20th WORKSHOP OF THE INTERNATIONAL ASSOCIATION OF PHYTOPLANKTON TAXONOMY AND ECOLOGY (IAP)

Frymburk, Czech Republic
September 14 – September 20, 2025

FIRST CIRCULAR

The 20th workshop of the International Association of Phytoplankton Taxonomy and Ecology will be held in Frymburk, Czech Republic, near the country's largest water body – the Lipno Reservoir, September 14–20, 2025.

The year 2025 marks the 20th edition of the Association's workshop, which has always aimed to bring together scientists focused on various aspects of phytoplankton taxonomy and ecology. Over the years, our workshop has provided a valuable platform for exchanging ideas and fostering discussions between early-career researchers and experienced scientists. The organising committee sincerely hopes that the upcoming workshop in the Czech Republic will carry forward the rich traditions of the IAP, strengthening productive collaborations while preserving the friendly spirit that defines IAP workshops.
As always, the meeting will feature plenary lectures, oral and poster presentations, and plenty of opportunities for informal conversations. Additionally, there will be dedicated microscopy sessions focused on analysing phytoplankton samples.

In keeping with a well-established tradition, the IAP workshop seeks presentations on a particular topic of general interest. After previous discussions, the **ecological theme** is:

Phytoplankton ecology studied at various temporal and spatial scales

Phytoplankton exhibits dynamic ecological patterns across a range of temporal and spatial scales (e.g., Harris, 1980, Padisák 1992) and along the trophic gradient (Reynolds 1984). In phytoplankton dynamics, there is a hierarchy of processes operating at different temporal and spatial scales, which results in patchiness in both time and space in terms of biomass and species composition (Reynolds 1990). To collect a representative sample of freshwater phytoplankton, it is important to consider its spatial heterogeneity and non-homogeneous distribution in the water column. Phytoplankton often forms patches or layers influenced by factors such as light, temperature, nutrient gradients or water movement. To account for this variability, sampling should be conducted at multiple depths where distinct phytoplankton communities may exist in surface layers, thermoclines or deeper waters. Typical examples are subsurface or deep chlorophyll maxima often found in stratified water bodies (Cullen 2015). Therefore, integrating vertical sampling or collecting discrete samples at key depths helps to capture this variability. Even today, when advances in instrumentation allow the use of fluorescence-based profilers that facilitate in situ measurement of the vertical distribution of phytoplankton, classical microscopic techniques are essential to determine the quantity of individual phytoplankton taxa. Regardless of which method we use, sampling at multiple locations in the water body can account for horizontal heterogeneity caused by inflows (Rychtecký and Znachor 2011), wind-driven mixing (Znachor et al. 2023) or local nutrient enrichment (Caputo et al. 2008). Even if we achieve the "representativeness" of the samples in terms of spatial variability, the temporal aspect comes into play.

On the shortest time scales, phytoplankton communities respond rapidly to changes in light, temperature and nutrient availability. Changes in light intensity, for example, drive photosynthetic activity and influence cellular processes such as carbon fixation and nutrient uptake. Diurnal variability, i.e. the day-night cycle, has a significant impact on phytoplankton as light availability changes dramatically within a 24-hour period. During daylight, photosynthetic activity peaks, leading to increased biomass and oxygen production, while at night, respiration dominates, resulting in a net carbon loss.

On a seasonal scale, phytoplankton communities undergo predictable successions driven by changes in temperature, light, nutrient availability and biological interactions (Reynolds 1984, Sommer et al. 1986). In temperate regions, the spring bloom marks a period of rapid phytoplankton growth fueled by increasing light and nutrient availability due to winter mixing. During the summer, when thermal stratification develops, the lack of nutrients in surface waters often leads to a shift in community composition in favour of species adapted to low-nutrient conditions, such as cyanobacteria. The optimised sampling strategy, reflecting the generation times of the algae, allows a precise description of the seasonal succession in adequate detail, which is crucial for understanding how phytoplankton support higher trophic levels, as different species provide varying nutritional value for zooplankton and fish.

Long-term studies, spanning years to decades, reveal how phytoplankton communities respond to gradual environmental changes such as climate change, eutrophication, or changing hydrological regimes. These trends often show shifts in species dominance, altered bloom timing, and changes in community resilience. Long-term data also help to determine the effects of large-scale climatic events on phytoplankton dynamics. These studies are critical for predicting future ecosystem changes and determining management strategies for water quality and ecosystem health.

