

## Dr. Tapolczai Kálmán questions answers

**1. Mesocosm experiments represent an interesting transition between laboratory experiments and research based on field sampling. Based on your experience and knowledge, what are the advantages (or disadvantages) of such mesocosm experiments compared to the other two kinds of research methods and for which purposes are they the best solution to use?**

**ASN:** Advantages:

- Mesocosm experiments provide a controlled environment that allows for the manipulation of specific variables while maintaining more natural conditions than laboratory experiments.
- Mesocosms appear more realistic than lab studies because they use natural substrates, organisms, and ecological interactions.
- They are also effective for moderate-scale investigations since they are bigger than microcosms but smaller than complete ecosystems.

Disadvantages:

- They require more setup and maintenance than lab experiments, and the many interacting variables make results harder to interpret.
- They can also be costly and resource-intensive due to infrastructure needs. While they provide more realistic conditions than labs, they may still miss larger ecosystem interactions present in the field.

Mesocosms are excellent for researching predator-prey dynamics and competition, evaluating pollution and climate change effects, and testing ecological hypotheses under semi-natural circumstances. Because they blend controlled settings with ecological validity, they are suitable for testing specific hypotheses that may be further investigated in the field.

**2. You write about how small forest ponds are important and unique habitats and that understanding the functions and response of diatoms could be helpful in formulating effective conservation strategies. What are the most important threats endangering these habitats? Can you detail or give some highlights about how your findings can help in the formulating of conservation strategies for these habitats?**

**ASN:** Small forest ponds are important ecosystems supporting diverse life forms, including diatoms, which are crucial indicators of environmental health. These habitats face significant threats such as pollution from agricultural runoff, climate change affecting hydrology, habitat destruction due to urban expansion, invasive species disrupting ecosystems and nutrient loading leading to eutrophication.

Understanding diatom functions and responses is essential for formulating effective conservation strategies. As excellent bioindicators, diatoms provide insights into water quality and ecological

changes, helping assess the health of pond ecosystems. By establishing baseline data and analyzing diatom communities, we can detect shifts caused by environmental stressors and guide restoration efforts. Conservation strategies should include regular monitoring of diatoms, pollution control measures, habitat protection policies and climate adaptation plans. These efforts, informed by diatom research, can enhance the conservation and resilience of small forest pond ecosystems.

A handwritten signature in blue ink, appearing to read 'Tiba Jassam Kaison Al-Imari', written in a cursive style.

Tiba Jassam Kaison Al-Imari