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# Felsic volcanism in a basic shield (El Hierro, Canary Islands). Implications in terms of volcanic hazards.

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El Hierro, the southwesternmost and smallest island of the Canary Archipelago, is a complex basaltic shield volcano characterized by mainly effusive volcanism with both Strombolian and Hawaiian activity. Explosive felsic volcanism is not a common feature of the archipelago and, so far, it has only been reported on the central islands of Tenerife and Gran Canaria, where it has been responsible for the formation of large central volcanic complexes. The presence of felsic rocks on the other islands of the archipelago and specifically on El Hierro is mostly restricted to subvolcanic intrusions and a few lava flows, generally associated with the oldest parts of the islands.

We hereby report the presence of a trachytic pumice deposit on the island of El Hierro, referred to here as the Malpaso Member. A detailed stratigraphic, lithological, and sedimentological study was carried out on the deposits of this explosive episode of felsic composition, which is the only one found on the Canary Islands apart from those of Gran Canaria and Tenerife. Four different subunits were identified on the basis of their lithological and granulometrical characteristics. The products of the eruption correspond to a single eruptive event and cover an area of about 13 km2. This deposit originated from a base-surge-type explosive eruption with a subsequent radial emplacement of dilute PDC currents, was emplaced from the vent that would have been located in a similar position to the volcano of Tanganasoga. The low vesicularity of juvenile fragments and the morphological characteristics of the fine particles, as well as the high proportion of lithic fragments and the ash-rich nature of the deposit, suggest that magma/water interaction controlled the dynamics of the eruption.

This study demonstrates that magmas from El Hierro could have the potential for producing an explosive eruption, in an environment in which the majority of the eruptions are basaltic and effusive in nature. Bearing in mind the style and the spatial extent of the studied eruption, a future event with similar characteristics would have a serious impact on the population, infrastructures, and economy of the island of El Hierro. For this reason it is clearly of great importance to assess the potential volcanic hazard on the island.

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