# 浅間火山1783年吾妻火砕流の本質ブロックの記載岩石学的研究

# Petrographic study of juvenile blocks of the 1783 A.D. (Agatsuma) pyroclastic flow in Asama Volcano

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The Agatsuma pyroclastic flow (APF) in the 1783 A.D. (Tenmei) eruption of the Asama volcano, central Japan, is characterized by occurrence of abundant rounded juvenile blocks with poorly vesiculated inner core and small proportion of fine ash matrix. The blocks have been referred to as cabbage for their shape and size. APF is a typical example of the "intermediate type" pyroclastic flow defined by Aramaki (1957), which have intermediate characters between the nuée ardente (dome-collapse type) and the pumice flows (column-collapse type) in terms of their volume, density of juvenile blocks and proportion of fine ash matrix. Because these characters may represent the magma outgassing and fragmentation processes, the intermediate type pyroclastic flow may be important to understand key processes that determine the bifurcation between explosive and effusive eruptions. Based on the observation that APF was composed of many (> 50) flow units, Takahashi and Yasui (2013) proposed that APF was generated through fountain collapses following Vulcanian explosions. They also suggested that lava lakes were formed by fall-backs of pyroclasts from the fountains during the Vuclanian activity on the basis of welding structures of the juvenile blocks. However, formation processes of these blocks are unclear. In this presentation, we propose that the cabbage-shaped juvenile blocks were formed repeatedly in the volcanic crater prior to each explosion.
On the surfaces of juvenile blocks ejected at the last stage of the 1783 A.D. eruption, we found the crusts impregnated with very fine (1–10 μm) ash particles and interstitial opal. The presence of opal shows that the juvenile blocks had been emplaced in a hydrothermal system after their rounded shape was formed. Since there is no geothermal area at the sampling location and its upper flank of the Maekake volcano, it is highly possible that silica precipitation from circulated geothermal water followed the formation of characteristic round shape of the juvenile blocks before generation of the APF. The weakly welded ash particles existed between the opal-bearing crust and the inner core; the welding process thus should have occurred before the crust formation. The surfaces of the juvenile blocks without opal-bearing crusts, which were collected from weakly-welded APF deposits, were covered instead with welded ash particles, which may have been formed at the higher temperature condition in the crater. These features indicate that the juvenile blocks were rounded probably via coagulation and welding and coated with volcanic ashes, and filled the crater before their eruption.

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