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Caldera Volcanoes in southern Kyusyu, Japan.

TETSUO KOBAYASHI[1] and MITSURU OKUNO[2]
[1]*Earth and Environmental Sciences, Faculty of Science, Kagoshima University*
[2]*Department of Earth System Science, Faculty of Science, Fukuoka University*

The Kagoshima graben, trending NNE-SSW, defines the eastern margin of the volcano-tectonic depression in southern Kyushu. Kagoshima Bay, approximately 20 to 30km in width, occupies two-thirds of the southern part of Kagoshima graben. This graben consists of Kakuto, Aira and Ata calderas and other small and unidentified depressions. About 40 km south of Kagoshima Bay is the Kikai caldera which is now submerged. These calderas are now partly occupied by the active volcanoes. Large volumes of highly vesiculated silicic magma in the form of pyroclastic falls and flows were repeatedly erupted from these calderas and formed vast pyroclastic plateaus around the area. In every case, there are many evidences that the basaltic magma had an important role to start the eruption. The good example is observed at the latest eruption of Kikai caldera.

The latest caldera-forming eruption of Kikai occurred ca. 7.3 ka, which produced the Koya pumice fall deposit, intra-plinian Funakura flow and Koya ignimbrite. The Koya pyroclastic flow travelled up to 40 km across the sea, and reached the Kyushu mainland up to 70 km away from the source.

Tephrochronological study revealed that frequent eruptions of basaltic magma lasted until the 7.3 ka eruption. This suggests that the basaltic magma had an important role for the formation of silicic magma, and that the long dormant period is not essential for the large-scale eruption. Another important evidence is that the precursory eruption of the same magma occurred shortly before the climactic eruption. Nagahama lava on the caldera rim is overlain by the Koya pumice fall deposit without any intervening soil. The chemical composition of the Nagahama lava is very similar to that of the ejecta from the Koya eruption. This evidence may suggest that the degassing process is also common even in the caldera-forming eruption.