Lithological Characteristics of the Basement of Northern Tip of Izu-Bonin Arc

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The lithological characteristics of the basement rock on the oceanic island arc were, examined using a 1450 meter drilled core sample at southwestern flank of the Hakone volcano and a 1500 meter drilled core sample at central crater of the Higashiyama volcano, Hachijojima.

The Hachijojima core sample is divided into three main stages based on lithological characteristics. Stage III (1062-1485 meter in drilling depth) is mainly composed of the turbidite and debrite of basaltic andesite breccia to dacite aphyric lapilli. Stage II (620-1062 meter in drilling depth) consists of basalt to basaltic andesite lava, hyaloclastite and dolerite dykes. Stage I (0-620 meter in drilling depth) is mainly composed of basaltic lava and pyroclastics, which are considered to represent rocks of volcanic edifice of Higashiyama volcano. Some parts of stage III were strongly altered. Lava and intrusive rocks are low-K tholeiite basalt or basaltic andesite.

The Hakone core sample is divided into three parts. The upper part (0-555 meter in drilling depth) consists of andesite lava and pyroclastics which are considered to old somma lavas of Hakone volcano. The middle part (555-1175 meter in drilling depth) consists of dacite to andesite lava and pyroclastics, which are considered to the lower formation of old soma. At 811 meter depth in this part is including fossils. This fossils show 4.5Ma (Mannen et al., 2002). The lower part (1175-1450 meter in drilling depth) is subdivided into three stages based on lithological characteristics. Stage 1 (1340-1450 meter in drilling depth) is mainly composed of the turbidite and debrite of basaltic andesite breccia to dacite aphyric lapilli. Stage 2 (1216-1340 meter in drilling depth) consists of basaltic andesite lava and hyaloclastite. The lava gradually changes to hyaloclastite upward. Stage 3 (1175-1216 meter in drilling depth) , upper most stage, consists of volcanic sand and lapilli. Some lapilli show reddish color on the surface, because of the high temperature oxidization.

The lithological characteristics of stage I on the Hakone core sample are similar to those of stage III at Hachijojima. They are characterized by turbidite and debrite of basaltic andesite breccia to dacite aphyric lapilli, and are comparable to those of Yugashima formation, distributed in the northern tip of the Izu-Bonin arc, under 800 meter in drilling depth core sample, formed after 10 Ka in Izu Oshima, and Oligocene fore arc core sample (ODP site 792).