

80th Birthday of A.N. Ilyaletdinov, Academician of the National Academy of the Republic of Kazakhstan

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In January 2009, we celebrated the 80th anniversary of Prof. Al'farid Nizamovich Ilyaletdinov, Doctor of Sciences (Biology), Academician of the National Academy of the Republic of Kazakhstan, Honored Scientist of the Republic of Kazakhstan, a prominent microbiologist, as well as the 55th anniversary of his scientific, pedagogical, and social activities.

A.N. Ilyaletdinov was born on January 16, 1929 at the station of Besh-Aryk, Yanykurganskii raion, Kzyl-Orda oblast into the family of a teacher.

In 1946, after graduating secondary school with a gold medal, he was enrolled at the Faculty of Biology, Moscow University and graduated with honors in 1951. After graduation from the university, he took a postgraduate course at the Department of Microbiology and successfully defended his Candidate of Science dissertation under the supervision of Academician V.N. Shaposhnikov in 1954. During 1954–1958, he worked at the Institute of Soil Science, KazSSR Academy of Sciences, as a junior and then a senior researcher. In 1958, A.N. Ilyaletdinov was elected on a competitive basis to take the post of Head of the Laboratory of General Microbiology, then

of the Laboratory of Ecology of Microorganisms, Institute of Microbiology and Virology, KazSSR Academy of Sciences. In 1966, A.N. Ilyaletdinov defended his doctoral dissertation in biology, and since that year he had been working as Director of the Institute of Microbiology and Virology, KazSSR Academy of Sciences, up to 1995. At present, he is a leading researcher at the Laboratory of Ecology of Microorganisms.

In 1999–2000, he combined his work at the Institute with his teaching activity at the Kazakh National Agrarian University, Republic of Kazakhstan Ministry of Science and Education.

A.N. Ilyaletdinov focused his scientific research on developing the following scientific directions: the role of microorganisms in the turnover of organic and mineral substances in nature; application of microorganisms in fodder production; and microbial ecology.

He is an author of 217 scientific works, including four monographs; he is a holder of 28 USSR and RK Inventor's and Patent Certificates.

His articles published in the 1960s and his monograph "*Biologicheskaya mobilizatsiya mineral'nykh soedinenii* (Biological Mobilization of Mineral Compounds) (1966) were devoted to elucidating the role of microorganisms in the formation of soil fertility, and the accumulation in soil of soluble phosphorus available to plants. A.N. Ilyaletdinov was among the first Soviet soil microbiologists to oppose the idea of using pure microbial cultures as a basis of soil fertilizers and developed a proposition on the necessity of creating favorable conditions for the activity of the aboriginal soil microflora mineralizing organic substances, and thus, involved in the formation of soil fertility.

The current state of the problem of nitrogen transformation (ammonification, nitrification, immobilization, and denitrification) in soil was highlighted in his monograph *Mikrobiologicheskie prevrashcheniya azotsoderzhashchikh soedinenii v pochve* (Microbiological Transformations of Nitrogen-Containing Compounds in Soil) (1976). A.N. Ilyaletdinov established that by slowing down the rate of mineralization of organic matter and by immobilizing nitrogen it is possible to avoid the loss of a considerable amount of soil carbon and nitrogen. The mode of flooding a rice field before sowing developed by him resulted in an average of a 20% increase of the yield of rice crops. In 1998,

this book was republished in English by the Nauka Publishing House, Moscow.

Geological microbiology was successfully developed under the guidance of A.N. Ilyaletdinov. A.N. Ilyaletdinov and his disciples have developed the modes of bacterial leaching of copper, zinc, and lead from ores and of arsenic from gold-bearing concentrates. The practical realization of these works is of great importance for the national economy.

In the 1970s, A.N. Ilyaletdinov developed a new direction, the use of microbial activity for purifying industrial liquid waste of heavy metal ions and cyanides, as well as of organic contaminants, such as α -methylstyrene and crotonic aldehyde, in the waste of the synthetic rubber industry. Effective biotechnological methods for purifying industrial waste of a range of toxic substances are used in the petroleum and chemical industry, as well as in nonferrous metallurgical works, having been developed in the framework of this direction of research. This direction was developed in complex with the studies conducted in the CMEA (Council for Mutual Economic Assistance) member states.

