

All-Russian Symposium with International Participation “Current Issues in Physiology, Ecology, and Biotechnology of Microorganisms” (Faculty of Biology, Moscow State University, December 24–27, 2009)

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The symposium “Current Issues in Physiology, Ecology, and Biotechnology of Microorganisms” held in December 2009 at the Faculty of Biology, Moscow State University, was dedicated to the 125th anniversary of the birth of Acad. Vladimir Nikolaevich Shaposhnikov (1884–1968), head of the Department of Microbiology of Moscow State University (1938–1967) and the founder of industrial microbiology in the Soviet Union, as well as to the 120th anniversary of the birth of Prof. Evgenii Evgen’evich Uspenskii (1889–1938), the founder (1924) and first head of the Department of Microbiology of Moscow State University, a distinguished scientist of the beginning of the 20th century in the field of physiology, ecology, and practical use of soil and aquatic microorganisms.

The commemorative session, a round-table meeting on the history of microbiology, was dedicated to the scientific heritage of Shaposhnikov and Uspenskii. Prof. N.S. Egorov, a follower of Shaposhnikov and head of the Department of Microbiology from 1967 to 1989 and Acad. M.V. Ivanov, Shaposhnikov’s grandson, as well as M.V. Nefelova, another follower of Shaposhnikov, spoke in commemoration of his life and work. A report presented by N.N. Kolotilova (Moscow State University) was focused on the published and unpublished facts of the life and tragic death of Uspenskii, who was executed in 1938, and included a brief analysis of his major scientific contributions. E.R. Kartashova (Moscow State University) spoke on the establishment of academic traditions in the works by A.S. Famintsyn, R.F. Timiryazev, and Uspenskii on plant physiology and microbiology. S.M. Abramov (Moscow State University) spoke about the historical and social aspects of the scientific development during the first decades of the Soviet Union, as well as on the issues of the ideologization and “dialectization” of biology.

The main focus of the symposium was biotechnology. In his plenary lecture, Acad. M.V. Ivanov discussed the implementation, current issues, and achievements of microbial biogeotechnology, as well as the issues of practical application of microorganisms for metal bioleaching from ores (corresponding member of the Russ. Acad. Sci. G.I. Karavaiko was

the founder of this scientific field in Russia), gold and oil extraction, microbiological methods for methane control in coal mines, etc.

An important group of issues was related to the use of microorganisms for energy applications. In his plenary lecture, Prof. A.I. Netrusov (Moscow State University) described new methods for the development of renewable sources of energy and technologies based on processing of cellulose-containing materials (algal biomass and wastepaper) by microorganisms for production of hydrogen and other gases. Special attention was paid to the development of a system of hydrogen-producing bioreactors based on the use of membrane technology for gas separation, as well as a system for energy production from microbially produced hydrogen. In the plenary lecture by Prof. A.A. Tsygankov (Pushchino), progress in the development of bioreactors on the basis of phototrophic bacteria activity was outlined. In the plenary lecture by Prof. B.K. Zayadan (Kazakhstan), a wide variety of achievements and prospects for the biotechnological application of cyanobacteria and algae were described. Development of biological indicator systems for pollutant detecting, production of bioadditives and biostimulants to enhance the productivity of livestock and poultry, development of biotechnology for waste water purification, and conversion of oil into biodiesel were discussed. Reports by I.S. Dzerzhinskaya (Astrakhan), O.V. Gavrilova and A.V. Bakeeva (St. Petersburg), E.V. Semenova, E.S. Mil’ko, M.F. Dorokhova (Moscow State University), and others addressed the issues of energy production, bioremediation, and cleaning up the environment.

Considerable attention was paid to the methods of immobilization of microbial cells, including cells of luminescent bacteria, on new and traditional carriers used in biotechnology (A.D. Ismailov, Moscow State University). In their reports, A.V. Oleskin and I.V. Botvinko (Moscow State University) and V.N. Korobov (Perm) described the characteristic traits of microbial biofilms, as well as the properties and biotechnological potential of microbial exopolysaccharides. In his report, Prof. M.U. Dahot (Pakistan) described production of fungal xylanases.

N.A. Baranova, K.A. Vinogradova, L.G. Stoyanova, N.I. Orlova, and A.I. Shestakov (Moscow State University) described the production of bioactive compounds by microorganisms and the problems of probiotic production.

The fundamental problems of the ecology of microorganisms were the second main focus of the symposium. A report by A.M. Semenov (Moscow State University) covered the theoretical aspects of microbial ecology, including the relationships between organisms, structures of microbial communities, etc. A report by B.B. Namsaraev (Ulan-Ude) on the functioning of microbial communities in the alkaline lake Khilganta (Buryatia), as well as the reports of K.E. Ivanov and A.I. Kurapova (Moscow State University), E.A. Rafailova (Kazan), and N.G. Sherysheva (Tolyatti) on soil and aquatic microbiology covered the issues of ecology of natural landscapes.

The questions of microbial physiology were discussed in a report by Prof. R.N. Ivanovskii (Moscow State University), who described the pathways of CO₂ fixation by microorganisms. In his report, I.A. Berg (Moscow State University) discussed the new mechanisms of acetate utilization by halobacteria. V.D. Samuilov and A.L. Bryukhanov (Moscow State University) and O.N. Oktyabr'skii (Perm) addressed the problem of oxidative stress. Reports by N.V. Doronina and V.N. Khmelenina (Pushchino) dealt with the physiology of methyloprophs.

During the final meeting of the symposium, a decision was made to hold such symposia every five years, as well as to file a petition to install two memorial plaques to honor the memories of Shaposhnikov and Uspenskii.

Scientists from Armenia, Belarus, Bulgaria, Egypt, Kazakhstan, China, Pakistan, Uzbekistan, and Ukraine, as well as from various cities of the Russian Federation, including Moscow, St. Petersburg, Pushchino, Perm, Vladivostok, Novosibirsk, Tomsk, Ufa, Ulan-Ude, Tver, Astrakhan, Kazan, Saratov, and others, participated in the symposium. More than 40 oral reports and more than 50 posters were presented. The *Proceedings* of the symposium includes 205 abstracts. The digest *Mozaika vospominanii* (A Memory Mosaic) (compiled by Kolotilova) and the brochure *O zhiznennom puti E.E. Uspenskii* (On the Life Path of E.E. Uspenskii) were published to coincide with the opening of the symposium and the 85th anniversary of the founding of Moscow State University's Department of Microbiology. The symposium was supported by the Russian Foundation for Basic Research, project no. 09-04-06121g.

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