

**Limnological Institute of the Siberian Branch of the
Russian Academy of Sciences**

Molchanov-Sibirsky Irkutsk Regional State Universal Scientific Library

SCIENTIFIC PROGRAMME

Third International Symposium

**«MERCURY IN BIOSPHERE: ENVIRONMENTAL AND GEOCHEMICAL
ASPECTS»**

22 - 27 August 2022

Irkutsk, 2022

Mercury is recognized as a global environmental pollutant due to its toxicity, mobility and ability to accumulate in the environment. The Minamata Convention on Mercury that took effect on 16 August 2017 resulted from long-term scientific research and was based on Global Mercury Assessment as part of the United Nations Environment Program (UNEP), including the information about mercury as a chemical substance and its health effects, sources, long-range transport, and mercury-related prevention and control technologies. The text of the Convention indicates that mercury is a chemical of global concern due to its long-range transport in the atmosphere, persistence in the environment after its occurrence as a result of anthropogenic activity and potential to bioaccumulate in ecosystems as well as due to significant negative consequences for human health and the environment caused by its impact.

Mercury-related issues are regularly discussed in detail within the framework of the largest international conference “Mercury as a Global Pollutant”. However, the representation of the experts from the Russian Federation and the CIS countries at this conference is minor. The Russian Federation signed the Minamata Convention in 2014, but has not yet ratified it, which limits application of the convention provisions aimed to reduce the negative impact of mercury on the environment and public health.

In the Russian Federation, the symposium “Mercury in Biosphere: Environmental and Geochemical Aspects” was organized twice: in Moscow (2010) and Novosibirsk (2015). This symposium is actually the only venue where issues relevant for the Russian Federation such as natural and anthropogenic migration of mercury and its impact on the environment and people are discussed.

The Third Symposium aims to combine individual studies, forming a general pattern of the state of research in the field of chemistry, biogeochemistry, ecotoxicology, and analytics of mercury in the Russian Federation and the CIS countries. Leading foreign experts are invited to the symposium, who will share their experience in studying mercury cycles in the environment, development and application of the best environmental practices. As a part of the Symposium, a school for young researchers “Interdisciplinary Approach to the Study of Mercury in Various Environmental Objects” will be held where conditions will be created for cooperation and exchange of experience between students from Russian and foreign universities as well as postgraduates and young scientists from scientific centres.

The agenda of the Symposium focuses on the representatives of academic and educational institutions, industrial organizations, and environmental authorities involved in research on this hazardous toxicant.

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22 August, Monday

09.00-10.30 Registration of participants; Opening of the *Lumex* Ltd. Device Exhibition;

Coffee break (lobby near the conference hall, LIN SB RAS);

10.30 -11.00 Opening of the Symposium (conference hall, LIN SB RAS):

Plenary talks: morning session (conference hall, LIN SB RAS), Chairs: Khodzher T.V., Mashyanov N.R.:

11.00-11.30 Komov V.T., Mashyanov N.R., Tatsiy Yu.G., Eyrikh S.S. International conferences ICMGP: tendencies in mercury problems study.

11.30-12.00 Komov V.T. Variations in mercury concentrations in the muscles of fish in biotopes within the water body and in different water bodies of Russia, Papanin Institute for Biology of Inland Waters Russian Academy of Sciences, Borok;

12.00-12.30 Tatsiy Yu.G. Mercury in bottom sediments of Russian Arctic lakes, Vernadsky Institute of Geochemistry and Analytical Chemistry of the Russian Academy of Sciences, Moscow;

12.30-13.00 Rasskazov S.V. Mercury hazard of earthquakes in the Baikal seismic zone, Institute of the Earth's Crust Siberian Branch of the Russian Academy of Sciences, Irkutsk State University, Irkutsk.

13.00-14.30 Lunch (canteen in Institute of Solar-Terrestrial Physics, 126-a, Lermontov St.; canteen in LIN SB RAS; cafe "Ezhevika", 2, Ulan-Batorskaya St.; cafe in Molchanov-Sibirsky Library).

