

Paleoenvironmental changes in Lake Khuvsgul catchment, Mongolia inferred from sediment core on eastern shore during the Holocene

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Paleoenvironmental studies in continent can result from the crucial objectives on long-term records from lacustrine sediments. Lake Khuvsgul provides us not only data about major climatically controlled events over a million year history like as Lake Baikal, but also gives us detailed information about local events associated with short-term climatic fluctuations in Holocene. Present study has focused on the environmental changes and sedimentation evidences in Lake Khuvsgul catchment during the Holocene inferred from a sediment core (BO03 core) in eastern shore, Bortsog Bay in order to review records of the Holocene climatic evolution in Northern Mongolia. Some physical and chemical properties for the BO03 core showed distinctly the four boundaries of the natural events occurred in the Lake Khuvsgul during the Holocene. A close correlation of the Bio-SiO₂ with organic matters than with HCl-soluble materials within the sediments shows that Bio-SiO₂ likes more acid condition than alkaline condition and their relationships seem different depending on the lake sediments. The HCl-soluble materials occurred highly in cold period as like as in HDP04 and was deposited into the sediments in the Bortsog Bay by adsorption of basalts including the sub-alkalines from the volcanic lava along the eastern shore of the lake. The sedimentation rate resulted from a modified age model by ¹⁴C method was suggested as meanly at about 0.1 cm/yr or 0.07 g/cm²/yr. The distribution of mineral grain size shows that mineral fractions are broadly consistent with large surface discharge in a mid-Holocene climatic optimum and late Holocene thermal optimum. The rich coarse minerals in the BO03 core imply that overland flow has been extremely occurred in the Bortsog Bay within the Lake Khuvsgul catchment due to not only thaw-melting water, but also base-flow associated with presence of thick permafrost around Khuvsgul region.