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The Seto Composite Cone Sheet around the Middle Miocene Odai Cauldron, SW Japan

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1. Introduction

To the northern margin of the Odai cauldron in central Kii peninsula, many composite dikes are exposed (Wada *et al*., 2009; 2011; Takashima *et al*., 2010), formed with the middle Miocene caldera volcanism (Miura and Wada, 2007). Then, in the results of detailed field survey of dikes we found the intrusive bodies in Seto area compose a cone sheet which inclines to the center of the Odai cauldron. In this presentation we report the distribution and field occurrence of the cone sheet, and discuss the time of the cone sheet emplacement on the caldera formation.

2. Distribution and Field Occurrence of the Seto Cone Sheet

We surveyed 2 km x 1 km area in Seto area, and observed 14 boundaries between the sheet and the host rock. Host rocks are chert, sandstone, mudstone and green rocks which are comprised in the Daifugen complex of Chichibu terrain (Sato and YORG, 2006). Locally low angle shear fractures are developed in host rocks.

In surveyed area the observed strikes of the cone sheet are varied from E-W in the eastern part to NE-SW in the western part, which are similar tendency to tuffite dike as an arcuate pyroclastic conduit (Wada and Iwano, 2001) and Shionoha-Kamataki fault as collapse fault (Sato and YORG, 2006) of the Odai cauldron. On the other hand, inclination of the sheet is approximately 30S through the area, with locally horizontal intrusive plane. Thus, the Seto sheet is inferred to be cone-shaped with horizontal steps.

Maximum thickness of the sheet is ca. 26 m. In any outcrops marginal basaltic andesite (0.2˜0.4 m thick) and central rhyolite (6˜25 m thick) are observed. While the boundaries between the margin and the center are clear because of the difference of rock facies, there is no chilled structure in both parts at the boundary. In addition the central rhyolite often includes some amoeboid mafic enclaves, closely resembling to the texture of marginal basaltic andesite. Therefore, the Seto cone sheet is a composite intrusion formed by separate magma injections with little time gap between two magmas.

3. Caldera and Cone Sheet Formations

Seto composite cone sheet is considered to be a member of Takegi arcuate dike swarm by Sato and YORG (2006). Takegi dikes are composed of composite intrusions such as Seto sheet and mafic simple dikes. Wada *et al*. (2011) concluded that Takegi dikes were intruded at the same time, based on field occurrence, rock texture and bulk rock chemistry, and that they were injected with mingling and mixing of mafic and felsic magmas from the chamber by collapse of the caldera floor, as proposed by Kennedy and Stix (2007) and Kennedy *et al*. (2008). According to those ideas, it is possible to explain that Takegi dikes were emplaced just after caldera collapse event. This is supported by field observations such as southward inclination of the Seto cone sheet and its focusing toward the center of Odai cauldron, and thus it is plausible that the time of emplacement of the Seto composite cone sheet or Takegi dike swarm is just after the Odai caldera formation.

References:

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