New lava tubes data of Cumbre Vieja (La Palma-Canary Islands)

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Photo: Alfred Montserrat-Nebot

Now, almost two years after the eruption of Cumbre Vieja (Tajogaite or Cabeza de Vaca, as it is also known), on the island of La Palma, speleologists and members of the IGME-CSIC (Instituto Geológico y MInero de España-Consejo Superior de Investigaciones Científicas) and other entities, have begun to penetrate some of the tunnels formed during the last months of 2021. Even at that time it was observed how large masses of lava penetrated into the flow losing any reference on the surface.

Although some openings had been located by drone sighting months ago, speleologists and scientists have not been able to approach them until a few days ago. Thermal images from drone flights have begun to show temperatures relatively low enough to allow access to the lava tubes.

Temperatures of 50-60 degrees Celsius have not allowed it to go any further than a few tens of meters in some of the most superficial ducts, where cooling has been faster due to air circulation.

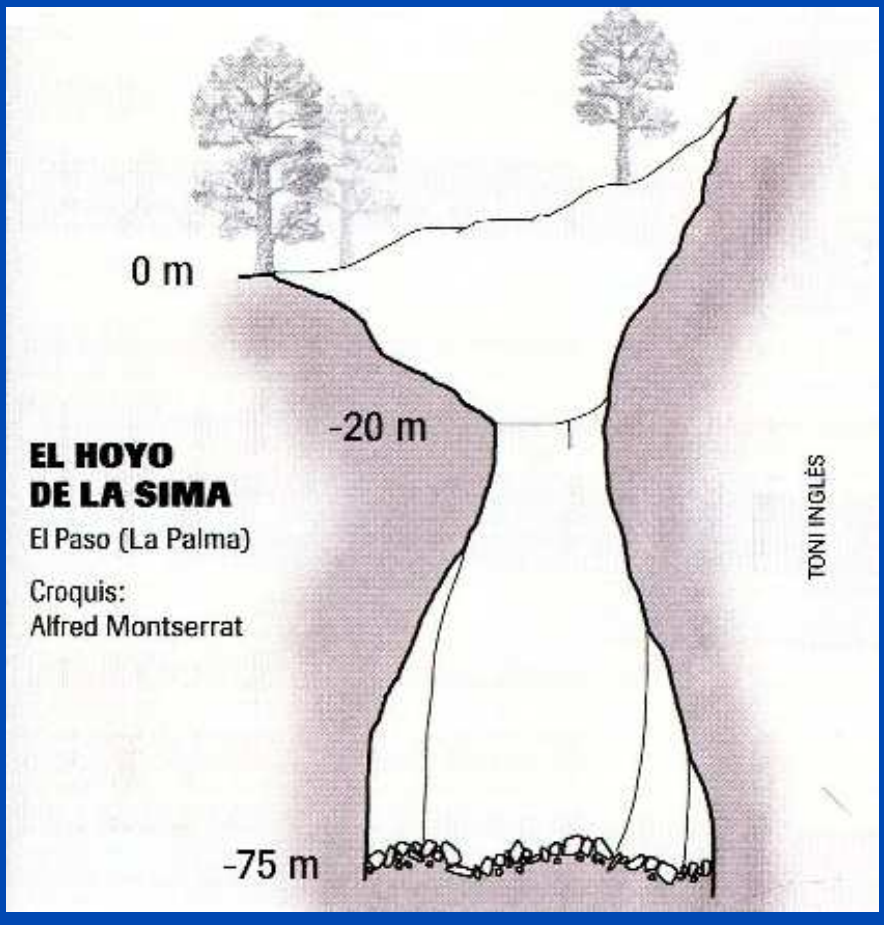
The thermal images obtained in some galleries show that the temperature of the surrounding rock is still above 200 degrees Celsius. This leads to suspicion that in the most important system of lava tubes, which is believed to be deeper, the temperature would exceed 400-500 degrees Celsius.

Expectations are set in the so-called "Tubo Rojo" (Red Tube), due to the color of the solidified lava. This is located in the flow that buried the population of Todoque, and it is believed that it could be the largest lava tube ever formed in the Canary archipelago.

Another conduit that has been visited for a few meters has been the "Austral Tube", one of the surface drainages of the emitting points of the Cogote Mountain.

Until now they have been almost anecdotal explorations but with the continued cooling of the lava tubes they can represent a job for years considering that the eruption of Cumbre Vieja contributed to the surface of the island more than 200 million cubic meters of lava during the 85 days that the 2021 eruption lasted.

From a petrological point of view, the products of this eruption are characterized as basanites, tephrites and phonolites. This gave rise to a flow of basic-alkaline composition, with a low content of Si and moderately high rates of Na and K. A fact to highlight is the low viscosity of the lava (Castro i Feisel 2022), which has been estimated to be ten times lower than lava from the 2018 Pu'u O'o eruption in Hawaii. The viscosity determines the flow regime, which in most castings is laminar. The data obtained show that in Cumbre Vieja the flows could have fluid in a turbulent regime. It will be necessary to study the effect that this low viscosity can represent in the formation of these new lava tubes.



The ridge of Cumbre Vieja or the Southern sector is the volcanically active area of the island of La Palma. Reactivated about 125.000 years ago, it has had seven historical eruptions during the last 500 years (Carracedo et al. 2022). The one in 1646 gave rise to one of the few vertical cavities on the island, the Bucaro San Martin. It is a 57 meter deep well. The other, Hoyo de la Sima, is located in El Paso and is 72 meters deep. Both have morphological features of having acted as eruptive

centers.
The eruption of 1949 gave rise to the Cueva de las Palomas or Tubo Volcánico de Todoque, more than 500 meters long, which was not affected by the flows of 2021. The last of the eruptions of the ridge of Cumbre Vieja, in 1971, gave rise to the Teneguia volcano.

Bibliography

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Photo: David Sanz (IGME-CSIC)