

### PIDOPLICHKO MYKOLA MAKAROVYCH (to the 120<sup>th</sup> anniversary of the birth)



**April 3, 2024** is the 120<sup>th</sup> anniversary of Mykola Makarovich Pidoplichko, talented Ukrainian scientist, mycologist. His way in science was very bright: botanist-mycologist in the Botanical cabinet and the Herbarium of the All-Ukrainian Academy of Sciences (AUAS, VUAN), where he created the mycotheca (1924—1929); lecturer of the Veterinary-Zootechnical Institute (1926—1928); scientific researcher of the Scientific-Research Institute of Sugar Industry, where he eventually headed the Laboratory of General Mycology (1928—1933). From 1933, he worked at the D. K. Zabolotny Institute of Microbiology, where he founded the Laboratory of Mycology

(1933), which in 1935 was turned into the Department of Mycology and later, in 1958, into the Department of Experimental Mycology. He obtained the title of senior researcher in 1941, in 1942 he defended his candidate and in 1955 his doctor theses. In 1956, he got the diploma of professor and in 1957 was elected a corresponding member of the Academy of Sciences of the Ukrainian SSR.

Mykola Makarovich Pidoplichko was born on April 3, 1904, in Ukraine in the village of Kozatske, Kazachanska volost, Zvenyhorodkyi povit, Kyiv guberniya (later the village of Kozatske, Zvenyhorodkyi Raion, Kyiv oblast; since 1956 till now — Cherkasy Oblast). Mykola Makarovich's father — Makar Evmenovych Pidoplichko was a rural teacher who thought progressively and wanted very much «all children of local peasants to learn to read and write». His home library contained the Guide of Plants and books on plant selection, and thanks to the father, children were instilled love to investigations and knowledge of natural environment.

In his student years, M. M. Pidoplichko studied the flora of Zvenyhorodshchyna and Kyivshchyna under the guidance of academician O. V. Fomin. Herbarium materials collected by M. M. Pidoplichko are still carefully preserved in the M. G. Kholodny Institute of Botany of the NAS

of Ukraine. From 1925 Mykola Makarovich began to study fungi of the Ukraine, the investigation of which later turned into his life's work. In 1926, he became a member of the Ukrainian Botanical Society and, being the student of the third course, published in the Ukrainian Botanical Journal his first scientific article «The Materials to Flora of Zvynohorodshchyna (Preliminary report)». In 1928, Mykola Makarovich was enlisted in the staff of the Ukrainian NDI of Sugar Industry, where he studied the fungi affecting sugar beet and the fungi developing on dried beet chips during storage of them. Having studied the causative agents of grey rot of beet, he proposed measures to combat them. He examined the species composition of fungi colonizing sugar beet and discovered the physiological processes that occur when sugar beet is defeated by «molds»: from invasion of fungal hyphae in the body of beet to necrosis due to the release of enzymes and toxic substances killing the alive cells of beet. That work, in which, based on the scientific achievements of the world mycology, Mykola Makarovich not only analyzed the species composition of fungiaffecting the beet but also revealed the physiology of fungal infection as a result of toxin-forming and enzymatic abilities of fungi, can be considered the first stage in experimental mycology. In 1931 Mykola Makarovich began to work at the D. K. Zabolotny Institute of Microbiology and Epidemiology of the AUAS at the Department of General Microbiology. At that time, he was the only mycologist at the Institute. In 1935 only three scientific researchers worked at a newly organized Department of Mycology, but 20 years later, its staff consisted of almost twenty specialists.

For the significant contribution to the development of microbiology, Pidoplichko M. M. was awarded orders and medals in different years, particularly in 1939, the Order «Badge of Honor» for outstanding progress in the fight with unknown lethal disease of horses stachybotryotoxicosis caused by saprophytic fungi. Near 50

fungal species were discovered and described by Mykola Makarovich for the first time, including the fungus *Dendrodochium toxicum* Pidoplichka N. et Bilai W. sp. nov., the causative agent of Zaporizhzhia UD of horses, dendrodochiotoxicosis, and fungi of genera *Fusarium*, the causes of «septic tonsillitis», human lethal disease in Trans-Urals (1939). For fruitful scientific activity during the World War II on revealing and studying toxic fungi that affected the cereal grain in Bashkiria (1942—1943, evacuation to the city of Ufa) and caused the «septic tonsillitis» with high mortality in people, Mykola Makarovich was awarded the Certificate of honor of the Presidium of the Supreme Council of the Bashkir Autonomous SSR (1943), as well as the Medal «For Labor Valor» in the war time of 1941—1944 for the achievements in the field of toxigenic fungi, which can contaminate grain.

