Features of sand volcano caused by the 2024 Noto Peninsula earthquake: preliminary descriptions of the sediments erupted from land cracks in a dry field, Niigata, Japan

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The 2024 Noto Peninsula Earthquake hit the Nishi Ward of Niigata City, located approximately 150 km from the Noto Peninsula, with an intensity of 5+ on the Japanese seismic scale. Consequently, ground liquefaction, deformation, and subsidence occurred broadly in the Niigata Dune and its backward lowlands. For Niigata City, the earthquake was a large-scale liquefaction event since the Niigata earthquake in June 1964. The deposits from sand volcanos formed by liquefaction had various forms and sizes, depending on the topography and geology. The deposits from sand volcanos formed by the liquefaction of the earthquake had various forms and sizes, depending on the topography and geology. In this survey, a large number of sand volcanoes were observed in a dry field in Shindori, Nishi-ku, Niigata City. Some of these volcanoes were associated with land cracks and reached a meter scale. After the survey, the lithological description, preparation of peel specimens, and grain size analysis were conducted in the laboratory. Depending on the geometry of the field surface, the transect was set obliquely at an angle of approximately 60˚ to the land cracks. The maximum thickness of the sediments that erupted from the large crack was approximately 13 cm near the cracks, but it decreased to less than 1 cm from the cracks. Based on observations of the peel specimens, parallel lamination was observed in the sand. An inversely graded structure was also observed in the deposits at a distance of approximately 3.5 m from the crack along the transect, with a thin layer of mud at the base and overlying sand. This may be explained by the fact that sand erupted after the first discharge of muddy water from the cracks due to liquefaction. The results of the grain size analysis will be examined in the future.

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