Lake Baikal Bibliography, 1989- 1999

This is a bibliography of 839 papers published in English in 1989- 1999 by members of Limnological Institute of RAS SB and by their partners within the framework of the Baikal International Center for Ecological Research. Some of the titles are accompanied by abstracts. Coverage is on different aspects of Lake Baikal.

Adov F., Takhteev V., Ropstorf P. Mollusks of Baikal-Lena nature reserve (northern Baikal). // World Congress of Malacology: Abstracts; Washington, D.C.: Unitas Malacologica; 1998: 6.

Afanasyeva E.L. Life cycle of Epischura baicalensis Sars (Copepoda, Calanoida) in Lake Baikal. // VI International Conference on Copepoda: Abstracts; July 29-August 3, 1996; Oldenburg/Bremerhaven, Germany. Konstanz; 1996: 33.

Afanasyeva E.L. Life cycle of Epischura baicalensis Sars (Copepoda, Calanoida) in Lake Baikal. // J. Mar. Syst.; 1998; 15: 351-357.
Epischura baicalensis Sars is a dominant pelagic species of Lake Baikal zooplankton. This is endemic to Lake Baikal and inhabits the entire water column. It produces two generations per year: the winter - spring and the summer. These copepods develop under different ecological conditions and vary in the duration of life stages, reproduction time, maturation of sex products and adult males and females lifespan. The total life period of the animals from each generation is one year. One female can produce 10 egg sacks every 10 - 20 days during its life time. The ratio of males and females is 1:1. One of the most essential features of the ecology of E. baicalensis is the alteration of its mass inhabited areas during a year, as well as in day time. This is due to the need for various conditions for gonad maturation, reproduction, nourishing and protection from being consumed by planktivors.

Afanasyeva E. Long-standing dynamics of the structure of Epischura baicalensis from Lake Baikal. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 230.

Agar S.M., Klitgord K.D. Rift flank segmentation, basin initiation and propagation: a neo-tectonic example from Lake Baikal. // J. Geol. Soc. London; 1995; 152: 849-860.

Ahn T.-S., Hong S.-H., Kim D.-J., Suck J.-H., Drucker V.V. The bacterial community of southern Lake Baikal in winter. // J. Microbiol.; 1999; 37(1): 10-13.
The bacterial abundance, proportion of respiring bacteria, and bacterial community of south-ern Lake Baikal were analyzed at 1 m and 400 m depths during winter. The total bacterial numbers were 5.1 x 10 5 cells ml -1 at 1 m and 2.5 x 10 5 cells ml -1 at 400 m depth, which are about half and quarter of the numbers of other lakes. The proportion of respiring bacteria was as low as 2.5% at 1 m and 1.4% at 400 m depth. Considering the amount of organic carbon which need to be degraded and low proportion of respiring bacteria, the bacteria could be assumed to have high activities. The EUB/DAPI ratios were 77 and 89% at 1 m and 400 m depths, respectively. Of the bacterial community, the 'other' group was dominant at both depths, and gamma group of proteobacteria followed next. But the beta group of proteobacteria and Cytophaga-Flavobacterium groups occupied very small proportions.

Alatin S.D., Belolaptikov I.A., Bezrukov L.B. et al. Physics capabilities of the second-stage Baikal detector NT-200. // Nuclear Physics B (Proc. Suppl); 1992; 28A: 491-495.

Amano M., Miyazaki N., Petrov E.A. Age determination and growth of Baikal seals (Phoca sibirica). // Biodiversity, Phylogeny and Environmental in Lake Baikal. Miyazaki N. ed. Tokyo,

Japan: Otsuchi Research Center, Ocean Research Institute, The University of Tokyo; 1999: 103-111.
Ages of 75 Baikal seal specimens were determined in order to study growth pattern of body length and body weight. Longitudinal decalcified and stained sections of canine teeth were prepared and growth layer groups (GLGs) in the dentine and cementum were counted. The GLG counts in dentine agreed well with those in cementum for the specimens younger than 10 GLGs. After that the cemental GLGs tended to exceed dentinal ones. The present sample lacked individuals of 4-5 years old, suggesting the mass mortality of Baikal seals in 1987-88 affected the age composition. Growths of body length, body weight and core weight cease around 15 years old. Asymptotic body length and core weight were significantly different between sexes, while body weight was not. Female body weights tended to be heavier than those of males with the same body length. This is attributed to the thicker blubber of females.

Amano M., Miyazaki N., Petrov E., Grachev M. Characteristics of growth, external morphology and organs of Baikal seal, Phoca sibirica. // Report on "Studies on the animal community, phylogeny and environments in Lake Baikal"; 1994; 121: 25-41.
Note: in Japanese with English summary.

Amelio S., Mattiucci S., Paggi L., Koie L., Podvyaznaya I., Pugachev O., Rusinek O., Timoshkin O., Nascetti G. Taxonomic rank and origin of Contracaecum osculatum baicalensis Mozgovoi and Ryjikov, 1950, parasite of Phoca sibirica from Lake Baikal, with data on its occurence in fish hosts. // IVth Int. Symposium of Fish Parasitology: Abstracts; Oct. 3-7, 1995; Institute of Zoology, Fish Biology and Fish Diseases. Univ. of Munich. Munich, Germany; 1995: 27.

Anoshko P.N. Pelagic Cottoid fishes of Lake Baikal: Part 2. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Japan; 1997: 22.

Anoshko P., Zubina L. Life history, oogenesis and allometric growth of Comephoridae (Pisces: Cottoidei) of Lake Baikal. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 223.

Appleby P.G., Flower R.J., Mackay A.W., Rose N.L. Paleolimnological assessment of recent environmental change in Lake Baikal: sediment chronology. // J. Paleolimnol.; 1998; 20: 119-133.

Arov I. Species diversity of Rotifera communities in the psammal of Lake Baikal. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 237.

Babanazarova O.V., Likhoshway E.V., Sherbakov D.Yu. On the morphological variability of Aulacoseira baicalensis and Aulacoseira islandica (Bacillariophyta) of Lake Baikal, Russia. // Phycologia; 1996; 35(2): 113-123.
Reliable identification of the diatoms is of crucial importance to understand the changing environmental signals stored in the sediments of Lake Baikal. Light and scanning electron microscopy combined with mathematical methods, including principal components analysis, were used to estimate morphological diversity in the structure of mantles of the two dominant species of Lake Baikal, Aulacoseira baicalensis (K. Meyer) Simonsen and Aulacoseira islandica (O. Muller) Simonsen. Species-specific features, such as areolar density, ultrastructure and form of linking spines, were found to be widely variable within cells of the same filaments of A. baicalensis This finding suggests that the diagnosis of this species will have to be broadened. Besides the thin-walled frustules and the ability to form spores, the population of A. islandica in Lake Baikal is characterized by a higher density of areolae on the mantle compared to the published diagnoses, including the diagnosis of the subspecies helvetica. Morphological features of A. baicalensis and A. islandica are very similar in early spring when the cells produce

auxospores, but diverge in summer. The most important distinguishing feature is the density of areolae - the number of areolae rows per 10 mm and the number of areolae per 10 mm of a row.

Back R.C., Bolgrien D.W., Guselnikova N.E., Bondarenko N.A. Phytoplankton photosynthesis in Southern Lake Baikal: size-fractionated chlorophyll a and photosynthetic parameters. // J. Great Lakes Res.; 1991; 17(2): 194-202.
Phytoplankton photosynthesis was measured on water samples from southern Lake Baikal (Siberia, USSR) during autumn 1989. Stations were selected to characterize differences between offshore and nearshore communities, and to address the influence of the Selenga River. The contribution of small size classes to total phytoplankton biomass and photosynthesis was estimated by sieving samples prior to analyses. Photosynthesis was estimated by the uptake of 14C along a gradient of light intensities in a ship-board incubator. The resulting P vs. I parameters were used, along with measurements of chlorophyll a and light penetration, to estimate areal photosynthesis. The results of this study showed that the < 10 mm phytoplankton accounted for 52-88% of the total chlorophyll a and 66-100% of the total 14C uptake during this time of the year. Also observed was a negative correlation between this dominance and the total chlorophyll a in the sample. The P vs. I parameters also allow insight into physiological differences between the whole water and < 10 mm communities. The < 10 mm fractions were characterized by higher assimilation numbers (0.36 - 5.03 mgC mgChl-1 hr-1) than the whole water samples (0.16 - 2.76 mgC mgChl-1 hr-1). The < 10 mm fractions also showed higher assimilation efficiencies (1.13 - 15.01 mgC mgChl mgChl-1 E-1 m2) and lower saturating irradiances (55 - 102 mE m-2 s-1) than the whole water samples (0.53 - 5.28 mgC mgChl-1 E-1 m2 and 62 - 152mEm-2 s-1). Whole water assimilation numbers were highest in the region of the Selenga River Delta, and decreased away from the influence of the river .

Back S., De Batist M., Kirillov P., Strecker M.R., Van Hauwaert P. The Frolikha Fan: a large Pleistocene glacio-lacustrine outwash-fan in Northern Lake Baikal, Siberia [in press]. // J. Sediment. Res.; 1998; 68(5).

Back S., Strecker M. Asymmetric late Pleistocene glaciations in the North Baikal basin, Baikal rift, Russia. // J. Geol. Soc. London; 1998; 155: 61-70.
New morphological, sedimentological, and radiocarbon data of Quaternary deposits from the northern Baikal Rift document at least three extensive late Pleistocene glaciations at >50 Ka, 40 to 35 Ka, and 26 to 13 Ka, respectively. During these periods valley glaciers advanced from the high rift shoulders (>2,500 m) down to the present-day coast of Lake Baikal (456 m); in places, the glaciers advanced beyond the present-day shoreline into the lake basin as indicated by large moraines exposed in steep cliffs along the lakeshore. Furthermore, stratigraphic relations between lacustrine sequences and glacial deposits, as well as 14C-ages of two paleo-shorelines 10 and 4 m above the present lake level, show that the last and the penultimate glaciations were followed by relative lake highstands. These land-based observations document a significant influence of late Pleistocene glaciations on the sedimentary development of this lacustrine rift basin. The northern Baikal Rift is characterised by an asymmetric half-graben geometry that controls river drainage and sedimentation. This asymmetry greatly influenced the development and spatial distribution of Pleistocene glaciers on both rift margins. On the western flank, tilted fault blocks parallel to the rift served as topographic barriers for valley glaciers advancing toward the lake basin; only in two locations glaciers could reach the present-day coast. On the eastern rift flank, in contrast, structure and drainage conditions allowed the development of numerous consequent streams providing thoroughfares and space for recurrent valley glaciations. Thus, the glaciers on the eastern flank could advance beyond the present-day lakeshore into the lake basin in numerous locations. These observations indicate that asymmetric rift structure in combination with the effects of global cooling were the important controls on the Pleistocene glacial development of the Baikal Rift. Keywords: Glaciation, rift sedimentation, structural asymmetry, Lake Baikal.

Back S., Vanhauwaert P., De Batist M., Strecker M.R. Quaternary depositional systems in northern Lake Baikal, Siberia. // Int. Conf. organized at the occasion of the end of INTAS Project 134 "Active Tectonic Continental Basins: interaction between structural and sedimentary processes": Abstracts; April 30 - May 2, 1998. Gent, Belgium; 1998: 35.

Baikal Drilling Project BDP-96 (Leg II) Members. Continuous Paleoclimate Record Recovered for the Last 5 Million Years. // Eos Trans. AGU; 1997; 78(51): 597, 601, 604.

Baikal Drilling Project Members (BDP-93). Preliminary results of the first scientific drilling on Lake Baikal, Buguldeika site, southeastern Siberia. // Quaternary International; 1997; 37: 3-17.
The Baikal Drilling Project (BDP) is a multinational effort to investigate the paleoclimatic history and tectonic evolution of the Baikal sedimentary basin during the Late Neogene. In March 1993 the Baikal drilling system was successfully deployed from a barge frozen into position over a topographic high, termed the Buguldeika saddle, in the southern basin of Lake Baikal. The BDP - 93 scientific team, made up of Russian, American and Japanese scientists successfully recovered the first long (>lO0 m) hydraulic piston cores from two holes in 354 m of water. High quality cores of 98 m (Hole 1) and 102 m (Hole 2), representing sedimentation over the last 500.000 years, were collected in 78 mm diameter plastic liners with an average recovery of 72% and 90%, respectively. Magnetic susceptibility logging reveals an excellent hole-to-hole correlation. In this report the scientific team describes the preliminary analytical results from BDP-93 hole 1 cores. Radiocarbon dating by accelerator mass spectrometry provides an accurate chronology for the upper portion of Hole 1. Detailed lithologic characteristics, rock magnetic properties and inorganic element distributions show a significant change to the depositional environment occuring at 50 m subbottom depth, approximately 250,000 BP. This change may be due to uplift and rotation of the horst block in the Buguldeika saddle. The sedimentary section above 50 m is pelitic with varve-like laminae, whereas the section below 50 m contains a high proportion of sand and gravel horizons often organized into turbidite sequences. Accordingly, high resolution seismic records reveal a change in sonic velocity at this depth. It is inferred that sedimentation prior to 250 ka BP was from the west via the Buguldeika river system. After 250 ka BP the Buguldeika saddle reflects an increase in hemipelagic sediments admixed with fine-grained material from the Selenga River drainage basin, east of Lake Baikal. Variations in the spore-pollen assemblage, diatoms, biogenic silica content, rock magnetic properties, clay mineralogy and organic carbon in the upper 50 m of BDP-93-1 reveal a detailed record of climate change over approximately the last 250,000 years. These variables alternate in a pattern characteristic of glacial/interglacial climatic fluctuations. The present age model suggests that the climate signal recorded in Lake Baikal sediments is similar to Late Quaternary signals recorded in Chinese loess sections and in marine sediments.

Balla Z., Kuzmin M., Levi K.G. Kinematics of the Baikal opening: results of modeling. // Ann. Tectonicae; 1991; 5: 18-31.

Bangs M. Climate change in Lake Baikal: paleoindicator evidence in turbidite free zones [Unpublished MRes dissertation, UCL]; 1998.

Baram G., Gorshkov A., Grachev M., Kiryukhina E., Lang B., Vereshchagin A. Di(2-ethylhexyl)phtalate in Lake Baikal. // International Congress on Analytical Chemistry: Abstracts; June 15-21 1997; Moscow, Russia; 1997; 1: E-105.

Baranov E.A., Petrov E.A. Baikal seal. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Japan; 1997: 23-24.

Barrett T., Blixenkrone-Moller M., Guardo G.Di., Domingo M., Duignan P., Hall A., Mamaev L., Osterhaus A.D.M.E. Morbilliviruses in aquatic mammals: report on round table discussion. // Vet. Microbiol.; 1995; 44/2-4: Proceedings of an Int. Symp. 'Morbillivirus Infections': 261-265.

A workshop was organised to ascertain the current situation with regard to morbillivirus infections in aquatic animals. The great interest generated by the discovery of these new virus infections in 1988 has to some extent abated but much high quality research has continued in this field as the workshop showed. There is some serological evidence that the viruses have continued to circulate in most areas since the initial epizootics. As to their origin, it appears that the most likely source of the European seal morbillivirus (PDV-1) is the North Atlantic and Arctic seal populations. As to the origin of the Mediterranean dolphin morbillivirus and the morbilliviruses isolated from porpoises, there is serological evidence that the viruses are widespread in many cetacean species in the Atlantic and 93% of long-finned pilot whales (Globicephala melas) which mass stranded between 1982 and 1993 were morbillivirus seropositive. The epizootic in freshwater seals in Lake Baikal was unrelated to events in the European marine mammal populations. The virus which infected these animals (PDV-2) is indistinguishable from canine distemper field strains. Serological and molecular biological studies provided evidence for the presence of the virus in the seals, at least as late as the Summer of 1992 when the animals were last sampled.Keywords: Pinniped morbilliviruses; Cetacean morbilliviruses; Epizootiology.

Bashurova V.S., Dreiling V., Khodzher T.V., Jaenicke R., Kutsenogii K.P., Kutsenogii P.K., Kraemer M., Makarov V.I., Obolkin V.A., Potemkin V.L., Pusep A.Y. Measurements of atmospheric condensation nuclei size distribution in Siberia. // J. Aerosol Sci.; 1992; 23(2): 191-199.
The least investigated atmospheric aerosol is the one in remote continental areas. In this study, measurements of condensation nuclei size distributions near Lake Baikal, Siberia, were performed. Data for total aerosol number concentration and aerosol size distribution were obtained. The measurement equipment consisted of a TSI screen diffusion battery (SDB) Model 3040 and a TSI condensational nuclei counter (CNC) Model 3020. The average aerosol concentration was about 10 4 cm-3. The evolution of aerosol number concentration during the day is correlated with the solar radiation. The inversion problem was solved using Tihonov's regularisation procedure. The possibility of applying this algorithm was tested in computer simulations. Different forms of aerosol size distributions were observed. The maximum radius of the distributions changes from l0 nm to about 100 nm. The data obtained are in agreement with existing theories. It is planned to continue the measurements in the next years to obtain further results.

Batoev V.B., Gulgonov V.E. Ecological problems of development of sustainable agriculture, forestry and fishery on the Baikal region. // Int. Baikal Conf. 1999 "Russian-German Co-operation in Sibiria - The Lake Baikal Region": Abstracts; Nov. 14-17, 1999. Schneverdingen, Germany; 1999.

Battarbee R., Mackay A. Biogenic composition of recent sediments: diatoms. // Baikal Symposium and 1st Baikal-Sed Workshop: Abstracts; Nov. 18-22, 1999; Berlin / Potsdam; 1999: 25-27.

Baturin V.A., Vassilyev S.N., Lakeyev A.V., Moskalenko A.I., Dumova I.I. Ecologo-Economic Models of the Lake Baikal Region Development. // NATO ASI Series. Partnership Sub-Series 2. Environment. Netherlands; 1995; 6: 229-243.

Bekman M.Yu., Kamaltynov R.M., Mekhanikova I.V., Takhteev V.V., comp. The lists of species of animals and plants inhabiting in Baikal. Gammaridae. // Lake Baikal: evolution and biodiversity. Kozhova O.M., Izmest'eva L.R. ed. Leiden, The Netherlands: Backhuys Publishers; 1998: 389-397.

Belan B.D., Panchenko M.V., Semyanova O.I., Tolmachev G.N. Chemical composition of the Baikal aerosol in 1991 and 1995. // IV Russian-French Seminar on the Application of Neutrons and Synchrotron Radiation for Condensed Matter Investigations: Abstracts; June 25-July 3,1996; Novosibirsk-Irkutsk, Russia. Dubna; 1996: 42.

Belikov S., Zemskaya T., Manakova Ye., Namsaraev B. Studies of bacterial biodiversity in Lake Baikal bottom sediments from different sites. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 232.

Belolaptikov I.A., Bezrukov L.B., Borisovets B., et al. Baikal-Experiments. // Nuclear Physics B (Free Suppl.); 1990; 14B: 51-60.

Belolaptikov I.A., Bezrukov L.B., Borisovets B.A. et al. The Lake Baikal deep underwater detector. // XIV Int. Conference on Neutrino Physics and Astrophysics: Abstracts; June 1990; CERN, Switzerland; 1990.

Belolaptikov I.A., Bezrukov L.B., Borisovets B.A., Bugaev E.V., Domogatsky G.V., Donskich L.A., Doroshenko A.A., Galperin M.D., Djilkibaev Zh.A.M., Klabukov A.M., Klimushin S.I., Lanin O.J., Lubsandorzhiev B.K., Panfilov A.I., Sokalsky I.A., Trofimenko I.I., Budnev N.M., Chensky A.G., Dobrynin V.I., Gress O.A., Koshechkin A.P., Lanin J.B., Litunenko G.A., Lorin A.V., Naumov V.A., Nemchenko M.I., Parfenov Yu.A., Pavlov A.A., Pokalev O.P., Primin V.A., Shestakov A.A., Sumanov A.A., Tarashansky V.A., Zurbanov V.L., Golikov A.V., Zaslavskaya E.S., Kabikov V.B., Kuzmichov L.A., Osipova E.A., Dudkin G.N., Egorov V.Yu., Gushtan M.N., Lukanin A.A., Ovcharov A.M., Padalko V.M., Padusenko A.H., Krabi J., Mikolajski T., Spiering Ch., Wischnewski R., Jenek L., Kiss D., Tanko L., Kusner Yu.S., Poleschuk V.A., Sherstyankin P.P.

Belykh O.I. Localization of Viral Antigens in Organs of Baikalian Seals by Means of Immuno-Electron Microscopy. // Scanning: Abstracts; 1996.

Belykh O.I., Goldberg O.A., Likhoshway E.V., Grachev M.A. Light, electron and immune-electron microscopy of organs from seals of Lake Baikal sampled during the morbillivirus infection of 1987-1988. // Eur. J. Vet. Pathol.; 1997; 3(3): 1-11.

Belykh O.I., Likhoshway E.V., Solodun Yu.V., Goldberg O.A., Kumarev V.P., Nagieva F.G. Organs of Baikal seal affected by morbillivirus. // XII Int. Congr. for Electron Microscopy: Abstracts. Seattle, USA; 1990: 468-470.

Bezrukova E.V. Biogenic composition of Lake Baikal recent sediments (pollen and spores of plants). // Baikal Symposium and 1st Baikal-Sed Workshop: Abstracts; Nov. 18-22, 1999; Berlin / Potsdam; 1999: 24.

Bezrukova E.V. Vegetation and climate of prebaikalie in the Late Glacial and Holocene [Dissertations Initiative for the Advancement of Limnology and Oceanography "DIALOG II": Abstracts of Ph.D Disserattions]. Walla Walla, USA; 1997, 6.

Bezrukova E.V., Letunova P., Karabanov E. Palynological investigations of Holocene deposits of Baikal. // International Project on Paleolimnology and Late Cenozoic Climate / IPPCCE Newsletter; 1992; 6: 59-68.

Bezrukova E.V., Takahara H., Krivonogov S.K., Miyoshi N., Levina O., Nakamura T., Vorobyeva S.S., Morita Y., Kawamuro K., Shinomiya T. Vegetation history and paleoclimate at Pre-Baikal of last 30 ky (by Lake Baikal sediments and peat deposits). // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 5.

Bockerman I., Raikova M., Reuter M., Timoshkin O. Ultrastructure of the nerve cells and sensilla of Geocentrophora baltica (Plathyhelminthes, Lecithoepitheliata) and the surface sensilla in the Geocentrophora group. // Hydrobiologia; 1995; 305: 183-188.

Two types of nerve cell could be distinguished ultrastructurally in the central nervous system of Geocentrophora baltica (Prorhynchida, Lecithoepitheliata). Both show invaginations in the plasma membrane, but they differ in the character of the cytoplasm (light or densely stained) and the distribution of the neuronal vesicles (evenly or in groups). Different kinds of vesicles and neuronal

release sites are observed. Special features of the synapses are pronounced local thickenings of the presynaptic membrane connected to paramembranous densities. In G. baltica and five endemic Geocentrophora spp. from Lake Baikal six types of surface sensillum were observed at the epidermal surface: 1. those with a long thin rootlet; 2. a short, balloon-shaped cilium with an aberrant axoneme and a reduced rootlet; 3. a rootlet branching into many striated bundles; 4. a thick rootlet; 5. a reduced rootlet and numerous neurotubules; and 6. collared sensilla each with one cilium in a deep pit surrounded by a collar of 11 to 12 microvilli. The variable number of microvilli in the collared sensillum is considered plesiomorphic relative to the stable number of eight microvilli known in sensilla of the Prolecithophora, Proseriata, and Rhabdocoela. The ultrastructure of the collar sensillum indicates that the Lecithoepitheliata is only distantly related to the Prolecithophora and higher turbellarians.

Bockerman I., Reuter M., Timoshkin O. Ultrastructural study of the central nervous system of endemic Geocentrophora (Prorhynchida, Plathyhelminthes) from Lake Baikal. // Acta Zool.(Stockholm); 1994; 75(1): 47-55.
The ultrastructure of the central nervous system of four species of the Geocentrophora group (Prorhynchida, Lecithoepitheliata) has been studied with Geocentrophora wagini as a model organism. This is the first ultrastructural study of the nervous system in flatworms of the endemic Geocentrophora group from Lake Baikal. The neurons are characterized by invaginations of the plasma membrane with extracellular material (ECM) extending deep into the neuronal cytoplasm. Two types of neuron are distinguished on the basis of the character of the cytoplasm and the content of neuronal vesicles. Several more vesicle types are observed in the nerve processes in the neuropile. The following kinds of neuronal release sites are distinguished: single synapses, shared synapses, nonsynaptic release sites characterized by omega profiles and neuromuscular contacts. Special features of the synapses in the species of Geocentrophora are pronounced total thickenings of the presynaptic membrane connected to paramembraneous densities. The ECM-filled invaginations and the local presynaptic thickenings are features that distinguish the neurons of Geocentrophora spp. from previously described turbellarian neurons.

Bolgrien D.W. Delineation of the hydrodynamics of Lake Michigan and Lake Baikal using satellite-derived surface temperatures [Dissertaton of doctor of Philosophy Biological Sciences]: The University of Wisconsin-Milwaukee; 1993, p.170.

Bolgrien D.W., Granin N.G., Levin L.A. Satellite observations of Lake Baikal thermal structures. // ASPRS/ACSM/RT 92. Technical papers; 1992; 1: Global Change and Education: 11-20.

