



In Memoriam



Prof. Dr. Roumen K. Kalchev (20.11.1951–12.03.2021)

Teodora Trichkova & Hristina Kalcheva

Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences,
1 Tsar Osvoboditel Blvd., 1000 Sofia, Bulgaria; E-mail: trichkova@gmail.com

The highly respected and eminent Bulgarian hydrobiologist, Prof. Dr. Roumen Kirilov Kalchev passed away on 12th March 2021.

Professor Dr. Roumen Kalchev was born on 20th November 1951 in Kubrat Town, Bulgaria. In 1979, he graduated from the University of Rostock, Germany, major in Biology, Freshwater and Marine Hydrobiology. In the period 1980–1984, he was a PhD student at the Taras Shevchenko University and the Institute of Plant Physiology of the National Academy of Sciences of Ukraine (NASU) in Kiev, under the supervision of the Corresponding Member of NASU Prof. D. M. Grodzinsky. He successfully defended his PhD dissertation in hydrobiology on the topic: 'Fluorescence characteristics of some algal species and possibilities for their application for studying primary production of fresh waters'. In 1984, he was appointed as an Assistant Professor at the Institute of Zoology, Bulgarian Academy of Sciences (IZ-BAS). In 2002, he became an Associate Professor, while in 2015 he received the rank of Professor at the Institute of Biodiversity and Ecosystem Research at BAS (IBER-BAS). Professor Kalchev was a head of the Phytoplankton Research Group and Hydrobiology Department at IZ-BAS. Since 2010, he was a leader of the Lentic Ecosystem RG and a head of the Section of Biodiversity and Processes in Freshwater Ecosystems at IBER-BAS.

With his research, Prof. Roumen Kalchev contributed to several fundamental areas of aquatic biology and ecology. The focus of his research was the composition and functioning of phytoplankton, the photosynthetic pigments, and measurement of primary production of reservoirs, fishponds, the Danube River and adjacent wetlands, as well as the Black Sea coastal lakes. He used different methods, such as variation in oxygen concentration, carbon radioactive isotopes and fluorescence technique. As additional method, he applied light measurements above and below the surface of water for estimation of solar radiation energy fluxes in aquatic ecosystems. Thus, Prof. Kalchev has revealed significant relationships between chlorophyll-a and the phytoplankton parameters (taxonomic and functional groups, algal size, abundance, biovolume, etc.) in water bodies of Bulgaria and the Danube River basin. Further, his research interests extended to aquatic chemistry and nutrient cycles, especially the phosphorus and nitrogen limitation of phytoplankton growth (seasonal and long-term variations). His research covered also the pelagic trophic relationships between solar energy, nutrients, bacterio-, phyto- and zooplankton and assessment of the trophic status (degree of eutrophication) and water quality gradients in stagnant water bodies. The results of his studies demonstrated the significance of the trophic relationships in the pelagial zone for the ecological status

improvement through different approaches as catchment regulation and biomanipulation. His original scientific and applied contributions helped to successfully solve problems in the areas of conservation and sustainable use of biological resources in standing natural and artificial water bodies, as well as in the restoration and protection of wetlands. Based on his expertise, Prof. Kalchev was involved in reference site selection, classification, and ecological status/ potential assessment of water bodies, contributing to the implementation of the EU Water Framework Directive 2000/60/EC in Bulgaria. Furthermore, in the period 2017–2019, he contributed to the hydrobiological monitoring of surface inland waters in Bulgaria coordinated by the Ministry of Environment and Waters.

