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Eruption history constructed from the tephra strata of Bandai volcano, Japan

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Bandai volcano (1816 ma.s.l.) is located in the north part of the Honshu island in Japan. The latest eruption was in 1888. Subsequently, one peak on the north side of the mountaintop collapsed, and a debris avalanche flowed down to the northern foot of the mountain. I researched the tephra, sedimentary state of the volcanic ash layers, the volcanic rocks and the debris avalanche deposits of the Bandai volcano. For this reason, the activity stages of Bandai volcano can be divided into seven. Stage 1: 300ka ≤, Stage 2: 300-280 ka, Stage 3: 250-230 ka, Stage 4: 170-85 ka, Stage 5: 75-57 ka, Stage 6: 36-28 ka, Stage 7: 24-0 ka.

The tephra-loam layers are divided into the Mineyama Loam Formation(MLF) which consists of 63 tephra layers, and the Hayama Loam Formation(HLF) which consists of 77 tephra layers. The correspondence between the tephra-loam formations and the volcanic activity periods are Stages 1- 4 for the MLF and Stages 5- 7 for the HLF. The combination of colored minerals in the ash layers of Bandai volcano are usually augite and hypersthene, and the ash layers in the upper part of the MLF and many of the HLF contain a small amount of olivine. The combination of colored minerals of phenocrysts in lavas are mainly augite and hypersthene, and stage 4-7 lava may contain a small amount of olivine. The combination of colored minerals in the groundmass are mainly augite and hypersthene, and sometimes silica minerals, hornblende and biotite are present. Hypersthene usually has a reaction rim of pigeonite.

Eruption Modes is below. Stage 1 is unknown due to the small distribution of volcanic ejecta. Stages 2 and 3 are sub-plinian eruption with lava effusions. Stages 5-7 are basically vulcanian eruptions accompanied by lava effusions, but in the early stages of stages 5 and 6, there were sub-plinian eruption, which caused pumice falls and pumice flows. Stages 5-7 are vulcanian eruptions with lava effusions. Stage 4 is considered to be the transition period from the sub-plinian eruption to the vulcanian eruption. Large-scale debris avalanches occurred at stages 2, 5, 6, and 7.