

Structural control and compositional variations associated to the emplacement of mafic monogenetic vents between 35.5° and 36.5°S in the SVZ of Chile

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In the Andean Southern Volcanic Zone of Chile the broad distribution of mafic monogenetic vents occurs mostly south of ~38°S, above a comparatively thin crust (~35 km) and spatially associated with the Liquiñe-Ofqui Fault Zone. However, in the northern arc segment between 35.5° and 36.5°S, above a thicker crust segment (~45 km), a group of about 40 poorly known mafic volcanoes compose a dispersed field of monogenetic vents. Considering the preservation state of the volcanic landforms it is suggested that at least nine of those vents have erupted during the Holocene, with seven of them having no evidence of glaciation, which at this latitude, has been recorded to begin at ~25 ka. The location of these mafic volcanoes is consistent with the occurrence of regional NNW-trending lineaments, often associated with ENE-trending structures. La Resolana Craters and Los Hornitos Cones (LHC), in the vicinity of the Descabezado Grande volcanic field, are situated in the boundary area between the Mesozoic, to the east, and the Cenozoic basement to the west. Additionally, at local scale, their positions coincide with the regional contact between the Miocene La Invernada pluton and the Eocene-Early Miocene Abanico Formation. The presence of high-forsterite olivine crystals in some of these vents, as the case of LHC, indicates the participation of primitive melts, which had undergone limited crustal differentiation processes, suggesting a rapid transport from the deep crust or the mantle to the surface, probably assisted by deeply rooted structures. This contribution additionally deals with the whole-rock and olivine mineral-chemistry compositional patterns depicted by the eruptive products from post-glaciation vents distributed through the ~100 km long segment. Implications regarding magma transport and mantle source will be discussed in more detail.