

The implication of concurrence with the Owakidani tephra group from Hakone Volcano and tectonic events in the region

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We discovered a set of phreatic explosion deposits herein referred to as the Owakidani tephra group on the northern slope of Mt. Kamiyama and in the Owakidani fumarolic area of the Hakone Volcano. It comprises five units Hk-Ow1 to Hk-Ow5 in the ascending order. It is possible that Hk-Ow1 and Hk-Ow2 were erupted from a fissure vent on a ridge of Mt. Kamiyama, while Hk-Ow3, Hk-Ow4 and Hk-Ow5 were erupted at Owakidani. Based on the calendar ages of the Owakidani tephra group and the stratigraphic position of the Kozushima-Tenjosan tephra, we estimated that Hk-Ow3, Hk-Ow4 and Hk-Ow5 were erupted in relatively short intervals between the latter half of the 12th and 13th centuries. On the other hand, Hk-Ow1 and Hk-Ow2 were erupted approximately 3 kyr BP and 2 kyr BP, respectively.

These eruptions generated airfall tephra composed of sandy and silty volcanic ash. In addition, the eruption that produced the Hk-Ow2 has emplaced a pyroclastic surge deposit. Since the pyroclastic surge deposit of Hk-Ow2 contains fresh volcanic glass, this eruption might have been phreatomagmatic.

The eruption ages of the Owakidani tephra group generally correspond to seismic events that occurred in the Kozu-Matsuda Faults and the Tanna-Hirayama Tectonic Line. It is suggested that the activity of the Hakone Volcano may be closely related to the tectonic events in this region.