

Oleksandr Maksymovych ZAICHENKO (1937—2022)



On September 25, 2022, laureate of the Zabolotnyi Prize of NAS of Ukraine, doctor of biological sciences, professor Oleksandr Maksymovych Zaichenko left this world forever. He was the leading specialist in Ukraine in the field of mycotoxicology and a recognized biochemist and mycologist.

Oleksandr Maksymovych was born on May 20, 1937 in the town of Smila (the Cherkasy province) in a working-class family. After graduating from school in 1956, he entered the biological faculty of the Taras Shevchenko National University of Kyiv where he not only enthusiastically studied biological disciplines and

attended the biochemical club but also actively participated in the life of the student community, in particular, in chess competitions, amateur performances as well as in the student crew on the Kazakhstan virgin land.

After acquiring higher education in the specialty “Physiology of Humans and Animals (Biochemistry)”, the question of life path choice arose, and Oleksandr decided to become a scientist.

So, in 1961, Oleksandr Maksymovych was accepted to the position of engineer at the Department of Biochemistry of Microorganisms of the D.K. Zabolotnyi Institute of Microbiology and Virology of the Academy of Sciences of Ukrainian SSR. At that time the department was headed by doctor of biological sciences, Professor Olena Yakivna Rashba. She became the first teacher and mentor for the young man and later was the scientific supervisor of his candidate dissertation. O.M. Zaichenko entered the postgraduate course on January 1, 1963. The years of study there transformed the young scientist into a keen researcher. He always recollected his teacher with great warmth, gratitude, and respect. In 1967, O.M. Zaichenko successfully defended his candidate thesis “The study of alkane oxidation by certain micromycetes” and became a candidate of biological sciences. Then he closely col-

laborated with researchers from the Department of Physiology of Fungi, especially with senior researcher Eleonora Zakhariivna Koval. On April 29, 1967, O.M. Zaichenko was appointed to the position of a senior researcher of the Department of Physiology of Fungi, which was headed by famous mycologist, corresponding member of the Academy of Sciences of Ukrainian SSR Vira Iosypivna Bilai. Since then, his scientific carrier have been closely connected with mycology and studying of physiological-biochemical bases of biosynthesis of mycotoxins, in particular biochemical mechanisms of their action. In 1972, O.M. Zaichenko was given the scientific rank of a senior researcher in the specialty “Biological Chemistry”.

O.M. Zaichenko actively participated in the collaboration of the D.K. Zabolotny Institute of Microbiology and Virology of the Academy of Sciences of Ukrainian SSR with the Institute of Microbiology of the Czech Academy of Sciences and the Institute of Experimental Phytopathology of the Slovak Academy of Sciences. During his internship at these institutions, he established the chemical structure of certain dendrodochins, their identity with macrocyclic trichothecene mycotoxins, in particular with verrucarins and roridins, and developed methods for isolation of analytically pure forms of these substances. He studied the biosynthetic pathways of dendrodochins, the functioning of the main pathways of carbon metabolism in fungi-producers with different levels of productivity. It was established that these substances are not typical secondary metabolites because their active synthesis is observed during the growth phase. O.M. Zaichenko proved that the role of dendrodochins in the activity of fungi lies in the ability of these toxins to inhibit the enzymes of tricarboxylic acid cycle, to induce the transformation processes, and to change the growth and metabolism of fungi. The scientist also established that one of the reasons for the damaging effect of these mycotoxins on eukaryotic cells is the inhibition of the activity of

the DNA-dependent RNA polymerase, which is the key enzyme of transcription processes.

Productive and hard work, accuracy, and perfectionism, which were inherent for O.M. Zaichenko, permitted him to reach significant scientific results that had no analogs in the world literature. Those findings formed the base of his doctoral thesis “Biosynthesis of dendrodochins by microscopic fungi”, which was successfully defended by him in April of 1990 by two specialties: “microbiology” and “mycology”.

In 1995, O.M. Zaichenko was appointed to the post of Head of the Laboratory of secondary metabolites which was separated from the Department of Physiology and Systematics of Micromycetes. Over 17 years, the laboratory employees performed investigations concerning the practical use of mycotoxins. In particular, they studied antibiotic, phytotoxic, herbicidal, and other properties of these substances. O.M. Zaichenko showed for the first time the principal opportunity of using mycotoxins as selective markers in the breeding of resistant plant varieties. Studies of the macrocyclic trichothecenes produced by fungi of *Stachybotrys*, *Myrothecium*, *Dendrodochium* genera went on. In 1999, Oleksandr Maksymovych was awarded the scientific title of professor in the specialty “Microbiology”. Under his supervision, 11 dissertations for the scientific degree of candidate of biological sciences were successfully defended by scientists of not only D.K. Zabolotnyi Institute of Microbiology and Virology of NASU but also other institutions.

O.M. Zaichenko and his colleagues developed a microbiological method of indication of mycotoxins in grain and products of its processing, which was successfully implemented in veterinarian laboratories in order to prevent mycotoxicoses of agricultural animals. On his own initiative, together with the Educational and Scientific Center of the State Standard of Ukraine, the training program for mycotoxicology for testing laboratories of the State Standard of

Ukraine and the Ministry of Health of Ukraine was developed. This program worked successfully over many years.

O.M. Zaichenko is the author of more than 200 scientific publications including the co-authored by candidates of biological sciences O.V. Andrienko and K.S. Tsyhanenko monography “Macrocyclic Trichothecene Mycotoxins”, which was awarded the Zabolotnyi Prize of NAS of Ukraine

O.M. Zaichenko always successfully combined scientific and social activities. He was a member of the S.M. Vynohradskyi Society of Microbiologists of Ukraine, the Ukrainian Botanical Society, the editorial board of the “Microbiological Journal” and the journal “Modern Problems of Toxicology”, the Problem Commission “Toxicology”, the Specialized Scientific Council at the M.G. Kholodny Institute of Botany of NASU, the Scientific Council of the D.K.

Zabolotnyi Institute of Microbiology and Virology of NASU. Also, he was the head of the expert council of the D.K. Zabolotny Institute and an expert of the National Accreditation Agency of Ukraine.

Olexandr Maksymovych Zaichenko was a scientist of high qualification and experience. He was distinguished by high professionalism, efficiency, inherence to principles and devotion to science. Oleksandr Maksymovych will forever be remembered by his colleagues and students.

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of Physiology and Systematics of Micromycetes
The D.K. Zabolotnyi Institute of Microbiology
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The S.M. Vynohradskyi Society
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