Plenary talks: afternoon session (conference hall, LIN SB RAS), Chairs: Komov V.T., Tatsiy Yu.G.:

14.30-15.00 Ivanov M.V. Mercury concentrations in the surface bottom sediments and cores of the East Siberian and Laptev seas and the adjacent area of the Arctic Ocean, V.I. Il'ichev Pacific Oceanological Institute Far Eastern Branch Russian Academy of Sciences, Vladivostok;

15.00-15.30 Eyrikh S.S. Mercury in paleoarchives as an indicator of the state of the environment and climate change, Institute for Water and Environmental Problems SB RAS, Barnaul, Russia;

15.30-16.00 Kalinchuk V.V. Atmospheric gaseous elemental mercury and its sea-air evasion fluxes from the Sea of Okhotsk to the South China Sea: results of cruise studies in 2019, V.I. Il'ichev Pacific Oceanological Institute Far Eastern Branch Russian Academy of Sciences, Vladivostok;

16.00-16.30 Grebenshchikova V.I. Mercury in the Baikal aquatic ecosystem (Lake Baikal, its tributaries, Angara River source), Vinogradov Institute of Geochemistry SB RAS, Irkutsk;

16.30-17.00 Coffee break (lobby near the conference hall, LIN SB RAS):

17.00-17.30 Kalyskan I.K. Mercury in soils and plants of the Aidarken biogeochemical territory, Osh State University, Osh, Kyrgyzstan;

17.30-18.00 Mashyanov N.R. Air mercury monitoring in the Baikal area (2011-2021), *Lumex* Ltd., St. Petersburg.

18.00-19.00 Devices and Instruments Exhibition (*Lumex* Ltd.)

19.00-21.00 Welcome reception and Ice breaker party (lobby near the conference hall, LIN SB RAS), **Excursion to the Equipment Sharing Centers** (LIN SB RAS)

23 August, Tuesday

Plenary talks: morning session (room 723, 7 floor, Molchanov-Sibirsky Library), Chairs: Eyrikh S.S., Grebenshchikova V.I.):

10.00-10.15 Kondratyeva L.M. Adaptation of cryomicrobiocenoses to mercury pollution, Institute of water and ecology problems FEB RAS, Khabarovsk;

10.15-10.30 Leonova G.A. Biogeochemical indication of technogenic mercury pollution of the ecosystem components in the Bratsk Reservoir (East Siberia) and the Bolshoye Yarovoye salt lake (Altai Territory), V.S. Sobolev Institute of Geology and Mineralogy SB RAS, Novosibirsk;

10.30-10.45 Shol L.V. The study of spatio-temporal dynamics of atmospheric concentrations of mercury in the Altai Territory, Institute for Water and Environmental Problems SB RAS, Barnaul;

10.45-11.00 Strakhovenko V.D. Spatio-temporal distribution of gross mercury contents in the bottom sediments of small lakes of the taiga zone, V.S. Sobolev Institute of Geology and Mineralogy SB RAS, Novosibirsk (он-лайн);

11.00-11.30 Coffee break (lobby, 7 floor, Molchanov-Sibirsky Library).

11.30-11.45 Stetsyuk A.P. Geochronology of mercury distribution in the bottom sediments of Inkerman Bay (Sevastopol Bay), A.O. Kovalevsky Institute of Biology of the Southern Seas of RAS, Sevastopol;

11.45-12.00 Gordeeva O.N. Mercury in soils and plants of periodically flooded islands of the Angara River in the zone of influence of *Usolyekhimprom*, Vinogradov Institute of Geochemistry Siberian Branch of the Russian Academy of Sciences, Irkutsk;

12.00-12.15 Lyapina E.E. Hg in waste from mining and processing enterprises in the Republic of Khakassia, Institute of Monitoring of Climatic and Ecological Systems Siberian Branch of Russian Academy of Sciences, Tomsk;

12.15-12.30 Lyapina E.E. Geoecological features of mercury load on the southern coast of the Republic of Crimea according to the study of needles, Institute of Monitoring of Climatic and Ecological Systems Siberian Branch of Russian Academy of Sciences, Tomsk;

12.30-12.45 Lyapina E.E. Mercury pressure in the Tomsk Region based on biomonitoring studies, Institute of Monitoring of Climatic and Ecological Systems Siberian Branch of Russian Academy of Sciences, Tomsk;

12.45-13.00 Krasilova V.A. Determination of mercury content in coal dust from commercial coals, NUST «MISiS», Moscow;

13.00-14.00 Lunch (canteen in Institute of Solar-Terrestrial Physics, 126-a, Lermontov St.; canteen in LIN SB RAS; cafe “Ezhevika”, 2, Ulan-Batorskaya St.; cafe in Molchanov-Sibirsky Library).