Bolgrien D.W., Granin N.G., Levin L. Surface temperature dynamics of Lake Baikal observed from AVHRR images. // Photogrammetric Engineering & Remote Sensing; 1995; 61(2): 211-216.
Satellite data are important in understanding the relationship between hydrodynamics and biological productivity in a large lake ecosystem. This was demonstrated using NOAA AVHRR, and in situ temperature and chlorophyll fluorescence data to describe the seasonal temperature cycle and distribution of algal biomass in Lake Baikal (Russia). Features such as ice cover, thermal fronts, and the dispersion of river water were described in a series of images from 1990 and 1991. The northern basin retained ice cover until the end of May. In June, thermal fronts extending < 10 km from shore were observed to be associated with shallows, bays, and rivers. Offshore surface temperatures in the northern basin did not exceed 4oC until late June-early July. The southern and middle basins warmed more quickly than the northern basin. In situ data showed phytoplankton concentrations to be low offshore and high near thermal fronts. The Selenga River, the largest tributary of Lake Baikal, supplied warm water and nutrients which contributed to localized increases in chlorophyll fluorescence.

Bondarenko N. Biology of the dominant baikalian diatom Aulacoseira baicalensis (Meyer) Sim. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 228.

Bondarenko N.A. Characteristics of phytoplankton community of Lake Baikal. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Janan; 1997: 12-13.

Bondarenko N.A. Floral shift in the phytoplankton of Lake Baikal, Siberia: Recent dominance of Nitzschia acicularis. // Plankton Biol. Ecol.; 1999; 46(1): 18-23.
Earlier this century, the cosmopolitan diatom Nitzschia acicularis was reported to inhabit river deltas (especially the Selenga River delta), lake shallows, and to only occasionally be found in the pelagic plankton of Lake Baikal. This paper attempts to estimate the progress of N. acicularis beginning from the early 1960s: its increased abundance and subsequent expansion into the pelagic zone of the lake. Between 1963 and 1995, large annual fluctuations in the number of its cells were recorded in the euphotic zone (0-50m) of southern Lake Baikal, with maximum values of 2.0 x 10 6 cells 1-1. The spatial distribution of N. acicularis was assessed in 1987, 1991 and 1995 in the 0-50 m layer over the entire lake; highest cell concentrations were found off the Selenga delta (1987, 1991), off the Upper Angara estuary (1991), and in the Kultuk Bay (1991, 1995). It is suggested that N. acicularis has become a major component of the Lake Baikal plankton, probably as a result of anthropogenic influence.

Bondarenko N.A., Guselnikova N.E. Response of the dominant planktonic algae in Lake Baikal to environmental change. // 13th Int. Diatom Symposium: Abstract Book; Sept. 1-7 1994; Acquafredda di Maratea (PZ), Italy; 1994: 183.

Bondarenko N.A., Guselnikova N.E., Logacheva N.F., Pomazkina G.V. Spatial distribution of phytoplankton in Baikal, Spring 1991. // Freshwater Biol.; 1996; 35(3): 517-523.
1. Studies carried out in Lake Baikal in late spring (late May - early June) 1991 showed marked differences in the species composition and abundance of phytoplankton in different regions of the lake. The south and north basins were characterized by small forms of algae. The middle basin, Maloe More and the shallow waters of the Selenga had species with large cells including Aulacoseira islandica subsp. helvetica, Dinobryon cylindricum and D. divergens. 2. Areas of high biomass were correlated with shallow waters and river inputs. This was especially apparent in the region of the Selenga delta. The vertical distribution of phytoplankton indicated the non-synchronous start of the spring homothermy throughout the lake. Phytoplankton were concentrated in the upper 100 m layer with subsurface maxima resulting from the sinking of large algae. 3. The concentration of phytoplankton biomass in general at this time characterized the lake as moderately productive.

Bondarenko N.A., Obolkina L.A., Melnik N.G., Zemskaya T.I., Logacheva N.F. Under-ice plankton of Lake Baikal. // Aquabiology; 1997; 19(2,3): 172-180, 261-269.
Note: In Japanese, with summary in English.
"Melosira's" year is phenomenon of the year in which diatoms of the genus Melosira (=Aulacoseira) occur intensively under ice of Lake Baikal by the law of repetition (usually on every 2-4 years). Although seasonal and yearly dynamics of phyto- and zooplankton offshore Baikal used to be synchronized with the rhythm of "Melosira's" year, since 1970's various scientists have noticed some peculiar changes in the dynamics of all planktonic species of Baikal, first of all, the cycle of "Melosira's" being disordered. Explication of the causes of these phenomena is matter of concern in which has been shown the deepest interest until today relating to the plankton of Baikal, and this needs recognition of structural characters (species diversity) of the communities, law of the dynamics, and interspecific relations of the organisms at various trophic levels in addition to the biological studies on some species of the genus Aulacoseira. The authors made it clear that under-ice planktonic communities showing unique dynamics in species and size structures under the conditions of low water-temperature and weak light in the early springs of 1989-1991. The remarkable change in trophic conditions of Baikal is mirror of the history of formation and the interactions of two communities composed of Baikal endemics and Palaearctic species. In spite of the dominant recovery of Baikal-endemic diatom Aulacoseira baicalensis after eight years' absence (since 1982), the following part of trophic chain in the pelagic ecosystem

(phytoplankton, Ciliophora, zooplankton, and bacterioplankton) did not react contrary to our expectations.

Bowmaker J.K., Govardovskii V.I., Shukolyukov S.A., Zueva L.V., Hunt D.M., Sideleva V.G., Smirnova O.G. Visual pigments and the photic environment: the cottoid fish of Lake Baikal. // Vision Res.; 1994; 34(5): 591-605.
The endemic cottoid fish of Lake Baikal in Eastern Siberia offer a singular opportunity for examining within a number of closely related species, the relationships of visual pigments, photoreceptor complements and depth within a deep freshwater environment. The lake, the deepest (16OO m) and one of the largest and most ancient in the world, is unique in mat the oxygen levels at the bottom are only reduced to about 8O% of the surface levels. We have studied, by light microscopy, microspectrophotometry and visual pigment extraction, the retinas from 17 species of Baikal cottoids that live at different depths within the lake. Generally the retinas contain, in addition to rods, large green-sensitive double cones and small blue-sensitive single cones: surprisingly for freshwater fish, the visual pigments are based on Vitamin A1. The A max of both rods and cones are displaced to shorter wavelengths with increasing depth. Surface species have cones with A max at about 546,525 and 45O nm and rods at 523 nm, deeper living species retain cones, but with A max shifting towards 5OO and 425 nm and with rods at 48O nm, whereas the deepest living fish possess only rods (A max 48O-5OO nm). These data clearly show a correlation between photoreceptor complement, visual pigment A max and depth, but question me hypothesis that there is a correlation of pigment A max with water colour since, in contrast to oceanic waters, the maximum transmission of Baikal water is between 55O and 6OO nm.

Boxshall G.A., Evstigneeva T.D. The evolution of lacustrine species flocks of copepods (Crustacea: Copepoda): comparisons between cyclopoids and harpacticoids of Lake Baikal. // Workshop Speciation in Ancient Lakes - Evolution, Biodiversity, Conservation: Abstracts; 1-5 March, 1993. Brussels, Belgium; 1993: 16.

Boxshall G.A., Evstigneeva T.D. The evolution of species flocks of copepods in Lake Baikal: a preliminary analysis. // Arch. Hydrobiol. / Beih. Ergebn. Limnol.; 1994; 44: 235-245.

Boxshall G.A., Evstigneeva T.D., Clark P.F. A new interstitial cyclopoid copepod from a sandy beach on the western shore of Lake Baikal, Siberia. // Hydrobiologia; 1993; 268: 99-107.
A new species of cyclopoid copepod, Diacyclops biceri sp. nov., is described from Lake Baikal. It was found in the interstitial water of a sandy beach at Buchta Peschanaya on the western shore of the central basin of Baikal. The new species is unique in possessing 2-segmented endopods in swimming legs 3 and 4. Swimming legs 2 to 4 have 3-segmented exopods. The slender body form, the lack of the antennal exopodal seta, and the presence of a secondary ' pseudosomite' anterior to the genital double somite of the adult female are interpreted as adaptations to the interstitial habitat. The harpacticoid Epactophanes richardi Mrazek was found in the same interstitial habitat as D. biceri.

Boyle J.F., Mackay A.W., Rose N.L., Flower R.J., Appleby P.G. Sediment heavy metal record in Lake Baikal: natural and anthropogenic sources. // J. Paleolimnol.; 1998; 20: 135-150.

Bradbury P. Holocene and Pleistocene limnologic environments at Lake Baikal, Siberia. // Eos Trans. AGU: Fall Meeting / Suppl.; 1992; 73(43).

Bradbury P., Bezrukova E.V., Chernyaeva G.P., Colman S.M., Khursevich G., King J.W., Likhoshway Ye.V. A synthesis of post-glacial diatom records from Lake Baikal. // J. Paleolimnol.; 1994; 10: 213-252.
The biostratigraphy of fossil diatoms contributes important chronologic, paleolimnologic, and paleoclimatic information from Lake Baikal in southeastern Siberia. Diatoms are the dominant and best preserved microfossils in the sediments, and distinctive assemblages and species provide inter-core correlations throughout the basin at millennial to centennial scales, in both high and low

sedimentation-rate environments. Distributions of unique species, once dated by radiocarbon, allow diatoms to be used as dating tools for the Holocene history of the lake. Diatom, pollen, and organic geochemical records from site 305, at the foot of the Selenga Delta, provide a history of paleolimnologic and paleoclimatic changes from the late glacial (15 ka) through the Holocene. Before 14 ka diatoms were very rare, probably because excessive turbidity from glacial meltwater entering the lake impeded productivity. Between 14 and 12 ka, lake productivity increased, perhaps as strong winds promoted deep mixing and nutrient regeneration. Pollen evidence suggests a cold shrub - steppe landscape dominated the central Baikal depression at this time. As summer insolation increased, conifers replaced steppe taxa, but diatom productivity declined between 11 and 9 ka perhaps as a result of increased summer turbidity resulting from violent storm runoff entering the lake via short, steep drainages. After 8 ka, drier, but more continental climates prevailed, and the modern diatom flora of Lake Baikal came to prominence. On Academician Ridge, a site of slow sedimentation rates, Holocene diatom assemblages at the top of 10-m cores reappear at deeper levels suggesting that such cores record at least two previous interglacial (or interstadial?) periods. Nevertheless, distinctive species that developed prior to the last glacial period indicate that the dynamics of nutrient cycling in Baikal and the responsible regional climatic environments were not entirely analogous to Holocene conditions. During glacial periods, the deep basin sediments of Lake Baikal are dominated by rapidly deposited clastics entering from large rivers with possibly glaciated headwaters. On the sublacustrine Academician Ridge (depth= 300 m), however, detailed analysis of the diatom biostratigraphy indicates that diastems (hiatuses of minor duration) and (or) highly variable rates of accumulation complicate paleolimnologic and paleoclimatic reconstructions from these records.

Bronte C.R., Fleischer G.W., Maistrenko S.G., Pronin N.M. Stock structure of Lake Baikal omul as determined by whole-body morphology. // J. Fish Biol.; 1999; 54: 787-798.
In Lake Baikal, three morphotypes of omul Coregonus autumnalis migratorius are recognized; the littoral, pelagic, and deep-water forms. Morphotype assignment is difficult, and similar to that encountered in pelagic and deep-water coregonines in the Laurentian Great Lakes. Principal component analysis revealed separation of all three morphotypes based on caudal peduncle length and depth, length and depth of the body between the dorsal and anal fin, and distance between the pectoral and the pelvic fins. Strong negative loadings were associated with head measurements. Omul of the same morphotype captured at different locations were classified to location of capture using step-wise discriminant function analysis. Jackknife correct classifications ranged from 43 to 78 % for littoral omul from five locations, and 45 -86 % for pelagic omul from four locations. Patterns of location misclassification of littoral omul suggested that the sub-population structure, hence stock affinity, may be influenced by movements and intermixing of individuals among areas that are joined bathymetrically. Pelagic omul were more distinguishable by site and may support a previous hypothesis of a spawning-based rather than a foraging-based sub-population structure. Omul morphotypes may reflect adaptations to both ecological and local environmental conditions, and may have a genetic basis.

Brzuzan P., Yakhnenko V.M., Mamontov A.M., Markowska A. Mitochondrial DNA variation among populations of Coregonus lavaretus from Baikal Lake as revealed by restriction analysis. // VI International Symposium on Biology and Management of Coregonid Fishes: Abstracts; September 23-26, 1996; Konstanz, Germany; 1996: 44.

Brzuzan P., Yakhnenko V.M., Mamontov A.M., Markowska A., Trofimova I. Mitochondrial DNA variation in whitefish Coregonus lavaretus from Lake Baikal as revealed by restriction analysis. // Arch. Hydrobiol. / Spec. Issues Advanc. Limnol; 1998; 50: 357-362.
Analysis of mitochondrial DNA from 21 females of whitefish (Coregonus lavaretus) inhabiting Lake Baikal, Russia, was conducted using restriction endonucleases. Eight restriction enzymes employed in the study produced a total of 30 fragments. Two enzymes (Bgl I and Nco I) produced variant fragment patterns which allowed identification of 3 mitochondrial genotypes. MtDNA diversity was low as revealed by estimates of pairwise nucleotide sequence divergence, p [mean = 0.84% + 0.67 (SD)], nucleon diversity, h = 0.40, and nucleotide diversity index, π = 0.071 %.

Population bottlenecks associated with Pleistocene glaciation events are suggested to have reduced the mtDNA genetic variability in Coregonus lavaretus in Lake Baikal.

Bulnayev A.I. Neutron Activation Analysis Investigation of the Composition and Geochemical Peculiarities of Lake Baikal Bottom Sediments. // Analyst; 1995; 120(5): 1445-1452.

Burov E.B., Houdry F., Diament M., Deverchere J. A broken plate beneath the North Baikal rift zone revealed by gravity modelling. // Geophys. Res. Lett.; 1994; 21(2): 129-132.

Bychinskii V.A., Levina O.V. The estimation of the standart isobar-isothermal potential of the biogenic silica by the physico-chemical model of Lake Baikal water. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 9.

Calais E., Deverchere J., Lesne O., Petit C., Sankov V.A., Levi K.G., Koulakov I.Yu. Active deformation in the Baikal rift from GPS measurements, sesmotectonic analysis, gravity and finite element modelling. // Proceedings of the IGCP Workshop on Lithospheric Structure, Evolution, and Sedimentation in Continental Rifts: Abstracts; March 20-22, 1997; Dublin; 1997.

Callender E., Deike R.G., Rossmann R. Geochemical and mineralogic indicators of sedimentation in Lake Baikal, South-Eastern Siberia, USSR. // Eos Trans. AGU: Spring Meeting; 1991; 72(17.V42C-12.1630h): 307.

Callender E., Granina L. Biogeochemical phosphorus mass balance in Lake Baikal, Russia. // Eos Trans. AGU: Ocean Sci. Meeting / Suppl.; 1994; 75(3): 021J-10.

Callender E., Granina L. Biogeochemical silica mass balance in Lake Baikal, Russia. // Water-Rock Interaction / Proceedings of the 8th Int. Symp. on Water-Rock Interaction - WRI-8 / Vladivostok / Russia / 15-19 august 1995. Rotterdam; 1995: 341-344.

Callender E., Granina L. Biogeochemical phosphorus and silica mass balances for Lake Baikal. // American Society of Limnology and Oceanography: Abstracts; June 16-20 1996. University of Wisconsin-Milwaukee; 1996: 43.

Callender E., Granina L. Biogeochemical phosphorus mass balance for Lake Baikal, southeastern Siberia, Russia. // Marine Geology; 1997; 139: 5-19.

Callender E., Granina L. Geochemical mass balances of major elements in Lake Baikal. // Limnol. Oceanogr.; 1997; 42(1): 148-155.

Callender E., Granina L. A sediment budget for Lake Baikal. // Eos Trans. AGU: Fall Meeting / Suppl.; 1992; 73(43).

Callender E., Granina L. Transition metal geochemistry of sedimentary pore fluids associated with hydrothermal activity in Lake Baikal, Russia. // Proceedings of the 7th international symposium on Water-Rock Interaction-WRI-7 (13-18 July 1992, Park City / Utah / USA). Rotterdam/Brookfeild; 1992: 621-626.

Carmack E.C., Weiss R.F. Convection in Lake Baikal: an example of thermobaric instability. // Deep convection and deep water formation in the oceans: Proceedings of the International Monterey colloquium on deep convection and deep water formation in the oceans. Chu P.C., Gascard J.C. ed. Amsterdam; 1991; (57): 215-228.

Carroll J., Williamson M., Lerche I., Karabanov E., Williams D.F. Geochronology of Lake Baikal from 210 Pb and 137 Cs radioisotopes. // Appl. Radiat. Isotopes; 1999; 50: 1105-1119.

Two box cores of near surface sediments were obtained from Lake Baikal in Southeastern Siberia, Russia. The cores were taken from the northern and southern basins of the lake during a joint American - Russian research expedition in the summer of 1994. The cores were analyzed for 210 Pb, 137 Cs and total organic carbon (TOC). Organic carbon is an indicator of photosynthetic production by phytoplankton, taking place primarily in the euphotic zone of the water column. Accumulation rates of TOC may be used as indicators of paleo-productivity when sedimentation rates are determined using the 210 Pb dating method and combined with both the density of sediment and organic carbon content. Accordingly, the lake is characterized by changes in accumulations of TOC, which may be linked to rates of sedimentation. Accumulations of TOC and sedimentation rates were higher in the southern basin site than in the northern basin site. The southern station core was taken from an area in close proximity to the Selenga River delta, which carries 50% of the water input to Lake Baikal. Productivity should thus be higher in this region due to the high nutrient input and sediment accumulation higher due to influx of riverine sediment input. Traces of 137 Cs (an anthropogenic product) were found in both cores. However, activities of 137 Cs were significantly higher in the southern basim, likely due to the input of the Selenga River in the southern region, which extends to a region in Mongolia in close proximity to the area of the Chinese atomic-bomb atmospheric testing of the 1970s. Application of a quantitative inverse model to the 210 Pb profiles yielded the following results: (I) station 12, near the Selenga Delta, had an accumulation rate of about 0.38 cm/y in 1957 but this rate was halved by 1980 to about 0.22 cm/y and has been roughly steady since that time; 137 Cs values are consistent with the age-to-depth determination from 210 Pb for station l2; (ii) since about 1960, station 5A in the northern basin had an accumulation rate lower by factor 2 - 4 than that of the station near the Selenga Delta; the 137 Cs values are consistent with the 210 Pb age-to-depth determination for station 5A; (iii) the 137 Cs activities for station 12 systematically increase with time towards the present day and are about a factor 6 - 10 higher than 137 Cs activities recorded for station 5A, which do not show a corresponding systematic increase with time.

Carter S.J., Colman S.M. Biogenic silica in Lake Baikal sediments: Results from 1990-1992 American cores. // J. Great Lakes Res.; 1994; 20: 751-760.
The Lake Baikal Paleoclimate Project is a joint Russian-American program established to study the paleoclimate of Central Asia. During three summer field seasons, duplicate Russian and American cores were taken at a number of sites in different sedimentary environments in the lake. Eight cores returned to the U.S. were quantitatively analyzed for biogenic silica using a single-step 5-hour alkaline leach, followed by dissolved silicon analysis by inductively-coupled-plasma atomic-emission spectroscopy. Sediments of Holocene age in these cores have biogenic silica maxima that range from about 15 to 80 percent. An underlying zone in each core with low biogenic-silica concentrations (0 to 5 percent) dates from the last glacial maximum. The transition from the last glaciation to the present interglaciation, recorded by biogenic silica, began about 13,000 years ago. Biogenic silica profiles from these cores appear to be a good measure of past diatom productivity and a useful basis for paleoclimatic interpretations. INDEX WORDS: Lake Baikal, silica, sediments, paleoclimate.

Ceramicola S., De Batist M., Khlystov O., Mats V.D., Grachev M. Sedimentary environments on Akademichesky Ridge (Lake Baikal) from seismic stratigraphy. // Int. Conf. organized at the occasion of the end of INTAS Project 134 "Active Tectonic Continental Basins: interaction between structural and sedimentary processes": Abstracts; April 30 - May 2, 1998. Gent, Belgium; 1998: 107.

Ceramicola S., Khlystov O., De Batist M., Grachev M., Klerkx J. Akademichesky Ridge 1995-'98: seismic and coring and expedition report. // International Project on Paleolimnology and Late Cenozoic Climate / IPPCE Newsletter; 1999; 12: 104-114.
An extensive data set consisting of more than 1000 km of high- resolution single channel seismic reflection profiles and a total 32 piston, gravity and Ьox cores was acquired during three successive campaigns on Akademichesky Ridge (Lake Baikal) over the time interval 1995-98. The three investigations were carried out by the Renard Centre of Marine Geology (Belgium)

jointly with the Russian Limnological Institute and the Royal Museum of Central Africa (Belgium) in the framework of the EC INTAS Programme and the joint Russian-Belgian CASIMIR (Comparative Analysis of Sediment Infill Mechanism in Rift) research project. The purpose of this research project is to provide new insights into the origin of the strong variability in depositional processes observed on the Ridge. This variability seems to be strikingly controlled by different - and possibly interrelated - factors such as, tectonic mechanisms, climate influence and current interference. The aim of this paper is to combine all the technical information concerning the three surveys carried out on the Akademichesky Ridge by RCMG over the last four years in one report and make it available to the scientific community involved in Lake Baikal studies. For this purpose all seismic track maps, core locations and a few examples of the quality of the seismic signal retrieved are herein included.

Ceramicola S., Khlystov O., Klerkx J., Vanhauwaert P., De Batist M., Grachev M. First results of the 1996 seismic and coring expedition on Akademichesky Ridge, Lake Baikal, Siberia. // European Union of Geosciences IX Meeting; 23-27 March, 1997; Strasbourg - France. Terra Nova; 1997; Abstract Supplement No 1, 9: 630.

Ceramicola S., Khlystov O., Grachev M., De Batist M., Henriet J.-P. Tectonic evolution and depositional processes in Akademichesky Ridge, Lake Baikal (Siberia) from high resolution reflection seismics and drilling/coring data. // 15th Int. Sedimentol. Congress: Abstracts; Universitat d'Alicante, Spain; 1998: 245-246.

Colman S.M. Water-level changes in Lake Baikal, Siberia: tectonism versus climate. // Geology; 1998; 26(6): 531-534.
Relative changes in the level of Lake Baikal, amounting to hundreds of Quaternary time, are well documented. Data presented here show that tectonic displacements of the lake outlet or former shoreline features are entirely sufficient to explain these relative lake-level changes. In contrast, the morphology and hydrology of the lake make its level hydrologically insensitive to climate change. Available evidence indicates that, throughout the past several hundred thousand years, Lake Baikal was a dilute, through- flowing lake controlled by the level of its outlet. On the basis of geologic data alone, climatic effects on lake level, whatever their magnitude, are difficult to separate from those caused by active rift tectonism. However, consideration of(1) the hydrologic budget of the lake and (2) the configuration of the outlet suggests that potential lake-level fluctuations due solely to climate change were less than about 2 m.

Colman S.M., Carter S.J., Peck J.A., King J.W., Karabanov E.B., Williams D.F. The last 250 000 years of continental climate and diatom productivity at Lake Baikal, Siberia [submitted for publication]. // GSA Meetings: abstract; New Orleans; 1995.

Colman S.M., Jones G.A., Rubin M., King J.W., Peck J.A., Orem W.H. AMS radiocarbon analyses from Lake Baikal, Siberia: challenges for dating sediments from a large, oligotrophic lake. // Quaternary Science Reviews (Quaternary Geochronology); 1996; 15: 669-684.
A suite of 146 new accelerator-mass spectrometer (AMS) radiocarbon ages provides the first reliable chronology for late Quaternary sediments in Lake Baikal. In this large, highly oligotrophic lake, biogenic and authigenic carbonate are absent, and plant macrofossils are extremely rare. Total organic carbon is therefore the primary material available for dating. Several problems are associated with the TOC ages. One is the mixture of carbon sources in TOC, not all of which are syndepositional in age. This problem manifests itself in apparent ages for the sediment surface that are greater than zero. However, because most of the organic carbon in Lake Baikal sediments is algal (autochthonous) in origin, this effect is limited to about 1000+-500 years, which can be corrected, at least for young deposits. The other major problem with dating Lake Baikal sediments is the very low carbon contents of glacial-age deposits, which makes them extremely susceptible to contamination with modern carbon. This problem can be minimized by careful sampling and handling procedures. The ages show almost an order of magnitude difference in sediment- accumulation rates among different sedimentary environments in Lake Baikal, from

about 0.04 mm/year on isolated banks such as Academician Ridge, to nearly 0.3 mm/year in the turbidite depositional areas beneath the deep basin floors, such as the Central Basin. The new AMS ages clearly indicate that the dramatic increase in diatom productivity in the lake, as evidenced by increases in biogenic silica and organic carbon, began about 13 ka, in contrast to previous estimates of 7 ka for the age of this transition. Holocene net sedimentation rates may be less than, equal to, or greater than those in the late Pleistocene, depending on the site. This variability reflects the balance between variable terrigenous sedimentation and increased biogenic sedimentation during interglaciations. The ages reported here, and the temporal and spatial variation in sedimentation rates that they imply, provide opportunities for paleoenvironmental reconstructions at different time scales and resolutions.

