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Environmental changes at the Holocene-Late Pleistocene transition: Sedimentation on Akademicheskii Ridge (Lake Baikal, Russia)

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Akademicheskii Ridge of Lake Baikal represents a 300 m deep underwater rise, which separates the Central Basin (1647 m water depth) and the North Basin (970 m water depth) of 640 km long lake. The large distance to the turbid load of particle-carrying tributaries and coastal areas as well as the absence of slide induced turbidites are responsible for low sedimentation rates. A large number of short cores (approx. 120 cm) was used to study in detail the Holocene-Late Pleistocene transition, using lithological composition, magnetic susceptibility, microfossils, pollen and spores, chemistry, grain size and mineral composition.

Holocene sediments show sedimentation rates from 0.015 to 0.25 mm y^{-1} and are mainly composed of biogenic material with rare admixtures of aeolian and ice-rafted terrigenous particles [1]. The sediments are characterized by abundant microfossils, such as diatoms, spicules of sponges, chrysophyte cysts, pollen and spores. Holocene diatom assemblages are representated by *Aulacoseira baicalensis*, *A. skvortzowii*, *Cyclotella minuta*, *C. baicalensis*, *Synedra acus var.radians*, *Stephanodiscus meyerii*, *Crateriportula inconspicuus* and *Cyclostephanos dubius* [2]. Concentrations of $C_{org.}$,$N_{tot.,}$and $Si_{biog.}$indicate clearly higher productivity of the lake during the Holocene [1].

Late Pleistocene sediments are composed of clastic, fine-grained, clayey material, mainly of terrigenous origin. This includes also aeolian particles and rare ice-transported sandy material and rock debris. A peak of the diatom species *Stephanodiscus flabellatus*, observed within the upper part of clayey sediments, defines the Late Pleistocene-Holocene transition [2].

Very low contents of microfossils (diatoms, spicules of sponges, chrysophyte cysts etc.) within Late Pleistocene deposits indicate lower productivity of Lake Baikal. Glacial melt-water dominated the sediment transport processes within the lake during this time.

The main minerals of the sand fraction are quartz, feldspars and mica. The heavy mineral assemblage contains amphiboles, pyroxenes, epidote, sphene, magnetite, garnet and chloritoide. Within the Holocene, contents of chloritoide are low (0.6-1.2 %), but they are distinctly higher within the Late Pleistocene sediments (3.2-14.6 %) [1]. An increase of chloritoide in sediments points towards an intensification of aeolian transport by stronger winds and longer-lasting periods of ice cover during the Late Pleistocene [3]. Results of pollen analyses support these findings. They indicate that mountain slopes of the catchment of Lake Baikal were mostly uncovered by vegetation.

A polymineral composition is characteristic for the clay fraction of Late Pleistocene deposits: hydro-mica, kaolinite, smectite and chlorite. This is caused by extensive glaciation of the catchment of the lake during this time [4], generating increased transport of terrigenous material to the lake by glacial melt water [5].

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