Some of the research topics of Prof. Kalchev were devoted to different threats to biodiversity and ecosystem functions and services. He studied the pollutant loads in rivers, as well as the effects of fertilisers of organic origin and different farming practices on plankton primary production, bacterioplankton, nutrients and water quality characteristics in fish ponds and reservoirs. He had a leading role in the project: ‘Exploring and assessment of influence of pollution by diffuse sources on ecological status of surface waters (2014–2015), funded by the Ministry of Environment and Water of Bulgaria. His recent studies focused on the impact of invasive alien species, in particular the mussel species of the genus *Dreissena*, on the physical and chemical parameters of water (pH, oxygen concentration, transparency) and bacterio-, phyto- and zooplankton in infested reservoirs in Bulgaria. Professor Kalchev was an active member of the East and South European Network for Invasive Alien Species (ESENIAS). He participated in several projects related to invasive alien species (IAS), such as: ‘Assessment and management of *Dreissena* spp. invasions in the Bulgarian water bodies (2009–2012)’, ‘East and South European Network for Invasive Alien Species – A tool to support the management of alien species in Bulgaria (ESENIAS-TOOLS) (2015–2017), and ‘Increasing understanding of alien species through citizen science: Approaches to citizen science, data management and standards (2019–2021)’.

Huge part of Prof. Kalchev’s research, project, expert and organisational activities were connected to the Danube River and the adjacent wetlands. He participated in several research projects at national level, among them: ‘Biological diversity of aquatic ecosystems in wetlands of floodplain of the Lower Danube regarding optimising ecosystem functions under global climate change (2009–2012)’ and ‘Potential threats to environmental and economic sustainability in the Danube and Black Sea region: Danube River as invasive alien species corridor (2012 – ongoing)’. From 2010 to 2021 he was the country representative of Bulgaria in the International Association

for Danube Research (IAD). He was an active member of IAD, contributing to several expert groups: Water Quality, Biotic Processes, Phytoplankton/ Phytobenthos, IAS, and others. Professor Kalchev was co-founder of the Danube River Invasive Alien Species Network (DIAS) (2014) and participated actively in all DIAS meetings and activities. Professor Kalchev participated in eight of the IAD Scientific conferences and was a chair of the Organising and Scientific committees of the 40th IAD Conference ‘The Danube and Black Sea Region – Unique environment and human well-being under conditions of global changes’ held on 17–20 June 2014 in Sofia, Bulgaria.

Professor Roumen Kalchev was very active in developing transboundary cooperation. Being fluent in three foreign languages (German, English and Russian), he easily established and maintained contacts with scientists from other countries. He has developed successful collaboration with colleagues from Austria, Germany, Hungary, Romania, and Ukraine. He was an initiator and national leader in the following bilateral projects: ‘Impact of Iron Gates reservoirs hydraulic river structure, tributaries and adjacent wetlands on ecological interactions, water quality and biodiversity in the Lower Danube (2005–2006)’ (Bulgaria – Romania); ‘BioWetMan: A science based approach to understand biodiversity driven functions and services for improving wetland management (2008–2009)’ (Bulgaria – Austria); Comparison between wetland – Danube River systems of Hungary and Bulgaria related to their biodiversity, functioning, services, management and nature conservation (2013–2015)’ (Bulgaria – Hungary); and ‘The significance of habitat diversity in Danubian wetlands of Hungary and Bulgaria for biodiversity, biological invasions, functioning, management and services of aquatic ecosystems (2016–2018) (Bulgaria – Hungary). He also actively participated in international projects, among them: ‘European mountain lake ecosystems: Regionalisation, diagnostics and socio-economic evaluation (EMERGE)’ (EU FP5, 2000–2002), and ‘Southern European Seas: Assessing and modelling ecosystem changes (SESAME)’ (EU FP6, 2008–2009).

Professor Roumen Kalchev is an author and co-author of more than 150 scientific publications, including a textbook on ecotoxicology. He was involved in teaching and practical training activities at the Biological Faculty of Sofia University ‘St. Kliment Ohridski’. For 12 years, he led practical courses on hydrobiology and advised two PhD and four MSc students.

We will remember Prof. Kalchev for his exceptional professionalism and collegiality, broad scientific expertise in hydrobiology, for his kindness and modesty, for his willingness to help other colleagues, and for his friendship!

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Prof. Kalchev at field work in Zhrebchevo Reservoir, 20.05.2010 (Photo: Mihaela Beshkova).