Colman S.M., Karabanov E.B., Williams D.F., Hearn P.P., Jr., King J.W., Orem W.H., Bradbury J.P., Shanks W.C.III, Jones G.A., Carter S.W. Lake Baikal paleoclimate project, South-Eastern Siberia: initial dating and paleoenvironmental results. // International Project on Paleolimnology and Late Cenozoic Climate / IPPCCE Newsletter; 1992; 6: 30-39.

Colman S.M., Karabanov E.B., Badardinov A.A. Preliminary results of high resolution seismic-reflection surveys of Lake Baikal, Siberia. // Eos Trans. AGU: Spring Meeting; 1991; 72(17.V42C-3.1400h): 306.

Colman S.M., Nichols D.R., Badardinov A.A., Foster D.S., O'Toole J.K., Parolski K.E. High-resolution seismic-reflection surveys of Lake Baikal, Siberia 1990-1992: methods and examples. // International Project on Paleolimnology and Late Cenozoic Climate / IPPCCE Newsletter; 1993; 7: 43-48.

Colman S.M., Orem W.H., Kuptsov V.M., Jones G.A. Radiocarbon ages from Lake Baikal, Siberia, and their relation to sources and residence times of organic carbon. // Eos Trans. AGU: Fall Meeting / Suppl.; 1992; 73(43).

Colman S.M., Peck J.A., Hatton J., Karabanov E.B., King J.W. Biogenic silica records from the BDP93 drill site and adjacent areas of the Selenga Delta, Lake Baikal, Siberia. // J. Paleolimnol.; 1999; 21: 9-17.
Biogenic silica of sediments on the Selenga Delta and Buguldeika saddle in Lake Baikal show distinct fluctuations that reflect changes in diatom productivity, and ultimately, climate. The pattern of the upper 50 m of the section, dating from about 334 ka, is similar to that of the marine oxygen-isotope record, increasingly so as the younger sediments become progressively finer grained and less locally derived with time. The last two interglaciations are marked by biogenic silica abundances similar to those of the Holocene. The equivalent of marine oxygen-isotope stage 3 is distinctly intermediate in character between full glacial and full interglacial biogenic silica values. Following near-zero values during the last glacial maximum, biogenic silica began to increase at about 13 ka. The rise in biogenic silica to Holocene values was interrupted by an abrupt decrease during Younger Dryas time, about 11 to 10 14 ka.

Colman S.M., Peck J.A., Karabanov E.B., Carter S.J., Bradbury J.P., King J.W., Williams D.F. Continental climate response to orbital forcing from biogenic silica record in Lake Baikal, Siberia. // Nature; 1995; 378: 769-771.
Changes in insolation caused by periodic changes in the Earth's orbital parameters provide the primary forcing for global ice ages. But it is not clear to what extent the climates in continental interiors are controlled directly by regional variations in insolation and to what extent they are driven instead by the highly nonlinear response of the oceans and ice sheets. Here we investigate this question using the record of biogenic silica in Lake Baikal as a proxy for climate change in this high-latitude mid-continental region. We find a good correlation between this record and that of marine oxygen isotopes. Over the past 250 kyr the Baikal record exhibits both a strongly nonlinear component (manifested in a 100-kyr periodicity) and weaker direct-insolation components (manifested in the 41-kyr (obliquity) and 23- and 19-kyr (precession) orbital cycles).

These results show that even though extreme continental climates such as this are influenced directly by insolation variations, they are dominated by the nonlinear rhythm of the oceans and ice sheets.

Crane K., Hecker B., Golubev V. Heat flow and hydrothermal vent in Lake Baikal, U.S.S.R. // Eos Trans. AGU; 1991; 72(52): 585, 588-589.

Crane K., Hecker B., Golubev V. Hydrothermal vents in Lake Baikal. // Nature; 1991; 350: 281.
Sir - Our discovery in mid-l990, in conjunction with a team from the National Geographical Society, of hydrothermal vents in Lake Baikal, confirms heat-flow and water-column temperature anomalies previously reported. The vents were found at a depth of 440 m on the sediment floor of Frolikha Bay (in the northeastern corner of Lake Baikal), at the foot of an east-west trending fault. Investigations were conducted from on board a ship fitted with two global positioning satellite receivers for navigation, with an accuracy of better than 100 m, 3.5 and 12 kHz echo sounders, a deep-towed camera and a CTD (conductivity, temperature, depth sensor). Photographs from the area around the vents reveal that the centre of the vent field is covered by a near-continuous bacterial mat, consisting of long, thick white strands in a matrix of translucent whitish material. Temperatures of the sediment beneath the bacterial mat were greater than 16 C, compared to an ambient temperature of 3.47 C. The most obvious large organism in the region is a white sponge encrusting small cobbles at the periphery of the vent field. Coiled gastropods and whitish translucent amphipods are found among the sponges and on the sediment at the edge of the bacterial mat. Whether this 'vent' community consists of vent-specific taxa or is merely a dense concentration of background lake fauna is not known. However, no similar concentrations of organisms, or sponges with the same growth form, are seen in areas removed from the vent field (approximately 85% of the photographs). Patches of dark grey sediment and patches of sediment pock-marked by thousands of small holes (burrows?) are also seen at the edge of the vent field. The fauna of Lake Baikal is unique in its high degree of endemism and in the number of species that have affinities to saltwater forms, suggesting that the lake may have been connected to the oceans. How the taxa inhabiting the Lake Baikal hydrothermal vents fit into the biogeographical arena of vent communities needs more detailed investigation, but promises to provide interesting clues to the evolutionary history of these intriguing communities, as well as of Lake Baikal itself. Unlike hydrothermal venting along the mid-ocean-ridge system, which occurs primarily along or near the axis of spreading, the hydrothermal vents in Lake Baikal occur along a flanking fault zone more than 18 km from the axis of the rift valley floor. This relationship between flanking faults and high heat flow is consistent with geothermal surveys in the central part of the tectonically similar East African Rift. The difference in setting between oceanic vents and continental-rift vents is thought to be a response to the different quantities of magma beneath. Along, most mid-ocean ridges, where magma is plentiful and located primarily along the axis of spreading, axial fissures and faults act as central conduits for water entrances and exits (K.C.F. Aikman, D. Altman & J. Perlin, manuscript submitted). Under the continental rift, however, magma is scarce and the young rift is dominated by tectonic activity, for example, deeply incised, flanking faults. Magma bodies, are either at great depth or nonexistent. Therefore meteoric water that enters flanking faults sinks to great depth, is heated by an enhanced geothermal gradient and then erupts back onto the surface along the same system, ot faults by which it entered the subterranean world. This fault-controlled hydrothermal exchange may have a substantial effect on the chemistry and the stability of the Lake Baikal water column. The tectonic setting of hydrothermal vents in Lake Baikal may provide clues to its degree of evolution as a continental rift. Lake Baikal and its associated rift contain biological and geological evidence linking the lake's origin to the birth of an infant ocean. The degree to which Baikal has evolved from a purely continental arena into its transition between a lake and a sea can only be deciphered by additional exploration.

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Dembitsky V.M., Kashin A.G., Rezanka T. Comparative study of the endemic freshwater fauna of Lake Baikal - V. Phospholipid and fatty acid composition of the deep-water amphipod crustacean Acanthogammarus (Brachyuropus) grewingkii. // Comp. Biochem. Physiol.; 1994; 108B(4): 443-448.
Lipid and phospholipid compositions of an endemic deep-water freshwater gammarid, belonging to the subphylum Crustacea, Acanthogammarus grewingkii was studied. Content of alkenylacyl, alkylacyl and diacyl forms in the main phospholipid classes (phosphatidylethanolamine and phosphatydilcholine) were established using reaction micro-thin-layer chromatography. The fatty

acids compositions of total lipids, neutral, glyco- and phospholipid fractions were investigated by capillary gas chromatography-mass spectrometry. Seventy-nine fatty acids were identified: 26 saturated (iso-, anteiso- and cyclo-), 26 monoenoic, 7 dienoic, 14 trienoic and 16 tetra-, penta- and hexaenoic. A number of demospongic fatty acids, such as 5,9-25:2, 5,9,19-26:3, 5,9,17-26:3, 5,9,23-28:3 and 5,9,21-28:3 acids, were found.

Dembitsky V.M., Rezanka T., Kashin A.G. Comparative study of the endemic freshwater fauna of Lake Baikal - I. Phospholipid and fatty acid composition of two mollusc species, Baicalia oviformus and Benedictia baicalensis. // Comp. Biochem. Physiol.; 1993; 106B(4): 819-823.
1. Lipid and phospholipid compositions of endemic freshwater molluscs belonging to the class Gastropoda, Baicalia oviformus and Benedictia baicalensis, were studied. 2. The fatty acids composition of total lipids, neutral, glyco- and phospholipid fraction was investigated by capillary gas chromatography - mass spectrometry. 3. Ninety-five fatty acids were identified: 23 saturated (both iso- and anteiso-), 28 monoenoic, 14 dienoic and 30 polyenoic. 4. High percentage of the two main acids, 18:4 and 18:4(n-3) in phospholipid and glycolipid fractions were identified. 5. A number of unusual polyunsaturated fatty acids, such as 19:4, 18:5(n- 3), 24:4(n-б), 24:5(n-б), 24:6(n-3), and furanoid acids, were found.

Dembitsky V.M., Rezanka T., Kashin A.G. Comparative study of the endemic freshwater fauna of Lake Baikal - II. Unusual lipid composition of two sponge species Baicalospongia bacillifera and Baicalospongia intermedia (family Lubomirskiidae, class Demospongiae). // Comp. Biochem. Physiol.; 1993; 106B(4): 825-831.
1. Lipid and phospholipid compositions of endemic freshwater sponges, belonging to the Family Lubomirskiidae, Class Demospongiae Baicalospongia bacillifera and Baicalospongia intermedia were studied. 2. The fatty acids of total lipids, neutral, glyco- and phospholipid fractions were investigated by capillary gas chromatography-mass spectrometry. 3. One hundred and eighty-five fatty acids were identified: 46 saturated (both iso-, anteiso-, branched, cyclic), 55 monoenoic, 37 dienoic, 25 trienoic and 22 polyenoic. 4. A number of unusual fatty acids, such as br7 -12-17:1, br9 -6-17:1, c-19-26:0, and very-long-chain polyunsaturated 6,9,12,15,18,21-24:6, 15,18,21,24-30:4, and 15,18,21,24-30:5 acids, were found.

Dembitsky V.M., Rezanka T., Kashin A.G. Comparative study of the endemic freshwater fauna of Lake Baikal - III. Phospholipid and fatty acid compositions of the amphipod crustacean of the genus Eulimnogammarus. // Comp. Biochem. Physiol.; 1994; 107B(2): 317-323.
Lipid and phospholipid, including plasmalogen forms, compositions of three endemic freshwater gammarides, belonging to subphylum Crustacea, genus Eulimnogammarus were studied. The fatty acid composition of total lipids, neutral, glyco- and phospholipid fractions were investigated by capillary gas chromatography-mass spectrometry. Ninety-four fatty acids were identified: 26 saturated (both iso-, anteiso- and cyclo-), 31 monoenoic, 11 dienoic, and 26 tri-, tetra-, penta- and hexaenoic. A number of unusual polyunsaturated fatty acids, such as c-9-17:0, c-9-19:0, 5,11,14-20:3, 5,11,14,17-20:4, 24:5(n-6) and 24:6(n-3), were found.

Dembitsky V.M., Rezanka A., Kashin A.G. Comparative study of the endemic freshwater fauna of Lake Baikal - IV. Phospholipid and fatty acid compositions of two gastropod molluscs of the genus Valvata. // Comp. Biochem. Physiol.; 1994; 107B(2): 325-330.

Dembitsky V.M., Rezanka T., Kashin A.G. Comparative study of the endemic freshwater fauna of Lake Baikal - VI. Unusual fatty acid and lipid composition of the endemic sponge Lubomirskia baicalensis and its amphipod crustacean parasite Brandtia (Spinacanthus) parasitica. // Comp. Biochem. Physiol.; 1994; 109B(2/3): 415-426.
Lipids and phospholipids (both plasmalogen and alkyl forms) of the freshwater sponge Lubomirskia baicalensis and the sponge's gammarid parasite Brandtia (Spinacanthus) parasitica were examined. Composition of alkenyl-acyl (plasmalogen), alkylacyl and diacyl forms of major phospholipid classes, phosphatidylethanolamine and phosphatidylcholine were determined. One hundred and eighty-three fatty acids were identified by GC-MS: 46 saturated, 55 monoenoic, 35

dienoic, 25 trienoic and 22 tetra-, penta- and hexaenoic. The freshwater sponges, belonging to the family Lubomirskiidae, were shown to contain unusual long-chain fatty acids: anteiso-5, 9-28:2, branched-5, 9-29:2, 5,9,23-29:3, 5,9,23-30:3, 15,18,21,24-30:4 and 15,18,21,24,27-30:5. Some from these fatty acids were found in lipids of the amphipod parasite.

Demske D., Muller J., Eckert C., Nowaczyk N., Mohr B., Oberhaensli H., Hubberten H.-W., Melles M. A sedimentological and palynological record of Lake Baikal at the Pliocene-Pleistocene boundary - a preliminary report. // International Project on Paleolimnology and Late Cenozoic Climate / IPPCE Newsletter; 1999; 12: 95-100.
Sedimentological and palynological studies on sediment samples of the BDP-96-1 drill cores from Lake Baikal provided a detailed record of the vegetation development from 3 to 2.4 Ma B.P. (million years before present). The results point to climate-influenced changes in sediment formation at the Academician Ridge and, based on palynological data, to changes in the plant cover around 2.9 Ma B.P. and especially 2.7 - 2.6 Ma B.P. Climatic cooling and dryness are indicated by the long-term decline of hemlock fir (Tsuga) and of climatically sensitive broadleaved trees as well as by a distinct increase in shrub, steppe (Artemisia) and cliff vegetation.

Denissova L., Belkova N., Ladygina N., Parfenova V., Zaychikov E. Phylogenetic analysis of deep aquatic bacteria of Lake Baikal. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 233.

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The large volume of water, approximately one-fifth of the total surface fresh water on the planet, contained in Lake Baikal in southeastern Siberia is distinguished by having a relatively high concentration of uranium (ca. 2 nM), and, together with the surface sediments, an unusually high 234U/238U alpha activity ratio of 1.95. About 80% of the input of uranium to the lake, with a 234U/238U ratio of 2.0, comes from the Selenga River. Profiles of uranium, as well as the extent of isotopic disequilibrium in a 9 m sediment core collected on Academic Ridge, generally show high values during interglacial periods corresponding to high diatom frustule numbers (DiFr) and biogenic silica (BSi) data that have been reported elsewhere. During glacial periods (low DiFr and BSi), uranium progeny (234U and 230Th) were in secular equilibrium with low concentrations of their parent 238U. Radionuclide distributions were interpreted in terms of a quantitative model allowing for adsorption of riverine inputs of uranium onto two classes of sedimenting particles with differing 238U/232Th ratios and uranium progeny in secular equilibrium. If the 234U/238U activity ratio of adsorbed uranium has remained constant, mean sedimentation rates can be independently estimated as 3.6 +- 0.6 and 3.7 +-0.9 cm kyr -1 for the decay of 234U and in-growth of 230Th, respectively. These rates are consistent with a mean rate of 3.76 cm kyr -1, calculated by optimization of the correspondence between adsorbed 238U and @ 18 O in dated oceanic sediments. The adsorbed uranium apparently tracks variable river flow during interglacials and is drastically reduced during periods of glaciation. Evidently, uranium has not been significantly redistributed within Baikal sediments over at least the past 250 kyr and is a unique, biologically non-essential, tracer for climate-sensitive processes, which provide their own internal geochronometers, potentially useful for ages up to 1 Myr BP.

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Einsle U., Alekseev V., Mazepova G. On the taxonomic status Cyclopoidae species from Prebaikalia, the Central Siberia. // Special International Conference "New Methods in Copepod Taxonomy": Abstracts; May 4-8, 1998; St. Petersburg, Russia; 1998: 6-7.

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Endo H., Sasaki H., Hayashi Y., Petrov E., Amano M., Miyazaki N. Examination of the head of Baikal seal (Phoca sibirica) [in press]. // J. Anat.; 1999.

Endo H., Sasaki H., Hayashi Y., Petrov E.A., Amano M., Miyazaki N. Functional relationship between muscles of mastication and the skull with enlarged orbit in the Baikal seal (Phoca sibirica). // J. Vet. Med. Sci.; 1998; 60(6): 699-704.

Endo H., Sasaki H., Hayashi Y., Petrov E.A., Amano M., Miyazaki N. Functional relationship between muscles of mastication and the skull with enlarged orbit in the Baikal seal (Phoca sibirica). // Biodiversity, Phylogeny and Environmental in Lake Baikal. Miyazaki N. ed. Tokyo, Japan: Otsuchi Research Center, Ocean Research Institute, The University of Tokyo; 1999: 141-146.
We expected that the enlarged area of zygomatic arch, one of some skull characters adapted for enlarged eye, has an influence on form and function of muscles of mastication in the Baikal seal (Phoca sibirica). So, in this species, the Mm. masseter, temporalis, pterygoidei, digastricus were observed in the macroscopic level. The skull characters related to these muscles were also compared between the Baikal seal and a close-related species, the ringed seal (Phoca hispida). The Mm. masseter and temporalis were well- developed using the enlarged attachment area of zygomatic arch. In contrast, the M. digastricus is suggested to be not so important in the Baikal seal, because the temporal bone is not so developed as in he ringed seal. It is suggested that the Baikal seal has especially developed the Mm. temporalis and masseter using an enlarged arxa of zygomatic arch among Pusa species. We also suggest that the robust temporal bone is equipped to have the M. digastricus developed as a main retractor of mandibular body in the ringed seal.

Endo H., Sasaki H., Hayashi Y., Petrov E.A., Amano M., Miyazaki N. Macroscopic observations of the facial muscles of the Baikal seal (Phoca sibirica). // Mar. Mammal Sci; 1998; 14(4): 778-788.
This study was performed to determine if, as expected, the enlarged eye of the Baikal seal (Phoca sibirica) has an influence on the form and function of the skull and facial muscles. Macroscopic observation of these muscles demonstrated that the M. orbiculuris oculi expands around the palpebral fissure and that some facial muscles attach and insert in the M. orbicularis oculi, possibly supporting M. orbicularis oculi function. We suggest that these muscles move the eye and palpebral area and constitute a morphological and synergistic facial muscle complex system. Further, the development of the M. rectus lateralis around the sclera of the eye indicates that this muscle is also involved in eye movement.

Epov V.N., Lozhkin V.I., Epova E.N., Vasilyeva I.E. The analysis of ultra fresh Baikal water by ICP-MS. // Chimia; 1998; 52(7-8): 391.

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Eriksson K., Reuter M., Timoshkin O. Analysis of catecholamines in Turbellarians of Lake Baikal. // Comp. Biochem. Physiol.; 1993; 105 C(3): 509-511.
1. The catecholamine content in six endemic turbellarians of Lake Baikal was examined with high pressure liquid chromatography (HPLC). 2. The planarians Archicotylus sp., Baikalobia sp., Bdellocephala angarensis, Rimacephalus arecepta, Sorocelis nigrofasciata and the lecithoepitheliat Geocentrophora wagini were analysed. 3. Dopa and dopamine (DA) were detected in all species and noradrenaline was detected in all species except Archicotylus. DA dominates in all species. 4. Neither adrenaline nor the DA-metabolite DOPAC were detected.

Eriksson K., Timoshkin O., Reuter M. Neuroactive substances in an endemic flatworm from Lake Baikal. // The Early Brain: Proceedings of the Symposium 'Invertebrate Neurobiology' / Acta Academiae Aboensis. Gustafsson M., Reuter M. ed. Abo; 1990; 50(7): 137-145.

The occurrence and distribution of nervous structures immunoreactive to antisera against 5-HT, FMRF-amide and SCP, in the prolecitophoran Friedmaniella sp. is studied with immunofluorescence and peroxidase-antiperoxidase staining methods. This is the first immunocytochemical investigation in an endemic flatworm from Lake Baikal. 5-HT-like IR is revealed in the brain and in nerve cords. FMRF-amide-like IR is demonstrated in mono- and bipolar cells surrounding the neuropil, in fibres in the neuropil and in nerve cords. In the epidermis FMRF-positive cells are revealed. By a double immunostaining technique fibres positive for both a-FMRF-amide and a-SCPb are observed in the pharynx and under the epidermis. The presence of these, or closely related substances, in this phylogenetically old species indicates that they are essential in the function of the nervous system.

Evstigneeva T.D. Description of Moraria utulikus n.sp. (Harpacticoida, Canthocamptidae, Baicalomoraria) from Lake Baikal. // Special International Conference "New Methods in Copepod Taxonomy": Abstracts; May 4-8, 1998; St. Petersburg, Russia; 1998: 7.

Evstigneeva T.D. Description of Moraria utulikensis n. sp. (Harpacticoida, Canthocamptidae, Baicalomoraria) from Lake Baikal [в печати]. // Zoosystematica Rossica; 1999.

Evstigneeva T.D. Precopulatory mate guarding in Harpacticella inopinata Sars (Copepoda: Harpacticoida) from Lake Baikal. // Hydrobiologia; 1993; 254: 107-110.
Precopulatory mate guarding is reported for the first time from a freshwater harpacticoid, Harpacticella inopinata. Adult males were observed grasping onto juvenile females from the third copepodid stage onwards, but most commonly with the fifth copepodid. This behaviour is interpreted as a plesiomorphic trait of the family Harpacticidae.

Evstigneeva T., Clark P.F., Boxshall G.A. Nocturnal emergence behaviour of the fauna of Lake Baikal, Siberia. // Prog. Underwater Sci.; 1991; 16: 85-88.
Quantitative samples of meroplanktonic animals that enter the water column at night but return to the substrate during the day were obtained using an emergence net around the shallow margins of Lake Baikal. The method of deployment of the diver-operated net is described. Large numbers of the harpacticoid copepod Harpacticella inopinata, cyclopoid copepods and gammaridean amphipods were found to enter the water column at night. The significance of this behaviour is discussed.

Evstigneeva T., Kikuchi Y. Results of russian-japanese research of harpacticoid copepods (1992-1998). I. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 16.

Fage N., Thorez J., Oberhaensli H., Andre L., Boski T., Likhoshway Ye. The VER-98-1-3 core, Academician Ridge, Baikal Lake: preliminary data about the bulk mineralogy, geochemistry and sedimentology of the last 250.000 years. // Baikal Symposium and 1st Baikal-Sed Workshop: Abstracts; Nov. 18-22, 1999; Berlin / Potsdam; 1999: 36-37.

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Falkner K.K., Measures C.I., Weiss R.F., Jeandel C., Thouron D. Trace element distributions in Lake Baikal. // Eos Trans. AGU: Fall Meeting / Suppl.; 1992; 73(43).

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Flower R.J. A review of current biological and recent environmental research on Lake Baikal from a British perspective. // Freshwater Forum; 1994; 4(1): 8-22.

Flower R.J. A taxonomic re-evaluation of endemic Cyclotella taxa in Lake Baikal, Siberia. // Nova Hedwigia, Beiheft; 1993; 106: 203-220.
Cyclotella taxa occurring in surface sediment samples from Lake Baikal are investigated using light and scanning electron microscopy. Original descriptions of Cyclotella baicalensis Skvortzow & Meyer and C. minuta (Skvortzow) Antipova are confirmed and additional morphological information is provided. Using differences in marginal structure, C. baicalensis fo. ornata Skvortzow is raised to specific status. Comparison of marginal structures indicate that this taxon, C. ornata comb. nov., is more closely related to C. minuta than to C. baicalensis. The significance of these taxa in relation to endemism and recent environmental change in Lake Baikal is discussed.

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Pliocaenicus taxa living or in very recent sediments from upland lakes around Lake Baikal are examined in relation to those found in Pleistocene and Miocene deposits in Kamchatcka and elswehere. The validity of the genus Pliocaenicus is substantiated and subdivision of P. costatus sensu lato is examined in some detail. Re-examination of material from Skabitchevsky's type locality and an LM and SEM study of conspecific and closely related taxa has been undertaken. Skabichevsky's type material is unavailable and two morphotypes have been described in the literature under this epithet. The taxonomy of P. costatus var. sibiricus (Skabitch.) Round & Hakansson is now clarified and a new variety, P. costatus var. leprindus, is established. Comparison with fossil material shows that P. costatus taxa are very stable over time with morphologies differing only in detail of valve central area areolar density, valve central area texture (colliculate or smooth), spacing of marginal costae, and number of central area fultoportulae. Valve shape and presence of marginal spines can be used as supporting characteristics. The occurrence of living P. costatus var. sibiricus (Skabitch.) Round & Hakansson in one Siberian lake permitted us to examine some modern ecological and recent palaeoecological attributes of this representative of a largely fossil genus. It is the most abundant planktonic diatom in several pristin, extremely softwater wilderness lakes near to Siberian Lake Baikal. In one of these lakes (Lake Bolshoie), its frequency abundance has increased since the 19th century. The P. costatus group of taxa could have considerable potential for indicating past biogeographic and climatic changes in Siberia and elsewhere.

