

The Omine Tuffite Dike and its Accompanied Andesite Fragments, Central Kii Peninsula, SW Japan

*Yutaka WADA¹, Kohnosuke NISHIMOTO²

1. Department of Earth Sciences, Nara University of Education, 2. Heguri Junior High School

Pyroclastic conduits exposed at the caldera margin give informations about pre-eruptive conditions of the pyroclasts and magma chamber. At the Kii peninsula in southwest Japan multiple caldera eruptions occurred 14 million years ago ⁽¹⁾, their pyroclastic conduits are exposed (e.g., Nakaoku dike⁽²⁾; Omine dike⁽³⁾⁽⁴⁾; Kozagawa dike⁽⁵⁾). In this study we report the field occurrence of the Omine dike and its accompanied andesite fragments.

The Omine dike is one of the conduit of the Omine-Odai caldera⁽⁶⁾, and extends NNE-SSW direction for ca. 30 km. At the Takigawa outcrop in Totsukawa area, the dike is ca. 70 m wide. U-Pb age from the zircon is 14.88 ± 0.45 Ma⁽⁷⁾.

The dike consists of tuffite, which includes lapilli- to block-sized fragments in welded matrix. There are andesites, sedimentary rocks derived from host rocks, and fiammes as the fragments. The andesite fragments, a few centimeter to 2 m in diameter, are irregular-shaped and have glassy but devitrified margins. The welded matrix includes broken crystals and rock fragments in brown volcanic glass. The brown glass with eutaxitic texture includes lensoidal and bubble-wall type glass fragments.

Field and microscopic observations above indicate that the welding occurred in the closed conduit after explosion and fragmentation, similar to the mechanism at the Nakaoku dike⁽⁸⁾, the other conduit of the Omine-Odai caldera. On the other hand, the irregular-shaped andesite fragments suggest strongly that they were emplaced as hot magma. One of the trigger for the felsic caldera eruptions may be the injection of mafic magma into felsic magma chamber⁽⁹⁾. Therefore, more detailed petrological studies about the andesite fragments are necessary to understand the development of the Omine-Odai caldera eruption.

References

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Keywords: caldera, pyroclastic conduit, Miocen volcanism, Kii peninsula, tuffite, mafic magma