

Volcanostratigraphy and K-Ar ages in the central part of Southern Yatsugatake volcanoes, central Japan

Kuniaki Nishiki[1]; Yasumoto Oginome[2]; Tatsuya Nagashima[3]; Akikazu Matsumoto[4]; Yasuyuki Miyake[5]

[1] GSJ,AIST; [2] Geosphere and Biosphere Science, Shinshu Univ.; [3] Geosciences, Shinshu Univ.; [4] GSJ, AIST; [5] Dept.Geology, Fac.Sci.,Shinshu Univ.

In the Yatsugatake area, central Japan, voluminous Quaternary volcanic products are widely distributed. They consist mostly of basalt and andesite. The radiometric ages of these volcanic products were reported by Kaneoka et al. (1980) and etc. Nishiki et al. (2007) clarified the spatiotemporal distribution of volcanism in the northern Yatsugatake area, and defined newly the volcanoes, which erupted in early Pleistocene as Yabashira volcanoes, and redefined the volcanoes, which erupted after early Pleistocene as Yatsugatake volcanoes. In contrast, the intimate volcanic history in southern Yatsugatake area has not yet built, because the stratigraphy of earliest eruptive products in this area was not clarified. In the present study, the authors report the geology and K-Ar ages around the Minoto to Akadake area, and consider the duration of volcanism and volcanic history in this area.

The concentration of radiogenic ^{40}Ar was determined by the conventional isotope dilution method at AIST. The analytical procedure and the estimation of analytical errors were based on the procedures described by Uto et al. (1995). Rock samples were crushed and sieved to 0.25-0.50 mm in diameter. Large phenocrysts were removed as much as possible by using a hand magnet and an isodynamic separator. The concentration of potassium was determined by the flame photospectrometry described by Matsumoto (1989).

The volcanic products in this study area are divided into 6 geological units, that is Akadake pyroclastic rocks, Jogosawa lavas, Yokodake volcanic rocks, Iodake volcanic rocks, Minotonakayama west lavas and Minotonakayama lava. Akadake pyroclastic rocks - Iodake volcanic rocks piles up conformably and formed a sequence of volcanic bodies. In contrast, Minotonakayama lower lavas and Minotonakayama lava are distributed inside the caldera of volcanic bodies, mentioned above.

From the volcanostratigraphic data and K-Ar ages newly obtained, it is clarified that the southern Yatsugatake volcanoes in this area occurred ca. 0.45 Ma and the volcanic body grew to an enormous size between ca. 0.3 Ma and ca. 0.2 Ma. This volcanic body constructed mainly welded pyroclastic rocks and agglutinate. It was formed by fissure eruption and/or Strombolian with high eruptive rate. In contrast, after the formation of erosional caldera, the volcanism changed, and formed lava domes with low eruptive rate, which could not form enormous volcanic body.