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Reconsideration of the Age of Zenkoji Debris Avalanche Deposits

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A great number of hummocks of the Zenkoji debris avalanche are distributed over the southern slope of Usu volcano, south Hokkaido. The hummocks are divided into two types: one is composed of lava blocks of the earlier stage of Usu volcano, and the other of Toya pyroclastic flow deposits(Soya et al., 1981). In previous studies, it has been suggested that the age of the Zenkoji debris avalanche deposits was around 7,000 - 8,000 years ago, because archeological sites of the Early Jomon Period were found on the Zenkoji debris avalanche deposits(Katsui et al, 1973 ; Katsui, 1988 ; Kosugi, 2007).

Several alluvial lowlands distribute among the hummocks. We took two boring cores from the lowland between hummocks of Toya-type, near the coast, east of Arutori Misaki. The cores about 10 m long, mostly consist of peat and organic clay, showing continuous sequence. At the bottom of the core, hard pumiceous deposit having the same chemical composition of the Toya pyroclastic flow was found. In the lowest horizon, small pumiceous blocks were intercalated in organic clay.

At least two tephras, Ko-g (from Komagatake, 7,000 y. BP) and Ng (from Nigorikawa caldera, 15,000 y.BP) are identified in the upper and the lower organic clay of the cores. Age determination of the peat and organic clay samples were done by AMS C-14 method. The result shows about 20,000 cal. BP. for the organic clay of - 8.7 m. Pollen analysis for the peat and organic clay clarified that the subarctic coniferous forest was dominant in the lower half of the core, and the Younger Dryas event can be detected from - 6.6 m to - 6.7 m.

Therefore , these facts suggest that the age of the Zenkoji debris avalanche deposits and the collapse of the Usu volcano must have been LGM (the last glacial maximum).

References:

Katsui , Y. et al. (1973) Geological map of Usu Volcano (1:25,000) ; Katsui, Y. (1988) Geological Evolution and Historical Eruptions of Usu Volcano ; Kosugi, Y. (2007) Post-glacial environmental changes and human adaptations in the area along the bay of Volcano ; Soya, T. et al. (1981) Geological map of Usu volcano (1/25,000).

Keywords: Usu Volcano, Zenkoji Debris Avalanche, Drilling, AMS Dating, Tephra