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Neutron Activation Analysis (NAA) and Synchrotron Radiation X-Ray Fluorescent Analysis (SRXRFA) were used to measure the content of uranium and a few other trace elements in samples of bottom sediments of Lake Baikal separated into biogenic (diatom algae frustules) and clastic components by an aerodynamic method. Uranium is rejected, rather than accumulated by diatom algae frustules.

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X - ray fluorescent analysis with synchrotron radiation (SRXFA) and neutron activation analysis (NAA) were used to study the distribution of elements in sediments of Lake Baikal over the time interval of Brunhes Epoch (0-780 kyr BP). The concentrations of some elements and their ratio respond to changes of the climate. Sr/Ba, Sr/Rb, Sr/Cs, Sr/Fe, Sr/Ti, U/Th, Zn/Nb, Mo, Eu, Y, Yb positively correlate with the content of biogenic silica (BiSi) which is high at intervals belonging to interglacials and small at those belonging to glacials. On the contrary Ba, Rb, Cs, Th, La, Ce, Nd, La (Ce)/Yb(Y.Zr) negatively correlate with BiSi. These two series of geochemical signals, along with BiSi, reflect oscillations of the climate between glacials and interglacials. Spectral analysis of the records revealed that are modulated by orbital forcing. This proves that the climates of East Siberia depend on orbital forcing to the similar extent, as does the global climate. Comparison of the climate records found in the sediments of Lake Baikal with the pattern of orbital parameters made it possible to estimate the mean rates of sediment accumulation over different time intervals and to reline the age-depth model.

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Lake Baikal is located in the tectonically active Baikal rift depression. The average heat flow, based on nearly 600 measurements which were mainly obtained by using a non-autonomous cable thermoprobe, is 71- 21 mW/m2. The heat flow is not randomly distributed over the basin: in the southern and middle basins, the positive heat flow anomalies are located near the eastern shore of the lake and are supposed to be connected with border faults; in the northern basin, the heat flow is fairly low and poorly variable along the lake axis. Heat flow maxima occur at intersections between the regional border fault and transverse faults. These high heat flow anomalies, reaching up to 8.6 W/m2, are related to hydrothermal discharge. Two sites of high heat flow - Frolikha Bay and Kukui Canyon - have been investigated in detail. The Frolikha Bay heat flow anomaly is associated with hydrothermal discharge along the slope of the basin resulting in temperature anomalies of the near-bottom water. Chemical evidence shows that the feeding zones of hydrotherms are located on the ridges bordering the lake, the meteoretic water permeating the basement rocks down towards the rift basin, where it discharges along the subwater slope. CTD-profiling in the Frolikha Bay area shows that the hydrotherm which is characterized by anomalous temperature and salinity, constitutes a dense layer which remains at the bottom of the water column and flows towards the deeper parts of the basin. Based on the observed increase in temperature and in mineralisation of the near-bottom water in Frolikha Bay, theoretical considerations confirm that the observed dense layer is able to flow down the slope to reach the deepest part of the northern basin up to depths of 700 meters. Not all the hydrotherms discharging along the slopes of the basin may have a sufficient excess in mineralisation to reach the bottom: some of them may, after flowing down part of the slope, constitute a wedge-like layer of hot and mineralised water. Others, discharging at great depth, will move upwards until their density equals that of the ambient water. The influence on the density of hydrotherms by mixing with ambient water is also evaluated. As a consequence of mixing with the lake water, the density of hydrotherms increases, which facilitates stagnation at the bottom or offers an additional possibility of flowing downslope towards greater depths. Key words: Heat flow, Thermal waters, Vents (Hydrothermal vents), Stability (Static stability), Fresh water, Rift zones, Lake Baikal, Baikal rift zone, Siberia.

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Study was made on the pollution of the surface aerosol of the southern coast of Baikal with polynuclear aromatic hydrocarbons (PAH) in the areas with potential sources. Twelve individual PAHs were determined from the list of compounds recommended for the analysis for evaluating the risk both for the environment and for people. The level of their concentration is maximum in wintertime, pollution is mainly of local nature. Keywords -polynuclear aromatic hydrocarbons, HPLC, pollution, surface aerosol, southern cost of lake Baikal.

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We - SIR have found that organisms of the rich, freshwater biological community involving sponges, flatworms and other benthic species near a thermal vent at the bottom of Lake Baikal are built of ancient carbon lacking 14C. The vent occurs at a depth of 420 m in Frolikha Bay (55o31' N, 109o46' E)1.2. It was found earlier that the carbon of its benthic organisms was produced by methanogenic bacteria, as revealed by the very small values of @ 13 C (- 60 to - 72%.). However, the age of this carbon was not known. Using a Tandetron accelerator mass-spectrometer, we measured the contents of 14C in carbon of two Bdellocephala flatworms and a sponge collected on a bacterial mat of Frolikha vent, and found them to be equal to 0.43, 0.34 and 0.28 of that typical of modern organic matter, corresponding to apparent radiocarbon ages of 6,860 +- 260, 8,740 +- 80, and 10,200 +- 220 years before present (BP), respectively. Hence, about 60-70 % of the carbon of the near-vent organisms has originated from ancient methane, rather than from modern atmospheric CO2 due to photosynthesis or methanogenesis. The source

of ancient carbon was also not limestone, as is sometimes the case in freshwater systems, since the uppermost layer of Baikal sediments is known to have an apparent radiocarbon age of less than 1,000 years BP at many locations (see ref. 3 and T. N. et al., unpublished data). Frolikha vent arises from meteoric water seeping through Baikal sediments that are known to contain high concentrations of methane; gas hydrates are ubiquitous under the floor of the lake, as shown by seismic profiling. The small dependence of the near-vent community on photosynthesis suggests that vents of this kind could have been important in the nascence of the unique faunistic complex of Lake Baikal consisting of 1,500 endemic species: vents could have many times served as refuges under unfavourable climates, and sources of species radiation under more favourable ones during the 20-million-year-long history of the lake. Communities of organisms built of ancient carbon are not uncommon in a marine ecosystem, but this is the first time they have been found in a freshwater ecosystem.

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SIR-An acute disease of Lake Baikal seals (Phoca sibirica) attributable to morbillivirus infection became evident in the autumn of 1987 when weakened seals crawled onto the lake's icy shores and died. Many of them had paralysed hind extremities and ophthalmitis. No similar event is known from records going back to the 1930s. By October 1988, several thousand of the 80,000-100,000 seals in Lake Baikal had died. In December 1987, during an expedition to Ushkani Island on the border between middle and northern Baikal, one of us (V.S.K.) noticed that three of the five dogs that lived there and had close contact with seals had died with typical symptoms of canine distemper virus (CDV) infection. In the same month, we observed signs of a similar disease in a 6-year-old female seal (code PB-6). Two days after capture the animal seemed to have recovered but after a further 3 days it again showed symptoms of acute disease - diarrhoea, ophthalmitis and convulsions of the hind flippers. It died 10 days after capture. Rectal temperature varied between 34 o C on days 1 and 10, and 24 o C on days 5-7. No severe pathology of internal organs was observed but cytological investigations of bladder epithelium showed intracytoplasmic eosinophilic inclusion bodies characteristics of canine distemper. Inclusions were also found in cells of liver, kidneys, spleen, lungs and in neurons of the brain and spinal cord. When the sera of eight dead seals were studied, six gave weakly positive indirect haemagglutination reactions (titres of 1:10 to 1:80) with measles antigen, which is a close relative of CDV; all sera neutralized the cytopathic effect of CDV vaccine strain EPM with titres from 1:8 to 1:64. To prove the presence of a CDV - like virus in seal tissues, we have recently used the technique of oligonucleotide probing. On the basis of the known sequences of CDV RNA we synthesized 14 - 40 deoxyoligonucleotide probes complementary to either virion RNA, or to the corresponding messenger RNA. The probes were designed to detect sequences that are either common to CDV and measles virus (probes 1-7, for gene N sequences, and probes 14-19 for gene P sequences), or sequences that differ between the two viruses (probes 8-13 for the gene N sequences that differ most). The precise sequences probed are shown in a in the figure. Probing revealed both virion and mRNA sequences in seal PB-6. These data suggest that CDV or a close relative was not only present but biologically active, inducing synthesis of its mRNA. These results and the preliminary immunological data were discussed at a conference held in Irkutsk in February 1988. In June 1988, several hundred samples of blood and tissues of Lake Baikal seals were obtained during the spring cull. Of 83 spleen samples subjected to oligonucleotide probing, 8% gave a strong positive signal for CDV RNA and there was a total of 55% positive samples. The 45% negative samples confirmed that the assay is selective (b in the figure). Along with CDV-neutralization tests, we also performed both radioimmunometric assays, using CDV vaccine absorbed on nitrocellulose and rabbit anti-seal lgG labelled with 125 I, and enzyme-linked immunosorbent assays (ELISA), using a monolayer of Vero cells infected with CDV il plastic wells and protein A conjugated with peroxidase. A large proportion of animals tested contained antibodies against CDV in their blood. In the neutralization assay, 55% of the sera had titres between 1:16 and 1:64; 50% were positive in the radioimmunometric assay; 89% were positive by ELISA, with titres from 1:16 to 1:1,280. These date indicated that the whole population of Lake Baikal seals had been in contact with the virus,

suggesting that the survivors should be immune to further infections. The lack of any unusual mortality of seals in the autumn or winter of 1988 confirms that immunity is now established. We mentioned CDV as the cause of the Baikal seal disease in September 1988 when, first from newspapers, and then from Dr A. Osterhaus, we learned that CDV or a closely related virus was also believed to have caused the disease of seals in Western Europe. This has been confirmed by several techniques. According to nucleic acid hybridization and immunological data the virus in European seals is not identical to CDV but a distinct seal virus (phocid distemper virus; PDV). Our data on Baikal seals prove only that they were infected by a morbillivirus closely related to CDV; its precise relationship to other morbilliviruses will only be established when the seal virus RNA has been sequenced. The fact that seals in Baikal and in Western Europe have been infected by very similar or identical, viruses poses new questions concerning the origin and spread of the seal virus. During a very recent visit, Dr A. Osterhaus brought us sera of European seals, some of which contained antibodies (with titres up to 1:1,080) to CDV in our ELISA. These data and those reported below by Osterhaus et al. strongly suggest that the Baikal and European seals have been infected by the same virus, or one that is closely related.

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Two protein-coding regions (cytochrome b, ATPase 8, and part of ATPase 6) from mitochondrial DNA of Cottus kessleri, Cottocomephorus grewingki, and Cottocomephorus inermis-Baikalian endemic sculpins - were amplified via polymerase chain reaction, and sequenced. Two novel primers-L8352 (5'-TAAAGATTGGTGAC TCCCAACCACC) and H8773 (5'-GTAGGGAGT AAGCCCAATATGTT) - were used for the latter region. Phylogenies suggested by sequence divergence of the genes of ATPases appeared to be different from those computed from data for cytochrome b. The time of species branching was estimated as 1-2 million years (Myr) on the basis of merged sequences. Hence, members of the Baikalian cottoid species flock are much more distant from each other than members of the cichlid fish flocks of the great lakes of Africa (0.2 Myr). Topology of the phylogenetic tree does not contradict the relationships derived from morphological data. However, genetic distances suggest that C. grewingki and C. inermis are not sister species, contrary to general belief.Key words: Mitochondrial DNA - PCR - Cottoid fishes - Baikal.

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Two parallel drilling cores, BDP96-1 (200 m), and BDP96-2 (100 m), have been taken from top of the underwater Akademichesky Ridge in Lake Baikal and dated by paleomagnetic techniques. These cores are part of the Baikal Drilling Project (Kuzmin et al., 1997a, b). Diatom analysis of the first 100 m of these sediments reveals that they store a 2.5 Myr high- resolution continuous record of the palaeoclimates of East Siberia. Sediments belonging to warmer climates have a high content of diatom algae frustules, whereas those belonging to global glaciations are diatom-barren. The record of Upper Pleistocene (500 kyr BP) strongly correlates with the oceanic SPECMAP curve and contains distinct 100, 41, 23, and 19 kyr periods, as revealed by Fourier analysis. Diversity of diatom species was small in Pliocene. Abrupt and frequent changes of the climate in Pleistocene resulted in frequent dramatic changes in the diatom communities. The extant dominating endemics, Cyclotella minuta and Aulacoseira baicalensis, became important in Lake Baikal 760 kyr and less than 120 kyr BP, respectively.

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Two families of Porifera are represented in Lake Baikal: cosmopolitan Spongillidae and endemic Lubomirskiidae. Systematics and phylogeny of Lubomirskiidae is still poorly known. Indeed, there is little agreement on the origin of freshwater sponges in general, and this group is considered to be polyphyletic. Lates morphological and embryological data indicate that Lubomirskiidae and Spongillidae are closely related. Using molecular data we explored the possible origins of Lubomirskiidae and determined the closest relatives of Spongillidae and Lubomirskiidae among marine sponges. Partial sequences of 18S rDNA for Halichondria japonica Lubomirskia abietina, Swartschewskia papyracea, Spongilla lacustris and Ephydatia, muelleri were compared with available sequences of 18S rDNA of other Porifera. Parsimony and neighbor-joining analyses gave trees of similar topology. Molecular data were in accordance with the notion of close relationships of endemic and cosmopolitan families. Some marine sponge families are assumed to be related to freshwater sponges.

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All four pairs of gill arches in Comephorus baicalensis and C. dybowskii (Comephoridae) are well developed. In contrast to other Baikalian cottoids (Cottidae, Abyssocottidae), the slit behind the fourth arch is well preserved and two hemibranchs are present on this arch in the golomyankas. These anatomical details are considered to contradict the opinion that Comephoridae may be derived from other Baikalian Cottoidei. The arches in golomyankas are elongated and equipped with very strong spinous gill-rakers. The external sides of the upper and lower jaws are covered with numerous spinelike denticles, the apices of which are bent toward the mouth cavity. The denticles and the spinous gill-rakers are considered to be a specific adaptation in sluggish golomyankas for precise grasping of zooplankton of different sizes, as well as fish larvae. Respiratory components of the gill apparatus in the golomyankas are reduced considerably because of short gill filaments and the sparce distribution of small respiratory lamella on them. The

allometry for the relationships between gill respiratory surface area (GRSA) and body mass (Y = a Wb) in both golomyankas is biphasic: in juvenile immature C. balcalensis Yj = 199.O13 W1.057 and in mature animals Ym = 322.354 W0.731. In C. dybowskii the values for immature and mature animals are Yj = 95.736 W1.190 and Ym = 199.609 Wo.707, respectively. In the sluggish bathypelagic golomyankas (Comephorus) the GRSA per body weight unit is 5-6 times smaller than that found in more active secondarily pelagic Baikalian sculpins (Cottocomephorus) examined previously.

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The paleoclimatic record from bottom sediments of Lake Baikal (eastern Siberia) reveals new evidence for an abrupt and intense glaciation during the initial part of the last interglacial period (isotope substage 5d). This glaciation lasted about 12,000 yr from 117,000 to 105,000 yr B.P. according to correlation with the SPECMAP isotope chronology. Lithological and biogeochemical evidence of glaciation from Lake Baikal agrees with evidence for the advance of ice sheet in northwestern Siberia during this time period and also with cryogenic features within the strata of Kazantzevo soils in Southern Siberia. The severe 5d glaciation in Siberia was caused by dramatic cooling due to the decrease in solar insolation (as predicted by the model of insolation changes for northern Asia according to Milankovich theory) coupled with western atmospheric transport of moisture from the open areas of Northern Atlantic and Arctic seas (which became ice-free due to the intense warming during preceeding isotope substage 5e). Other marine and continental records show evidence for cooling during 5d, but not for intense glaciation. Late Pleistocene glaciations in the Northern Hemisphere may have begun in northwestern Siberia. Key Words: Sileria, Lake Baikal, glaciation, Pleistocene.

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The St.16 core obtained from the Academician Ridge of Lake Baikal in eastern Siberia may span about 260 000 years, and some physical properties of the core samples are closely related to aquatic paleoproductivity and climatic change. The median of grain size, grain density, and water content fluctuate synchronously. They also are connected with change in the abundance of biogenic silica (diatoms). The physical parameters indicate that there were high aquatic productivity periods around 'interglacial' periods (MIS 5 and 7; 70 000 - 125 000 yr B.P. and 180 000 - 250 000 yr B.P.). Comparatively large clastics were transported from outside of the lake through various routes (ice rafting, etc.) in addition to fluvial routes during the 'glacials' or 'stadials'. There are ca. 20 000 yr, 40 000 yr and 100 000 yr periods in the variations of physical properties. These are related to the three Milankovitch parameters of solar insolation.

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Khursevich G.K., Karabanov E.B., Prokopenko A.A., Williams D.F., Kuzmin M.I., Fedenya S.A. New diatom species of Stephanodiscus from Pleistocene deposits of Lake Baikal, Siberia, deep drilling core BDP-96-2. // International Project on Paleolimnology and Late Cenozoic Climate / IPPCE Newsletter; 1999; 12: 77-87.
Two new extinct species of the genus Stephanodiscus Ehr. (S. williamsii sp. nov., S. princeps sp. nov.) and one unique species of this genus (S. cf. yukonensis Kling) already knwon from Kanada, are described for Lower and Middle Pleistocene lacustrine sediments of Lake Baikal (borehole BDP- 96-2). The biostratigraphic position of these taxa are discussed. The narrow age ranges of these species warrants their use for robust correlation and age control of Lake Baikal sediments.

Khursevich G.K., Karabanov E.B., Prokopenko A.A., Williams D.F., Kuzmin M.I., Fedenya S.A. New fossil species of Cyclotella (Bacillariophyta) from Uppen Cenozoic deposits of Lake Baikal, Siberia, and their stratigraphic significance. // International Project on Paleolimnology and Late Cenozoic Climate / IPPCE Newsletter; 1999; 12: 62-77.
Three new extinct diatom species and two new varieties of the genus Cyclotella (Kutz.) Breb. are described in Upper Cenozoic lacustrine sediments of Lake Baikal. These species occur in narrow

age ranges and are therefore suggested as index-species for the newly defined diatom zones in Lake Baikal sediments. They can be used for robust correlation and age control of Lake Baikal deposits. The phylogenetic relationships are established between the newly described Lake Baikal species with closely related extant Cyclotella species.

Khursevich G.K., Karabanov E.B., Williams D.F., Kuzmin M.I., Gvozdkov A. Pliocene-Pleistocene geochronology and diatom biostratigraphy of bottom sediments of Lake Baikal: new results of deep drilling cores. // Int. Sympos. "Paleoclimates and the Evolution of Paleogeographic Environments in the Earth's Geological History": Abstracts; Aug. 27-31, 1998; Petrozavodsk, Russia; 1998: 27-28.

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In order to elucidate the faunal relationships of harpacticoid copepods between Lake Baikal and the connected rivers, we made expedition at four rivers in the northern and southern areas of Lake Baikal. Four species of harpacticoid copepods, Bryocamptus chappuisi, Harpacticella inopinata, Bryocamptus chappuisi, and Canthocamptus gibba were collected in these areas. Their characteristics of distribution were briefly described.

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Kipfer R., Aeschbach-Hertig W, Hofer M., Hohmann R., Imboden D.M., Baur H., Golubev V., Klerkx J. Bottomwater formation due to hydrothermal activity in Frolikha Bay, Lake Baikal, eastern Siberia. // Geochim. Cosmochim. Acta; 1996; 60(6): 961-971.
Hydrothermal water enters Frolikha Bay, a well-known site of high geothermal heat flux in the northern part of Lake Baikal, at 400 m depth. On the basis of CTD profiles, the hydrothermal

water is identified as forming an anomalous bottom layer with a higher temperature (>0.15oC) and salinity (>2.5 mg x kg-1) than the overlying water. Due to the entrainment of lake water, a distinct dense water layer up to 40 m thick, stabilised by its slightly higher salinity, becomes established close to the bottom of the bay. The density current thus generated flows out of the bay towards the deeper parts of the basin. Since helium isotope analysis shows that the geochemical characteristics of the hydrothermal water are similar to those of water from nearby hot springs on land, the bottomwater of Frolikha Bay is easily interpreted in terms of the mixing of ordinary fresh water from the lake and hydrothermal water carrying isotopically heavy He from the continental crust. Because of its high crustal He content, a similar hydrothermal component may even be identified in the open water of the northern basiny.

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The free sterol fraction of the Baikalian freshwater sponge Lubomirskia baicalensis was isolated, separated on AgNo3 impregnated silica gel, and studied by GLC-MS and NMR analyses. It was shown that the sterol fraction contains at least 16 components belonging to the 5-series; 14 of them were identified. 25(26)-Unsaturated sterols, 24-norcholesta-5,22-dien-3B-ol and rare sterol baicalosterol (24-ethyl-26-norcholesta-5,22E,25-trien-3B-ol) were found as minor components of L. baicalensis.

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To improve knowledge of the taxonomic relationship between 3 species of the subgenus Pusa (Phoca sibirica, Phoca caspica and Phoca hispida), we examined 60 Baikal seals (Phoca sibirica), 46 Caspian seals (Phoca caspica) and 51 ringed seals (Phoca hispida) from aspects of growth and skull morphology. Ages of the samples ranges from 0.25 to 35.5 years old for Baikal seals, from 0.5 to 41.5 for Caspian seals, and from 0.5 to 19.5 for ringed seals. Baikal seals show

sexual difference in growth indicating that males are larger than females. On the other hand, no sexual difference of growth is observed in Caspian seals and ringed seals. Comparison of skull morphology between three species shows that Baikal seals have closer affinity to ringed seals than to Caspian seals.

Kozhova O.M., Izmesteva L.R., Erbaeva E.A. A review of the hydrobiology of Lake Khubsugul (Mongolia). // Hydrobiologia; 1994; 291: 11-19.
Lake Khubsugul phytoplankton is dominated by Diatoms and Chlorococcales. Its algal flora is rather peculiar, but lacks Baikalian endemics. Primary production ranges from 2 to 5 mg C m-3 d-1. Total bacteria in the open water is 150-200 x 10 3 cells ml-1. Predominant in numbers and biomass throughout the year are two pelagial species of Copepoda - the endemic Mixodiaptomus kozhovi Step., and Cyclops abyssorum Sars. The bottom fauna consists of cold stenothermic invertebrates, mostly Chironomidae. In biomass, they rank only third, however, after Gammaridae and Mollusca. The average zoobenthos biomass of the lake is 5.5 g m-2.

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Annual cycles in chemical composition of the body, liver, gonads, red and white muscles were determined for two medium fat sculpins, Cottocomep- horus grewingki and C. inermis, endemic to Lake Baikal. Their total lipid content ranged from 3 to 9% during the year. The content of defatted dry substance was 14-17%, similar to the protein content of the other Baikali- an cottoid fishes. The prespawning period was characterized by a positive lipid and protein balance in both species. In C. grewingki the liver per- formed largely a metabolic function, whereas in C. inermis it served also as a storage site for lipid reserves. During spawning, total body lipids of females of both species showed a two- to threefold decrease. Males of C. grewingki guarding nests deplete greatly their total body lipids, which decrease seven- to ninefold by the time of larval hatching in comparison with the prespawning period, and constitute 1-2%. After spawning, lipid reserves of C. grewingki were quickly restored to the initial level (from about 3 to 9%) and maintained during the long sexual maturation period. In C inermis total body lipids increased only twofold in comparison to those observed during the spawning period.

Kozlova T., Khotimchenko S. Fatty acid composition of endemic Baikal fish and Crustacea. // Comp. Biochem. Physiol.; 1993; 105B(1): 97-103.
A study was made of the fatty acid composition of polar and neutral lipids in liver, gonads and red and white muscles of two endemic Baikal fish species: Cottocomephorus grewingki and Cottocomephorus inermis and of the Crustacea Epischura bacalensis and Macrohectopus branickii. We have detected a high level of polyunsaturated (n-3) series fatty acids, unusual for freshwater fish. According to the fatty acid ratio (n-3)/(n-6) in polar lipids, the Baikal fish occupy an intermediate place between freshwater and marine fishes and, in regard to neutral lipids, they refer to typically freshwater species. It is shown that 22:6(n-3), 16:O, 18:1 are the main components of fatty acids of these fish and Crustacea and, among them, 22:6(n-3) is dominant. In the spawning period, in comparison with that of sexual maturation, the 22: 6(n-3) content of polar lipids decreases in the liver; the content of 16:1 decreases in neutral lipids and the content of C18 of polyunsaturated fatty acids increases in the liver and red muscles in both species. The fish C. grewingki and C. inermis have an identical fatty acid composition, although their foods differ in fatty acid composition.

Kozlova T.A., Smirnova N.S., Dzyuba E.V. Chemical composition of Baikal omul of different populations. // VI International Symposium on Biology and Management of Coregonid Fishes: Abstracts; September 23-26, 1996; Konstanz, Germany; 1996: 58.

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Kuimova L.N., Sherstyankin P.P. Climate change and extreme hydrological events on Lake Baikal during the last 250,000 years. // Proceedings of the Second Int. Conf. on Climate and Water (Aug. 17-20 1998). Espoo, Finland; 1998; 3: 1197-1204.
On the basis of data on Greenland core GRIP Summit (Dansgaard et al. 1993) the reconstruction of extreme climatic and hydrological events in Lake Baikal during the last 250,000 years is discussed in this paper. The periodicity of climatic changes in Lake Baikal and in the North Atlantic are in good correlation. Therefore, the main glacial cycles and the last interstadials up during the period studied can be reconstructed. The reliability of the reconstruction on the temperature is verified by the comparison with Tair given by E.I. Ravsky (1972) for Upper Pleistocene of East Siberia, as well as by the analysis of Baikal sediments (Kuzmin et al., 1997; Grachev et al. 1997). The analysis such situations is a window in the future.

