae cover the slope surface. 4) Micrite occurs mostly in the spaces left by the calcified stems or as thin laminae between the coarse crystalline bands. It contains diatoms and some microbial structures such as filaments, spheres and EPS. Contrary to the expected in thermal deposits, in the Calabozo travertine the barriers are built by macrophytes incrustated by coarse palisade and laminated calcite. Macrophyte stems created small obstacles and were later coated by coarse crystalline calcite. The coarse size of the crystals probably reflect high precipitation rates under disequilibrium caused by water degasification after it exit from the plumber and also by probably high velocity due to the slope. The rate of calcite precipitation would have been very high, which was necessary to preserve and coat the stems that formed the original obstacle. In these conditions travertine growth on the slope can contribute to a fast change of landscape, whether or not induced by man-activity.