



Risk assessment at Olot, Catalan Volcanic Zone (Girona, NE Spain)

J. Martí (1), R. Ortiz (2), A. Felpeto (1), A. Ordoñez (1), A. Geyer (1) and Ll. Planagomà (3)

(1) Institute of Earth Sciences "Jaume Almera", CSIC, Barcelona, Spain, (2) National Museum of Natural Sciences, CSIC, Madrid, Spain, (3) TOSCA-Parc Natural de la Zona Volcànica de la Garrotxa, Olot (Girona), Spain.

The Olot volcanic region is a Quaternary basaltic volcanic field that forms part of the Catalan Volcanic Zone (CVZ), located at the NE of Spain. The CVZ is included in the Middle Miocene to recent alkaline volcanism of the Valencia Trough, a NE-SW oriented Neogene basin, located between the Iberian Peninsula and the Balearic promontory, related to the European Rifts System. The CVZ contains the greatest concentration of Middle Miocene to recent volcanism in the València Trough. Despite the fact that this volcanism is significant in extension and volume, and that several eruptions occurred in Holocene times, it is mostly unknown compared to the contemporaneous alkaline volcanism in other parts of Western and Central Europe.

We focus our study on the Olot region, the area of the CVZ that concentrates the most numerous and youngest volcanic manifestations. They originated a volcanic field composed of monogenetic cones that formed along tectonic fissures and faults. Basaltic strombolian and phreatomagmatic eruptions generated a wide diversity of cinder and scoria cones, lava flows, tuff rings, tuff cones and maars. Magmatic eruptions range from small to violent strombolian eruptions. Phreatomagmatic activity generated locally extensive pyroclastic surges and explosion breccias, and in many occasions appears associated with strombolian activity. Different eruption sequences alternating strombolian and phreatomagmatic phases can be distinguished in the Olot volcanism. The age of the Olot volcanism is poorly constrained but field stratigraphic relations and the existence of a few radiometric dates suggest a time period covering the last 300 ka, having the last eruption occurred a few thousand years ago.

We want to address your attention to the problem that represents to assess volcanic risk on a region like Olot in which the lack of data and of recent (historical) eruptions could let us to assume that volcanic hazard and, consequently, risk is inexistent. On the contrary, applying, for example, the same protocol used by the USGS to evaluate hazard in the USA volcanoes to the Olot area it gives us that Olot has a moderate risk. This is basically due to the important socio-economic development of the area and the high number of infrastructures, including airports, that could be affected by an eruption of the same type than the ones occurred in the area. Based on a susceptibility analysis and hazard assessment of the area we develop an eruption scenario to illustrate the short and long term consequences of an eruption there and we discuss the implications of conducting risk assessment on those volcanic zones in which the probability of new eruptions could appear as very low or even null.