論　説

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# 降下火砕堆積物からみた浅間前掛火山の大規模噴火

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# Large-scale Eruptions Inferred from the Pyroclastic Fall Deposits of the Asama-Maekake Volcano

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Geological research on the large-scale eruptions of the Asama-Maekake volcano was carried out by investigating pyroclastic fall deposits such as A (1783 AD), B′ (1128 AD), and B (1108 AD). These deposits are mainly composed of pumice layers. In the case of the well-studied 1783 eruption, the most voluminous fall unit A-21 is classified as subplinian from its estimated weight. Ash and lapilli layers composed of lithic fragments also characterize the pyroclastic fall deposits. The particles of these layers are massive and angular to subangular in shape. They are also similar to the particles produced in the recent small-scale eruptions (*e.g.*, 2004 eruption). Most of the recent eruptions, typically vulcanian eruptions, have mainly generated pyroclasts originating from solidified lava in a shallow level of the conduit. The pyroclastic fall deposits of the large-scale eruptions consist of pumice layers and lithic fragment layers, suggesting that intermittent vulcanian and subplinian eruptions occurred in the course of the large-scale eruptions as above.

Descriptions and isopach maps of the pyroclastic fall deposits were made as detailed as possible in this study. The distributions of some fall units of the lithic fragment layers of pyroclastic fall deposits B and B′ were mappable. These isopach maps show elongated distributions, suggesting the strong effect of wind on dispersal. These lithic fragment layers are composed of coarser grains than those of the recent small-scale eruptions preserved in the ashy soil at all localities. These findings indicate that large-scale vulcanian eruptions occurred in the course of the 12th century eruptions.

At present, the 1783 eruption is the only example in the history of the Asama-Maekake volcano for which the temporal variations in the eruptive style and eruptive volume can be discussed with high reliability. Detailed reconstruction of the 1783 eruptive sequence was found to be possible by comparison between the stratigraphy of the eruptive products and information in old documents. The large-scale subplinian eruption that occurred after the intermittent eruptions is considered to be associated with the large-scale clastogenic lava flows owing to vigorous fountaining. On the other hand, little information is available on eruptions before 1783 because of the limited exposure and the availability of few old documents. Although the reconstruction reliability for the eruptions in the 12th century is poor, these eruptions might have occurred with a different sequence from those of the 1783 eruption. The eruptions in the 12th century were characterized by intermittent large-scale vulcanian eruptions after a major pyroclastic eruption in which subplinian pumice falls and pyroclastic flows were generated. This is a major difference from the 1783 eruption. Furthermore, little information, such as the distribution and stratigraphy of the eruptive products, is available for eruptions predating the 12th century owing to the lack of exposure. For instance, although isopach maps of the pyroclastic fall deposits can be prepared, the preparation of an accurate map is difficult for older deposits. Consequently, in the case of the Asama-Maekake volcano, it is not easy to predict the eruptive sequence of future large-scale eruptions on the basis of past eruptions.

**Key words**: Asama-Maekake volcano, pyroclastic fall deposit, isopach map, eruptive sequence, eruptive style

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