Galina BOLOBANSCHIKOVA and Denis ROGOZIN, 2014. Analysis of Diatoms of the Water Column and Bottom Sediments of Lake Shira (Khakassia, Russia). *Acta Geologica Sinica* (English Edition), 88(supp. 1): 56-57.

Analysis of Diatoms of the Water Column and Bottom Sediments of Lake Shira (Khakassia, Russia)

Galina BOLOBANSCHIKOVA[1] and Denis ROGOZIN[1,2]

1 Institute of Biophysics Siberian branch of RAS Akademgorodok, 50/50, Krasnoyarsk, 660036, Russia
2 Siberian Federal University, Svobodny 79, Krasnoyarsk, 660041, Russia

Meromictic lakes are interesting objects for study in terms of paleolimnology. The lamination of the bottom sediments well expressed in these lakes. It is related with permanent stratification of the water column. Through this in the lake bottom layer of water – monimolimnion - is formed. It is promotes conservation of the newly deposited sediments. Lake Shira (Khakassia, Russia) is one of such lakes. Analysis of the bottom sediment: comparison results with dating layers, climate data of the lake location and seasonal vital activity organisms in the lake at present time, can report us about climate in the past, and we can predict the future climate in the presence of periodicity in the results. Diatoms are one of the widely-bioindicators of the lake condition. They have a silica shell, which preserved in bottom sediments for thousands of years. The purpose of this research was study contemporary species and quantitative composition of diatoms in the sediments traps and in the water column and comparison it with fossil composition of diatoms at the top of bottom sediments in the lake Shira.

Analysis of seasonal dynamics of species composition diatoms in water samples, sedimentation traps and core of bottom sediments of the lake was shown that Cyclotella choctawhatcheeana Prasad dominated in water samples and sediment material during all study period. In the investigated core diatoms were found above the white carbonated layers. In other layers diatoms were absent. The specie Cyclotella choctawhatcheeana and other diatoms were found above the first white carbonated layer. These species attend in the lake at present time. That suggest the condition of the lake remains invariable from 1946 [Popova, 1946].

The species Aulacoseira valida (Grunow) Krammer и A. ambigua (Grunow) Simonsen were dominant at the layers above the second white carbonate. The species Nitzschia sigmoidea (Nitzsch) W.Smith, Fragilaria construens var. venter (Ehrenberg) Grunow. met sporadically. These species are freshwaters and belong to the group of Arctic, Alpine and temperate latitudes diatoms. These groups are common in the shallow reservoirs with the medium temperature and the layers of the core where they were found dated approximately 1655-1690 years. That suggests the lake Shira was less salty in the middle and the end of the 17th century than at present, and climate was colder.

Fig. 1. Lake Shira (Khakassia, Russia).

Key words: paleolimnology, meromictic lake, sedimentation, diatoms, Cyclotella choctawhatcheeana, Aulacoseira valida, Aulocoseira ambigua

References

Genkal S.I. 2012. Morphology, taxonomy, ecology, and distribution of Cyclotella choctawhatcheeana prasad (Bacillariophyta). // Inland Water Biology. Vol. No. 2. P. 169–177.

Kalugin I., Darin A., Rogozin D., Tretyakov G. Seasonal and centennial cycles of carbonate mineralisation during the past 2500 years from varved sediment in Lake Shira, South

* Corresponding author. E-mail: galina.ibp@mail.ru

Siberia // Quaternary International. V. 290-291C. 2013. P. 245-252.

Lange-Bertalot, H. 2001. Navicula sensu stricto. 10 Genera separated from Navicula sensu lato. Frustulia // Diatoms of Europe: diatoms of the European inland waters and comparable habitats. Vol. 2. P. 1-526.: A.R.G. Gantner Verlag. K.G..

Levkov, Z. 2009. Amphora sensu lato. In.: H. Lange-Bertalot (ed.) // Diatoms of Europe: Diatoms of the European Inland Waters and Comparable Habitats. Vol. 5. P. 5-916.: A.R.G. Gantner Verlag K.G.

Makeeva E. G., Naumenko Y. V.. 2012. Data on the Flora of Algae Bacillariophytha of Shira Lake (Russia, Khakasia) // Contemporary Problems of Ecology. №3. pp: 351-359.

Tracey B., Lee N., Card V. 1996. Sediment indicators of meromixis: comparison of laminations, diatoms, and sediment chemistry in Brownie Lake, Minneapolis, USA // Journal of Paleolimnology 15 (2). P. 129 – 132.

AlgaeBase – a database of information on algae that includes terrestrial, marine and freshwater organisms. http:// algaebase.org