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Late Quaternary Tephrostratigraphy of Marine Cores off Joetsu, Japan

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The piston cores and gravity cores from off Joetsu in the southeast Japan Sea contain widespread tephras from distal volcanoes in the Kyushu, Chugoku, Chubu, and Hokkaido area. Identification of these tephras is based on the mineral composition, and the morphologic feature and chemical composition of volcanic glass shards.

Since the Joetsu offing is located near the center of the Japanese islands, the place is advantageous in a tephra study geographically. In addition, sedimentation rate in this area is faster than in the other spots of Japan Sea because this area is near the shore. This means that this area has potential to reconstruct paleoenvironment with high resolution. MD179-3312 core with the length of about 32 m is the main target of this study, and the recovery of the core is regarded as 100%.

On the basis of the stratigraphy, petrography, and chemical composition of volcanic glass shards measured by microprobe analyzer (SEM-EDS; JEOL JSM-6390LA), tephras can be correlated to the As-K, Jo-2, AT, On-Ng, Aso-4, On-Kt, K-Tz, SK, Toya in descending order. As-K, AT, Aso-4, On-Kt, K-Tz, SK have been already found around the Sado Island, and the source of supply volcano has been known (Machida and Arai, 2003). Fernando(2010) finds two marker tephras of Jo-1 (Joetsu 1 tephra) and Jo-2, and former of which we compared with As-K. We discovered On-Ng and Toya at around this area for the first time. Furthermore, the tephra found in the lower of Toya through this project is correlative to Hikage-2 (HK-2: Nagahashi et al., 2007), although SiO₂ of the volcanic glass is slightly lower than that of HK-2. There are some drift pumices (diameters are about 2-4mm) which might be correlative to On-Pm1 between K-Tz and SK based on its stratigraphic position. But it deviates from chemical composition of volcanic glass of On-Pm1.

This study expanded the isopachs of On-Ng and Toya. If the correlation between lower tephra of Toya and HK-2 is true, it indicates at least one of the eruption ages of Toya (113-114ka: Ganzawa et al., 2007) or HK-2 (105.9ka: Nagahashi et al., 2007) should be revised. In addition, If the drift pumices above can be correlated with On-Pm1, it means the Pm1 pumices were transported by Jinzu River and drifted in the Japan Sea.

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