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Kuimova L.N., Sherstyankin P.P. Reconstruction of paleohydrophysical regime of Lake Baikal in Upper and Middle Pleistocene and Heinrich events. // 7th Inter. Conf. on Lakes Concervation and Management (Lacar'97) (San Martin de las Andes, Argentina; Oct. 26-31, 1997): Reports; 1997; 1: 83-86.

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Samples ofthe 1996 I & II core on the Academician Ridge from the Lake Baikal Drilling Project were studied for diatoms. Besides of dominating planktonic algae a number of benthic species could be registered.

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The main purpose of this study was to measure the ion composition of atmospheric aerosol near Lake Baikal together with the number size distribution of particles with diameters ranging from p few nanometres to about 30 mm. All measurements of the properties of atmospheric aerosol were followed by conventional meteorological observations. The mean aerosol number

concentration was 5700 cm -3 , the mean mass concentration about 20 mg m-3. Among the cations the main contribution to the total aerosol mass is from calcium and among the anions, by sulfate. The size distribution number and mass concentrations, and the ion composition, of the aerosol near Lake Baikal are similar to the remote continental aerosol described in the literature.

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Kuznedelov K.D., Timoshkin O.A. Phylogenetic relationships of Baikalian species of Prorhynchidae turbellarian worms as inferred by partial 18S rRNA gene sequence comparisons (preliminary report). // Molecular Marine Biology and Biotechnology; 1993; 2(5): 300-307.
The polymerase chain reaction (PCR) and direct sequencing of RNA genes were applied for phylogenetic relationship analysis among Turbellaria (flatworms). Representatives of 10 species of the genus Geocentrophora (Prorhynchidae family) were used to establish homology between nucleotides in the 5'-end portion of the 18S rRNA gene sequences. Sequence data were subdivided into 3 subsets- unpaired and basepaired (according to rRNA secondary structure) and transversion, including only transversion substitutions-that were independently analyzed to construct phylogenetic trees. Distance matrix and maximum parsimony approaches were applied to infer phylogenies. Trees were examined in terms of morphological taxonomy. The DNA sequences support the taxonomy and systematics of Baikalian flatworms. The hypothesis of Geocentrophora origin in Baikal is discussed.

Kuznedelov K.D., Timoshkin O.A., Kumarev V.P. X65071 G.intersticialis gene for 18S rRNA (Baikal). X65072 G.sphyrocephala gene for 18S rRNA (St.Petersburg region). X65073 G.baltica

gene for 18S rRNA (St.Petersburg region). X65074 G.incognita gene for 18S rRNA (Baikal). X65075 G.porfirievae gene for 18S rRNA (Baikal). X65076 G.wasiliewi gene for 18S rRNA (Baikal). // EMBL J; 1992.

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1. Fatty acid composition of total lipids was studied in 6 species and 2 morphs of fresh-water sponges (Ceractimorpha Lubomirskiidae) of Lake Baikal. 2. Intracellular microalga and bacterial symbionts were separated from cell homogenate of the sponge Lubomirskia baicalensis in the density gradient of Ficoll 400. An analysis of fatty acids of polar and neutral lipids of microalgae and total lipids of symbiotic bacteria has not detected appreciable amounts of "demospongic" acids either in storage or in structural lipids. This may indicate that biosynthetic centers of normal and "demospongic" acids are separated in symbiotic associations. 3. The amount of polyenoic fatty acid 18: 3w 3 typical of chloroplast membranes suggests that microalgal contribution to the total pool of fatty acids of the sponge Baicalospongia bacillifera significantly decreased at greater depths, without any rise in the content of branched fatty acids which are characteristic of bacteria.

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Forty seven ca. 1 m sediment cores were collected from Lake Baikal during a summer cruise in 1996 and analysed for whole-core susceptibility. Fifteen of these cores were further analysed using a new prototype surface scanning sensor on board the ship R.V. Vereshchagin. The main purpose of this paper is to show that the measurement of Lake Baikal short cores using two susceptibility sensors gives valuable field data and can be used as a tool for identifying undisturbed sediment sequences. Four coring transects were sampled to identify sedimentation patterns reaching from the shelves and sub-basins of the near lake shore and across mainly the northern basin of Lake Baikal (water depth ca.1500 m). Also in the sub-basins and in the Southern Basin other groups of cores were taken. One of the main sediment features of interest is that of turbidite sedimentation. Whole core magnetic susceptibility traces are used to identify turbidite 'fingerprints' and correlate them between cores along the transects. The results from the two magnetic susceptibility sensors the whole-core sensor and the new prototype surface scanning sensor, both giving volume Kappa values, are compared and are found to be significantly correlated given the difference in resolution. The whole-core sensor gives a smoothed equivalent to a 'moving average' curve of magnetic susceptibility while the surface

scanner can give fine resolution (ca. 2 mm) results picking out fine peaks with Kappa values of between 150 to 650.

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Likhoshway E.V. Biodiversity, fine structure, and morphological variability of fossil diatom algae of Lake Baikal with emphasis on the roles of diatom algae and chrysophycean cysts in paleolimnological reconstructions. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Japan; 1997: 17-18.

Likhoshway E.V. Fossil endemic centric diatoms from Lake Baikal. // 14th International Diatom Symposium: Abstracts; Sept. 2-8, 1996. Tokyo, Japan; 1996: 70.

Likhoshway E.V. Fossil endemic cetric diatoms from Lake Baikal, upper Pleistocene complexes. // XIV Int. Diatom Symposium 1996. Mayama, Idei & Koizumi ed. Koeltz Scientific Books, Koenigstein; 1999: 613-628.
The paper describes complexes of fossil diatom species found in an 8.6-meter core of bottom sediments of Lake Baikal (Core 18) obtained from the top of the underwater Akademichesky Ridge at a depth of 300 m. This core is believed to span a time interval from Holocene to Upper Pleistocene, ca. 90 ky (Grachev et al. 1997). The numerical abundance of diatom valves changes with depth below sediment surface from less than 1 to several thousand per 100 mg of dry sediment. Diatom species were identified and counted using SEM. Seven (from IX to XV) complexes of dominant pelagic algal species of Lake Baikal belonging to the Upper Pleistocene are described. In addition to diatom valves, SEM was used to quantify chrysophycean cysts. The diatom algae / chrysophycean cyst ratio varied with depth, from 3 to 100%. Increased relative abundance of cysts was typical of layers separating different diatom complexes.

Likhoshway E.V. Stephanodiscus khurseviczae sp. nov. from Pleistocene sediments of Lake Baikal. // Diatom Research; 1996; 11(2): 273-281.
A new species, Stephanodiscus khurseviczae, has been found in Lake Baikal in sediments from the Pleistocene. The diameter of the cells of this species varies between 12.5 and 28 mm. Areolae are placed densely and evenly over the valve surface and there are no distinct fascicles of areola rows. The foramina of the areolae have a characteristic form: polygons with rounded corners. There are one to four valve face fultoportulae (with two or three satellite pores) near the centre. Some characters of this species are similar to those of diatoms described earlier: to S. grandis Churs. & Log., in the arrangement of' areolae; to S. binatus Hakansson & Kling, in the form of foramina. However, there are enough differences between the new species and those described earlier to justify its separation.

Likhoshway A.V. Structure of diatom algae of the Aulacoseira genus using a personal computer. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Japan; 1997: 20.

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Likhoshway E.V., Chernyaeva G.P. Distribution of diatom frustules in a 100 - meter drilling core of sediments of Lake Baikal. // 13th Int. Diatom Symposium: Abstract Book; Sept. 1-7 1994; Acquafredda di Maratea (PZ), Italy; 1994: 154.

Likhoshway E.V., Grachev M.A., Kumarev V.P., Solodun Yu.V., Goldberg O.A., Belykh O.I., Nagieva F.G., Nikulina V.G., Kolesnik V.S. Baikal seal virus. // Nature; 1989; 339: 266.
SIR - We have recently reported evidence that the cause of the disease in Lake Baikal seals (Phoca siberica) in the autumn of 1987 was infection by a morbillivirus similar to canine distemper virus (CDV). The same, or a very similar, virus attacked European seals the following spring. By means of electron microscopy combined with immunogold staining, we can now confirm the presence of morbillivirus antigens in the tissues of a seal. The seal, kept in captivity, died with typical symptoms of distemper. Its serum contained anti/CDV antibodies, and its spleen and liver gave a positive reaction with oligonucleotide probes. Pieces of liver, kidney and spleen were fixed, sectioned, exposed first to monoclonal antibodies against the morbillivirus that causes measles, then to colloidal gold-protein A. Tissues of a dog infected with CDV were studied for comparison. Gold particles in livers of both seal and dog were present mainly as clusters, which were particularly abundant in cell nuclei (a, b in the figure). Some clusters reside on virus-like particles of oval or hexagonal form having a diameter of about 80 nm. (c, d in the figure). Similar patterns were seen in kidneys, but in spleens gold spheres were present as single particles rather than clusters. The proportion of cells containing morbillivirus antigens was high, indicating the severity of infection. Practically no gold particles were found in controls treated with gold-protein. A in the absence of monoclonal antibodies. The similarity of the patterns obtained with seal and dog tissues is in favour ot the suggestion that a morbillivirus similar to CDV caused the disease of Baikal seals.

Likhoshway E.V., Kurylev A.V. Stratigraphy of Chrisophycean cysts in Lake Baikal. // 3rd Intern. Chrysophyte Sympos.: Abstracts; Aug. 12-16, 1991; Queen's University, Kingston, Ontario, Canada; 1991: 14.

Likhoshway E.V., Kuzmina A.E., Potyomkina T.G., Potemkin V.L., Shimaraev M.N. The distribution of diatoms near a thermal bar in Lake Baikal. // J. Great Lakes Res; 1996; 22(1): 5-14.

Likhoshway E.V., Vorobyova S.S. History of diatom algae in Lake Baikal from Pliocene to the present. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 63.

Likhoshway E.V., Yakushin A.O., Puzyr A.P., Bondarenko N.A. Fine structure of the velum and girdle bands in Aulacoseira baicalensis. // Diatom Research; 1992; 7(1): 87-94.
The fine structure of Aulacoseira (Melosira) baicalensis frustules has been studied by means of scanning and transmission electron microscopy. It appears that the form of the suture spines is conservative. Areolae are of two types. Type 1 areolae are loculate and are covered internally with a velum, with an additional finely perforate, membrane, which is bell-shaped. Areolae of type 2 are laminar (non-loculate) with vela of the vola and rota types and do not have fine membranes, or have only minute ones. Intermediate forms are also present. The fine structure of the copulae has been investigated: they are perforated by fine pores (20-40 nm in diameter) in regular rows.

Linqing Qiu, Williams D.F., Gvozdkov A., Karabanov E., Shimaraeva M. Biogenic silica accumulation and paleoproductivity in the northern basin of Lake Baikal during the Holocene. // Geology; 1993; 21: 25-28.
The effects of the Holocene climatic amelioration, productivity, and preservation on biogenic silica accumulation in the northern basin of Lake Baikal are evaluated by analyzing biogenic silica, organic carbon, nitrogen, and the stable carbon isotopic composition of organic matter in a 4 m piston core and a companion box core. In the early Holocene (11,000-8500 yr B.P.), biogenic silica accumulation was low because of low productivity, strong oligotrophy, and the influx of nutrient-limited alpine glacial meltwater. In the middle Holocene, productivity increased significantly during 8500-7000 yr B.P., but little biogenic silica accumulated in sediments because the dominant primary producer was not diatom flora and because of the relatively higher productivity caused by enhanced terrestrial nutrient infux. The highest accumulation rates of biogenic silica were those between 7000 and 4500 yr B.P., when aquatic productivity increased, limnological stratification occured, a mature diatom flora developed. In the late Holocene (the past 4500 yr), biogenic silica accumulation decreased because of enhanced recycling and regeneration of silica and a low sedimentation rate.

Linqing Qiu, Williams D.F. Origin of carbonate materials in the northern basin of Lake Baikal and its relationship to Holocene paleoclimate. // Chin. J. Oceanol. Limnol.; 1993; 11(1): 57-69.
Fine-grained disseminated carbonate was found in Holocene sediments in a core taken from the northern basin of Lake Baikal. The core had two distinct facies, a terrigenous blue-clay overlain by a diatomaceous silt. Oxygen and carbon stable isotope analyses, combined with SEM, X-ray diffraction and palynology show that the carbonate in the blue-clay layer is pedogenic in origin, rather than biogenic or authigenic. The @13 C values in the blue clay suggest that the carbonate is derived from a single source, while the carbonate in the diatom-rich layer might be transported by winds from different sources. On the assumption that the carbonate was formed during the post-glacial age and was transported primarily by river runoff, the @18 O isotopic values suggest that the annual temperature in the northern Baikal drainage area was about 3 oC warmer during the middle Holocene (8500 - 7000 a, B.P.) than during the early Holocene (11000-8500 a, B.P.) when the blue clay was being deposited. This interpretation is consistent with the dominant vegetation consisting of grasses in the northern Baikal drainage area prior to 7000 a, B.P. Key words: Lake Baikal, carbonate, oxygen isotopes, carbon isotopes, paleoclimate. .

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Litvinov A.C., O'Gorman R. Biology of Amur Sleeper (Perccottus glehni) in the Delta of the Selenga River, Buryatia, Russia. // J. Great. Lakes Res.; 1996; 22(2): 370-378.
We determined the fecundity growth, diet, and density of the Amur sleeper (Perccottus glehni) in the Selenga River Delta on Lake Baikal during 1986-1991 to better understand how this invading exotic will affect Baikal's endemic fishes. We also compared the Amur sleeper's diet with that of other fishes living in the delta. The largest Amur sleepers were about 20O mm long and weighed 2OO g; the oldest were age 7. All females were nature at age 2. Fecundity ranged from 884 eggs at age 1 to 37,056 eggs at age 7. Highest densities of Amur sleepers were found in oxbow lakes where densities sometimes exceeded 4,OOO fish per ha. The bulk of the diet of amur sleeper age 2 and older was chironomids, fish, and fish eggs. Chironomids were also important in the diet of the commercially valuable Siberian roach (Rutilus rutilus lacustris) and Siberian dace (Leuciscus leuciscus baicalensis). Thus the Amur sleeper may cause population declines of these important endemic fishes through resource competition and predation on their juvenile life stages. However, Amur sleepers were the species of fish most frequently eaten by Eurasian perch (Perca fluviatilis) and northern pike (Esox lucius). So, maintaining vigorous populations of these two predators may well be an effective strategy for limiting the size of Amur sleeper populations.INDEX WORDS: Amur sleeper, Lake Baikal, Selenga River; exotics.

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Luczynski M., Mamontov A.M., Yakhnenko V.M. Allozyme study of two Siberian whitefish: Coregonus lavaretus baicalensis and C.l. pidschian. // VII Int. Sympos. on the Biology and Management of Coregonid Fishes: Abstracts; Aug. 9-12, 1999; The University of Michigan. Ann Arbor, Michigan, USA; 1999: 51.

Luczynski M., Mamontov A.M., Yakhnenko V.M., Vourinen J.A., Bodaly R.A., Reist J.D. Genetic characristics of two Siberian whitefish populations: Baikal whitefish, Coregonus lavaretus baicalensis Dybowskii, from Baikal Lake, and pidschian, C.l.pidschian from Baikal Lake Labaz, Tajmyr region. // VI International Symposium on Biology and Management of Coregonid Fishes: Abstracts; September 23-26, 1996; Konstanz, Germany; 1996: 64.

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A free sterol fraction, a-methylglucopyranoside, and fatty acid monoglycerides were isolated from the sponge Baicalospongia bacilifera. Structures of the sterols, including a novel minor sterol 24-ethyl-26-norcholesta-5.22E,25-trien-3B-ol (baikalosterol) (1], were established.

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Mamaev L.V., Denikina N.N., Belikov S.I., Volchkov V.E., Visser I.K.G., Harder T.C., Liess B., Osterhaus A.D.M.E., Barrett T. Characterisation of morbilliviruses isolated from Lake Baikal seals. // Int. Symposium on Morbillivirus Infectons: Abstracts / European Society for Veterinary Virology; 12-13 June 1994; Hannover Veterinary School. Hannover; 1994.

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Sequence analysis of the haemagglutinin protein (H) gene of the morbillivirus (PDV-2) isolated from a Siberian seal (Phoca sibirica) during the 1987/1988 epizootic in Lake Baikal revealed that it was most closely related to two recent isolates of canine distemper virus (CDV) from Germany and different from CDV vaccines currently in use in that region. The virus continued to circulate in seals in Lake Baikal after the 1987/1988 epizootic since sera collected from culled seals in the spring of 1992 were positive in morbillivirus ELISA tests, reacting most strongly with the CDV antigen.Keywords: Morbillivirus; Lake Baikal seals; PCR; Haemagglutinin protein gene sequence.

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Mamontov A., Luczynski M., Yakhnenko V., Kirillov V. Study of links between Lake Baikal and other large Siberian lakes and the origins of Baikal's whitefishes. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 245.

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Mamontov A.M., Yakhnenko V.M. Ecological, morphological and iso-enzyme differentiation of coregonid populations in Lake Baikal. // Arch. Hydrobiol. / Spec. Issues Advanc. Limnol.; 1995; 46: 13-23.
Two forms of whitefish, the lake (Coregonus lavaretus baicalensis Dybowski) and the lake-river subspecies (C.l. pidschian (Gmelin)) occur in Lake Baikal. These subspecies are well differentiated by spawning place, morphology, and the frequency of some iso-enzyme alleles. Both subspecies can be further subdivided into different spawning populations. Populations of the lake whitefish differ from each other in the number of gill rakers and in one of the seven polymorphic loci revealed by iso-enzyme analysis of 27 loci. The extent of genetic variation was relatively small, however. Nei (1972) genetic distances among populations of lake whitefish varied from O.OOI-0.0022. Populations of the lake-river whitefish are more diverse with regard to sex composition, growth, and maturation rates. Greater genetic differentiation (Nei genetic distance of O.OO27 between two populations) could be due to the fact that they inhabit different zones in the lake.

Mamontov A.M., Yakhnenko V.M. Izoenzyme polymorphizm in Lake Baikal omul (Coregonus autumnalis migratorius Georgi). // Arch. Hydrobiol. / Spec. Issues Advanc. Limnol; 1998; 50: 375-381.

Martens K., Mazepova G. On Limnocythere baicalensis n. sp. from Lake Baikal (Siberia, USSR), with notes on the position of the L.goersbachensis-group (Crustacea, Ostracoda, Limnocytheridae). // Arch. Hydrobiol. /Suppl.90 (Monographishe Beitrage); 1992; 1: 115-131.
Limnocythere baikalensis n. sp. is described on material from a bisexual population from Lake Baikal. The species is very closely related to the fossil L. goersbachensis Diebel, 1968, described from the German Middle Pleistocene, yet differs in aspects of valve morphology, especially in the female. L. baikalensis n. sp. is here referred to Limnocythere s. s., but might in time require a separate (sub) genus, as a number of aspects of soft part morphology in the male are quite peculiar: the absence of moveable trabecule and the hyper-development of the furcal ramus in the hemipenis and the giant rays on the respiratory plate of the Mx1.

Martens K., Wouters K., Mazepova G., Schoen I. The genus concept in ancient lakes: a comparison between the Cyprideis - lineage in Lake Tanganyika and the Cytherissa lineage in Lake Baikal (Crustacea, Ostracoda). // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 172.

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Martin P., Brinkhurst R.O. A new genus and two new species of Tubificidae (Oligochaeta) from the abyssal zone of Lake Baikal with redescriptions of Lymphachaeta pinnigera, Rhyacodriloides abyssalis and Tubifex bazikalovae. // Zoologica Scripta; 1998; 27(3): 197-207.
Recent sampling of the abyssal zone of Lake Baikal (Siberia) made possible redescriptions of the poorly known species Lymphachaeta pinnigera Snimschikova, Rhyacodriloides abyssalis Chekanovskaya, Tubifex bazikalovae Chekanovskaya, and descriptions of Burchanidrilus petitbonum gen. n., sp. n. and Rhyacodriloides gladiiseta sp. n. Lymphachaeta and Burchanidrilus belong to a complex of small Tubificinae, characterised by true penes in penis sacs, rather simple atria, and lack of coelomocytes and spermatozeugmata. These may be considered plesiomorphic character states for Tubificinae. Rhyacodriloides is still assigned to the Rhyacodrilinae, despite simple-pointed setae, the lack of coelomocytes, the presence of single genital seta and possible 'multiple' prostates.

Martin P., Ferraguti M., Kaygorodova I. Description of two new species of Rhynchelmis (Oligochaeta: Lumbriculidae) from Lake Baikal (Russia), using classical morphology and ultrastructure of spermatozoa. // Annls Limnol.; 1998; 34(3): 283-293.
The study of new samples of oligochaetes from Lake Baikal (Siberia) made possible description of two new species of the genus Rhynchelmis, R. alyonae sp. n. and R. shamanensis sp. n. Rhynchelmis alyonae sp. n. has modified genital setae, character mentioned for the third time in

the Lumbriculidae. These species belong to complex of small Rhynchelmis, characterised by two pairs of testes, two pairs functional sperm funnels, no connection between spermathecae and gut cavity, and short, elongate, straight atria extending, at most, into segment XII. Other representatives of this group are R. olchonensis, R. paraolchonensis and probably R. spermatochaeta. The Hrabe specimens of R. olchonensis are not considered to belong to this species and are included into R. shamanensis sp. n. An examination of the ultrastructure of spermatozoa of R. alyonae sp. n. indirectly gives some support to the validity of this group. The group is suspected to harbour other new species in Lake Baikal where it seems more and more to constitute species flock.

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Mashiko K., Kamaltynov R.M., Sherbakov D.Yu., Morino H. Genetic separation of gammarid (Eulimnogammarus cyaneus) populations by localized topographic changes in ancient Lake Baikal. // Arch. Hydrobiol.; 1997; 139(3): 379-387.
Individuals of the gammarid Eulimnogammarus cyaneus, a littoral species endemic to Lake Baikal, were collected at 11 localities along the southwest shore of that lake, and the population genetic structure was investigated by allozyme analysis of 21 gene loci. The populations were genetically separated (Nei's D = 0.0126) between the northern and southern localities divided by the outlet into a large drainage, the Angara River. The origin of the genetic separation was estimated by a molecular clock to be 60,000 years ago, which coincided with the geologically observed rise of that outlet as a barrier to gene flow during the 2nd half of the Late Pleistocene. The result suggests that intralacustrine speciation by localized topographic changes played a substantial role in the steady increase of indigenous species in ancient lakes.

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The mechanism of intralacustrine speciation is a key to the problem of speciation in ancient lake. In Lake Baikal, genetic population structure of gammarid Eulimnogammarus cyaneus, indigenous littoral species, was investigated by allozyme analysis. The 26 populations examined all over the lake were genetically separated into the two groups (genetic distance D=0.035), southern populations in South and Central Baikal and northern populations in North Baikal. A sharp genetic change between the two groups was recognized near the Olkhon Strait, suggesting that they are reproductively dissociated there. As there appears no external barrier to prevent gene flow between them in the present state of the lake, the two groups may have ever been separated in different areas of the lake, and secondarily contacted near the Olkhon Strait as now observed. The group of southern populations was further separated into two subgroups by the Angara River outlet (D=0.012). The results was discussed in connection with past environmental changes of the lake.

Mashiko K., Kamaltynov R., Sherbakov D., Morino H. Population - genetic structure of the amphipod Eulimnogammarus cyaneus in Lake Baikal. // Report on "Studies on the animal community, phylogeny and environments in Lake Baikal"; 1994; 128: 84-92.
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Mashiko K., Kamaltynov R.M., Sherbakov D.Yu., Morino H. Speciation of gammarids in ancient Lake Baikal. // Animal Community, Environment and Phylogeny in Lake Baikal. Miyazaki N ed. Tokyo, Japan: The University of Tokyo; 1997: 51-56.
The problem of speciation in ancient lakes has attracted special interest for several decades. The mechanism of intralacustrine speciation is a key to this problem. We found that populations in a littoral species of gammarid (Amphipoda) in Lake Baikal are genetically separated within the lake basin by the current at the outlet of a large drainage, the Angara River. The origin of the genetic differentiation was estimated by the allozymic molecular clock to be 60,000 years ago, which coincided with the geologically observed rising of that drainage in the 2nd half of the late Pleistocene. This result reads a new view of intralacustrine speciation by localized topographic change, well accounting for the steady increase of indigenous species in ancient lakes such as Baikal.

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Masuda Y., Itskovich V., Weinberg E., Efremova S. Studies on the taxonomy and distribution of freshwater sponges in Lake Baikal. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 218.

Masuda Y., Itskovich V., Veinberg E.V., Efremova S.M. Study on the distribution of Baikalian sponges. // 5th Int. Sponge Symposium 1998 "Origin & Outlook": Book of Abstracts; 27 June - 3 July 1998. Queensland Museum, Brisbane, Australia; 1998: 46-47.

