



## In Memory of Petro M. Tsarenko (12.07.1956 – 21.01.2023)



Petro Tsarenko, Doctor of Biological Sciences, Professor, Corresponding Member of the National Academy of Sciences of Ukraine, a laureate of the Boris Paton National Award and a long-term head of the Department of Phycology, Lichenology and Bryology of the M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine, passed away on 21 January 2023 in Kraków, Poland.

Petro Mykhaylovych Tsarenko was born in the village of Smilchyntsi, Lysianka District in Cherkasy Region, Ukraine, in the family of Mykhailo Nychporovych Tsarenko and Valentyna Kononivna Tsarenko. He grew up together with two brothers in a family where respect to books, to the history of the native land, to learning and knowledge was cultivated from his childhood years. Probably his great devotion to work and his caring and kind attitude to the family and colleagues were rooted in and inherited from his family traditions, and thus were evident during his whole life.

In 1973–1978 Petro studied at T.G. Shevchenko Kyiv State University (now the Taras Shevchenko National University of Kyiv), specializing at the Department of Lower Plants headed by Professor Nadiya Prokhorivna Massjuk (also sometimes transliterated as Masyuk or Masiuk) who was his first mentor in the field of phycology. While still a student, Petro came to the Department of Algology and Lichenology of the Institute of Botany of the Academy of Sciences of the Ukrainian SSR (now the M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine), where he later worked during his whole scientific life. The luminaries of the department, students of Academician Oleksandr V. Topachevsky, bright representatives of the Kyiv scientific school of phycologists, such as Nadiya P. Massjuk, Galyna M. Palamar-Mordvintseva, Nadiya V. Kondratyeva, Zinaida I. Asaul-Vetrova, Nonna O. Moshkova and others, significantly influenced the formation and development of Petro Tsarenko as a scientist. Consequently, high organization, punctuality, logic in expressing opinions in his publications, numerous reports, and lectures were the features that Petro inherited from his teachers and mentors. In 1979, when P.M. Tsarenko demonstrated his young graduate's interest in floristic and taxonomic studies of green algae, he was recommended for an internship to a well-known researcher in this field, Professor Vera Mikhaylovna Andreeva from the V.L. Komarov Botanical Institute of the Academy of Sciences of the USSR.

In 1980 Petro Tsarenko entered the postgraduate program at the Institute of Botany, where his supervisor was Professor Galyna M. Palamar-Mordvintseva. Petro conducted research on chlorococcal algae in the reservoirs of the Ukrainian Polissia and successfully defended his Candidate

of Science (comparable to PhD) thesis in 1984. As a result of his graduation project, he published his first monographic book, a *Brief Identification Manual of Chlorococcal Algae of the Ukrainian SSR* (1990), which is still a standard handy reference for many phycologists.

In the 1990s, P.M. Tsarenko collaborated with German scientists in conducting their joint scientific research at the Jülich Scientific Center (Forschungszentrum Jülich, Jülich, district of Düren, North Rhine-Westphalia, Germany, 1991, 1993) and at the Leibniz Institute of Freshwater Ecology and Inland Fisheries (Neuglobsow, Brandenburg, Germany, 1995). In 1991, he participated the expedition to the Indian Ocean onboard the scientific research vessel *Akademik Vernadsky* (named in honor of Academician Volodymyr I. Vernadsky), studying algae of Madagascar, Namibia, Indonesia, Singapore, the Seychelles, and other countries and regions.

In 1996, P.M. Tsarenko defended his doctoral (Doctor of Science) thesis "Chlorococcal algae (*Chlorococcales*, *Chlorophyta*) of water bodies of Ukraine (flora, morphology, ecology, geography, evolutionary trends and principles of systematics)". In 2002, he started his work as the Head of the Department of Phycology (since 2016, the Department of Phycology, Lichenology and Bryology) at the M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine, and remained the head of that department for two decades, until the end of his life. He also paid considerable attention to his teaching activities as a professor of the Department of Botany (2000–2007) and the head of the Department of Physiology, Plant Ecology and Biomonitoring (2006–2007) at the National Agricultural University (now, since 2008, the National University of Life and Environmental Sciences of Ukraine) and a professor of the Department of Botany at the Taras Shevchenko National University of Kyiv (2010).

