

The Evolution of Mayuyama, Unzen Volcano, Western Kyusyu, Japan.

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Mayuyama, which is located on the eastern foot of Unzen volcano, is composed of two adjacent lava domes. Due to the appearance of these lava domes, a part of the basement rocks was uplifted towards the surface. Moreover, the Taruki plateau, just a west neighbor of Mayuyama, is a tilted mass characterized by its asymmetrical topography. This plateau is composed mainly of volcanoclastic materials which are the main constituents of volcanic fan. Many lineaments, probably formed during the crustal movements are also observed on the plateau. Based on the tephrochronological study, this plateau was generated almost simultaneously with Mayuyama formation. It is therefore considered that the effusion of semi-solid viscous magma caused conspicuous crustal deformation around the Mayuyama.

Mayuyama, which is located on the eastern foot of Unzen volcano, is composed of two adjacent volcanic edifices, Shichimenzan and Tenguyama. It is well known that the eastern sector of Tenguyama collapsed at the end of the 1792 eruption, and caused a severe tsunami hazard around the Ariake Bay. Based on the tephrochronological study and ¹⁴C dating, we estimated that the Mayuyama was formed about 4 ka. By the addition of recent research results, we propose the evolution process of Mayuyama.

The volcanic edifice of Shichimenzan and Tenguyama are different from each other. Shichimenzan is a kind of volcanic spine whose surface topography is divided into two parts, one has very steep scarps, and the other has smooth flat slopes which is composed of basement rocks such as mudstone, hornfels, and crumble breccia. The steep scarps were formed by the significant collapse of the enclosing materials which makes inner lava crop out on the surface. On the other hand, Tenguyama is a lava dome with abundant crumble breccia, as evident on the 1792 scarp collapse. Central lava is significantly brecciated.

Mayuyama is located in the central part of Unzen graben, which is an active volcano-tectonic depression. Basement rocks such as Old stage Unzen volcanic and sedimentary rocks can be observed at the base of the Mayuyama collapsed wall. It is speculated therefore that the basement rock materials found near the surface were transported from the original basement rocks during the formation of Mayuyama.

Just a west neighbor of Mayuyama is the Taruki plateau, a tilted mass characterized by its asymmetrical topography, i.e., a steep cliff on the north and a relatively gentle slope on the south. The plateau is composed mainly of volcanoclastic materials which are the main constituents of volcanic fan. Many lineaments, probably formed during the ground deformation are also observed on the plateau. Moreover, 6.5 ka ash of K-Ah and the associated 4 ka ash of Fugendake are strongly disturbed by the faults as observed from a lineament outcrop. These evidences strongly suggest that the Taruki plateau was formed by the crustal movement associated with the formation of Mayuyama.

The differences of volcanic edifice between Shichimenzan and Tenguyama is most likely due to the degree of solidification of magma, that is, the magma of Shichimenzan was more viscous than that of Tenguyama. Tilted topography around the Taruki was probably caused by the intrusion of semi-solid magma into an overlying thin crust. Similar examples of Taruki plateau are the Yaneyama of Showa-shinzan and the Usu-shinnzan (Ogariyama) of Usu volcano, Hokkaido.