

Geology of Heian-period eruption in Towada Volcano

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The Towada volcano is an active volcano in North-East Japan. It started eruptive activity about two hundred thousand years ago. Some of the eruptions were large-scale explosive ones such as a caldera forming eruption. In the present study we focus on the deposit by Heian-period eruption, the latest eruption of Towada volcano (Hayakawa 1985, Matsuyama and Ooike 1986). To understand the eruption sequence, we investigate the thickness, structures, and size distributions of the pyroclastic deposit.

The obtained geological data derived from the following scenario for Heian eruption: It started with Plinian column and deposited pyroclastic falls (OYU-1). Outburst of the pyroclasts enlarged the vent, and resultant water supply led to phreatplinian eruption (OYU-2a). After the phreatplinian eruption, the eruption changed to pyroclastic flow eruption again (OYU-2b). These episodes were not recognized in past research. After the collapse a new Plinian column grew (OYU-3). The scale of Plinian column of OYU-3 is smaller than one of OYU-1. The last pyroclastic eruption in Heian-period is Kemanai pyroclastic flow eruption. The successive eruptions ended with Ogurayama lava dome formation. The chemical compositions of deposit in Heian-period eruption can divide into two types. The group of Pyroclastic deposit is higher silica content than Ogurayama lava dome.

All the Pyroclastic fall deposits were mostly distributed to southwestward, and their chemical compositions were identical. They lead us to the conclusions that the successive Plinian and Phreatplinian eruptions finished within relatively short time, and they were caused by single magma.