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Paleoclimatic investigations during the late Quaternary using gravity core sediments of Lake Hovsgol in Mongolia

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The Lake Hovsgol is located in northeast Eurasia which is a tectonic lake formed by rifting, and its thick bottom sediments record climatic change of the past. The lake is a suitable site to study a rapid Quaternary climate change. This study includes analysis of smear slides, particle size analysis, data of spectrophotometer and magnetic susceptibility, trace element analysis using XRF core scanner for HS-3, 5 gravity core sediments from the middle southern Lake Hovsgol. HS-3 core sediments were measured for TOC, and HS-5 core was scrutinized for species analysis of ostracods. HS-3 core was obtained at 160 m water depth, and is divided into three sedimentary units. Unit A of HS-3 is characterized by distinct lamination, high sand contents considerably decreasing towards the upper part, and the ostracods are rarely discovered at the upper part of Unit A. Unit B is characterized by weakly lamination, and some ostracods are observed in the lower part, but diatoms are observed in the upper part of Unit B. Also grain size is getting smaller toward the upper part. Unit C consists of fine diatomaceous ooze and contains abundant diatoms. Overall organic contents are high, and lamination with black-colored organic layer is observed in the lower part of Unit C. HS-5 core was obtained at 210 m water depth and is divided into two sedimentary units with faint boundary. Unit A of HS-5 is characterized by lamination and contains abundant diatoms and ostracods. At Unit B, grain size is getting smaller toward the upper part, and occurrence change of ostracods is observed in the upper part. Framboidal pyrite were formed during the diagenesis. Four species of ostracods are observed in the core sediments, i.e. Cytherissa lacustris, Limnocythere inopinate dominate in the lower part, and Candona lepnevae, Leucocythere sp dominates in the upper part. Carbon age dating results show that sediment unit B of HS-5 and unit C of HS-3 containing rare ostracods are similar in age. The reason of low occurrence of ostracods fossils and high content of sand is consistent with that ostracods disappeared as temperature rise or inhabitant change since late LGM. An age of sediment unit B of HS-3 is the Last Deglacial period when organic contents increased obviously and contents of sand decreased as the lake level rose. The change of magnetic susceptibility and Fe/Al, Ca/Al and Si/Al ratio values are observed at 90 cm depth section of HS-3, which indicates that input sediments changed as the lake level fell due to a temporal cooling at Younger Dryas during the Last Deglacial. The age of the sediment unit C of HS-3 is Holocene. At this period, high contents of organic materials were caused by increase of nutrition input because of a thick vegetation cover as temperature rose, and thus diatom blooming. The organic strata containing mica minerals at early Holocene have been formed during fall or stagnation periods of the lake level. We interpreted that those are closely related to the global environmental change.