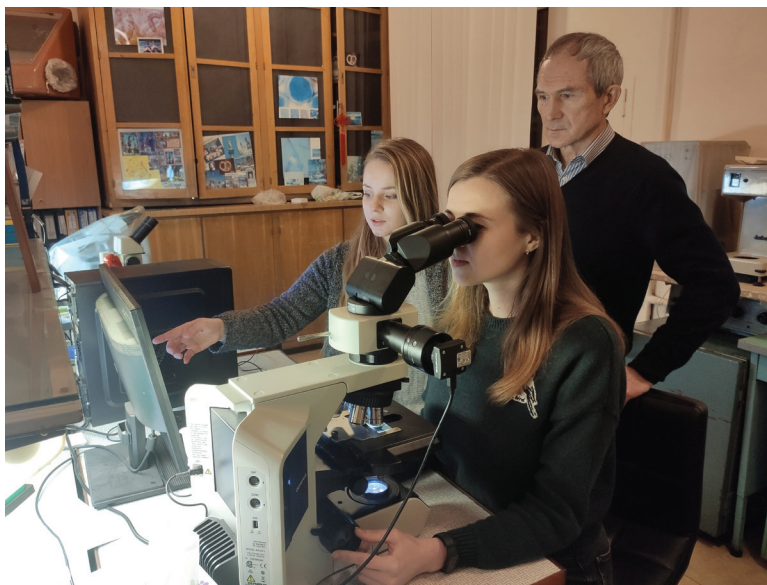
The scientific activity of P.M. Tsarenko covered various issues and fields of floristics, morphology, ecology, geography, nomenclature, taxonomy, evolution and phylogeny of algae (mainly coccoid green algae, charophytes, diatoms), history

of science, theoretical and applied aspects of phycology, bioindication, bioenergy conversion, and the innovative field of conservation of algae (now sometimes termed algosozology). In particular, he developed the concept of specificity and taxonomic and ecological diversity of the algal flora of Ukraine, proposed a system of regional zoning of that flora based on the zonal and basin approach and ecological-hydrological peculiarities, and developed criteria for categorization of rare and threatened species of algae and their conservation.

Petro Tsarenko had a special interest in comprehensive and integrative studies of coccoid green algae (especially *Scenedesmaceae*) in the flora of Ukraine and other countries. He was one of the best specialists in identification of these algae, in studies of cell morphology and ultrastructure of *Scenedesmus*-like algae of Ukraine and Germany, in carrying out taxonomic studies (for example, more than 40 proposed nomenclatural changes in the group of *Scenedesmus* s. l.), and in developing collections that included more than 150 strains of representatives of *Scenedesmaceae*.

Petro described 9 species and infraspecific taxa of green algae (*Desmodesmus communis* var. *polisticus* P. Tsarenko & E. Hegewald, *D. costatogranulatus* var. *costatus* E. Hegewald & P. Tsarenko, *D. multivariabilis* E. Hegewald, Antal Schmidt, A. Braband & P. Tsarenko, *D. multivariabilis* var. *turskensis* P. Tsarenko & E. Hegewald, *Enallax acutiformis* var. *reticulatum* E. Hegewald & P. Tsarenko, *Pteromonas carteri* P. Tsarenko & D. Kapustin, *Scenedesmus polessicus* P. Tsarenko, *Sc. serratopectinatus* P. Tsarenko, *Tetradesmus arenicola* Mikhailyuk & P. Tsarenko). He also proposed more than 100 nomenclatural novelties at various ranks, such as the family (*Scotiellocoystoidaceae* (Fott) P. Tsarenko, *Sphaerocystidaceae* Fott ex P. Tsarenko, *Bracteacoccaceae* Kostikov emend. P. Tsarenko, *Gloeochaetaceae* Kies & Kremer ex P. Tsarenko), genus (*Acutodesmus* (E. Hegewald) P. Tsarenko), species and infraspecific taxa in *Chlorophyta*, *Charophyta*, *Glaucophyta*, and *Bacillariophyta*.

