



Dear Friends,

Twelve years ago, we dedicated an issue of this journal to Baikal – the deepest and most ancient fresh lake of the planet featuring the greatest biodiversity among freshwater lakes. Over half of Baikal animals and up to 10% plants are endemics, that is, do not occur anywhere else in the world.

Our journal published materials about the bacteria capable of destroying hydrocarbons at very low temperatures, which can be of interest for the developers of biotechnologies to control oil contamination (Invisible guards of Baikal by Olga N. Pavlova); communities of ice “jungles” inhabiting the pores and canals of melting ice (Ice as the keeper of life by Nina A. Bondarenko, Lyubov A. Obolkina and Oleg A. Timoshkin); “methane preserves” – gas hydrates first lifted from the bottom of the freshwater lake in 1997; the unique chronicle of sediments, many kilometers long, that can be read with the help of diatom algae, and about many other phenomena of Baikal.

In 2011, SCIENCE First Hand was the first official Russian mass medium to break the news of a troubling event: the disease and death of Baikal’s endemic filtering sponges that keep the lake water clean (What has happened to Lake Baikal Sponges? by Aleksei E. Bormotov.

The latest expeditions conducted by the Irkutsk-based Limnological Institute SB RAS have found that the negative phenomena span the 1,800-kilometer perimeter of the lake shallow water. Thousands tons of putrefying spirogyra cover the lakeshore, and Baikal’s underwater landscapes have changed beyond recognition because of the dead sponge “forests” and a thick layer of slime spreading over the offshore bottom.

In an attempt to explain these fast changes, researchers have put forward a lot of hypotheses. Some of them refer

to the previous stages of warming resulting in similar changes or to more disastrous global warming and thinning of the ozone layer. There are some more exotic events like the return to Baikal of huge flocks of cormorants or emergence of a new spirogyra species. And yet the most likely cause, according to the specialists of the Limnological Institute, is the excessive income of biogenic elements (nitrogen and phosphorus) together with inadequately treated industrial and especially household effluents. This seemingly simple answer generates a lot of new questions. Why do the contaminated shallow waters not exchange with the main sea of Baikal? What is the connection between the crisis events that happen virtually simultaneously? What mechanisms are at the heart of the stability of the lake ecosystem, and what does the near future have in store for us? There are no answers to these questions so far.

*In the new issue of the journal, young scientists of the Limnological Institute SB RAS, together with their leaders Academician M.A. Grachev and Doctor of Biology E. V. Lishovai, share with us their insight into the remarkable dwellers of Baikal, which continue doing their everyday work, invisible yet necessary for the lake. You will find out about the crownwork on the “teeth” of epischura, a tiny crustacean that is one of the main filter-feeding organisms of the lake and basal feed for the Baikal cisco; the role of Baikal fish in controlling arteriosclerosis and age-dependent mental deficiency; and mapping the entire genome of the diatomic algae *Synedra acus*.*

Despite many problems, Baikal lives on, and limnologists continue with their research of the mechanisms underlying the functioning of this complex system, where infinitely small reasons can generate infinitely great consequences.

Academician Nikolay L. Dobretsov,
Editor-in-Chief

A handwritten signature in black ink, appearing to be 'N. L. Dobretsov', written in a cursive style.