A.N. Ilyaletdinov and his associates investigated the mechanisms of the oxidation of elements with varying valences by heterotrophic microorganisms. The group of arsenite-oxidizing bacteria was studied in detail; the decisive role of unsaturated fatty acid hydroperoxides in oxidation of the elements with varying valences was established. New properties of facultatively anaerobic bacteria capable of sequentially reducing several electron acceptors (oxygen, nitrates, pentavalent arsenic, ferric iron, and sulfates) were revealed. The results of these works were generalized in the monograph *Mikrobiologicheskie prevrashcheniya metallov* (Microbiological Transformations of Metals) (1984).

Under A.N. Ilyaletdinov's supervision, research was carried out into the development and introduction of new biopreservatives for vegetable fodder and the technologies of its production, as well as in the techniques of growing fodder yeast under live farming conditions, resulting in a significant improvement of the quality of fodder, which increased the productivity of farm animals. These studies were appreciated not only in this country but also abroad (Czechoslovakia, Mongolia, Hungary, China, etc.). The manufacturing of the Kazakhsil biopreservative was organized at the microbiological industry enterprises: the Kiev plant of bacterial preparations, the Stepnogorsk Progress plant, the Vyshnii Volochek plant of enzyme preparations, the Berdsk chemical plant, and the Turkestan nutrient antibiotics plant. The preparation found wide application in the manufacturing of fodder in Kazakhstan, Russia, and Kyrgyzstan.

At present, A.N. Ilyaletdinov is taking an active part in developing bacterial preparations for agriculture and environmental health, in particular, the microbial pre-

parations for bioremediation of Kazakh petroleum-contaminated soils.

In 1968, the title of professor was conferred on A.N. Ilyaletdinov, and in 1970 he was elected a Corresponding Member of the KazSSR Academy of Sciences. In 1971, he was awarded the title of Honored Scientist of the KazSSR. In 1983, A.N. Ilyaletdinov was elected as an academician of the KazSSR Academy of Sciences, an academic secretary of the Branch of Biological Sciences, and a member of the Presidium of the KazSSR Academy. The many years of prolific scientific, pedagogical, and social activities of A.N. Ilyaletdinov, his merits in developing biological science and training personnel were marked by rewards: the Certificate of Honor of the Presidium of the Kazakh SSR Supreme Soviet (1979), the Sign of Honor order (1981), and the Astana medal (1998).

A.N. Ilyaletdinov gives much strength and attention to training scientific personnel. He has been in charge of the specialized Council for Defending Candidates and Doctoral Dissertations for many years. At present, he is a member of the Dissertation Board at the Institute of Microbiology and Virology under the Republic of Kazakhstan Ministry of Science and Education. A.N. Ilyaletdinov was Editor-in-Chief of the journal *Izvestiya Akad. Nauk KazSSR Ser. Biol.*, a member of the Editorial Board of the journals *Vestnik Nacional'noi Akad. Nauk Respubliki Kazakhstan* and *Mikrobiologiya* (Microbiology) (Moscow).

Forty candidates and 13 doctoral dissertations have been defended, and dozens of graduation essays have been prepared under A.N. Ilyaletdinov's guidance and supervision. His disciples work successfully at the leading scientific and pedagogical centers of Kazakhstan.

Despite his high-ranking position, Al'farid Nizamovich has always been a person of high tact and refinement, his attitude towards a laboratory technician and an eminent scholar is equally sensitive and sympathetic. As the Institute Director, A.N. Ilyaletdinov strove to foster a creative atmosphere for the team of like-minded colleagues, tried to support any new line of research, and to help every specialist. At the same time, he remains a man of principle, a demanding and hard-edged scientist, whose opinion even now is highly authoritative.

Academician A.N. Ilyaletdinov's great erudition, adherence to principles, and benevolent attitude to people earned him deserved respect in the scientific world. Many of Al'farid Nizamovich's colleagues, friends, and disciples sincerely congratulate him on the glorious date and wish him good health and creative longevity.

*Collective of the Institute of Microbiology
and Virology, Ministry of Science
and Education, Republic of Kazakhstan*