Petro Tsarenko also initiated studies in the field of applied phycology, in particular, the search and cultivation of algae of biotechnological importance,



Petro Tsarenko with graduate students of the department, Sofia Sadogurska and Olga Kryvosheia-Zakharova (Kyiv, 2020)

studies of their biological properties, development of cultivation methods and protocols, formation of a collection of strains promising for industrial cultivation, etc. His knowledge allowed him to form a unique collection of strains of coccoid green algae (part of the well-known collection of algae at the Institute of Botany – IBASU-A), as well as a collection of microalgae that are promising producers of biomass and lipids, and found out the environmental factors involved in the production and resource process of their biosynthesis according to conditions of closed ecosystems. For many years, Petro was not only the head and curator, but also a tireless collector of the Algotheca (Algotheque, algal collection) of the Institute of Botany (KW-A) and the Collection of Living Cultures of Algae (IBASU-A), both are now the units of the National Heritage of Ukraine.

Petro M. Tsarenko was active in organizational and expert work. He was a member of the National Agency for Higher Education Quality Assurance and the National Commission for the Red Data Book of Ukraine. He was also an experienced member of the specialized scientific councils at the M.G. Kholodny Institute of Botany, the Institute of Hydrobiology, and the Institute of Marine Biology of the National Academy of Sciences of Ukraine.

Petro Tsarenko was one of the responsible editors of the *Algal Flora of Ukraine* and *Algae of Ukraine* series, a member of the editorial board of the journals *Algologia*, the *International Journal on Algae*, and the *Ukrainian Botanical Journal*. Under his supervision, six dissertation studies were completed for the scientific degree of the Candidate of Biological Sciences (earlier comparable to PhD) and one for the Doctor of Philosophy (PhD) degree.

Petro Tsarenko studied not only the algal flora of Ukraine, but also floras of other countries. He participated in numerous international projects to study the algoflora of the United Kingdom, Israel, Germany, and Mongolia. It was indeed a great pleasure to be in field trips together with Petro Tsarenko (all regions of Ukraine, the coastal zone of the Pacific or Atlantic oceans, the Black and Mediterranean seas, high mountains of Central Asia, the Near East, etc.), or to participate in workshops or conferences organized and prepared by Petro: all travel details, sampling points, all permits for collecting were prepared and agreed upon with local colleagues in advance, and usually everything was implemented in the best way possible.

In appreciation of Tsarenko's contribution to taxonomy, colleagues named three species of

diatom algae in his honor: *Buryatia tsarenkoi* Kulikovskiy, Metzeltin & Lange-Bertalot, *Fallacia tsarenkoi* Kulikovskiy, Lange-Bertalot & Metzeltin, and *Nitzschia tsarenkoi* Lange-Bertalot. We know that several more names of algae and lichens will be dedicated soon to Petro Tsarenko (publications now in preparation or submitted).

Petro Tsarenko is the author and co-author of more than 450 scientific publications, including 34 monographs and 29 educational and teaching manuals. P.M. Tsarenko had a special inspiration and interest in preparing monographic studies on biodiversity. Among them, there are fundamental overviews of algae of the British Isles (*The Freshwater Algal Flora of the British Isles*, 2002), Israel (*Biodiversity of Cyanoprocaryotes and Algae of Continental Israel*, 2000), Mongolia (*Limnology and Paleolimnology of Mongolia*, 2014) and the four-volume collective monograph *Algae of Ukraine: Diversity, Nomenclature, Taxonomy, Ecology and Geography* (2006–2014). He is one of the leading authors of the third edition of the *Red Data Book of Ukraine* (volume of plants and fungi) (2009). The last large-scale and fundamental works by P.M. Tsarenko, on which he worked as the chief editor, were the *Prodromus of Spore Plants of Ukraine: Lichens* (2021), *Prodromus of Spore Plants of Ukraine: Bryophyta* (2022), as well as the chief editor and author of many chapters in the *Prodromus of Spore Plants of Ukraine: Algae* in two volumes (2023). In his free time P.M. Tsarenko was fascinated by the history of his native land, the history of Ukraine.