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Masuda Y., Itskovich V., Veinberg E.V., Efremova S.M. A study on the distribution of freshwater sponges in Lake Baikal. // Biodiversity, Phylogeny and Environmental in Lake Baikal: Abstracts. Tokyo, Japan: Otsuchi Research Center, Ocean Research Institute, The University of Tokyo; 1999: 216.

Masuda Y., Itskovich V.B., Veinberg E.V., Efremova S.M. A study of the vertical distribution of freshwater sponges in the littoral zone of Lake Baikal. // Biodiversity, Phylogeny and Environmental in Lake Baikal. Miyazaki N. ed. Tokyo, Japan: Otsuchi Research Center, Ocean Research Institute, The University of Tokyo; 1999: 25-34.
During the summers of 1997 and 1998, expeditions to survey the vertical distributions of sponges in Lake Baikal from the surface to a depth of 45m were carried out by shore survey and diving surveys. The sponges were tentatively classified into 2 families, 6 genera, and 14 species. Most belonged to the Lubomirskiidae, and except at inappropriate substrata, were widely distributed in Lake Baikal. A few sponges, which were confined to one station in the Little Sea near Olkhon Island, belonged to the Spongillidae. Lubomirskiidae were distributed from a depth of 1m to 40m. On the other hand, Spongillidae were confined to at a depth of 0.5m. B.intermedia had the highest frequency among all species and also showed higher frequency in the shallow zone. L. baicalensis had the second highest frequency and showed higher frequency in the shallow zone. Other Baikalospongia species showed higher frequency in the deeper zone. Until now, it had been believed that Swartschewskia papyracea inhabits only the deeper zone, but this species was also found in the shallow zone.

Mats V.D. Baikal basin in the Cenozoic: a paleogeographic scenario. // XXXth Int. Geological Congress: Abstracts; August 4-14, 1996; Beijing, China; 1996; 1 of 3: 247.

Mats V.D. Baikal depression: tectonic stratigraphic sub-units of Cenozoic and their correlation with seismic stratigraphic complexes of bottom sediments. // Int. Conf. organized at the occasion of the end of INTAS Project 134 "Active Tectonic Continental Basins: interaction between structural and sedimentary processes": Abstracts; April 30 - May 2, 1998. Gent, Belgium; 1998: 36.

Mats V.D. Comparative characterisation of cenozoic sediment lithology in the Lake Baikal rift valley. // The 2nd Int. Congress of Limnogeology "LENNOU": Abstracts; May 25-28, 1999; Brest, France; 1999: Talk 44.

Mats V.D. Geological history of Lake Baikal. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Japan; 1997: 9.

Mats V.D. The structure and development of the Baikal rift depression. // Earth-Science Riveiws; 1993; 34: 81-118.

Mats V.D. The structure of the Baikal rift depression and its development in the Neogene-Quaternary time. // The 2nd Int. Congress of Limnogeology "LENNOU": Abstracts; May 25-28, 1999; Brest, France; 1999: Poster 34.

Mats V.D., Bezrukova Ye.V., Vorobyova S.S. Late cenozoic paleoclimates, reconstructions based on studies of onland cross-sections and their correlations with BDP-96 deepwater drilling data (Lake Baikal, Central Asia). // The 2nd Int. Congress of Limnogeology "LENNOU": Abstracts; May 25-28, 1999; Brest, France; 1999: Talk 45.

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Mats V.D., Khlystov O.M., De Batist M., Smoliansky E.N. Structure and development of interdepressional dam Nortern-Central Baikal basins on the base of comparative studies of its on-land fragments and underwater one. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 68.

Mats V.D., Vorobyova G.A. Correlation of pre-middle Pleistocene part of BDP-96 cross-section and late Cenozoic Olkhon cross-section. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 69.

Mats V.D., Vorobjeva G.A., Shimaraeva M.K. The late Pliocene - Quaternary paleogeography of the Near - Baikal area. // XIII International Union for Quaternary Research. Congress: Abstracts; August 2-9 1991; Beijing, China; 1991: 233.

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Matthias-Maser S., Obolkin V., Khodzher T., Jaenicke R. Seasonal variation of primary biological aerosol particles in the remote continental region of Lake Baikal / Siberia. // J. Aerosol. Sci.; 1998; 29, Suppl.1: S545-S546.
Primary biological aerosol particles (PBAP) are an ubiquitous component of the atmospheric aerosol, they are present in all size ranges. Besides their effects on air hygiene and health biological particles play an important role in cloud physics, for example some microbes are able to accumulate water and act as ice nuclei or condensation nuclei (Dingle, 1966, Schnell and Tan-Schnell, 1982, Vali et al., 1976). In the present study we will determine the size distribution of the above mentioned PBAP for different meteorological and seasonal situations in the remote continental area of the Lake Baikal in Sibiria. The sampling site was located at the Astrophysical Observatory situated at the south part of the Lake Baikal near Listvjanka village. The samplers were mounted at the top of the hill in an altitude of about 250 m above the lake and 700 m above m.s.l.. The vegetation in the surrounding is predominated by coniferous trees (pine, cedar, fir) and some decidous trees (birch, aspen). Using the above mentioned methods the impactor samples were analysed and the size distributions of the biological and non-biological aerosols were obtained. Samples were taken during the complete year. The percentage shows a distinct seasonal variation. Regarding all particles with r> 0.2 мm, (b) this includes the smaller spores and bacteria, no seasonal variation is seen. This corresponds with results we have for an urban/rural influenced region (Matthias-Maser et al. 1995). Averaging all data the biological particles amount to 20% in number and 28% in volume concentration.

Matton C. Contribution to the tectonic study of the NW bonder of the Baikal rift. Interpretation of satellite images. // Free University of Brussels (in Dutch): Thesis; 1994.

Matton C., Delvaux D., Dehandschutter B., Fronhoffs A. Transfer fault zones and basin evolution of central Baikal. // Int. Conf. organized at the occasion of the end of INTAS Project 134 "Active Tectonic Continental Basins: interaction between structural and sedimentary processes": Abstracts; April 30 - May 2, 1998. Gent, Belgium; 1998: 16.

Matton C., Fronhoffs A., Delvaux D., Ceramicola S., De Batist M. Transfer fault zones and basin evolution in Central Baikal. // The 2nd Int. Congress of Limnogeology "LENNOU": Abstracts; May 25-28, 1999; Brest, France; 1999: Talk 46.

Maximova I.I. Lessons of the struggle for the Federal Law "On the protection of the Lake Baikal" and major implementation. // Int. Baikal Conf. 1999 "Russian-German Co-operation in Sibiria - The Lake Baikal Region": Abstracts; Nov. 14-17, 1999. Schneverdingen, Germany; 1999.

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Mazepova G.F. On comparative aspects of ostracod diversity in Baikalian fauna. // I Int. Symp. "Speciation in Ancient Lakes": Abstracts; 1-5 March 1993. Brussels, Belgium; 1993: 27.

Mazepova G.F. On comparative aspects of ostracod diversity in the Baikalian fauna. // Arch. Hydrobiol. / Beih. Ergebn. Limnol.; 1994; 44: 197-202.

Mazepova G.F. Role of copepods in the Baikal ecosystem. // VI International Conference on Copepoda: Abstracts; July 29-August 3, 1996; Oldenburg/Bremerhaven, Germany. Konstanz; 1996: 78.

Mazepova G.F. The role of copepods in the Baikal ecosystem. // J. Mar. Syst.; 1998; 15: 113-120.
This describes a study of the pelagic zone of Lake Baikal with particular reference to copepods. In addition the cycling of matter and energy in lacustrine basins is described.

McCalpin J.P., Khromovskikh V.S. Holocene paleoseismicity of the Tunka fault, Baikal rift, Russia. // Tectonics; 1995; 14(3): 594-605.

Melnik N.G. Biodiversity and dynamics of Baikal zooplankton. // New Scope on Boreal Ecosystems in East Siberia: Proc. of the Intern. Workshop, Kyoto, Jap; 23-25 nov., 1994 (DIWPA Ser.). Wada E. et al ed. Novosibirsk: Russ. Akad. of Sci. Siberian Branch; 1997; 2: 25-33.

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Net samples taken in the pelagic zone of Lake Baikal have revealed 6 Calanoida species, 14 Cyclopoida species and 1 Harpacticoida species. The paper reports the occurrence and abundance of these species in different pelagic biotopes of the lake in 1988 - 1995.

Melnik N.G., Sheveleva N.G., Pomazkova G.I. Planktonic Copepods of the Lake Baikal: distribution, dynamics and role in food chains. // VI International Conference on Copepoda: Abstracts; July 29-August 3, 1996; Oldenburg/Bremerhaven, Germany. Konstanz; 1996: 79.

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Experimental studies and statistical analyses were performed to evaluate hydroacoustic methods for assessing the density of Macrohectopus branickii (Amphipoda, Gammaridae) in Lake Baikal. Minimal registered abundance (expressed as volume) appeared to be <I mg m (echosounder at a frequency of 2OO kHz). Patterns of Macrohectopus diel vertical migration varied with individual age, size, and sex. It is preferable to assess abundance of Macrohectopus at night when the population is distributed primarily in the upper 1OO m. Under these conditions, acoustic estimates of animal densities can be made by applying calculated data on the scattering ability of Macrohectopus within the size range of 1-30 mm: TS(kg) = -36.8+O.5 dB kg-1 (mean +95% C.I.).

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Merenkov A.P., Belyaev L.S., Gorelov V.A., Koshelev A.A., Saneev B.G., Sokolov A.D., Lachkov G.G., Borisov G.O., Gorlov V.M., Kuimov S.V. Energy: World Trends, the Situation in the Russian Federation and Siberia, Recommendations on Sustainable Development of the Lake Baikal Region. // NATO ASI Series. Partnership Sub-Series 2. Environment. Nederlands; 1995; 6: 133-147.

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Moore T.C., Klitgord K.D., Golmshtok A.J. Subsidence and sedimentation in Lake Baikal, central and North basins [submitted for publication]. // GSA Meetings: abstract; New Orleans; 1995.

Morino H. Specimens of the Baikal amphipods of Heterogammarus generic cluster (Crustacea) deposited in the Zoological Institute, St. Petersburg, the Museum fur Naturkunde, Berlin, and the Zoologisches Institut und Museum der Universitat Hamburg. // Biodiversity, Phylogeny and Environmental in Lake Baikal. Miyazaki N. ed. Tokyo, Japan: Otsuchi Research Center, Ocean Research Institute, The University of Tokyo; 1999: 61-66.
Specimens of the Baikal amphipod genera Heterogammarus, Corophiomorphus, Eulimnogammarus, Eurybiogammarus, and Philolimnogammarus deposited in the Zoological Institute, St. Petersburg, the Museum fur Naturkunde, Berlin, and the Zoologisches Institut und Museum der Universitat Hamburg are listed with type information. Thirty-two species and subspecies are enumerated.

Morino H., Kamaltynov R.M. A preliminary revision of the Baikal amphipod genus Eulimnogammarus (Crustacea). // Animal Community, Environment and Phylogeny in Lake Baikal. Miyazaki N ed. Tokyo, Japan: The University of Tokyo; 1997: 43-50.
The Baikal amphipod genus Eulimnogammarus is analysed phenetically with 13 species from Lake Baikal and 5 species from European waters to establish the relationship among subgenera and related European forms. The subgenera Eulimnogammarus and Philolimnogammarus composed a good phenetic cluster, though the relationship of subgenera Eurybiogammarus, Heterogammarus and Corophiomorphus remains unresolved. A brief taxonomical review of this genus is also given.

Morino H., Kamaltynov R., Mashiko K. Studies on the taxonomy and distribution of Eulimnogammarus s.l.(Crustacea: Amphipoda) in Lake Baikal. // Report on "Studies on the animal community, phylogeny and environments in Lake Baikal"; 1994; 127: 71-79.
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Morino H., Yamauchi M., Kamaltynov R.M., Nakai K., Mashiko K. Amphipod association in the surf belt of Lake Baikal. // Biodiversity, Phylogeny and Environmental in Lake Baikal. Miyazaki N. ed. Tokyo, Japan: Otsuchi Research Center, Ocean Research Institute, The University of Tokyo; 1999: 45-60.
Species composition and depth distribution of amphipods in the surf belt of gravel shores were studied quantitatively in Lake Baikal. Philolimnogammarus cyaneus, P. vittatus and Eulimnogammarus verrucosus were dominated in the number and biomass at six localities of the lake. The three species occurred from the water edge to 0.5 m deep at Bol. Koty, and the center of depth distribution were subtly separated from each other. The breeding season, nature size and life span in E. verrucosus were quite different from those in P. cyaneus.

Mueller J., Sturm M., Vologina E.G. Clay mineral distribution in surface sediments of Lake Baikal - results from a west-east transect in the northern basin. // Baikal Symposium and 1st Baikal-Sed Workshop: Abstracts; Nov. 18-22, 1999; Berlin / Potsdam; 1999: 40.

Muller J., Eckert C., Melles M., Nowaczyk N., Schwab M., Hubberten H.-W. Lake Baikal cores BDP-93 and BDP-96: 5 million years climate history in central Asia. // Wuerzburger Geographische Manuskripte: Abstract Volume; 1997; 41.

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Clay minerals of 16 samples of the core BDP-96-2 on the Academician Ridge were analysed. Illite (37-65%), Smectite (9-46%), Chlorite (10-28%), Kaolinite (2-14%) and Vermiculite (1-15%) were found. Traces of fire clay and mixed layer minerals could be observed.

Munehara H., Sideleva V. Intra- and interspecific competition between two Baikal sculpins for spawning resources. // Biodiversity, Phylogeny and Environmental in Lake Baikal: Abstracts. Tokyo, Japan: Otsuchi Research Center, Ocean Research Institute, The University of Tokyo; 1999: 209.

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Nagata T., Takai K., Kawanobe K., Kim D.-S., Nakazato R., Guselnikova N., Bondarenko N., Mologawaya O., Kostornova T., Drucker V., Satoh Ya., Watanabe Ya. Autotrophic picoplankton in southern Lake Baikal: abundance, growth and grazing mortality during summer. // J. Plankton Research; 1994; 16(8): 945-959.
Autotrophic picoplankton were highly abundant during the thermal stratification period in late July in the pelagic area (water depth 500-1300 m) of southern Lake Baikal; maximum numbers were 2 x 10 6 cells ml-1 in the euphotic zone (~15 m). Unicellular cyanobacteria generally dominated the picoplankton community, although unidentified picoplankton that fluoresced red under blue excitation were also abundant (maximum numbers 4 x 10 5 cells ml-1) and contributed up to ~40% of the total autotrophic picoplankton on occasions. Carbon and nitrogen biomasses of autotrophic picoplankton estimated by conversion from biovolumes were 14-84 mg C 1-1 and 3.6- 21 mg N 1-1. These were comparable to or exceeded the biomass of heterotrophic bacteria. Autotropic picoplankton and bacteria accounted for as much as 33% of particulate organic carbon and 81% of nitrogen in the euphotic zone. Measurements of the photosynthetic uptake of [14C] bicarbonate and the growth of picoplankton in diluted or size-fractionated waters revealed that 80% of total primary production was due to picoplankton, and that much of this production was consumed by grazers in the <20 mm cell-size category. These results suggest that picoplankton-protozoan trophic coupling is important in the pelagic food web and biogeochemical cycling of Lake Baikal during summer.

Nakai K. Prelininary investigation of the littoral ecosystem of Lake Baikal. // Ecological factors promoting biodiversity in Lakes Biwa, Baikal, Tanganjika and Malawi / Report of Int. Sci. Res. (Joint Research) N 07044194. Kyoto University; 1997: 25-28.

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Nakata H., Tanabe Sh., Tatsukawa R., Amano M., Miyazaki N., Petrov E.A. Bioaccumulation profiles of polychlorinated biphenyls including complanar congeners and possible toxicological implications in Baikal seal (Phoca sibirica). // Animal Community, Environment and Phylogeny in Lake Baikal. Miyazaki N ed. Tokyo, Japan: The University of Tokyo; 1997: 151-164.

Nakata H., Tanabe Sh., Tatsukawa R., Amano M., Miyazaki N., Petrov E.A. Bioaccumulation profiles of polychlorinated biphenyls including coplanar congeners and possible toxicological implications in Baikal seal (Phoca sibirica). // Environ. Pollut.; 1997; 95(1): 57-65.

Isomer specific concentrations of individual polychlorinated biphenyls (PCBs) including toxic non-ortho (IUPAC 77, 126, 169), mono-ortho (105, 118, 156) and di-ortho (137, 138, 153, 180) coplanar congeners were determined in the blubber of 40 Baikal seals (Phoca sibirica) and as their fish diet collected from Lake Baikal, Siberia. Residue levels of total PCBs in Baikal seals were noticeably high and comparable to those reported for seals from the North Sea, suggesting the recent usage of this compound in the watershed of Lake Baikal. Non-, mono-, and di-ortho coplanar congeners were also detected in Baikal seals and fish. An approach to estimate bioaccumulation profiles of PCB congeners revealed that the non-ortho PCBs, IUPAC 77, 126 and 169 seemed to be less persistent than other congeners. Furthermore, selective biotransformation of PCB congeners having either meta- para vicinal H atoms or both adjacent chlorinated meta-para and ortho-meta positions has been suggested. Comparison of 2,3,7,8-TCDD toxic equivalents (TEQ) of non-, mono- and di-ortho coplanar congeners in Baikal seals with those for other marine mammals suggested higher enrichment of mono-ortho congeners, particularly IUPAC 105 and 118, which contributed significantly to the total TEQs in Baikal seals. Results imply that the TCDD-like toxicity is relatively serious in Baikal seals, because of the enrichment of these toxic PCB congeners in tissues.

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Lake Baikal, one of the oldest lakes of the world, harbors rich and unique flora and fauna. Sculpins (cottoid fishes) represent animal groups with remarkable adaptive radiation in this lake. Elucidation of the process and mechanism of adaptive radiation is one of the most important subjects in evolutionary biology. A reliable phylogenetic flamework is essential for any

evolutionary or comparative studies. In this study, a 1188-base-pair segment of the mitochondrial 16S ribosome RNA gene was sequenced from 16 species of sculpins to search for such a reliable phylogenetic framework for Baikalian cottoids. Phylogenetic analysis of the sequence data showed that all Baikalian sculpins examined, including two Comephorus species of the family Comephoridae, were grouped together exclusively into a single lineage, suggesting them to be monophyletic. Cottus gobio from a river in the western Russia was found to be the sister group of this Baikalian lineage. Cottus kazika and Trachidermus fasciatus from Japanese rivers were most closely related to each other, and with sister-group relationship to the lineage of Baikalian sculpins and Cottus gobio. Three Cottus species examined were placed into three different branches, indicating the genus to be polyphyletic. Furthermore, resultant trees also showed that the family Cottidae is polyphyletic or paraphyletic at least. The genus Cottus and the family Cottidae are needed to be revised carefully.

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Sediments from three cores obtained from distinct depositional environments in Lake Baikal, Siberia were analyzed for organic carbon, total nitrogen and lignin phenol concentration and composition. Results were used to examine changes in paleoenvironmental conditions during climatic cycles of the late Quaternary (< 125 ka). Average organic carbon, and total nitrogen concentrations, atomic C/N ratios and organic carbon accumulation rates were significantly higher in the Holocene compared with the late Pleistocene, reflecting overall warmer temperatures and increased runoff during the Holocene. A Holocene maximum in organic carbon was observed at about 6 ka, and may represent the warmest/wettest period of the Holocene. At one site (Academician Ridge) pronounced late Pleistocene maxima in organic carbon and biogenic silica were observed at about 80-85 ka, probably indicative of an interstadial period with enhanced aquatic productivity. Total sedimentary lignin phenol contents were generally lower in the late Pleistocene compared to the Holocene, but with several peaks in concentration during the late Pleistocene. These late Pleistocene peaks in total sedimentary lignin content (dated at about 80,

50 and 30 ka) directly precede or occur during peaks in sedimentary biogenic silica contents. These periods likely represent relatively warm interstadial times, with increased precipitation producing the observed increase in terrestrial runoff and aquatic productivity. Lignin phenol ratios (S/V, C/V and P/V) were used to examine changes in terrestrial vegetation type resulting from changes in paleoenvironmental conditions during the late Pleistocene. A degree of caution must be used in the interpretation of these ratios with regard to vegetation sources and paleoenvironmental conditions, because of potential compositional changes in lignin resulting from biodegradation. Nevertheless, results show that long glacial periods were characterized by terrestrial vegetation composed of a mix of non-woody angiosperm vegetation and minor gymnosperm forest. Shorter interstadial periods are defined by a change to dominant gymnosperm forest and were observed at about 80, 75, 63, 50 and 30 ka, ranging from about 2-6 kyr in duration. These interstadial periods of the late Pleistocene defined by lignin phenol ratios generally occur during longer periods of enhanced sedimentary biogenic silica content (about 10-15 ka in duration), providing corroborative evidence of these warm interstadial periods.

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The recent epizootic among harbour seals (Phoca vitulina) in North West Europe was caused by a morbillivirus (phocid distemper virus PDV related to canine distemper virus (CDV) and rinderpest virus (RPV) (Kennedy and others 1988. Mahy and others 1988. Osterhaus and others 1988. Osterhaus and Vedder 1988. Osterhaus and others 1989c). It was also shown that a CDV - like morbillivirus had caused an epizootic of distemper in Lake Baikal seals (Phoca sibiria), one year before the outbreak took place in North West Europe (Grachev and others 1989. Osterhaus and others 1989a). Therefore it has been speculated that the virus may have spread from Siberia to Europe either by terrestrial carnivores or by means of the extensive bird migration between Siberia and Europe (Osterhaus and others 1989a). Using a selected panel of monoclonal antibodies (mAbs) generated against the structural proteins of CDV (Orvell and others 1985), the present authors have antigenically compared a morbillivirus isolate from the Lake Baikal seals (MbV-B) (Osterhaus and others 1989a) with a PDV isolate from European seals (Osterhaus and others 1988), CDV, RPV, and measles virus (Table 1). The mAbs were tested in an indirect immunofluorescence assay (Osterhaus and others 1988) on Vero cells infected with the respective viruses. As expected (Sheshberadaran and others 1985), only a minority of the mAbs reacted with measles virus and RPV. All the N- and P-specific mAbs and all except one of the F-specific mAbs reacted with MbV-B. Also three of the eight H-specific mAbs recognised this virus. PDV was recognised by five of the nine N-specific, five of the nine P-specific and five of the eight F-specific mAbs, whereas three of the eight H-specific mAbs reacted with this virus. These data indicate that the MbV-B isolate is antigenically very similar to CDV and may on the basis of the known antigenic variation amongst CDV isolates, which is most pronounced in the H protein (Orvell and others 1985), perhaps even be regarded as a genuine CDV isolate. The PDV isolate is antigenically more distinct from CDV, and PDV should, on the basis of the cross reactivities observed and in line with previous suggestions (Mahy and others 1988), be regarded as a separate phocid morbillivirus. The demonstration of three apparently different morbilliviruses in seals, PDV, the CDV-like isolate from Lake Baikal seals and a morbillivirus which was recently shown to have infected European harbour seals before the epizootic of 1988 (Osterhaus and others 1989b), indicates that seals may be considered important host species of morbilliviruses. More detailed biological and biochemical studies on different morbillivirus isolates of pinniped species will be required to further resolve

their origins and variations. From the data presented it should be considered unlikely that an epizootiological link has existed between the epizootics among seals in North West Europe and Lake Baikal.

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The computer simulation of a Lake Baikal seismic profile located in the Selenga River Delta area resulted in a lake level record of the last 600 kyr. This curve demonstrates several low-magnitude episodes and both a dramatic 300 m fall and a more than 150 m increase of the lake level relative to present situation. The greatest change in paleo-lake depth at 300 ka corresponds in time with the major glaciation in the Eastern Siberia and is probably the response of the lake to this climatic phenomenon. The results this study conform with existing hypotheses on the regional tectonic history and climatic events.

Ropstorf P. Diving sports, tourism and scientific diving. // Int. Baikal Conf. 1999 "Russian-German Co-operation in Sibiria - The Lake Baikal Region": Abstracts; Nov. 14-17, 1999. Schneverdingen, Germany; 1999.

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1. A description is given of Baicalina tallingi sp.n. (male and female) a new endemic caddis fly from Lake Baikal, Siberia .

Rudstam L.G., Melnik N.G., Timoshkin O.A., Hansson S., Pushkin S.V., Nemov V. Diel dynamics of an aggregation of Macrohectopus branickii (Dyb.)(Amphipoda, Gammaridae) in Barguzin Bay, Lake Baikal, Russia. // J. Great Lakes Res.; 1992; 18(2): 286-297.
The dominant invertebrate zooplanktivore in Lake Baikal, Russia, is the pelagic amphipod Macrohectopus branickii. We followed the dynamics of an aggregation of this amphipod in Barguzin Bay, middle Lake Baikal, between 27 and 30 September 1989, using a 200 kHz echosounder and vertical net tows. Correlations between amphipod biomass and volume back-scattering yielded a target strength of -66.8 dB/g or -82 dB/individual (15 mm, 30 mg animal). This is similar to results from theoretical scattering models. Macrohectopus were aggregated in a 29 km2 large patch over bottom depths of 150 to 200 m (density 73 g/m2) during the day. This patch spread out to 40 km2 during the night (density 64 g/m2). Density estimates for the whole bay were 9.1 g/m2 (night) and 8.9 g/m2 (day). Total area surveyed was 415 km2. The amphipod migrated from daytime depths of 100-200 m to nighttime depths of 20-70 m. Both the evening ascent and the morning descent lasted about 1.5 h, corresponding to a migration velocity of 1 m/min. Larger females were found deeper than smaller females both day and night. Reaction of Macrohectopus to a flood light suggested that the animals avoided light levels brighter than 0.0001 lux. The prey of Macrohectopus (smaller zooplankton) were primarily distributed above 50 m depth both day and night. These data indicate remarkable similarities with the migration patterns of mysids, the ecological analog to Macrohectopus in many large northern lakes. This is the first study to continuously follow the diel dynamics of the amphipod and to map the size of an amphipod aggregation using hydroacoustics.

