

Late Quaternary tephtras and basin fill sediments under Ukinuman, Murayama city in the north part of Yamagata basin, Nort

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Yamagata basin, one of the tectonic basins aligning along the west part of Ou Backbone Range, Northeast Japan Arc, exists between hills and mountains. Active faults concentrate along the west margin of the Yamagata basin. In the north part of the basin where more active faults were recognized than the south part of the basin, not only marginal faults bordering hills and mountains but also isolated faults in central part of the basin were recognized by Yagi et al. (2001). In order to establish the history of fault activity and landform development in the basin, chronological and sedimentological studies on the basin fill sediments beneath the ground surface is necessary. In this study, an all-core boring (MR-13-1) with a depth of 101.00 m was carried out at Ukinuma (81.40 m a.s.l.), Murayama City, Yamagata Prefecture in October to November, 2013. Preliminary results are as follows.

Stratigraphy

Fine sediments dominate less than 64.60 m in depth, composing of silt to organic silt except three sand and gravel layers with thickness of <1.65 m. Sediments between 64.60 and 101.00 m in depth consist of an alternation of silt, sands, and gravels. Depths of tephtras already identified are 3.34-3.47 m, 35.34 m, and 75.86-76.24 m.

Tephra

A gray to white ash-fall deposit with a depth of 3.34-3.47 m contains hornblende ($n_2=1.670-1.673$) and orthopyroxene ($\gamma=1.709-1.714$). Refractive indices of glass shards is $n=1.499-1.500$. These characteristic properties show that this ash is correlative to Hijiori-Obanazawa Tephra (Hj-O, 11-12 ka; Machida & Arai 2003).

A thin white vitric tephra (4 mm in thickness) at 35.34 m in depth characterized by bubble-wall to stripe types of glass shards ($n=1.496-1.500$; SiO₂: 78.44 wt.%, Al₂O₃: 12.05 wt.%, CaO: 1.08 wt.%, FeO: 1.12 wt.%, K₂O: 3.21 wt.%, Na₂O: 3.40 wt.%) (containing a small amount of quartz) is correlated to Kikai-Tozurahara Tephra (K-Tz, 95 ka; Machida & Arai 2003).

An ash-fall deposit with a depth of 74.86-75.17 m was detected. This tephra contains orthopyroxene ($\gamma=1.724-1.730$), quartz, and sponge to fiber types of glass shards ($n=1.498-1.502$), and is possibly originated from volcano in the vicinity.

In presentation, chemical compositions of glass shards in tephtras mentioned above and ages by carbon 14 dating will be reported.

Keywords: Yamagata basin, Underground geology, Tephra, Late Quaternary, Boring core