



## **The CEDROS ignimbrite, Faial island (Azores, Portugal)**

Guy Caniaux

LAVE, TOULOUSE, France

About 25 ignimbrites are known on the various islands of the Azorean archipelago. Most of them can be observed on São Miguel and Terceira islands, where they are considered as associated with caldeira-forming eruptions. In the Azores, ignimbrites form generally low volume deposits, although their volumes are largely unknown due to the particular geometry of the islands and the unknown fraction entering the ocean. Except the Povoação (Duncan et al., 1999) and Fogo ignimbrites (Wallenstein, 1999) on São Miguel island, or the ignimbrites of Terceira island (Self, 1976; Guertisser et al., 2009), most ignimbrites have not been extensively studied.

The Cedros ignimbrite on Faial island, is the most recent and accessible ignimbrite of the Azores. Its age (1200 B.P.) is well constrained by several C14 datings (Shotton et al., 1970; Chovelon, 1982; Madeira et al., 1995; Pacheco, 2001). It formed during one of the latest and largest explosive events of the holocene activity of the Vulcão da Caldeira (1043 m), an event certainly at the origin of the present morphology of its large caldeira (Pacheco, 2001; Forjaz et al., 2006). The deposit is easily accessible since it outcrops at the surface except when partly covered by only one, more recent, thin deposit. The ignimbrite was produced at the end of a magmatic and hydromagmatic, sub-plinian eruption, with pumice fall deposits and multiple flow / fall ash deposits located on the north-western flank of the volcano (Pacheco, 2001).

A detailed mapping of the ignimbrite is proposed, based on more than 300 documented outcrops. The mapping reveals the existence of 9 different units, radially spread on the northern flank of the volcano where it forms lobes some kilometers in length. Lobes never exceed 20 m in thickness. In the upper part of the volcano, the units were largely channeled either in deep valleys carved on the steep slopes of the main cone, either in the two branches of the well marked Pedro Miguel – Ribeira Funda graben. In the lower part of the volcano, the pyroclastic density currents had rather linear trajectories, weakly influenced by the local topography. Most of the units entered the ocean at the end of their terrestrial pathways, some after jumping high sea cliffs. The volume of the ignimbrite on land is small, nearly 0.06 km<sup>3</sup> but the fraction deposited in the ocean is not known. The ignimbrite is light grey, non-welded through its thickness, even in maximum section up to 18 m. Several lithofacies have been identified, some depending on the distance to the vent, some clearly related to the local topography. The conspicuous variations of various lithofacies along the same unit can be associated with different mechanisms of transport and emplacement.