

What happened during the climactic stage of Tenmei eruption of Asama-Maekake volcano in 1783AD?: detailed process of the eruption of Agatsuma pyroclastic flow and Onioshidashi lava flow.

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The detailed process of eruptions of Agatsuma pyroclastic flow and Onioshidashi lava flow during the climactic stage of Tenmei eruption (1783AD) of Asama-Maekake volcano is reexamined, based on the occurrence of volcanic deposits, their stratigraphy and old documents. The Agatsuma pyroclastic flow deposit comprises four stages: the earliest, early, A-scoria flow and late stages. The pyroclastic flows of the earliest stage and A scoria flow were the column-collapsed type. Those of the early stage were the boilover type and those of late stage were the fountain-collapse type. The Onioshidashi lava flow is clastogenic and consists of three units: L1, L2 and L3. The L1 and L3 are the slope-collapsed (rootless) type; the formation of L1 was synchronous with the last stage of Tenmei pumice fall deposits (21p), which were the climactic sub-Plinian eruption. The L2 is the spatter-fed type, outpouring from the crater of Kamayama welded pyroclastic cone. The earliest stage of Agatsuma pyroclastic flow was small-scale and occurred during the eruption of Tenmei pumice fall deposit around 18:00 in August 3 (corresponding to 10a to 14a). The early stage of Agatsuma pyroclastic flow began during the dormant stage of eruption of Tenmei pumice fall deposit from 16:00 to 18:00 in August 4 (corresponding to 20a). The pyroclastic flow deposits of the early stage with low aspect ratio are abundant in matrix ash, the essential clasts of which are high in SiO₂ (62 to 64wt. %). The A-scoria flow was small-scale and erupted during the eruption of Tenmei pumice fall deposit around 20:00 and 24:00 in August 4. The late stage of Agatsuma pyroclastic flow deposit erupted from 3:00 to 6:00 in August 5 just after the cessation of Tenmei pumice fall deposit. They show high aspect ratio and are relatively poor in matrix ash, the essential clasts of which are low in SiO₂ (61 to 62wt. %). The L1 of Onioshidashi lava flow with relatively high SiO₂ content (60.5 to 64wt. %) began to flow down around 18:00 in August 4 during the eruption of Tenmei pumice fall deposit and continued to 3:00 in August 5. The onset of effusion of L2 with relatively low SiO₂ content (60 to 63wt. %) was around 3:00 in August 5 concurrent with the eruption of late stage of Agatsuma pyroclastic flow. The flowing down of L3 (60.5 to 61.5wt. %) of the Onioshidashi lava formed by the collapse of slope of Kamayama pyroclastic cone was later than 3:00 in August 5.

Keywords: Asama volcano, Tenmei eruption, pyroclastic flow, clastogenic lava flow