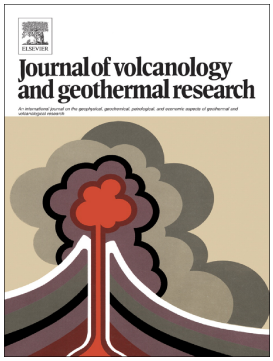

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Distribution and size of lava shields on the Al Haruj al Aswad and the Al Haruj al Abyad Volcanic Systems, Central Libya

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Abstract

The Al Haruj Volcanic Province (AHVP) consists of two distinct volcanic systems. In the north is the system of Al Haruj al Aswad, covering an area of 34,200 km^2, while in the south the system of Al Haruj al Abyad, covering an area of 7,850 km^2. The systems have produced some 432 monogenetic volcanoes, primarily scoria (cinder) cones, lava shields, and maars. The density distribution of the volcanoes in each system, plotted as eruption points or sites, has a roughly elliptical surface expression, suggesting similar plan-view geometry of the magma sources, here suggested as deep-seated reservoirs. More specifically, the Al Haruj al Aswad magma reservoir has major and minor axes of 210 km and 119 km, respectively, and an area of 19,176 km^2, the corresponding figures for the Haruj al Abyad reservoir being 108 km and 74 km, for the axes, and 6,209 km^2 for the area. We measured 55 lava shields on the AHVP. They are mostly restricted to the north and southern parts of AHVP and date from late Miocene to (at least) the end of Pleistocene, while some may have been active into Holocene. In fact, although primarily monogenetic, some of the lava shields show evidence of (possibly Holocene) fissure eruptions in the summit areas. The early lava shields tend to be located at the edges of volcanic systems and with greater volumes than later (more central) shields. The average lava shield basal diameter is 4.5±0.45 km and height 63±6 m. There is strong linear correlation between lava shield volume and basal area, the coefficient of determination (R^2) being about 0.75. When 22 Holocene Icelandic lava shields are added to