In 1952 M. M. Pidoplichko was honored the State Prize of the USSR for a discovery of the new therapeutic drug «Microcidium» and its producer — *Penicillium vitale* Pidopl. et Bilai. This preparation was the first antibiotic of fungal origin discovered in Ukraine, and it is still used in medical practice. Among other strains of *P. vitale* Pidopl. et Bilai., there were also selected the active producers of glucose oxidase and catalase, which are widely used in national economy.

To the 50<sup>th</sup> anniversary of the birth (1954) Mykola Makarovich was awarded the highest award of that time, the Order of Lenin.

M. M. Pidoplichko laid the foundation for the main directions of study at the Department of Mycology such as systematics and physiology of micromycetes, biotechnology, phytopathology, soil mycology, mycotoxicology, studying fungi that can destruct monuments and buildings, products and materials, and testing on resistance of technical and building materials to these fungi; studying of contaminants of animal feed and food products, and studying of biologically active substances produced by microscopical fungi (antibiotics, plant growth stimulators etc.).

A number of monographs, well-known among mycologists, were published under his editorship: «Systematics of fungi of genera *Fusarium*» (Bilai V. Y.), «Mycoflora of the soils of the neighborhood of Kyiv and fungi of genera *Mortierella* Coemans (Khalabuda T. V.), «The influence of external environment on the germination of the conidia of imperfect fungi (*Fungi imperfecti*)» (Koretskaia Z. M.), «Fungal flora of alfalfa rhizosphere in the south of Ukraine» (Moskovets V. S.), «The fungi of order *Mucorales*» (Mylo A. A.), «Dark-colored hyphomycetes in corn rhizosphere of different climatic zones of the Ukrainian SSR (Zhdanova N. M.), «The microscopic fungi of soils of the Ukrainian SSR which develop under elevated temperature» (Zakharchenko V. O.), «The fungi of pinewoods soils of the Central Polissia» (Hrebenuk N. V.), and «Mycoflora of soils of pine plantations which are resistant and susceptible to pine fungus» (Shekhovtsov O. H.).

The fungal resistance of industrial materials was a separate field of the research at the Department of Experimental Mycology. The reasons for the damage of industrial and building materials as well as artworks, frescoes in churches, cathedrals, and monasteries by micromycetes were studied. It is known that at the Department certain fungal resistance tests on request of various enterprises, producing technical products exported to tropical countries, were performed. The technique for these tasks were tested, and most importantly, the Department obtained a set of pure cultures of fungi—destructors of technical materials. Unfortunately, Pidoplichko N. M. did not have any publications on this topic.

In 1958 with his assistance, on the base of the Department of Mycology, the Laboratory of Physiology and Biologically Active Substances was established. Eventually, it was transformed into the Department of Physiology of Fungi. Thus, the Department of Mycology was divided into two departments, namely, into the Department of Experimental Mycology headed by Mykola Makarovych Pidoplichko and the De-

partment of Physiology of Fungi headed by his disciple and close associate Vira Yosypivna Bilai.

More than 40 years (1935—1975), M. M. Pidoplichko was the permanent head of the Department of Experimental Mycology and until the last days of his life, he remained an inspirer, mentor, often coauthor, reviewer, opponent, and initiator of works in the field of mycology performed by the researchers of the young department created with his assistance.

For his achievements in the development of mycology, which were highly evaluated by scientific community, and teaching scientific personnel along with organizational and social activities, in 1969 M. M. Pidoplichko was awarded the Memory medal in honor of the 50<sup>th</sup> anniversary of the Academy of Sciences of the Ukrainian SSR.

