

## Miocene felsic igneous rocks in Kii peninsula: as a background for the current geological processes

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Outer zone of the Kii peninsula is an attractive field for the research of deep crustal fluid; complex form of subducting slab, existence of the Kinki spot, and high-T hot springs. To discuss on the deep crustal structure of the Kii peninsula, presence of Miocene large felsic igneous bodies cannot be ignored. We will review the recent progress of the research on the felsic igneous bodies in the Outer Zone of Kii Peninsula.

### **(1) Outline of the felsic igneous rocks in the Outer Zone of Kii peninsula**

The major exposed felsic igneous bodies were divided into Omine granitic rocks and Kumano acidic rocks. The northernmost plutons of Omine granitic rocks are only I-type granites, and the others are S-type granites. Recently, geological survey including dikes around these major igneous bodies revealed the presence of two major calderas (Kumano and Odai calderas). To the west of Omine granitic rocks and dikes in central mountains, no felsic igneous rocks were reported. Only high-Mg andesite dikes were known as the Miocene igneous rocks.

### **(2) Contemporaneity of the igneous activities**

Systematic determination of biotite K-Ar and zircon fission track ages have been carried out for Omine granitic rocks and Kumano acidic rocks (Sumii et al., 1998; Sumii and Shinjoe, 2003; Iwano et al., 2007). They revealed that the radiometric ages well concentrates at ca. 15 Ma. Their result also supports that the Muro pyroclastic flow deposits (over 100km<sup>3</sup>) on the north of MTL was derived from felsic igneous rocks in the Outer Zone.

### **(3) Concealed igneous body and the magnitude of the igneous activities**

Information of the depth of melting was obtained from the analysis of metamorphic enclaves in S-type granitic rocks. In Kii peninsula, Murata (1984) reported presence of mineral clots formed under 0.5 GPa from Omine granitic rocks. From Miocene S-type granitic rocks in Shikoku, a metamorphic enclave with still higher P condition (0.7 GPa) was reported. These pressure conditions support that the presence of concealed gigantic batholith up to 20 km depth beneath the region of the Omine granitic rocks and the Kumano acidic rocks estimated by MT studies. Presence of concealed granitic rock body is also suggested to the north of Omine granitic rocks close to the MTL by the report of granitic enclave in dikes (Shinjoe et al., 2003). Total effusive volume of the Kumano and Odai calderas was estimated for 2000km<sup>3</sup> (Miura and Wada, 2007).

### **(4) Zonal distribution of the felsic igneous rocks**

Zonal arrangement of the geological belt in SW Japan runs E-W also in Kii peninsula. However distribution of the Miocene igneous rocks are subparallel to the strike of subducting slab (NE-SW). It was suggested that the northern border of the S-type granite is close to the Butuzo tectonic line (Murata, 1984), however distribution of S-type felsic rocks expands more to the north in the eastern Kii peninsula. Distribution of high-Mg andesitic rocks in the Outer Zone of Kii peninsula also extends NE-SW direction (Shinjoe et al., 2007).