IRIS AperTO

UNIVERSITÀ DEGLI STUDI DI TORINO

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

Multidisciplinary approach to the hazard assessment for the Holocenic Tenerife flank eruptions

This is the author's manuscript

Original Citation:

Availability:

This version is available http://hdl.handle.net/2318/153237 since

Publisher:

IAVCEI

Terms of use:

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

12 October 2024

Multidisciplinary approach to the hazard assessment for the Holocenic Tenerife flank eruptions

CLAUDIA PRINCIPE[1], MARIA J BLANCO[2], DANIELE GIORDANO[3], GIANLUCA GROPPELLI[4], JOAN MARTI MOLIST[5], STAVROS MELETLIDIS[2]

[1]Istituto di Geoscienze e Georisorse, CNR, Pisa, ITALIA, [2]Instituto Geografico Nacional, Calle La Marina 20. Santa Cruz de Tenerife., Espana, [3]Dipartimento di Scienze della Terra, Universita degli studi di Torino, ITALIA, [4]Istituto per la Dinamica dei Processi Ambientali, Milano, CNR, ITALIA, [5]Instituto de Ciencias de la Tierra Jaume Almera, CSIC, Barcelona, Espana

E-mail: c.principe@igg.cnr.it

A multidisciplinary approach has been applied to assess the hazard related to the eruptive fissures on the slopes of the main volcanic edifices in Tenerife. We concentrated on the historical eruptions and on the whole framework of the NW rift. Tenerife is a complex volcanic area in which long-lived volcanic centers coexist with a number of different-age scoriae and spatter cones. Our work concentrated on the youngest portion of these cones, their age, and distribution. In order to achieve this goal, a detailed fieldwork has been carried out by means of a 1:5,000 scale cartography of volcanic deposits and structural feature. An area of about 10 sq km has been surveyed up to now. Archaeomagnetic method has been used to elucidate age relations of the main recent volcanic record (last 8.000 yrs BP) and a suitable field work was done. Chronostratigraphic characterization of 42 different localities (i.e. 590 archaeomagnetic measurements) was performed. In addition, petrochemical and rheological analyses are in progress. The present data set allows us to point out some important findings that depict a new scenario for the flank activity in Tenerife with strong implication for hazard assessment. At present, we are able to produce the complete cartographic and chronostratigraphic sequence of two famous and distinct areas, Fasnia-Siete Fuentes-Arafo and Chinyero volcanic fields, that probably represent the "general behavior" of the up to known monogenetic activity on Tenerife. Polygenetic cones, instead of monogenetic scoriae cones, seem to be the main character of the Holocene activity in Tenerife. No previous investigations have ever evidenced this aspect. In the Fasnia area we recognized the effect of at least two volcano-tectonic trends (one 120N oriented and the other one 50N) resulting in three different lava flows outpouring, in stratigraphic order, from two dismantled scoriae cones and from an eruptive fissure oriented 30N. Three orders of lava levees are well exposed in the southern portion of the lava field. Only the 1km long and last emitted lava flow belongs to the 1704-05 eruptive episode. Scoriae ramparts, pit craters and a small cover of lapilli fallout complete the deposits associated to 1704-05 eruption. The contemporaneous presence of big scoriae cones and small scoriae ramparts has been frequently recognized elsewhere in Tenerife and is a characteristic of the Chinyero volcanic field too, where the 1909 volcanics are mantling two previous scoriae cones. These observations have implications on the hazard assessment for opening of eruptive fissures in Tenerife and hazard maps have to be deeply revised taking into account that large older scoriae cones are related to a vigorous Strombolian activity, characterized by high explosivity (highly vesicular lapilli and bombs) and long lasting lava flows, while the real historical activity expressed only scoriae ramparts along eruptive fissures and moderate lava flows.

©IAVCEI 2013 Scientific Assembly. All rights reserved.