A lava dome simultaneously erupted from the different magmatic plumbing systems: the Hanareyama lava dome of Asama Volcano

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The Hanareyama lava dome, situated about 8km ESE from the present summit crater of Asama-Maekake volcano, is a monogenetic volcano, which erupted in 20ka. The base of the Hanareyama lava dome is oval-shaped and slightly elongated in EW with the major axis of 1.5km and maximum net height of 300m. The lava dome consists of two parts: a lobe and dome. A lobe is wedge-shaped; its eastern side is higher than the west. A dome is constructed on the eastern half of the lava lobe. The lobe comprises pyroxene dacite with phenocryst content of 11 to 21vol.% and the dome consists of hornblende-bearing rhyolite with phenocryst content of 8 to 16vol.%. The pyroxene dacite contain phenocryst of plagioclase, orthopyroxene, clinopyroxene and rarely olivine, while hornblende-bearing rhyolite has phenocryst of plagioclase, hornblende, orthopyroxene, clinopyroxene, quartz and rarely biotite.

The pyroxene dacite is intruded by the hornblende-bearing rhyolite. The SiO2 content of pyroxene dacite ranges from 63 to 69wt.% and that of hornblende-bearing rhyolite from 70 to 76wt.%. The whole-rock chemical compositions of pyroxene dacite and hornblende-bearing rhyolite show different trends on the SiO2 variation diagrams. The hornblende-bearing rhyolite is higher than the pyroxene dacite in K2O, Rb and Ba contents, and Rb/Zr, Rb/Y, Rb/Ba, Ba/Zr, and Ba/Y ratios. The pyroxene dacite and hornblende-bearing rhyolite cannot be derived from the same parental magma through simple crystallization differentiation. The compositional trends of hornblende-bearing rhyolite are explained by the magma mixing of silica-rich hornblende-bearing rhyolite and silica-rich member of pyroxene dacite. The whole-rock chemical composition of pyroxene dacite is similar to the eruptive products of Asama-Hotokeiwa volcano which is active from 20 to 10ka, but that of hornblende-bearing rhyolite is distinctly different from them. There were two independent magma chambers beneath the Hanareyama lava dome just before its eruption. One is composed of the pyroxene dacitic magma similar to that of the Asama-Hotokeiwa volcano, but the other comprises completely different rhyolitic magma. Firstly, pyroxene daicitic magma closely related to the magmatic plumbing system of the Asama-Hotokeiwa volcano erupted, followed by the effusion of hornblende-bearing rhyolitic magma of dissimilar origin, which partly mixed with the silica-rich member of pyroxene dacitic magma.

The Karuizawa area, where the Hanareyama lava dome was erupted, may be the boundary region between the two distinct magmatic plumbing systems: Asama-Hotokeiwa and neighboring other system.