

Formation of parasitic cones on polygenetic volcanoes

by I. Yokoyama, The Japan Academy, No. 7, Ueno Park, Taito-Ward, Tokyo
110-0007 Japan

Formation of parasitic volcanoes at different distances from the central vent of a polygenetic volcano may be understood from the standpoint of material mechanics. The theory of maximum shearing stress is applied to interpret the formation of parasitic vents on the flanks of volcanoes in terms of crustal strength. Whether the new magma erupts at the main crater or at a new parasitic crater depends on conditions of the main crater and on the relative strengths of both the sites. Distributions of parasitic vents are closely related to movement of magma beneath central volcanoes. The radial distribution of parasitic vents is characterized in terms of the number of parasitic vents per unit area with distance from the central vent. The distributions are exemplified on some volcanoes in Japan; Comparatively high concentration of parasitic vents at a certain distance from the central crater can be interpreted to reflect the shallow magma plumbing system. That is, ascending magmas branch from a central conduit at different depths and hence reach the surface at different distances from the central crater. Parasitic volcanoes are usually monogenetic; its reason may be explained by their formation mechanisms.