

## Reevaluation of magma discharge volume of the 864-866 Jogan eruption of Fuji Volcano based on results of lake Senoumi drilling

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The 864-866 Jogan eruption of Fuji Volcano, Japan, is one of the most voluminous eruptions during the past 3200 years. This eruption was mostly effusive and discharged a lot of lava flows, which are totally called the Aokigahara lavas. Part of the lavas poured into an old lake, which is called Lake Senoumi in historical documents, and divided it into two lakes (Lakes Shojiko and Saiko). Because Lake Senoumi was widely covered by thick lava flows, we cannot recognize the original shape/depth and thus cannot estimate the volume of the Aokigahara lavas exactly.

To estimate the total magma discharge volume of the Jogan eruption, we have drilled a 160.00m hole at the locality, which is estimated to have been in a central part of Lake Senoumi. The stratigraphy of the hole, which was clarified by observation of drilled cores and borehole TV images, is as follows:

[Depth 0-136.80m] Many basaltic flow units are observed. These lavas do, however, not intercalate any layer showing clear pauses of volcanic activity. In depth 0-69.60m, lava flows are vesicular and take a color of reddish brown due to high-temperature oxidation. In depth 69.60-136.00m, alternation of hyaloclastic lavas and massive lavas are observed. Reddish color is, however, not observed. In depth 134.00-135.05m, a diatomaceous silt layer is intercalated in a crevice between lava flows. The radiocarbon age of this deposit is 2105±35yBP.

[Depth 136.80-148.30m] A massive basaltic flow is observed. The lithofacies and the result of XRF analysis are almost the same as those of upper (depth 0-136.80m) lava flows. The radiocarbon age of the lake deposit under this lava flow is 2675±35yBP.

[Depth 148.30-156.90m] Lake deposits, which contain several tephra layers, are observed. In depth 148.40-148.70m, a scoria layer is observed. This scoria is considered to be the Fuji Omuro scoria (about 3ka) because of the lithofacies. At depth 149.00m, a pumice layer was found. This pumice can be correlated with the Kawagodaira pumice (3.2ka) from the Higashi Izu monogenetic volcano field because of the refractive index and mineral composition. The radiocarbon age of the lower part of this lake deposit is 7495±45yBP.

The thickness of the Aokigahara lavas is estimated to be 135.00m, because the radiocarbon age of the lake deposit at depth 135.00-135.05m.

On the basis of drilling results mentioned above, topographic data, and CSAMT (Controlled Source Audio Frequency Magnet Telluric Method) data, we estimated the original shape of Lake Senoumi and calculated the volume of lava flows, which buried the ancient lake. Total magma discharge volume of the Jogan eruption is reevaluated to be at least 1.2km<sup>3</sup>(DRE). This value exceeds that of the 1707 Hoei eruption and means the most voluminous eruption during the past 3200 years of Fuji Volcano.