Plenary talks: afternoon session (room 723, 7 floor, Molchanov-Sibirsky Library), Chairs: Leonova G.A., Kondratyeva L.M.)

14.00-14.15 Komova N.S. Membrane analytical test system for highly sensitive determination of Hg²⁺ ions in natural waters, Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow;

14.15-14.30 Vasilevich R.S. Geochemistry of mercury in oligotrophic and hilly swamps of the European North-East of Russia, Institute of Biology of Komi Scientific Centre UB RAS, Syktyvkar;

- 14.30-14.45 Pogarev S.E.** Determination of mercury in samples by Zeeman AAS using pyrolysis - 20 years of development, *Lumex* Ltd., St. Petersburg;
- 14.45-15.00 Ryzhov V.V.** Experience with monitors for direct continuous determination of mercury in ambient air, natural and process gases, *Lumex* Ltd., St. Petersburg;
- 15.00-15.15 Mayorova N.A.** Lumex Group of Companies is a domestic developer and manufacturer of analytical instruments and methodological solutions, *Lumex* Ltd., St. Petersburg;
- 15.15-15.30 Melkonyan M.G.** Hg pollution severity assessment and application to considerations of ecological risks in Vanadzor city (Armenia) environment tailoring geogenic and anthropogenic factors, CENS, Yerevan, Armenia;
- 15.30-15.45 Udodenko Yu.G.** Impact of gold mining on mercury content in the small river ecosystem of Northern Mongolia, Papanin Institute for Biology of Inland Waters, Borok;
- 15.45-16.00 Krupnova T.G.** Total Hg level in hair, its predictors and relationship with health risk of Chelyabinsk residents, South Ural State University, Chelyabinsk;
- 16.00-16.30 Coffee break** (lobby, 7 floor, Molchanov-Sibirsky Library).
- 16.30-18.00 Poster Session** (lobby in Molchanov-Sibirsky Library, 7 floor).

Poster Session

(lobby in Molchanov-Sibirsky Library, 7 floor)

Belyanin D.K. Distribution of mercury content in lichens, mosses and larch needles on the territory of Western Siberia (according to 2019 data), Sobolev Institute of Geology and Mineralogy, Siberian Branch of the Russian Academy of Sciences, Novosibirsk State University, Novosibirsk;

Gradov O.V. Vector field techniques for the detection of neuronal dynamics in the presence of mercury, N. N. Semenov Federal Research Center for Chemical Physics of the Russian Academy of Sciences, Moscow;

Guseva M.A. Gender differences in blood counts (ALT, AST) in people with cardiovascular disease and their association with total mercury levels in hair, Cherepovets State University, Cherepovets;

Diéguez M.C. Hg²⁺ incorporation in Andean Patagonian ultraoligotrophic lakes: insights into the role of pelagic protists, INIBIOMA, CONICET, GESAP, Argentina;

Dobryakova N.N. Standard method for determination of mercury in solid mineral fuels, NUST «MISiS», Moscow;

Lutskin E.S. Distribution of total and dissolved mercury content in the snow cover of Irkutsk in 2022, Limnological Institute SB RAS, Irkutsk;

Morshina T.N. Mercury compounds in the environmental objects of the Baikalsk Pulp and Paper Mill influence zone, Research and Production Association *Typhoon*, Obninsk;

Nuzhdaev A.A. Mercury migration at different stages of the existence of the Nizhne-Koshelevsky New thermal field (Kamchatka), Institute of Volcanology and Seismology, Far Eastern Branch of the Russian Academy of Sciences, Petropavlovsk-Kamchatsky;