As one of the founders of the new fields of science, mycotoxicology and experimental mycology, Mykola Makarovych Pidoplichko contributed to the development of new terminology in these directions and created the collection of microscopic fungi. The monograph in co-authorship «Toxin-forming microscopic fungi», published in 1970, became a significant milestone in mycotoxicology and was awarded D. K. Zabolotny Prize of the Academy of Sciences of the Ukrainian SSR.

From 1965 till 1971, M. M. Pidoplichko headed the Presidium of the Central Council of the Ukrainian Microbiological Society and the Ukrainian Division of the All-Union Microbiological Society, for which in 1972, he was awarded a jubilee medal released to celebrate the 150<sup>th</sup> anniversary of Louis Pasteur.

To continue the research in the field of mycotoxicology and experimental mycology, he actively trained scientific personnel. Mykola Makarovych, whose vital energy was colossal, founded at the D. K. Zabolotny Institute of Microbiology and Epidemiology of the Ukrainian SSR (now the D. K. Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine) the scientific school of mycologists-microbiologists and prepared 3 doctors and 11 candidates of science.

Many fungi species, which were discovered and described by him, are recognized by the world scientific community and put into the database of the International Mycological Association «MycoBank». There is a number of micromycetes named after M. M. Pidoplichko.

M. M. Pidoplichko devoted a lot of time, effort, and energy to organizational problems. According to the Instruction of the Government and the Academy of Sciences of the Ukrainian SSR he headed the Commission of the Council for the Study of the Productive Forces of the Republic and organized two conferences on wart of potato (1955, 1957). In close collaboration with phytopathologists and plant breeders, M. M. Pidoplichko revised the quarantine regulations. Basing on the data of biology of causative agents and nature of potato varieties resistance, he made important changes in them. In particular, the new quarantine regulations set the zones of individual microregions where the cultivation of potato had to be controlled by Quarantine Services. As a result of this work, in 1955 and 1957 two collective monographs, initiated and edited by M. M. Pidoplichko, were published. He also was the initiator and ideologist of two conferences on mycotoxicoses of humans and agricultural animals held in Kyiv in 1956 and 1961. Over 24 years, he was a member of the editorial board of «Microbiological journal» issued by the D. K. Zabolotny Institute of Microbiology and Virology of the AS of the Ukrainian SSR (1951—1975) and fruitfully worked as a member of the Bureau of the Biological Division of the AS of the Ukrainian SSR (1957—1963). M. M. Pidoplichko was a member of the All-Union Scientific and Technical Society of Agriculture and the Bureau of the Agricultural, Scientific and Pedagogical section of the Ukrainian Society of Agriculture. Over several years, Mykola Makarovich headed the Section of Mycology and

Phytopathology of the Ukrainian Botanical Society (1959—1965) and then he became the President of the Ukrainian Microbiological Society and the organizer of its First Congress in 1965.

M. M. Pidoplichko participated actively in the work of Ukrainian and International forums, congresses, symposia, and conferences. As a consultant on micromycetes, he visited Bulgaria, Czechoslovakia, Romania, Hungary, and Yugoslavia. He established connections with many advanced scientific institutions of near and far abroad as well as with industrial enterprises on production of preparations of microbial origin.

The list of his printed works includes 13 books and brochures, 119 articles, 11 certificates of authorship, 5 monograph reviews, and 11 books under his editorship. His monographs «The guide of fungi, parasites of cultivated plants» (1938), «The fungal flora of roughage» (1953), «Penicillia» (1972), and «Parasitic fungi of cultivated plants. The Guide in 3 volumes» (1977—1978) for a long time were the main handbooks on mycotoxicology and systematics of micromycetes for a wide scientific community. Even now these books are rarities that have not lost their relevance. His works on systematics of micromycetes are cited in well-known foreign editions, particularly, in the book «Compendium of Soil Fungi» (first issue in 1980, second issue in 2008).

Mykola Makarovich devoted all his life to the service of science and for the benefit of Ukraine which he loved with all his heart and the true patriot of which he was.

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