

## Petrological study of northern part of ca. 300-100 ka volcanic edifices in Zao volcano.

TAKANO, Toru<sup>1\*</sup>; INOUE, Tsuyoshi<sup>2</sup>; BAN, Masao<sup>3</sup>; OIKAWA, Teruki<sup>4</sup>; YAMASAKI, Seiko<sup>4</sup>

<sup>1</sup>Graduate School of Department of Earth and Environmental Sciences, Yamagata University, <sup>2</sup>Nippon Koei Co., Ltd., <sup>3</sup> Department of Earth and Environmental Sciences, Faculty of Science, Yamagata University, <sup>4</sup>Institute of Geology and Geoinformation, Geological Survey of Japan, National Institute of Advance

Zao volcano is a Quaternary stratovolcano located in the middle part of the volcanic front of northeast Japan arc. The volcanic activity started at about 800 ka, and has continued to present. During ca. 300 to 100 ka activity of the Zao volcano, several middle sized edifices were formed. These volcanic edifices can be divided into northern and southern parts. We performed petrologic study on eruption products of the northern part to reveal the variation of magma compositions along with the evolutionary history.

Eruption products are divided into 8 units from lower to upper: Yokokurayama lavas, Kanshodaira lavas, Jizosan west lavas, Kumanodake west eruption products, Kumanodake main edifice products, Jizosan east agglutinate and lavas, Kumanodake agglutinate and lavas, Umanose eruption products. Yokokurayama lavas, Kanshodaira lavas, and Jizosan west lavas are composed of andesitic lavas. Kumanodake west eruption products are consisted of andesitic lapilli tuff, tuff breccia, agglomerate, and andesitic lavas. Kumanodake main edifice products are consisted of alternation of andesitic lavas and pyroclastic rocks in the lower part, and andesitic tuff breccia and agglomerate in the upper part. Jizosan east agglutinate and lavas, Kumanodake agglutinate and lavas are consisted of basaltic andesitic agglutinate, agglomerate, and lavas. Umanose eruption products are mainly composed of basaltic andesitic lavas, with subordinate amounts of agglomerate.

The eruption center of the Yokokurayama lavas would be located westward from the main chain of eruption centers. The main eruption centers for the other units were located in between the Kumanodake-Jizosan area. Jizosan east agglutinate and lavas, Kumanodake agglutinate and lavas, Umanose eruption products are characterized by the agglutinate and/or agglomerate distributing near the eruption centers.

All of eruption products belong to medium-K calc-alkaline series. All units other than the Yokokurayama lavas are plotted on same general trends in most of the SiO<sub>2</sub> variation diagrams. The Yokokurayama lavas show a lower trend than the other units in K<sub>2</sub>O diagram. Other than the Yokokura lavas, the lower four units are andesitic, whereas upper three units are basaltic andesitic. Looking at in detail, slight differences in compositions can be observed among units. Among the four andesitic units, Kumanodake main edifice products show higher trends in the Cr, Ni, Zr, Nb diagrams and a lower trend in Rb diagram than the others. The Umanose eruption products are plotted in higher part in Cr and Ni diagrams from the trends of the other products.

Keywords: Zao volcano, stratovolcano, eruption history, evolution of magma