Understanding phytoplankton ecology requires holistic ecosystem approaches that consider both the spatial heterogeneity of the environment and temporal changes. Each temporal scale - from minute to minute, daily cycles, day-to-day variability to long-term trends spanning decades - provides unique insights into the processes driving phytoplankton dynamics and their responses to environmental variability.

Taxonomic workshop:
"Cyanobacteria" and "Euglenophyceae"

Considering the detrimental effect of phytoplankton blooms on water quality and the ecological integrity of freshwater systems, some phytoplankton groups are far more important than others. Undisputedly, cyanobacteria are on the top of the list of nuisance planktonic organisms; therefore, they are suggested to be **the taxonomic topic** of the meeting. We also included *Euglenophyceae* as a subject of our taxonomic workshop since they can also form blooms, sometimes even toxic, such as those caused by *Euglena sanguinea*. Recognition of newly defined taxa in euglenoid research is crucial for better understanding of their species-specific autecology. Advances in molecular taxonomy may provide deeper insights into their ecological roles and interactions.

Caputo, L., L. Naselli-Flores, L.J. Ordoñez & J. Armengol. (2008). Phytoplankton distribution along trophic gradients within and among reservoirs in Catalonia (Spain). Freshwater Biology 53: 2543–2556.

Cullen, J.J. (2015). Subsurface chlorophyll maximum layers: enduring enigma or mystery solved? Annual Review of Marine Science, 7, 207–239.

Harris, G.P. (1980). Temporal and spatial scales in phytoplankton ecology. Mechanisms, methods, models, and management. Canadian Journal of Fisheries and Aquatic Sciences, 37: 877–900.

Padisák, J. (1992). Spatial and temporal scales in phytoplankton ecology. Abstracta Botanica, 16, 15–23. http://www.jstor.org/stable/43519281

Reynolds, C. S. (1984). Phytoplankton periodicity: the interactions of form, function and environmental variability. Freshwater Biology 14: 111–142.

Reynolds C.S. (1990): Temporal scales of variability in pelagic environments and the response of phytoplankton. Freshwater Biology 23: 25–53. https://doi.org/10.1111/j.1365-2427.1990.tb00252.x

Sommer, U., Gliwicz, Z.M., Lampert, W., Duncan, A. (1986): The PEG-model of seasonal succession of planktonic events in fresh waters Archiv fur Hydrobiologie 106: 433–471.

Rychtecký, P. & Znachor, P. (2011): Spatial heterogeneity and seasonal succession of phytoplankton along the longitudinal gradient in a eutrophic reservoir. Hydrobiologia 663: 175–186.

Znachor, P., Nedoma, J., Kolar, V., Matoušů, A. (2023): Spatial and temporal variability of methane emissions and environmental conditions in a hyper-eutrophic fishpond. Biogeosciences 20: 4273–4288. https://doi.org/10.5194/bg-20-4273-2023

Venue

The meeting will take place in the town of Frymburk (map), located in the South Bohemian Region, near the shores of the Lipno Reservoir, the largest waterbody in the Czech Republic. The Wellness Hotel Frymburk (web) will host all workshop activities. The hotel offers conference rooms, two restaurants, outdoor and indoor swimming pools, and various wellness and sports facilities. Frymburk is situated on a peninsula of the Lipno Reservoir, and it is known as a popular summer resort with restaurants, bars and a pleasant atmosphere. Field trips to explore the surroundings and collect samples will be organised based on participants' interests.

Detailed instructions on how to reach the venue will be sent in the second circular and the last-minute circular. The most convenient airports are Prague (200 km) and Vienna (240 km).

Pre-registration

There are no registration fees for the meeting. Participants will be charged for accommodation (single, double or triple rooms with breakfast, light lunch and dinner) and social events and field trips. Participation fees will be announced in the second circular and should be approximately 950 EUR in total. We will make a great effort to offer a reduced fee for students.

Please pre-register online:

https://forms.office.com/e/dqXGnXgS4k

Any questions, please contact:
info@AP2025.cz
Follow all the news and announcements on 20th IAP webpage:
www.IAP2025.cz

Important deadlines (preliminary)

January 2025 – Second circular with instructions for payment and abstract submission
15 May 2025 – Abstract submission and payment of the fees
15 July 2014 – Last minute circular and definitive program