Sedimentary structure and composition of sand blows and sand dikes formed by the 2018 Iburi-Tobu Earthquake, Hokkaido, Japan

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The M6.7 Hokkaido Iburi-Tobu Earthquake of September 6th, 2018, left sand blows and sand dikes result from liquefaction at Tomakomai, Atsuma, and Mukawa. We investigated distribution, shape, sedimentary structure and composition of the new deposits. Sand blows are mainly observed in flat areas on coast and estuaries that have undergone artificial modification. Size of the sand blows varies from several tens of centimeters to several meters in diameter. Each sand blow has a vent or vent system that aligned along a fissure. Sand blows are composed by fine to coast sand, mud, pebbles and various size of pumice. A layered structure is commonly seen in the cross-section. In most of the case, mud, pumice, and sand are deposited in order from the bottom to the top of the deposit. It seems that the mixed layer of sand and pumice in the landfill soil liquefied and sand and pumice separated in the layer. Then they ejected with mud from the accumulated light particles near to the vent. The sand dikes are observed by trenching or by using a handy geo-slicer. Most of the dikes are not straight, they are curved or bent along the boundary of the inhomogeneous medium around them. The width of the dikes vary from 1 mm to 10 cm, and they are filled with sand or pebbles that are the same materials as those came out at the final stage of the ejection. There are dikes that are clogged from the bottom with pumice and coarse sand. In those dikes, the size of the particle filling the dike decreased upward with the clogged location as the boundary. Thus, a feature of sand blow and sand dike can be complicated reflecting the size and density characteristics of the particles constituting the liquefaction layer. The precise description of the new sand blows and sand dikes can provide a better understanding of the liquefaction process and also can be useful for the identification and evaluation of paleo liquefaction deposits.

Keywords: liquefaction, sand blow, paleo-eathquake

