

Geological structure interpreted from tephra in boring core and vicinity of the Tachikawa Fault Zone, Tokyo, NE Japan

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In order to clarify the activity of the Tachikawa Fault Zone during Quaternary, an all-core boring survey (95 m in depth) was conducted at Enoki in Musashi-Murayama City. Sediment with a depth 28.70 to 95.00 m is composed of the alternation of gravels, sands and silt, correlative to the Kazusa Group. These sediments contained many tephra layers. Two pumice fall deposits with depths of 61.82 to 61.85 m and 62.42 to 62.89 m have unique characteristic properties. The upper pumice layer mainly comprises pumice (sponge) type of glass shards (maximum diameter: 3 mm) and hornblende, and their refractive indices are $n=1.509-1.511$, $n_2=1.667-1.685$. Chemical composition of the glass shards are SiO₂: 75.6 wt.%, Al₂O₃: 13.8 wt.%, FeO: 1.8 wt.%, CaO₂: 2.4 wt.%, K₂O: 2.5 wt.%. The lower pumice layer comprises hornblende, titanomagnetite, orthopyroxene and cummingtonite and their refractive indices are 1.703-1.708 (γ) for orthopyroxene, 1.668-1.676 (n_2) for hornblende and 1.658-1.661 (n_2) for cummingtonite. These data indicate that upper and lower pumice layers can be correlated with Byobugaura Ob4b-4 and Ob4b-1 Tephra, respectively, in the Obama Formation, Inubo Group, Byobugaura, Chiba Prefecture. Ob4b-5 immediately above Ob4b-4 and Ob4b-1 were dated at 1.62 Ma and 1.63 Ma, and Ob4b-1 was correlated to 1st Horinouchi Tephra in the Oyamada Formation, Kazusa Group in the Tama Hills by Suzuki and Murata (2011).

Additionally, we reexamined tephra in two boring cores (MTB1 Core and Musashi-Murayama Core) at Mitsugi in Musashi-Murayama City (2.7 km northwest of Enoki) and in the Sayama Hills, previously reported by Suzuki et al. (2008). MTB1-9 to -10L Tephra with basal depth of 56.08 m (67.93 m asl) in the MTB1 Core and MM-8 to -8.2 Tephra with basal depth of 36.36 m (88.01 m asl) in the Musashi-Murayama Core have been correlated to SGO Tephra in the Sayama Hills. These tephra have characteristic properties similar to those of Ob4b-1 (=1st Horinouchi Tephra), suggesting their correlation.

Basal altitudes of the Ob4b-1 and its correlative tephra are as follows, Mikatairi, Sayama Hills: 128 m, Musashi-Murayama Core: 88.01 m, MTB1 Core: 67.93 m, Enoki: 37.78 m, Fujimicho-3 chome, Tachikawa: 59 m, Tama River: 70m, Naganuma Park, Tama Hills: 150 m. Changes in these altitudes indicate the uplifting of the northeast side of Tachikawa Fault Zone and the general trend of the geological structure of the Kazusa Group. The altitude at Enoki is 30.15 m lower than that at Mitsugi. This can be explained by the geological structure of the Kazusa Group or the local deformation cause by the Tachikawa Fault Zone.

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