Rudstam L.G., Melnik N.G., Shubenkov S.G., Johannsson O.E. Invertebrate predators in pelagic food webs: similarities between Macrohectopus branickii (Crustacea: Amphipoda) in Lake Baikal and Mysis relicta (Crustacea: Mysidacea)in Lake Ontario. // Conf. of Int. Assoc. for Great Lakes Research: Abstracts; May 18-22 1998; MacMaster Universiry, Ontario, Canada; 1998.

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Rusinek O.T. Role of Epischura baicalensis Sars (Copepoda, Calanoida) in the life cycle of Proteocephalus exiguus (Cestoda, Proteocephalidae) - a parasite of Coregonids fishes of Lake

Baikal. // VI International Conference on Copepoda: Abstracts; July 29-August 3, 1996; Oldenburg/Bremerhaven, Germany. Konstanz; 1996: 93.

Rusinek O.T., Bakina M.P., Nikolskii A.N. Natural infection of the calanoid crustacean Epischura baicalensis by procercoids of Proteocephalus sp. in Listvenichnyi Bay, Lake Baikal. // J. Helmintol.; 1996; 70: 237-247.
Natural infection of the plankton Epischura baicalensis Sars (Calanoida: Temoridae) by procercoids of the genus Proteocephalus in Lake Baikal is analyzed in detail. Over one year Epischura was infected by procercoids of proteocephalids at a prevalence of 0.13% (in Listvenichnyi Bay, South Baikal). Male E. baicalensis were infected more (0.39%). The number of procercoids of genus Proteocephalus was 2.7 specimens/m3. The largest number of procercoids was found in females (1.26), the least in the third copepodid stage (0.03 specimens/m3). Because of the close ecological contacts between E. baicalensis and Coregonus autumnalis migratorius it is probable that E. baicalensis is infected by P.exigaus, the species usually found in C. a. migratorius (Zaika, 1965). The parasite lives for about 8 months in the winter-spring Epischura generation and about 10 months in the summer generation.

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Salemaa H., Kamaltynov R. Chromosomal relationships of the endemic Amphipoda (Crustacea) in the ancient lakes Ohrid and Baikal. // Genetics and Evolution of Aquatic Organisms: Abstracts; 10-16 September 1992; England, Bangor; 1993: 49-50.

Salemaa H., Kamaltynov R. Chromosomal relationships of the endemic Amphipoda (Crustacea) in the ancient lakes Ohrid and Baikal. // Genetics and evolution of aquatic organisms. London; 1994: 405-414.

Salemaa H., Kamaltynov R. The chromosome numbers of endemic Amphipoda and Isopoda - an evolutionary paradox in the ancient lakes Ohrid and Baikal. // Arch. Hydrobiol. / Beih. Ergebn. Limnol.; 1994; 44: 247-256.
Endemic species of isopod and amphipod crustaceans are a biogeographical peculiarity of the ancient lakes, Ohrid in Macedonia and the Siberian Baikal, but also the Lake Titicaca. The chromosome numbers in freshwater Gammaridae (Amphipoda) are generally relatively stable, varying around modal number n = 26. However, more variability has been observed in marine and brackish-water species. Nine species of Cammarus occur in the Ohrid valley, seven belonging to the endemic G. ochridensis species group. The chromosome number of C. roeseli and C. balcanicus, species with a wider European distribution, have a typical gammaridean haploid number (n = 26). An unusual chromosome complement was found in the ochridensis complex. A new species, C. salemaai G. Karaman 1985, has the lowest chromosome number, n = 12, ever observed in freshwater Gammaridae. Other exceptional numbers were found in C. macedonicus (n = 21) and in C. lychnidensis (n = 34). The haploid number n = 25 was recorded for the four species of the C. ochridensis group. The observed haploid series n = 12, 21, 25 and 34 suggesting polyploidy is in contradiction to the modal number established in genus Gammarus so far investigated. The amphipod species living in Lake Baikal display an extreme morphological and ecological diversification when compared to other freshwater gammarids. However, after investigating the chromosome numbers in 33 species and two subspecies in 18 endemic genera (Micruropus, Poekilogammarus, Hyallellopsis, Pallasea, Acanthogammarus,

Philolimnogammarus, Eulimnogammarus, Spinacanthus, Plesiogammarus, Palicarinus, Garjajewia, Boeckaxelia, Ommatogammarus, Echiuropus, Heterogammarus, Brandtia, Gmelinoides and Macrohectopus) corresponding to 13 % of the Baikalian species and to 39 % of the genera, practically only one basic number was found. This is n = 26, typical of the freshwater genus Gammarus. The only exceptional karyotype in Baikal was the one found in the genus Echiuropus with the haploid number n = 32. Our results suggest that the speciation in the endemic species groups, inhabiting Ohrid and Baikal, has taken place through processes with different karyological mechanisms and rearrangements. Centric fragmentation or even polyploidy may be responsible for karyotypical variability in the G. ochridensis-complex. On the other hand, our results do not support the hypothesis that the endemic species of Lake Baikal are remnant of ancient marine fauna.

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Schmeider K., Tremp H. GIS-based monitoring of selected littoral zones of Lake Baikal. // Int. Baikal Conf. 1999 "Russian-German Co-operation in Sibiria - The Lake Baikal Region": Abstracts; Nov. 14-17, 1999. Schneverdingen, Germany; 1999.

Scholz C.A. Structure and stratigraphy of the Lake Baikal rift: results of multichannel seismic reflection surveys. // Int. Conf. organized at the occasion of the end of INTAS Project 134 "Active Tectonic Continental Basins: interaction between structural and sedimentary processes": Abstracts; April 30 - May 2, 1998. Gent, Belgium; 1998: 17-18.

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Semovski S.V. Lake Baikal: paleoclimatic reconstruction of diatoms - picoplancton relationship using Bio-optical Modelling. // Proceedings of the Second Int. Conf. on Climate and Water (Aug. 17-20 1998). Espoo, Finland; 1998; 3: 1031-1036.
Lake Baikal phytoplankton community dynamic is simulated for modern conditions and for few hypothetical paleoclimate scenarios. The one- dimensional bio-optical model of water ecosystem dynamic is used. The aim of the investigation is to simulate few suggested factors influence, which were proposed as possible reasons lead to full extinction of diatoms during cold climates. Effects of silicon influx change, winter period duration, ice optical properties variability and glaciers-generated suspended matter impact are studied. It is shown that diatoms production is highly sensitive to optical properties of ice and suspended matter influence. The most probable

reason for diatoms extinction during cold climates is glacier-generated suspended matter optical impact.

Semovski S.V. News from the great lakes. // Backscatter; 1998; 9(1): 30.
This column will introduce another Great Lake, Lake Baikal in east Siberia. The first Russian Basic Science Foundation Grant has been awarded to the Limnological Institute and the Institute of Solar-Terrestrial Physics of the Siberian Branch of the Russian Academy of Science, Irkutsk, Russia. Dr. Sergey V. Semovsky of the Limnological Institute would like to publicize that, due to this Grant, he will be able to enhance his present Lake studies, using NOAA AVHRR data, with a geographic information system and hopes for collection of SeaWiF's data. He is inviting researchers with an interest in this subject to contact him to discuss joint problems and possible forms of cooperation. Preliminary studies were first conducted for physical and biological feature analysis using AVHRR data. These involved the synoptic infrared bands for detection of thermal fronts and other mesoscale pattern studies, e.g., the offshore spring and autumn thermal bars typical for temperate lakes. Studies of water quality and ecosystem dynamics for Lake Baikal can be portrayed with multispectral remote sensing in the visible bands. However, it is well known that the first two AVHRR channels can give only a general estimation on total suspended matter content. New SeaWiF's data can give more precise estimations of the concentration of optically active water components if the correct bio-optical procedure for Lake waters can be constructed.

Semovski S.V., Bondarenko N.A., Sherstyankin P.P., Minko N.P., Mogilev N.Yu. Lake Baikal phytoplankton annual cycle studies using AVHRR imagery collection. // Proceeding for the 27th Int. Sympos. on Remote Sensing of Environment (Tromso, Norway, June 8-12 1998). Tromso, Norway; 1998: 320-323.

Semovski S.V., Bondarenko N.A., Popovskaya G.I. Perspectives for monitoring of Lake Baikal ecosystem variability using remote sensing data. // Proceeding "IGARSS'99" / Int. Geoscience and Remote Sensing Symposium (28 June-2 July 1999, Congress Centrum Hamburg). Hamburg, Germany; 1999: 852-854.

Semovski S.V., Grachev M.A., Sherstyankin P.P., Shimaraev M.N. Bio-optical model of Baikal phytoplankton: using for paleolimnological studies. // 2nd Workshop on "Physical Processes in Natural Waters": Abstracts; Nov. 3-5, 1997; Ispra, Italy; 1997: 99.

Semovski S., Mogilev N., Minko N. Multiparameter AVHRR - based description of Lake Baikal ice cover variability. // Proceeding of SPIE "Hyperspectral Remote Sensing and Application". Green R.O., Tong Q. ed.; 1998; 3502: 270-277.

Semovski S.V., Sherstyankin P.P. Bio-optical ecodynamic model of the Lake Baikal phytoplankton annual variability. // 7th Inter. Conf. on Lakes Concervation and Management (Lacar'97) (San Martin de las Andes, Argentina; Oct. 26-31, 1997): Reports; 1997; 2: 47-50.

Semovski S.V., Sherstyankin P.P. Bio-optical model of the Lake Baikal phytoplankton community dynamics in water ecosystem [submitted for publication]. // Lakes Reservoirs: Research and Management. Blackwell Science Asia; 1999.

Semovski S.V., Sherstyankin P.P., Shimaraev M.N., Gnatovsky R.Yu., Granin N.G. Lake Baikal thermal fronts and currents analysis studies using IR AVHRR imagery. // 7th Inter. Conf. on Lakes Concervation and Management (Lacar'97) (San Martin de las Andes, Argentina; Oct. 26-31, 1997): Reports; 1997; 1: 138-141.

Semovski S.V., Sherstyankin P.P., Mogilev N.Yu. Lake Baikal ice dynamics and its impact on phytoplankton: remote sensing, physical and ecological modelling. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 92-93.

Semovski S.V., Shimaraev M.N., Alpers W., Schrum C. Internal waves in Lake Baikal. // 4th Workshop on Physical Processes in Natural Waters (Roosta, Estonia, 13-17 Sept., 1999): Report series, No 10. Tallin: Estonian Marine Institute; 1999: 49-54.

Semovski S.V., Shimaraev M.N., Grachev M.A., Domysheva V.M. Inverse stochastic box models for the Lake Baikal silica vertical balance parameters estimation. // 7th Inter. Conf. on Lakes Concervation and Management (Lacar'97) (San Martin de las Andes, Argentina, Oct. 26-31; 1997): Reports; 1997; 2: 51-54.

Semovski S.V., Shimaraev M.N., Popovskaya G.I., Kuimova L.N., Sinyukovich V.N., Tsekhanovsky V.V. Lake Baikal climate and ecology: evidence of the recent warming and El-Ninio related variations. // Proceedings of the Second Int. Conf. on Climate and Water (Aug. 17-20 1998). Espoo, Finland; 1998; 3: 1355-1362.
Intensive 1997-98 El Ninio and its global consequences stimulate new studies of local manifestations of irregular climatic variations and their relationships with general climatic variability. Lake Baikal is situated in the deep of Eurasia, and climate of the area is sensitive both to Western transport of Atlantic and Arctic air masses, and to Indo-Pacific atmospherical circulation. Due to these factors, temperature anomalies in Baikal region generally have no statistical correlation with those in North Atlantic and Europe. Interannual changes of few physical and biological parameters for the lake is presented. Correlation with El Ninio and La Ninia events is discussed.

Shanks W.C.III, Callender E. Thermal springs in Lake Baikal. // Geology; 1992; 20: 495-497.
Pore waters extracted from sediment cores analyzed for their oxygen and hydrogen isotopic compositions and major ion chemistry to determine the source of water from a vent area for diffuse lake-bottom thermal springs or seeps in Frolikha Bay, norteastern Lake Baikal. The @ 18 O values of pore waters range from -15,2%. to -16,7%., and @D values range from -119%. to -126%. (both isotopes determined relative to standard mean ocean water [SMOW]). Bottom water in Lake Baikal has a @ 18 O value of -15,6 %. and a @D value of -120%. . Pore waters in the vent area are significantly enriched in Mg, K, Ca, and especially Na and have the lowest @D and @ 18 O values; these pore waters are isotopically and chemically distinct from pore waters in other, more typical parts of the lake. The pore-water isotopic data fall on a local meteoric water line, and covariations in water isotopes and chemistry are not consistent with evaporation or hydrothermal water-rock interaction. The thermal springs represent discharging meteoric waters that have been gently heated during subsurface circulations and are largely unaltered isotopically. Chemical variations are most likely due to dissolution of subsurface evaporites.

Shanks W.C.III, Seal R.R.II, Hearn P.P. Stable isotopes studies of pore waters and diatoms: paleolimnology of Lake Baikal. // Eos Trans. AGU: Spring Meeting; 1991; 72(17.V42C-5.1430h): 306.

Sherbakov D. A comparison of evolutionary histories of some invertebrate species flocks in Lake Baikal. // XXVII Soc. Int. Limnol. (SIL) Congress: Book of Abstracts; Aug. 8-14 1998; Dublin, Ireland: Brunswick Press Limited; 1998: 177.

Sherbakov D.Yu. Comparison of evolutionary histories of some of the Lake Baikal invertebrates species flocks as inferred from molecular biological data. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 94.

Sherbakova T.A. Genetic approach to the taxonomy of Baikal algae. // 13th Int. Diatom Symposium: Abstract Book; Sept. 1-7 1994; Acquafredda di Maratea (PZ), Italy; 1994: 70.

Sherbakov D.Yu. Molecular phylogenetic studies on the origin of biodiversity in Lake Baikal. // Trends in Ecology & Evolution; 1999; 14: 92-94.

Lake Baikal is host to some 2500 metazoan species, maybe more, the majority of which are endemic. When studies of the lake shifted from purely descriptive work to a more analytical approach in the second half of this century, the question of the origin of its fauna became central and Is still one of the main challenges to researchers of Baikalian biodiversity. Current research is investigating whether biodiversity can be explained by a few adaptive radiations since the Miocene, whether it results from the accumulation of diversity throughout the whole history of the Baikalian rift zone (about 70 million years) or whether it stems from even older events.

Sherbakov D.Yu., Kamaltynov R.M., Ogarkov O.B., Vainola R., Vainio J.K., Verheyen E. On the phylogeny of Lake Baikal amphipods in the light of mitochondrial and nuclear DNA sequence data. // Crustaceana; 1999; 72(8): 911-919.

Sherbakov D.Yu., Kamaltynov R.M., Ogarkov J.B., Verheyen E. Patterns of evolutionary change in Baikalian Gammaridae inferred from DNA sequences (Crustacea, Amphipoda). // Molecular Phylogenetics and Evolution; 1998; 10(2): 160-167.
The Baikalian gammarids (Crustacea, Amphipoda) are the most widely known and most spectacular example of an adaptive radiation among contemporary freshwater invertebrates. To study the phylogeny of the Baikalian gammarids we sequenced a 622-bp-long fragment of the nuclear gene coding for 18S rRNA from species of 18 endemic Baikalian genera and Gammarus pulex - a non-Baikalian taxon. Some important morphological characters appear independently in both lineages and suggest parallelism in the development of gigantism and body armament. The first lineage comprises benthic, mostly unarmed taxa. The second lineage contains predominantly armed taxa, most of which are detrivorous or carnivorous.

Sherbakov D.Yu., Zakharova O.G., Zubakov D.Yu., Sitnikova T.Ya. The use of "Taxonomic fingerprinting" for the inference of evolutionary interrelationships of nine species of baikalian endemics snails. // 12th Intern. Malacol. Congr. "Unitas Malacoligica": Absrtracts; Sept. 3-8, 1995; Vigo, Spain; 1995: 432-433.

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Sherstyankin P.P. The limnetic turbulence of deep reservoir an example Lake Baikal. // 3rd Int. Lake Ladoga Sympos. "Monitoring and sustainable management of Lake Ladoga and other large lakes": Abstracts; Aug. 23-27, 1999; Petrozavodsk, Karelia, Russia; 1999: 80.

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This paper is a review of all the original and published data of the present authors on the crustaceans (Cladocera, Cyclopoida, Calanoida) and rotifers of Lake Baikal. The fauna of these groups have been revised using these data. The paper includes a list of species and subspecies, data on their distribution in the lake (different biotopes, regions and types of communities) and some data on species ecology.

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Sitnikova T.Ya. Baikalian prosobranchia and their relative forms. // 12th Intern. Malacol. Congr. "Unitas Malacoligica": Absrtracts; Sept. 3-8, 1995; Vigo, Spain; 1995: 326-327.

Sitnikova T.Ya. Biodiversity of benthic animals of Lake Baikal. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Japan; 1997: 22-23.

Sitnikova T.Ya. Gastropods of Baikal Lake. The family Valvatidae. // Ruthenica; 1994; 4(1): 85-96.
The purpose of the work is to publish for the first time a list of all previously described species of Baikalian molluscs of the family Valvatidae Gray, 1940. It consists of 15 species, among which 4

species of Cincinna (Sibirovalvata) are non-endemic, other 5 species of C. (Pseudomegalovalvata) and 6 species of Megalovalvata (Megalovalvata) are endemic. The data on species morphology and distribution were obtained from published works as well as from the samples stored in the collections of the Zoological Institute of the Russian Academy of Sciences and the Limnological Institute of the Siberian Division of the Russian Academy of Sciences. The dimensions given in the species diagnoses are average for adult specimens.

Sitnikova T.Ya. Gastropods of the family Benedictiidae from Lake Baikal. // Ruthenica; 1995; 5(1): 77-90.
The family Benedictiidae includes 2 genera each consisting of 2 subgenera: Kobeltocochlea (Kobeltocochlea) - 3 species, K. (Pseudobenedictia) - 1 species, Benedictia (Benedictia) - 6 species, and B. (Baicalocochlea) - 4 species. All of them are Baikalian endemics. The data on species morphology and distribution were obtained from published works as well as from the samples stored in collections of the Zoological Institute of the RAN and Limnological Institute of the Siberian Division of the RAN. The dimensions given in the species diagnosis are average for adult specimens.

Sitnikova T. Modes of speciation in baikalian endemic gastropod molluscs. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 238.

Sitnikova T.Ya. Recent views on the history and diversity of the Baikalian malacofauna. // Arch. Hydrobiol. / Beih. Ergebn. Limnol.; 1994; 44: 319-326.

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Sitnikova T.Ya., Fialkov V.A., Starobogatov Ya.I. Gastropoda from underwater hydrothermal vent of Baikal Lake. // Ruthenica; 1993; 3(2): 133-136.
Three species of Gastropoda have been found around underwater hydrothermal vent in the Frolikha Inlet (NE Baikal shore). Two of them are common dwellers of the depths over 300 m and are not specific for hydrothermal vents. The third species is new for the science, it is described as Pseudancylastrum (Frolikhiancylus) frolikhae subgen. et sp. nov. (Acroloxidae). Species of the genus Pseudancylastrum live on stones and rocks and had never been collected in Baikal deeper than 36 m. At present this species cannot be directly connected with the hydrothermal vent because it is yet unknown whether it possesses the methane-based metabolism shown for some other animals inhabiting this region [Kuznetsov et al., 1991]. At this depth (340-420 m) the stones and rocky substrates are found which are typically inhabited by the Baikalian Acroloxidae. The paper contains diagnoses of new subgenus Frolikhiancylus and new species P. (F.) frolikhae.

Sitnikova T.Ya., Ostrovskaya R.M., Poberezhnyi E.S. Abnormal shells and frequency of chromosomal aberrations in the embryonic cells of Benedictia baicalensis, a Baikalian endemic mollusk. // World Congress of Malacology: Abstracts; Washington, D.C.: Unitas Malacologica; 1998: 308.

Sitnikova T., Ropstorf P. A new species of Pulmonate (Planorbid) Gastropod from Lake Baikal. // Ruthenica; 1999; 9(2): 123-128.
A new species of the pulmonate gastropods, the endemic for Lake Baikal Choanomphalus grachevi (family Planorbidae) from the littoral of Lake Baikal is described. The shell, radula and anatomy were investigated.

Slobodyanyuk S.Ya., Kirilchik S.V., Pavlova M.E., Sideleva V.G. Evolution of endemic cottoid fishes of Lake Baikal and of non-baikalian cottoid fishes as revealed by methods of molecular bology. // New Scope on Boreal Ecosystems in East Part of Russia: Abstract. Kyoto: Kyodai Kaikan; 1994: 14.

Slobodyanyuk S.Ya., Kirilchik S.V., Pavlova M.E., Sideleva V.G. Evolution of endemic Cottoid fishes of Lake Baikal (East Siberia) and some of non-baikalian Cottoid fishes as revealed by methods of molecular biology. // New Scope on Boreal Ecosystems in East Siberia: Proc. of the Intern. Workshop, Kyoto, Jap; 23-25 nov.1994 (DIWPA Ser.). Wada E. et al. ed. Novosibirsk: Russ. Akad. of Sci. Siberian Branch; 1997; 2: 77-86.

Slobodyanyuk S.Ya., Pavlova M.E., Belikov S.I. Analysis of tandem DNA repeats of cottoid fish in Lake Baikal by direct consensus sequencing. // Molecular Marine Biology and Biotechnology; 1994; 3(6): 301-306.
This paper presents a simple method of consensus sequencing of monomeric repeat units during a single sequencing procedure by the example of a recently found BspMII family of tandemly arrayed repeats of Baikal cottoid fish (Cottoidei). This approach is based on obtaining multimeric repeat forms by the polymerase chain reaction, which eliminates the need of cloning and significantly simplifies the use of tandem repeats in phylogenetic studies. An attempt has been made to derive a phylogenetic evolution pattern of the In1 element of BspMII repeats for eight cottoid species of Lake Baikal. The position of two golomyanka species (Comephorus dybowskii and Comephorus baicalensis) on a phylogenetic tree confirms the theory of their relatively recent origin, based on mitochondrial cytochrome b gene analysis. It was estimated that the tandem repeat element In1 evolves at least one order of magnitude faster than genome coding sequences.

Slobodyanyuk S.Ya., Pavlova M.E., Kirilchik S.V., Belikov S.I., Novitsky A.V. The evolutionary relationships of two families of cottoid fishes of Lake Baikal (East Siberia) as suggested by analysis of mtDNA. // J. Mol. Evol.; 1995; 40(4): 392-399.
Fragments of mtDNA genes Cyt B, ATPase 6, and ATPase 8 of six cottoid fishes species of Lake Baikal (East Siberia) were amplified and sequenced. In addition mtDNAs of the same fish were subjected to restriction analysis. The data obtained were used to construct phylogenetic trees. The topology of the ATPase tree differs from those of the Res (restriction) and Cyt B trees. Clustering of species within the trees confirms the viewpoint ot Taliev (1955, Baicalian Sculpins (Cottoidei) according to which Baikalian cottoids originate from two ancestral forms. The times of branching obtained do not confirm the existing viewpoint according to which the two golomyankas (Comephorus baicalensis and Comephorus dybowskii) are pre-Baikal (Myocene) relicts: these two species may have originated 1.2 -1.8 million years ago in Baikal, and they seem to represent an example of rapid morphological evolution which resulted in the formation of a new family.Key words: Mitochondrial DNA - sequensing - Phylogeny - Cottoid fishes - Baikal.

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Slugina Z. Role of wave currents in the distribution of Baikal bivalve molluscs. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 239.

Slugina Z.V., Starobogatov Ya.I., Korniushin A.V. Bivalves (Bivalvia) of Lake Baikal. // Ruthenica; 1994; 4(2): 111-146.

Slugina Z.V., Starobogatov Ya.I., Korniushin A.V. Bivalves (Bivalvia) of Lake Baikal. // Ruthenica; 1994; 4(2): 111-146.
The work includes a complete review, key for identification, and list of bivalve mollusks of Lake Baikal with description of 32 species belonging to 12 genera and 4 families. Among them 1 nonendemic species belongs to Unionidae, 11 species (5 endemics) - to Sphaeriidae, 3 species (1 endemic) - to Pisidiidae and 17 species (9 endemics) - to Euglesidae. New subgenera Sibirisphaerium subgen. nov. (type species Sphaerium westerlundi) of the genus Sphaerium and Baicalipisidium subgen. nov. (type species Pisidium raddei) of the genus Conventus and new species, Euglesa (Euglesa) subgranum sp. nov., E. (E.) platyvalva sp. nov., Conventus

(Baicalipisidium) dybowskii sp. nov. and C. (B.) lamuanus sp. nov., are described. The subgenus Nucleocyclas of the genus Sphaerium is rised to generic rank.

