Distribution of eolian sand on the hills along the west coast of the Noto Peninsula, central Japan

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Coastal sand dunes are distributed widely along the coast of the Japan Sea. The Togi dune, which is 3 km in length, 2 km in width, and 45 m in altitude at its highest point, and was formed in Holocene, lies on the west coast of the Noto peninsula (Fuji, 1975). On the rocky shore south of the Togi dune, Hattori et al. (2014) found old sand dunes, which reached an altitude of 30 to 50 m with interbedded tephra of Pleistocene age, along approximately 10 km of the coast, even though this area have been recognized to have widely distributed marine terraces (e.g., Koike and Machida, 2001). This result implies that eolian sands are possibly distributed widely around the shore south of the Togi dune. However, the research area of Hattori et al. (2014) has been limited, so that we need to examine a detailed distribution of eolian sands. The objective of this study is to characterize the distribution of eolian sands on the inner hills by conducting boring and outcrop surveys, and to determine their depositional ages based on buried soils and tephra analysis.

The survey reveals that the sediments which overlie the andesite of basement rock consist of sand and gravel bed, sand bed, and soil in ascending order in the study area. The sand and gravel bed is distributed locally, less than 1 m in thickness, and consists of sub-rounded andesitic gravels. The sand bed is 5–30 m in thickness and is composed of mainly fine to medium sand that is well sorted and contains parallel laminae with interbedded coarse layers. Buried soils are interbedded in the sand layer, and the number of these layers increases with the distance from the coast. We detected AT (26-29 ka), K-Tz (95 ka), and SK (110-115 ka) in the sand layer, buried soils and soils from the tephra analysis (the ages of tephra are quoted from Machida and Arai, 2003). The upper part of the buried soils is eolian, because it deposited after emergence and lacks the surface of unconformity. The lower parts are also interpreted to be eolian from the similarity of facies between sand layers and its thickness > 20 m.

From the above results, we estimate that the distribution area of eolian sands of Pleistocene reaches over 0.9 km along the coast and 1.6 km toward inside from the coast around the shore south of the Togi dune. We consider that eolian sand had been intermittently supplied from the mid-Pleistocene to present in this area, as it contains K-Tz and SK tephra and buried red soils interpreted to have formed during interglacials. The center of the sedimentary deposition varies from inward to seaward over time with some pauses based on the increase of the number of the buried soils and the decrease of the thickness of the sand layer between the K-Tz and SK tephra with the distance from the coast.

Keywords: the Noto Peninsula, eolian sand, dune

