

Post and pre caldera eruption history of Miyakejima Volcano - Entombment process of Hachodaira Caldera and eruption history of pre A.D. 2000 Caldera -

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Collapse caldera is a common volcanic structure in basaltic volcanoes. However, the entombment process of the caldera and the eruption history of the post-caldera are poorly understood. To make an effective forecasting of the volcanic activity, we have to understand the variations of the eruption activities during the caldera filling stage based on the eruption history of the post-caldera period of many volcanoes. Based on the caldera wall observation, tephrochronology, and radiocarbon dating, in the Miyakejima Volcano, we clarify the entombment process of Hachodaira Caldera and the eruption history of the pre A.D. 2000 Caldera.

The cross section of Hachodaira Caldera, forming age at ca. 2.5 ka, is exposed on the wall of the A.D. 2000 caldera on Miyakejima volcano. The cross section of Hachodaira Caldera is divided into 7 units; pyroclastic cone (130 m thick), many thick lava flows (200 m thick), single lava flow (5-10 m thick), scoria fall deposit (40 m thick), lava flows (30 m thick) and scoria fall deposit, in ascending order. The caldera was filled mainly by the lava flow which makes a lava lake. On the other hand, many large-scale fissure eruptions, such as Kazahaya Scoria at 1.4 ka (ca. the 6th century, radiocarbon ages calibrated to calendar years) occurred outside of caldera during the caldera-fill stage (ca. 2.5 ka to the 9th century) of Hachodaira Caldera. The production rate during the caldera-fill stage of Hachodaira Caldera is estimated at least 0.4 km³ / ky. This value is larger than the production rate 0.2 km³ / ky for the last 1100 years after the caldera filling stage.

After the 9th century, the eruption number of pre-A.D.2000 Caldera is 17 times. These eruptions are flank fissure eruption in most cases. The frequency of eruption is 1-2 times in 100 years. Just before the formation of the A.D. 2000 Caldera, the frequency of eruption was slightly larger (3 times in 100years). But it is not a significant difference.