

## Grain Size Composition of Crevasse Spray Sediments in the middle part of Kinu River

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Crevasse splays are distributed along the left bank in the middle part of the Kinu River, central Japan. Although Sadakata (1972) suggested that crevasse splays had been formed during the 200–300 years around the 13th century, detail geomorphological development process has not been clarified due to the lack of their grain size composition and formation age. The purpose of this study is to clarify detail sedimentary process of crevasse splays based on coring survey, radiocarbon dating and grain size analysis of three boring cores, GS-JIS-6 to 8, drilled on a crevasse spray around the Ishige district, Joso City. Grain size analysis was performed at 1 cm intervals using a laser diffraction particle size distribution analyzer of Niigata University.

Sediments found in GS-JIS-6 to 8 cores are roughly classified into three units, Units 1 to 3 in ascending order. The Unit 1, 9.0 to 12.5 m T.P., consists of organic silt and silt with fine sand, and presumed to be back marsh sediment. Radiocarbon ages of 2,797–2,953 cal BP and 3,576–3,695 cal BP were obtained from this unit. The Unit 2 is found around 11 to 12 m T.P., which overlies the Unit 1, in only GS-JIS-8 core and consists of medium sand with granules. Coarser sand including plant fragments suggests that this unit is river channel sediment. Radiocarbon ages of 1,175–1,280 cal BP and 1,289–1,348 cal BP were obtained from the Unit 2. The Unit 3 composes of alternating layers of very fine to medium sand and silt and is found above 12 to 13.5 m T.P. Higher and thicker distribution toward west suggest that this unit should be crevasse spray deposits. From the bottom of the Unit 3, radiocarbon ages of 731–903 cal BP to 798–955 cal BP were obtained.

Number of sandy layers in the Unit 3 suggest that crevasse spray was formed by at least three flooding events. Thickness of each sand layer ranges between 2 cm and 1.1 m, and increases upward, which suggesting that the crevasse spray prograded eastward, from river channel to floodplain side.

Radiocarbon ages of Unit 3 indicate that crevasse splay deposits deposited after ca. 700–900 cal BP, which is consistent with Sadakata (1972). Thin sand layers at the base of Unit 3 with a thickness of 2 to 4 cm consist of vary fine to fine sand with thin mud drape. Geometric mean [GM] of grain size of these thin layers range between 40 and 240  $\mu\text{m}$ , showing coarsening upward. Thick sand layers distributed above thin layers can be subdivided into two or three subunits, Subunits A to C in ascending order, based on grain size composition. Subunit A, with 5–10 cm thickness, consists of very fine sand to fine sand coarsening upward as well as thin sand layers, and Geometric Standard Deviation [GSD] is around 4. Subunit B consists of fine to medium sand with about 10 cm thickness. GSD of this subunit is around 4–7, indicating poorer sorted deposit compared to other subunits. The Subunit C consists of fine to medium sand with granules, showing upward fining. Thickness of this subunit, around 20 to 100 cm, is largest in the Unit3 sediments. In addition, GSD is measured to be around 2–3 and increasing upward, which indicates that sorting becomes poorer upward. Composition of these thick sand layers shows differences among coring sites. For example, Subunit B was found only in the GS-JIS-6 core. This subunit may be corresponding to the upward fining sandy sediment immediately after the Kinu River breaching during the 2015 flooding (Sato et al. 2017).

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**References**

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