Sluys R., Timoshkin O.A., Kawakatsu M. A new species of giant planarian from Lake Baikal, with some remarks on character states in the Dendrocoelidae (Plathyhelmintes, Tricladida, Paludicola). // VIIIth International Symposium of the Biology of the Turbellaria: Abstracts; August 18-23, 1996; Brisbane, Australia; 1996: 87.

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On the basis of newly collected material the subspecies Bdellocephala angarensis bathyalis Timoshkin & Porfirjeva, 1989 is raised to full species status, B. bathyalis Timoshkin & Porfirjeva, 1989. Specimens of this species have been collected in Lake Baikal from depths ranging between 610 and 1060 m. The species is characterized by a light, uniform brown pigmentation, absence of eyes, distinct atrial folds, and large size. It is suggested that two features may be useful in elucidating the phylogenetic relationships between dendrocoelid genera: pharynx musculature, and presence of an extra layer of circular muscle in the ventral subepidermal body musculature.

Smirnov V.V. A comparative characteristic of the Lake Baikal omul populations Coregonus migratorius (Georgi). // VI International Symposium on Biology and Management of Coregonid Fishes: Abstracts; September 23-26, 1996; Konstanz, Germany; 1996: 91.

Smirnov V.V. Intraspecific Structure of Baikal Omul (Coregonus autumnalis). // International Symposium on Biology and Management of Coregonid Fishes. Participants/Programme Resumes: Abstract; 19-23 August 1990; Quebec / Canada; 1990: 138.

Smirnov V.V. Intraspecific structure of Baikal omul Coregonus autumnalis migratorius (Georgi). // Pol. Arch. Hydrobiol.; 1992; 39(3-4): 325-333.
Baikal omul, Coregonus autumnalis migratorius (Georgi), has a number of reproductively isolated populations. Each has its own spawning river or group of rivers and is adapted to conditions in one of three food-rich zones of the lake: the epipelagic zone; benthic layers of the underwater slope; and the coastal-pelagic area. The populations themselves consist of subpopulations which spawn in rivers at different times. The specific morpho-ecological characteristics of subpopulations are necessary for maintaining the stability of populations in an oligotrophic basin with an unstable food resource. The adaptability of populations and subpopulations of omul to different ecological niches fits well with the theory of divergent species formation in Lake Baikal. At the same time, the ecological similarity of some subpopulations of omul from different populations also does not reject convergence in micro-evolutionary changes of species.Key words: Baikal Lake, Coregonus, ecology, microevolution, morphology, subpopulations.

Smirnova N.S. The omul of Lake Baikal. // Lake Baikal: 2nd Intern. Field Biology Course (IFBC) Ser. 2 / DIWPA, LIN of RAS SB, CER, BICER, JISE: Abstracts of Lectures and Field Practices; Aug. 7-28, 1996; LIN SB RAS. Japan; 1997: 21.

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Smirnov V.V., Smirnova-Zalumi N.S. Changeability of distribution and growth of omul in Lake Baikal. // Int. Simp. on biology and management of coregonid fishes: Abstracts. Olstyn, Poland; 1993: 64.

Smirnov V.V., Smirnova-Zalumi N.S., Sideleva V.G., Mamylov V.S., Nemov V.I., Pushkin S.V. An estimation of number, biomass and distribution of the Baikal omul Coregonus migratorius (Georgi) by hydroacoustic techniques. // VI International Symposium on Biology and Management of Coregonid Fishes: Abstracts; September 23-26, 1996; Konstanz, Germany; 1996: 92.

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Smirnov V., Smirnova-Zalumi N., Sukhanova L. The omul Coregonus autumnalis migratorius (Georgi) in the ecosystem of Lake Baikal. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 247.

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Snimschikova L.N., Akinshina T.V., comp. The Lists of species of animals and plants inhabiting in Baikal. Oligochaeta. // Lake Baikal: evolution and biodiversity. Kozhova O.M., Izmest'eva ed. Leiden, The Netherlands: Backuys Publishers; 1998: 360-368.

Snimschikova L.N., Akinshina T.V. Oligochaete fauna of Lake Baikal. // Hydrobiologia; 1994; 278: 27-34.
Oligochaetes are one of the most abundant groups of invertebrates in Lake Baikal. They compose up to 70-90% of the biomass and numbers of zoobenthos and are distributed from the water edge to the maximum depth. There are 207 identified species and subspecies belonging to 44 genera and seven families, of which 160 species and 13 genera are endemic. Many are relict species. The main peculiarities of oligochaete fauna of Lake Baikal are; immiscibility of its ecologically different complexes (Palaearctic and Baikalian), its antiquity and heterogeneity, and intense radiation of the species.

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Depth profiles of carotenoids, chlorophylls and related pigments in the sediments of the southern basin of Lake Baikal were analyzed. The photosynthetic pigments were found to be preserved through the sediment cores which spanned several hundreds years. Pigments originating from green algae, diatoms, Cryptophyceae and cyanobacteria were abundant in the sediments and a major part of chlorophylls a and b were preserved as pheophytin. Biogenic perylene was detected throughout the core layers and its presence indicates that the sediment had been anoxic.

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The paper begins from the brief discussion on the term "biodiversity"; author distinguishes biodiversity in a narrow and broad sences. A short comparative analysis of the taxonomic diversity of the ancient lakes of the world is given. It is clarified, that with regards to species diversity Lake Baikal holds a steady first place in the world among the lakes. According to the author, Baikal is inhabited by 2565 species and 198 subspecies of animals. That is actually 2 times more, than of its closest "rival" - Lake Tanganyika occupying the second place. Biodiversity of Baikal fauna is considered within 3 ecological groups - free-living, parasitic and commensal animals. Impressive diversity of the first group - free-living animals is analyzed on the example of Ciliophora, Spongia, Plathelminthes ("Turbellaria") and Cottoidei. Brief reviews of the history of investigations, most probable trends of the evolution and phylogenetic relationships of the mentioned groups and their main ecological characteristics have been discussed. Except taxonomic diversity, the author analyzed the state-of-the- art of the cytogenetic diversity, diversity of the nucleic acids and gene structures, diversity of the principal structural plans of Baikal organisms at the anatomical, hystological and ultrastructural levels. The main reasons for the evolution of such a unique taxonomic and ecological diversity of the Lake Baikal fauna and prospects in the future research are treated.

Timoshkin O.A. Biology of Lake Baikal: 'White spots' and Progress in Research. // Berliner Geowissenschaftliche Abhandlungen E; 1999; 30: 333-348.
Lake Baikal is one of the most intensively investigated lacustrine ecosystems on Earth with more than 200 years' history of research. About 12000 references on Baikal and Pribaikalye are located only in the data base of the Limnological Institute SD RAS. It was found that Baikal represents the most unusual lake ecosystem in many respects. Therefore it has been inscribed in the list of the World Heritage Natural Properties by UNESCO in 1996. However, Baikal is still full of enigmas. Its natural history cannot be regarded as perfectly understood. The main aim of the manuscript is to show how many white spots we do have in our knowledge on biology of the "pearl of Siberia". The most exciting results of the modern biological investigations and prospects for the future research are briefly characterized. The author states that the lake is inhabited by 2565 animal and around 1000 plant species and subspecies. 64% of the animals are endemic. However, this number of fauna species might be doubled in the nearest future. It is shown here that the scientists still do not have a common viewpoint on the present state of the ecosystem Lake Baikal, including the degree of anthropogeneous impact and that benthonic communities of the lake are still very poorly investigated. The landscape-ecological method is proposed to represent the most prospective for future investigations of benthos ecology and monitoring. Three types of communities new for Baikal and even for freshwater ecosystems (partly) are briefly described: the ciliopsammon (specialized interstitial ciliophorans); the freshwater hydrovent and the cryophilic community. Finally, a review of the hypotheses on the origin of the Baikal fauna is given. The author analyses the results of the modern investigations, including molecular-biological data. It has been shown that many Recent faunistic groups, formerly regarded as "classical" relicts, like cottoid fishes, lubomirskiid sponges, baicaliid gastropods, etc., might be much younger than the lake proper and have much more closer phylogenetic relationships to the corresponding groups, recently distributed in Palearctic than it was supposed before. Scientists still do not have a synthetic theory for the origin of the Baikal fauna, but a set of hypotheses instead. Many important questions on the biology of Lake Baikal are still beyond our knowledge. The new synthesis of modem information on the natural history of the lake is highly desirable. The author is of the opinion that Baikal will play a more and more important role in international science.

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Timoshkin O.A. Taxonomic revision of the relict Turbellarian group Prolecithophora Protomonotresidae from Lake Baikal (Plathelmintes): description of Porfirievia n. gen,. six new species of the genus and notes on the phylogeny of Baicalarctiinae. // New Scope on Boreal Ecosystems in East Siberia: Proc. of the Intern. Workshop, Kyoto, Jap; 23-25 nov.1994 (DIWPA Ser.). Wada E. et al. ed. Novosibirsk: Russ. Akad. of Sci. Siberian Branch; 1997; 2: 151-179.

Timoshkin O.A. Turbellaria Lecithoepitheliata: morphology, systematics, phylogeny. // Hydrobiologia; 1991; 227: 323-332.

A review of the literature on the world fauna of Lecithoepitheliata and Prolecithophora and extensive observations by the author on species of the Prorhynchidae, including cosmopolitan species as well as some endemic to Lake Baikal, and on endemic species of Baicalarctiinae (Prolecithophora) show that the Prorhynchidae and Gnosonesimidae are properly classified in the Neoophora. The morphological similarity of the Prorhynchidae and Prolecithophora proves these taxa are closely related. A hypothesis relating the Lecithoepitheliata Prorhynchidae to primitive prolecithophorans appears to be the only tenable hypothesis on the phylogeny of Lecithoepitheliata. The question of whether the Lecithoepitheliata is monophyletic still needs investigation; more evidence on the phylogeny of the Gnosonesimidae is needed.

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Timoshkin O.A., Kawakatsu M. Taxonomic revision of the genus Diplosiphon Evdonin, 1977 (Plathelminthes, Neorhabdocoela, Kalyptorhynchia), endemic to Lake Baikal, with the description of two new species, a new diagnosis of the genus Diplosiphon and establishment of D.baicalensis neotype. // Bulletin of Fuji Women's College; 1996; (34, Ser.II): 63-85.
The first results of a taxonomic revision of the Baikal kalyptorhynchian turbellarian fauna are presented. A new diagnosis is given of the endemic genus Diplosiphon Evdonin, 1977, which at present includes only 3 species: D. baikalensis (Rubtzov, 1929)(type species), D. mamkaevi sp. n. with two subspecies, and D. wadai sp. n. The neotype for D. baikalensis is established. Hypotheses of Diplosiphon relationships are briefly discussed. General characteristics of Baikal kalyptorhynchian fauna are given in comparison with analogous faunas of other freshwater basins (including ancient lakes).

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We constructed a complementary DNA (cDNA) library from Baikal omul (Coregonus autumnalis migratorius Georgi) pituitary glands. Synthetic oligonucleotide probes corresponding to chum salmon prolactin (PRL) cDNA were used to select the recombinant plasmids carrying the omul PRL gene. The larger insert was sequenced and found to encode a polypeptide of 210 amino acid residues, including a putative signal sequence of 23 amino acids. Nucleotide and predicted amino acid sequence of omul PRL showed high homology with other salmonid PRLs.

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Van Malderen H., Van Grieken R., Khodzher T., Obolkin V., Potemkin V.L. Composition of individual aerosol particles above Lake Baikal, Siberia. // Atmospheric Environment; 1996; 30(9): 1453-1465.
More than 20,000 individual aerosol particles, taken from research vessels over the total area of Lake Baikal (Siberia) during June 92 and September 93, were analysed by automated electron probe X-ray microanalysis. The obtained data set was reduced by a combination of multivariate techniques. Hierarchical cluster analysis indicated 11 major particle types, among which soil dust, Fe-rich, Ca-rich, organic, biogenic, S-rich particles and gypsum were the most abundant. Abundance variations as a function of sampling position were investigated by means of nonhierarchical clustering techniques. Significant differences were found between the pristine northern and middle basin, and the anthropogenically influenced southern basin. Emissions from industrial complexes near Irkutsk and in the valley of the Angara and Selenga river seem to have

an impact on the atmosphere over the lake. Samples taken in the proximity of the Baikalsk paper plant revealed a huge influence by the factory on the natural aerosol. Principal factor analysis showed four possible sources of the Baikal aerosol.

Van Malderen H., Van Grieken R. Epxma characterization of individual aerosol particles collected over Lake Baikal. // Int. Workshop "Siberian Haze - 2": Abstracts; Sept.14-18, 1993. Novosibirsk; 1994: 16-17.

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Veinberg E.V., Khlystov O.M., Vorobyova S.S., Kornakova E.G., Levina O.V., Efremova S.M., Grachev M.A. Distribution of sponge spicules in sediments of the underwater Akademichesky Ridge of Lake Baikal. // Berliner Geowissenschaftliche Abhandlungen E; 1997; 20: 141-145.
Spicules of sponges (Lubomirskia abietina, Baicalospongia bacilifera II, B. intermedia, B. bacilifera IV, Swartschewskia papyracea, and Rezinkovia sp.) were found in sediments of Lake Baikal collected on top of the underwater Akademichesky Ridge. Abundance of spicules varies with depth below sediment surface. It is relatively high in sediments belonging to Holocene and to those time intervals of Upper Pleistocene (100,000-11,000 years B.P.) when the abundance of diatom algae in the water body was high, presumably, due to the warm cliamtes. However, peaks of high spicules abundance sometimes occur in those layers of sediments which contain no diatoms. The "spicule" signal in sediments of Lake Baikal may give valuable information on the paleoclimates of East Siberia. Keywords: Lake Baikal, sediments, Pleistocene, sponge spicules.

Verbolov V.I., Sinyukovich V.N., Karpysheva N.L. Water and mass exchange in the Lake Baikal and storage reservoirs of the Angara cascade. // Arch. Hydrobiol. / Beih. Ergebn. Limnol.; 1989; 33: 35-40.

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Verkhozina V.A., Kusner Yu.S., Pastukhov V.D., Popovskaya G.I., Safarova V.A., Sudakova N.D. Stability principle and mathematical modelling Lake Baikal ecosystem. // InterCarto 2: Gis for environmental studies and mapping (Irkutsk, Russia; June 26-29, 1996). Parker Sherwood, INC, (USA): Geoinformational Technologies and Services; 1996: 133-142.
The well-known stability principle of ecosystems states that high variability of population quantity is rare in multicomponent system and allows significantly simplify a formulation of the problem for mathematical modelling ecosystem and also estimate errors of assumptions and approximations. In this work the assertions of interest have now been demonstrated with the description of Baikal

hydrodynamics with turbulent diffusion and spatial distribution bacterio- and phytoplankton of Lake Baikal. As illustrated there is remarcable accord between theory and observations of many years.

Visser I.K.G., Kumarev V.P., Orvell C., de Vries P., Broeders H.W.J., van de Bildt M.W.G., Groen J., Teppema J.S., Burger M.C., UytdeHaag F.G.C.M., Osterhaus A.D.M.E. Comparison of two morbilliviruses isolated from seals during outbreaks of distemper in North West Europe and Siberia. // Arch. Virol.; 1990; 111: 149-164.
Recently morbilliviruses were isolated from harbour seals (Phoca vitulina) in North West Europe (phocid distemper virus-1: PDV-1) and from Baikal seals (Phoca sibirica) in Siberia (phocid distemper virus-2: PDV-2) during outbreaks of severe disease which resembled distemper in dogs. PDV-I and PDV-2 were passaged in SPF dogs, in which they caused distemper-like disease symptoms, and were subsequently passaged in Vero cells in which they caused cytopathic changes. PDV-1, PDV-2, and canine distemper virus (CDV) were compared with respect to their biological, morphological, physical, protein chemical, and antigenic properties. It was concluded that PDV-I should be considered a newly recognized member of the genus Morbillivirus, whereas PDV-2 proved to be quite similar if not identical to CDV.

Vologina E., Sturm M., Granina L., Vorobyova S.S., Levina O.V., Ohlendort C. New results of high-resolution studies of the Holocene-Late Pleistocene bottom sediments of Lake Baikal. // Baikal Symposium and 1st Baikal-Sed Workshop: Abstracts; Nov. 18-22, 1999; Berlin / Potsdam; 1999: 43-44.

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Vorobyev V.V., Batuev A.R. Informational and Cartographic Support of Sustainable Development in the Lake Baikal Region. // NATO ASI Series. Partnership Sub-Series 2. Environment. Nederlands; 1995; 6: 217-229.

Vorobyova S.S., Pomazkina G.V., Baranova E.Yu., Likhoshway E.V., Sandgren C.D. Chrysophycean cysts (stomatocysts) from Lake Baikal and Irkutsk Reservoir, Siberia. // J. Paleolimnol.; 1996; 15: 271-277.
Chrysophycean cysts (stomatocysts,.statospores) from Lake Baikal and Irkutsk Reservoir, Siberia, Russia have been investigated by mean of scanning electron microscopy for the first time. The paper contains descriptions and illustrations of 7 particularly distinctive forms. Five of the cyst types described here are new to the literature. Two are very similar to cysts previously described from lake sediments in North America, but differ in details of surface ornamentation and cyst collar construction.

Vychuzhanina M.V., Churilova I.L., Parshutkina I.P. Ice nuclei measurements in Lake Baikal. // Int. Workshop "Siberian Haze - 2": Abstracts; Sept. 14-18, 1993. Novosibirsk; 1994: 8.

Vysotskii M.V., Imbs A.B., Popkov A.A., Latyshev N.A., Svetashev V.I. Trans-olefinic very-long-chain fatty acid (26:3 4c,9c,19t) in lipids of fresh-water sponges of Lake Baikal. // Tetrahedron Lett.; 1990; 31(30): 4367-4370.
A novel trans-olefinic very -long-chain fatty acid was found in the lipids of the Lake Baikal sponges. It has a structure of 26:3 5c,9c,19t, as shown by chemical and instrumental methods.

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Wada E., Yoshii K., Kawai T., Ueda S., Ueda T., Timoshkin O.A., Melnik N.G., Gorbunova L.A., Guselnikova N.E. Hydrobiogeochemistry of Lake Baikal: its scope and preliminary survey. // Publ. Itako Hydrobiol. Stn.; 1995; 8: 7-26.
Results of preliminary surveys on the distributions of hydrographic variables involving nutrient salts and plankton were described in several sites in Lake Baikal involving the pelagic and coastal bay systems. In the pelagic region, the food chain is rather simple in July, starting with Aulacoseira baicalensis to Epischura baicalensis and then to Macrohectopus branickii. Various kinds of plankton was found in the coastal regions, of which characteristics were described on the basis of the accumulated baseline data. Vertical distributions of dissolved CH4 and N2O were also reported.

Wada E., Yoshii K., Kawai T., Ueda S., Ueda T., Timoshkin O.A., Melnik N.G., Gorbunova L. Preliminary studies on the distributions of nutrient salts, plankton, and stable isotope ratios (d15N) in Lake Baikal. // The 58th Annual Meeting of the Japanese Society of Limnology: Abstracts. Matsue, Japan; 1993: 43.
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Watanabe Ya., Drucker V.V. Eutrophication of Lake Baikal with reference to phytoplankton blooms in summer. // Joint Int. Sympos. on Lake Baikal: Abstracts; Nov. 5-8 1998; Yokohama, Japan; 1998: 115.

Watanabe Ya., Drucker V. Phytoplankton diversity oh Lake Baikal, with reference to bloom formation and environmental heterogeneity. // Int. Conference on Ancient Lakes: their Biological and Cultural Diversities (ICAL'97): Abstracts; June 21-29,1997. Shiga, Japan; 1997: 144.

Watanabe Y., Drucker V.V. Phytoplankton blooms in Lake Baikal, with reference to the lake's present state of eutrophication. // Ancient Lakes: Their Cultural and Biological Diversity. Kawanabe H., Coulter G.G., Roosevelt A.C. ed. Kenobi Productions: Belgium; 1999: 217-225.
Lake Baikal is the largest ancient lake in volume, containing about 200% of the Earth's surface fresh water. The water of Lake Baikal has long been considered clear, but recent observations have shown decreases in the transparency of the lake, in particular owing to phytoplankton blooms over broad areas in early spring and summer, when the lake's water is thermally stratified. Especially in summer, blooms of very small phytoplankton (picocyanobacteria) develop in the pelagic zone of most the lake. Additionally, massive growths of large colonyforming, nitrogen-fixing cyanohacteria such s Anabaena and Gloeotrichia, similar to those observed in highly eutrophic temperate lakes, are observed in hays into which large rivers flow. These facts suggest that the water of Lake Baikal is potentially eutrophic. Because of the large amount of cold water in the hypolimnion and long retention time of the lake's water, eutrophication of Lake Baikal does not appear to be advancing rapidly. However, it is urgent to monitor the water quality of the lake and the nutrient loads from the watershed, where great social and economic changes are now taking place. The influence of eutrophication on the biological community, made up of many valuable endemic species, also has to be investigated for the protection and conservation of Lake Baikal, an invaluable natural heritage of the world.

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Trace element concentrations (Fe, Mn, Zn, Cu, Pb, Ni, Cd, Co and Hg) were determined in 60 Baikal seals and in fishes collected from Lake Baikal in 1992. Low levels of Hg and Cd were found in Baikal seals in comparison with those of marine mammals and it was due to their low

concentrations in dietary fish. These results suggest that pollution by Hg and Cd was low in Lake Baikal and these toxic elements were unlikely to be the causative factors for mass mortality of Baikal seal in 1987-1988. Significant correlation of Hg concentration between hair and internal tissues suggested the use of hair for Hg monitoring in pinnipeds. Among essential elements, higher Fe and lower Cu levels were specifically found in the liver of Baikal seal. The noticeable accumulation of essential elements might be related to the unique and specific environment of Lake Baikal.Keywords: Toxic elements, essential elements, bioaccumulation, Lake Baikal, Baikal seal.

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Concentrations of Fe, Mn, Zn, Cu, Cd, and Hg were determined in the liver, kidney, and muscle of 60 Baikal seals collected from Lake Baikal in 1992 to investigate age-dependent accumulation. Among essential elements, Fe concentrations in the muscle, liver, and kidney increased with age, suggesting development of diving ability. The concentrations of Mn, Zn, and Cu decreased with age, especially at immature stages. Toxic elements such as Hg and Cd decreased in adult males and thus the male- female difference was clearly observed in their concentrations, which differed from patterns usually found in marine mammals. Such accumulation patterns were due to difference in the feeding rates between males and females under low exposure to Hg and Cd. In addition, greater excretion of Hg than that of Cd through molting and parturition was estimated.

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Persitent organochlorines, such as PCBs including coplanar isomers, DDTs, HCHs, chlordanes (CHLs) and HCB were determined in the blubber of Caspian seals (Phoca caspica) and their diet fish (Rutilus sp.) collected in 1993 from the northern Caspian Sea, Russia. Notable concentrations of DDTs and HCHs were observed at mean values of 19 and 1.3 mg/g wet wt basis respectively, in adult male seals. PCB pollution in Caspian seals was not so serious compared with those in seals that suffered mass mortality. Smaller gender difference of organochlorine residue levels in adult animals implies less excretion of organochlorines from the body of adult females through lactation and gestation, probably due to the higher pregnancy failure rate. Immature seals had a wide range of organochlorine concentrations with lower levels noted as body length increases, suggesting that the rapid growth affected the residue levels of organochlorines in the blubber of immature seals. Caspian seals were suggested to have higher degradation capacity especially for coplanar PCBs. TEQs (2,3,7,8-TCDD toxic equivalents) for non-, mono- and di-ortho coplanar PCBs were obtained in the mean value of 51 pg/g wet wt in Caspian seals, which was lower than

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Stable isotope ratios of various organisms were analyzed to elucidate food web structure in the pelagic zone of Lake Baikal. The pelagic food web of Lake Baikal is simple and consists of five major ecological groups: phytoplankton (Aulacoseira baicalensis), mesozooplankton (Epischura baicalensis), macrozooplankton amphipod (Macrohectopus branickii), fish (Coregonus autumnalis migratorius and four species of cottoid fishes), and seal (Phoca sibirica). Because of the low diversify and consequently small number of possible diets for each species, we were able to quantitatively estimate the diet composition of each animal with stable isotopes. Our carbon isotope data indicated that pelagic phytoplankton are the primary carbon source of the pelagic food web because @13C levels of animals were close to those of pelagic phytoplankton. The @15N levels of animals showed a clear trend of stepwise enrichment with trophic level according

to the following equation: @13N (%.) = 3.3 (Trophic Level - 1) - 3.8. In addition to interspecific food web analysis, important pelagic animals, such as M. branickii, two species of pelagic sculpin, C. autumnalis migratorius, and P. sibirica, were also examined, with emphasis on ontogenic diet changes. @15N levels of M. branickii and sculpins increased with body length, suggesting a change in feeding habits during growth. We demonstrate that carbon and nitrogen stable isotopes can be successfully applied to elucidate trophic relationships and conclude that the pelagic food web of Lake Baikal has an ideal, isotopically ordered structure.

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