

Petrography of the deep drilling at the arc-arc collision zone in the Yamakita area, Kanagawa Prefecture, central Honshu, Japan

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The northern end of Philippine Sea Plate subducts beneath, and partly collides with, North-America Plate and Eurasia Plate. This complex plate coordination has not been fully figured out especially at the Izu-arc and Honshu-arc junction. From 2003, deep drilling project was carried out at Yamakita, Kanagawa Prefecture. In the vicinity of the rig site, the trough-filling Ashigara group is thought to thrust up on the southward Hakone Volcano by the E-W trending low-angle faults. Our aims are to clarify the shape and motion of the faults, the relation between the development of Hakone Volcano, and the temporal change of the volcanic ejecta. In the drilling, out of 2,000m total drill-hole depth, shallower 1,076m whole core samples were recovered. We are now investigating the core samples from petrographic and stratigraphic viewpoints.

The core consists mainly of volcanic breccia, lapilli tuff, lava flow, and subordinate conglomerate, sandstone, mudstone. Based on assemblage and proportion of phenocrysts in the lava flows and lava fragments in breccia, the core divided into four groups;

Group I (deeper than 721m) : Two pyroxene andesite

Group II (from 721m to 445m) : Olivine basalt

Group III (from 445m to 221m) : Olivine bearing two pyroxene basaltic andesite

Group IV (from 221m to 13m) : Olivine basalt

Age control data obtained by K-Ar, Fission track methods, fossil zone (Yanagisawa et al., in press) are as follows. Group I pumice tuff (1070.4-1070.5m depth FT age) : 1.1±0.3Ma, lava flow (898.7-898.95m K-Ar age) : 1.45±0.19Ma, Group II lava flow (621.1-621.25m K-Ar age) : 0.34±0.39, 0.30±0.39Ma, lava flow (450.0-450.2m K-Ar age) : 0.31±0.08Ma, 0.28±0.08Ma, Group IV lava flow (210.1m K-Ar age) : 0.55±0.29 Ma, 0.57±0.29Ma. Appearance of *G. oceanica*, *P. lacunose* (calcareous nannofossil from 830.75m shell-sandstone) corresponds to CN13b - CN14a Zone (Okada & Bukry, 1980), which ranges from 1.65 to 0.41Ma.

Besides these, trace of bubble-wall glass shards were detected from 679.35m, 632.3m and 422m deep. They are possibly correlated to wide-spread tephra, Kakuto tephra (0.33-0.34Ma), Aso-1 tephra (0.25-0.28Ma), and Ata-Torihama tephra (0.24Ma), respectively.

We conclude that the deepest Group I is interpreted to be the Pre-Hakone stage in terms of age, distribution and petrography of lava flow. Shallower Groups II, III, IV are classified to the Hakone Volcano Old-Somma (OS) stage. Petrographic similarities of some lavas belonging to Group III on the north to northeast flank of Hakone Volcano support above interpretation. But, we don't have reasonable explanation of age reversal of the Group III and IV (although uncertainty of the age data is large), and have not confirmed the presence of thrusting fault in the drilling core, so far.