



# 42nd International Conference of the Polish Phycological Society



*Vast potential  
of algae and cyanobacteria –  
– from diversity to application*

## ABSTRACT BOOK



**May 27th - 30th, 2025    Białystok - Tykocin, NE Poland**



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## Autochthonous algae in post-mining waters

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Intensive exploitation of hard coal deposits often brings significant threats to the environment through the discharge of so-called drainage waters contaminated with heavy metal and chloride compounds into surface and ground waters. The first symptom of this is the decrease in the number and biodiversity of organisms inhabiting these waters. Considering the fact that algae communities are adapted to the bioaccumulation of heavy metals contained in water, search for them was started in two degraded ditches carrying post-mining waters. They both have increased values of conductivity but differ in the level of organic pollution, heavy metals and silica. It was assumed that an increase in the population size of autochthonous species would cause the settlement and development of other taxa, what would enable an increase in the gene pool of algae resources in degraded ditches and also accelerate the self-purification process.

In the studied ditches, ca. 15 taxa of algae were recognized, among them diatoms, green algae, yellow-green algae, and cyanobacteria. In order to obtain rich inoculum from the aforementioned isolates, individual aerated cultures were established. As a supplement to autochthonous species, selected *Tribonema* sp. (Xanthophyceae), *Stigeoclonium* sp. and *Scenedesmus* sp. (Chlorophyceae) allochthonous taxa known as very good bioaccumulators of heavy metals, were used. Laboratory experiments were carried out on them in the environment of two-phase media using post-mining waters as a liquid substrate and stone shales as a solid substrate being the basis of “biological starters”. In parallel to the experiments, a multi parameter electronic sonde/sampler equipped with an analyzer of various photosynthetic algal pigments is being developed and constructed to study the course of development of algal communities and their diversity.

The conducted observations confirmed that the fouling species (epilithic and epiphytic) have high physiological resistance to the variability of environmental conditions.

Acknowledgements: The research was financed by the National Centre for Research and Development project no. Hydrostrateg2/0002/2023 and the statutory funds of the W. Szafer Institute of Botany, Polish Academy of Sciences.