Grain size and OSL dating of river bank dune deposits: an example from the Kiso River, central Japan

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River bank dunes are common along the left side bank of the Kiso River. Existing studies have reported the distribution of dunes and the grain size of dune surface deposits. However, the vertical change of grain size of dune deposits is poorly known. Additionally, the age of dune formation is unknown because organic matter suitable for radiocarbon dating is uncommon in the dune sand. This study used a sand auger to dig the dunes up to a depth of 6 m, took the dune deposits, and performed the grain size analysis and optically stimulated luminescence (OSL) dating of the deposits. Grain size analysis of sand deposits shows that median grain size is 0.20–0.45 mm and vertical variation in grain size is relatively small. The size is similar to the present river bed sand. Ages from feldspar infrared-stimulated luminescence (IRSL) at 50°C are 0.2–0.7 ka, and the youngest age of 0.2 ka indicate that residual doses are negligible. In contrast, post-IR IRSL measurements at 150°C yielded 0.5–2.7 ka, which are significantly older than those from IRSL at 50°C because of incomplete bleaching. IRSL ages suggest that the dunes have formed since approximately 600–700 years ago. The beginning of dune formation may be related to anthropogenic influence in the drainage basin.

Keywords: river bank dune, OSL dating, Holocene