Osipova N.A. Distribution, sources and forms of mercury occurrence in the street dust of Mezhdurechensk (Kemerovo Region), Tomsk Polytechnic University, Tomsk;

Tkacheva E.V. Ecogeochemistry of mercury, antimony and arsenic in Kuzbass coals, Tomsk Polytechnic University, Tomsk;

Filimonenko E.A. Pyrogenic change in the content of mercury in the soils of the forest-tundra of the YNAO, Tyumen State University, Tyumen;

Filimonenko E.A. Mercury in dust aerosols of the city of Tyumen, Tyumen State University, Tyumen;

Khoroshevskaya V.O. Comparative analysis of the sources of mercury concentration formation in the water of the Paatsjoki River basin, Hydrochemical Institute, Rostov-on-Don.

24 August, Wednesday

Plenary talks: morning session (room 723, 7 floor, Molchanov-Sibirsky Library) Chairs: Tselyuk D.I., Levchenko L.M.):

- 10.00-10.15 Tselyuk D.I.** Environmental problems of operation and reclamation of storage facilities storing wastes with mercury in Eastern Siberia, Krasnoyarsk Scientific Research Institute of Geology and Mineral Raw Materials, Krasnoyarsk;
- 10.15-10.30 Makarov V.N.** Mercury migration in permafrost soils of the urban cultural layer, Institute of Permafrost Science SB RAS, Yakutsk;
- 10.30-10.45 Krestyannikova E.V.** Mercury in the dust component of snow cover, Tyumen State University, Tyumen;
- 10.45-11.00 Malov V.I. Distribution of mercury content in the system water-suspended matter-bottom sediments of the water area of Lake Onega (NW Russia), V.S. Sobolev** Institute of Geology and Mineralogy of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk.

11.00-11.30 Coffee break (lobby, 7 floor, Molchanov-Sibirsky Library).

- 11.30-11.45 Myagkaya I.N.** Hg minerals formed in the dispersion halos of mining waste (Western Siberia), V.S. Sobolev Institute of Geology and Mineralogy SB RAS, Novosibirsk;
- 11.45-12.00 Shuvaeva O.V.** The study of mercury accumulation by plants depending on the chemical form of the element in the growing media, Nikolaev Institute of Inorganic Chemistry, Siberian Branch of Russian Academy of Sciences, Novosibirsk (он-лайн);
- 12.00-12.15 Rukhlov A.S.** Gas and mercury survey in atmospheric air. New Opportunities, British Columbia Geological Survey, Victoria, BC, Canada;
- 12.15-12.30 Levchenko L.M.** Technology for the treatment of mercury-containing wastes, Nikolaev Institute of Inorganic Chemistry SB RAS, Novosibirsk;
- 12.30-12.45 Levchenko L.M.** Синтез и исследование углеродных фильтрующих материалов для улавливания паров ртути из газовых сред, Nikolaev Institute of Inorganic Chemistry SB RAS, Novosibirsk;
- 12.45-13.00 Tsvetkova E.A.** Dynamics of mercury concentrations in wastewater from the Usolye-Sibirskoye industrial zone in periods with different technogenic loads, Vinogradov Institute of Geochemistry Siberian Branch of the Russian Academy of Sciences, Irkutsk;

13.00-14.00 Lunch (canteen in Institute of Solar-Terrestrial Physics, 126-a, Lermontov St.; canteen in LIN SB RAS; cafe “Ezhevika”, 2, Ulan-Batorskaya St.; cafe in Molchanov-Sibirsky Library).

Plenary talks: afternoon session (room 723, 7 floor, Molchanov-Sibirsky Library), Chairs: Vokina V.A., Poddubnaya N.Ya.):

- 14.00-14.15 Mustafin S.K.** Geological and environmental aspects of mercury migration in natural and technogenic ecosystems of subsoil use regions, Bashkir State University, Ufa;
- 14.15-14.30 Ulyanova M.A.** Participation of water deer (*Hydropotes inermis argyropus*) in mercury transport in the ecosystem of Southern Primorye, Cherepovets State University, Cherepovets;
- 14.30-14.45 Poddubnaya N.Ya.** Sea fog increases the total mercury level in the terrestrial ecosystem (on the example of the tiger *Panthera tigris altaica* Temminck, 1844), Cherepovets State University, Cherepovets;