The beginning of the large-scale phase of the aggressive war waged by ruscists against Ukraine forced Petro Tsarenko to leave his home in Kyiv, mainly because of the damage caused by the shockwave and fragments of a missile to the building where he lived, in the northeastern part of Kyiv City. Petro also cared for his family, his wife and two daughters, and wanted to safeguard them against any further shocks and dangers. After this event, Petro accepted an invitation made by Professor Konrad Wołowski (W. Szafer Institute of Botany of the Polish Academy of Sciences, Kraków) to move with his family to Kraków. Having received



Petro Tsarenko during the field work in 2022 in Poland: Morskie Oko Lake

funding from the Polish Academy of Sciences, as a visiting professor at the W. Szafer Institute of Botany within the framework of the project, Petro continued to work on his main passion and dedication, the study of green algae, and also conducted his taxonomic research and revision of algal cultures of the National Biodiversity Collection of Recent and Fossil Organisms at the W. Szafer Institute of Botany.

At the same time, Petro Tsarenko combined his work at a Polish institute with quite active parallel research for the benefit of Ukrainian phycology and higher education in his home country; in particular, he prepared a number of articles, highlighting the peculiarities of the diversity of algae in different regions of Ukraine, completed his work on the *Prodromus of Algae of Ukraine*, and participated in forming decisions on issues of the quality of higher education in Ukraine at meetings of the National



Visiting the Institute of Nature Conservation (Kraków, 2011):  
Janina Kwadrans, Konrad Wołowski and Petro Tsarenko



An interview at the Rada TV channel

Agency for Higher Education Quality Assurance of Ukraine.

The scientist worked at the Szafer Institute until the last days of his life. Ukrainian and Polish colleagues remember his inexhaustible plans and ideas for future research, which were interrupted by his sudden death. In the last days of 2022, Petro Tsarenko told Professor Konrad Wołowski that he would be especially happy to help his colleagues from Ukraine as much as possible. Together with Konrad they drafted the idea and scope of activities for a new grant proposal involving colleagues from Ukraine. They also drafted a list of potential partners; negotiations with the Ukrainian scientists were underway when Petro passed away suddenly. His thoughts were always with his beloved country of Ukraine, his Kyiv City, and the M.G. Kholodny Institute of Botany, which he missed so much.

Petro Tsarenko was an exceptional man, a wise, calm, kind and sincere person, and a researcher wholeheartedly devoted to science. The door of his office room was always open for colleagues, friends, and many other visitors. Despite his very busy schedule, he always managed to find some time to discuss both scientific issues and various life situations. Petro was always aware of what was happening with the employees of his department, supported and helped them. He combined the qualities of a caring and understanding manager,

while at the same time his attitude was demanding, persistent, and stimulating to work.

He sincerely loved his work and devoted a lot of time to it. At the same time, Petro was the caring and loving husband for his wife Olga (also a botanist) and the devoted and kind father for their two daughters. The order and harmony that reigned in his family also contributed to Petro's scientific work and achievements. He will be sorely missed by his family, especially his beloved wife Olga and daughters Olena and Nataliia. Petro was especially proud that one of his daughters, Olena Bilous (née Tsarenko), continued the scientific tradition of her father and is now a professional psychologist and hydrobiologist.

Whilst we will greatly regret the many unfulfilled projects Petro Tsarenko was about to launch, we will miss him most of all as a colleague and friend. With him, international psychology has lost an experienced and valued member, and Ukraine lost one of our most important researchers. It is also undoubtedly a major loss not only to psychology but also to the international and national scientific community.

Serhij KONDRATYUK,  
Oksana VYNOGRADOVA, Konrad WOŁOWSKI,  
Solomon WASSER, Olga BUROVA,  
Tetiana MIKHAILYUK, Sergei MOSYAKIN