

Stratigraphy and chemical compositions of eruption products in Umanose agglutinate activity, Zao volcano

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The newest stage of the Zao volcano, central part of NE Japan, began at about 30 ka and the activity has continued to present. The Zao newest stage eruption products are classified into Komakusadaira agglutinate, Umanose agglutinate and Goshikidake pyroclastics. In this study, we examined the stratigraphy of eruption products in the Umanose agglutinate activity (ca. 8-4 ka). Besides, we examined temporal change in chemical compositions of the products.

«Tephra-stratigraphy» We re-examined the tephra-stratigraphy and recognized nine volcanic sand layers (Z-To 5a, 5b, 5c, 5d, 5e, 5, 6, 7, 8) during the Umanose agglutinate activity. The tephra (volcanic sand) layers younger than the Z-To 5e widely distribute around the summit area, while the others are found only in the northern part. Based on ¹⁴C ages on paleosols and fossil leaf samples from the tephra-loam succession coupled with the stratigraphy, ages of Z-To 5a to 8, except for Z-To 5, are estimated to be ca. 8.9, 7.3, 6.0, 5.6, 5.3, 4.7, 3.9, 3.6 ka, respectively.

In addition, we found whitish yellow colored wide-spread tephra layer between Z-To 5e and 5d in the northern and bellow 5e in the southern part of the summit area. This tephra is mainly composed of pumice type volcanic glass. This layer can be correlated to To-Cu (Towada-Chuseri) tephra, based on the major element compositions of the volcanic glass and the stratigraphic horizon.

«Stratigraphy of the proximal layers» The proximal layers are well exposed in the central part of the summit area. In this part, the Umanose agglutinate covers the Komakusadaira agglutinate, which include less-vesiculated volcanic bombs with glassy luster as well as scoria. Overlying products of the Umanose agglutinate are composed of alternation of agglutinate, scoria fall deposit, and pyroclastic surge deposit. More than ten layers are recognized by intercalating loam layers.

«Temporal change in chemical compositions» The eruptive products are olivine +- pyroxene andesite (56.0-59.2% SiO₂) and belong to medium-K calc-alkaline series. All samples are plotted on same linear trends in SiO₂ variation diagrams. The silica contents increase gradually from the bottom to the middle part. Afterwards, the content drops to the lowest, and gradually increase upwards again.

Keywords: Zao volcano, Umanose agglutinate, tephra stratigraphy, evolution of magma