- 14.45-15.00 Ivanova E.S.** Fish from local water bodies as a source of mercury in the diet of the population of the Upper Volga region, Cherepovets State University, Cherepovets;
- 15.00-15.15 Gustaytis M.A.** Distribution of mercury concentrations in lichens, mosses and larch needles in Western Siberia (according to the 2019 data), Novosibirsk State University, Novosibirsk;
- 15.15-15.30 Vokina V.A.** Transgenerational effects of mercury chloride, East-Siberian Institute of Medical and Ecological Research, Angarsk;
- 15.30-15.45 Lisetskaya L.G.** Influence of mercury load on the population microelement status, East-Siberian Institute of Medical and Ecological Research, Angarsk;
- 15.45-16.00 Korchuganova E.N.** Differential diagnosis of sleep disorders in the presence of chronic mercury intoxication, East-Siberian Institute of Medical and Ecological Research, Angarsk;
- 16.00-16.15 Sosedova L.M.** Development of technology for modeling mercury intoxication: approaches, evaluation of effectiveness, East-Siberian Institute of Medical and Ecological Research, Angarsk;
- 16.15-16.30 Efimova N.V.** Mercury and hazard to health of the population of the Yamalo-Nenets Autonomous Okrug, East-Siberian Institute of Medical and Ecological Research, Angarsk.
- 16.30-17.00 Coffee break** (lobby, 7 floor, Molchanov-Sibirsky Library).
- 17.00-17.15 Rumiantseva O.Yu.** Influence of environmental and social factors on mercury accumulation in the hair of residents of the Northwest Russia, Cherepovets State University, Cherepovets;
- 17.15-17.30 Bazhenova D.E.** The content of mercury in the tissues of real frogs (Ranidae) of the Vologda region, Cherepovets State University, Cherepovets;
- 17.30-17.45 Ermakov V.V.** Features of mercury accumulation by plants, Особенности аккумуляции ртути растениями, Vernadsky Institute of Geochemistry and Analytical Chemistry RAS, Moscow;
- 17.45-18.00 Pastukhov M.V.** Long-term dynamics of mercury concentration in fish from the Bratsk reservoir, Vinogradov Institute of Geochemistry Siberian Branch of the Russian Academy of Sciences, Irkutsk.

25 August, Thursday

10.00-12.00 International Scientific School for Young Researchers and Round Table Discussion «Interdisciplinary Approach to the Study of Mercury in Various Environmental Objects» (room 723, 7 floor, Molchanov-Sibirsky Library).

12.00-13.00 Summing up the results of the Symposium (room 723, 7 floor, Molchanov-Sibirsky Library).

13.00-14.00 Lunch (canteen in Institute of Solar-Terrestrial Physics, 126-a, Lermontov St.; canteen in LIN SB RAS; cafe “Ezhevika”, 2, Ulan-Batorskaya St.; cafe in Molchanov-Sibirsky Library).

14.00 -18.00 City Tour for Guests of the Symposium.

19.00-22.00 Dinner Party (Restaurant «Winkel», 257, Lermontov St.).

26-27 August, Friday-Saturday

Outdoor session (Lake Baikal, Biological Station in Bolshiye Koty) «Mercury Study in Various Environmental Objects of Southern Baikal: air, water, and terrestrial environment with the use of the *Lumex* Ltd. Devices:

09.00- Departure from Irkutsk to the museum «Taltsy».

10.00-12.00 Excursion to the architectural and ethnographic museum «Taltsy».

12.00-13.00 Lunch in the museum «Taltsy».

13.00 Departure from the museum «Taltsy» to Listvyanka.

13.30-14.30 Excursion to Baikal Museum (Listvyanka).

14.30 Departure from Baikal Museum to the Seal Aquarium (Listvyanka).

15.00-16.00 Excursion to the Seal Aquarium (Listvyanka).

16.00 Optional: Outdoor session to Bolshie Koty and Lake Baikal. Return to Irkutsk - August 27 (around 19-00 local time).

17.00 Optional: Departure to Irkutsk.

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