

HQR010-11

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## Holocene paleohydrology and geomorphology of River Lepsi, Kazakhstan

Toshihiko Sugai<sup>1\*</sup>, Hitoshi Shimizu<sup>1</sup>, Reisque Kondo<sup>2</sup>, Kunihiko Endo<sup>2</sup>, Yasunori Nakayama<sup>2</sup>, Yoichi Hara<sup>2</sup>

<sup>1</sup>GSFS, University of Tokyo, <sup>2</sup>Nihon University

River Lepsi is the third largest river in the Balkhash lake catchments. Fluvial geomorphology, sedimentology and radiocarbon dating have been used to reconstruct variations in flooding and hydrological changes during the Holocene at four sites along the lower Lepsi catchments in Kazakhstan. Three terrace levels of LRT 1, 2, and 3 were indentified along the Lepsi valley and lots of datable organic materials were sampled from exposed channel bank sections. The highest and oldest terrace of LRT 1, with relative height of 10 to 15 m above the local river bed level, was probably formed in the last glacial period under the periglacial environment. The middle terrace of LRT 2 with relative height of 3 to 6 m above the river bed level is composed of five or six alluvial units characterized by a pair of well-sorted sand and peaty silt layers. The ages of the dated samples from the peaty layers and their elevations indicate that valley floor aggradations had already started c.4000 cal BP and that channel bed incision occurred after c.400 cal BP. This is concordant with the fact that the top of LRT 2 was generally covered with very fine reddish aeolian sand layer with a thickness of a few ten cm. LRT 3 can be considered as a fragment of the river bed formed by recent ( 1969 ? ) large flooding event because of lack of soils and aeolian sands. To summarize, five or six major flooding episodes may be identified during the mid Holocene and these episodes probably influenced the Balkhash lake level changes.

River Lepsi develops a delta at the mouth with a relatively steep slope of about 0.5/1000, which is almost equivalent of that of upper reaches. Because of the steeper slope of offshore bottom, lake level drop probably accelerates upstream river incision. The delta surface was partly terraced and correlated with LRT 2. Geomorphic analysis of the delta indicates that fluvial-dominated lobes and wave-dominated lobes were formed alternately associated with lake level drop and rise, respectively. These twenty years are in the wave-dominated phase and shoreline retreat is visible everywhere along the coast.

Keywords: fluvial landform, radiocarbon dating, hydrological environment, Kazakhstan, arid region, paleoflood