

Precise U-Pb age determination for the Mid-Miocene granitic magmatism of the Outer Zone of SW Japan, Kyushu Island

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Mid-Miocene granitic plutons, related to subduction of young Shikoku Basin (SB) of the Philippine Sea plate after immediate clockwise rotation of SW Japan [1], are sporadically but widely exposed along the Shimanto belt in the Outer Zone of SW Japan. Kyushu Island studied here is located in the western part of the Outer Zone. Combined with our previous study [2], we newly determined precise U-Pb ages for fourteen felsic dikes and granitic plutons exposed in Tanegashima, Yakushima, Minami-Osumi, Takakumayama, Kimposan, Shibisan, Nomamisaki, Hioki, Akanita, Kumagadake, Osuzuyama, Murasho, Okueyama and Koshikijima localities using LA-ICPMS technique. The obtained U-Pb ages for twenty-two samples ranged from 15.6 to 9.9 Ma and divided two periods: 15.6 – 13.5 Ma (main period) and 10.3 – 9.9 Ma in Koshikijima. The main period was subdivided into three pulses: 15.6 Ma (first pulse), 14.8 – 14.1 Ma (second pulses) and 13.5 Ma (third pulse) and the maximum peak was seen at 14.6 – 14.1 Ma of second pulses. Compared to Rb-Sr isochron and K-Ar ages of 20 – 12 Ma for the above fourteen plutons, mainly determined until 1980's, our U-Pb data was narrowly clustered. Some scattered ages obtained in the previous literatures could be due to problems in sample quality, technical procedure, etc. Based on our U-Pb age data, the Mid-Miocene granitic magmatism of the Outer Zone SW Japan in Kyushu Island was started at 15.6 Ma and continued during ca. 2 m.y. The U-Pb ages of Koshikijima pluton yielding ca. 10 Ma were much younger than those of the other plutons. We suggest that the granitic magmatism in Kyushu Island during 15.6 – 13.5 Ma was related to the slab melting of young SB, while the granitic magmatism in Koshikijima started at ca. 10 Ma was NOT linked to the slab melting but lateral flow of asthenospheric upwelling of the Kyushu Trough [3] after the slab melting was ceased at 13.5 Ma.

[1] Otofujii et al. (1991) *Geophys. J. Int.*, **105**, 397-405. [2] Orihashi et al. (2013) abstr. Goldschmidt 2013, 1986. [3] Seno (1999) *Island Arc*, **8**, 66-79.