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Reconstruction of eruptive sequence of AD 838 eruption in Kozushima Island

NAITO, Takeshi[1*] ; SUZUKI-KAMATA, Keiko[1]

[1]Department of Earth and Planetary Sciences, Graduate School of Science, Kobe University

Kozushima Island locating on Zenisu Ridge is composed of 16 rhyolitic monogenetic volcanos. The latest AD 838 eruption started by pyroclastic eruption and ended lava dome forming. Pyroclastic eruption was mainly pyroclastic flow, which formed pyroclastic plateau in the topographically low area and covered thinly the basement topography in high area. Lithofacies of pyroclastic-flow deposit is different according to the distribution area. We will discuss the eruptive sequence of AD 838 eruption based on the lithofacies and emplacement temperature of the deposit.

Lithofacies of pyroclastic-flow deposit are mainly laminated pyroclastic surge where topographical barrier exist between the source and depositional area. Massive lithofacies are observed in pyroclastic-flow deposit where there is no topographic barrier from the source area. Massive pyroclastic-flow deposit changes into the laminated pyroclastic-surge deposit along the slope from lower area to higher area on Matsuyamabana, suggesting that pyroclastic flow changed to pyroclastic surge when the pyroclastic flow climbed the slope.

We collected 79 samples for the thermal demagnetization experiments. 50 samples show stable magnetization. They show a broad emplacement temperature values from ambience temperature to 650 ℃. Emplacement temperature of pyroclastic-flow deposit is 20 ℃-350 ℃ in south and southwest area. In the west and northwest area, pyroclastic-flow deposited at above 450 ℃, and pyroclastic surge deposited above 500 ℃.

We estimated following eruptive sequence of AD 838 eruption of Kozushima Island. Lava dome forming started at first, then earlier pyroclastic flows occurred by cooled dome collapse, which flow down toward south area. Pyroclastic flow in the west and northwest emplaced preserving the high temperature by hotter lava dome collapse. Pyroclastic flow ascending topographical barriers changes to pyroclastic surge by dropping the pyroclastic materials.

Keywords: pyroclastic flow, pyroclastic surge, emplacement temperature