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**Habitat conditions responsible for interspecific differences in the biology of mussels of the family Unionidae**

Freshwater mussels are the fastest dying group of animals on Earth, and Unionidae is the most numerous family of mollusc species recognized as globally endangered. At the same time, these mussels are among the least known groups of animals: little is known about their biology, habitat requirements, spatial distribution or interactions with other species.

This PhD thesis includes three scientific publications on research conducted in Lake Pińczów (Świętokrzyskie province) between 2013 and 2018.

In the first paper (I) I modelled what would happen to a hypothetical mussel population (in terms of population growth rate and the probability of its extinction) that released the same number of glochidia (parasitic larvae) during one to five reproductive events during a season, in unpredictable habitat conditions differing in the probability of host fish infestation.

In the second paper (II) I described the massive die-off of approximately one-third of the unionid mussels inhabiting Lake Pińczów that took place within the space of just a few days in the summer of 2018. The massive die-off was probably caused by motorboat movements, which must have disturbed the lake sediments, negatively affecting the physiological processes of mussels. The results showed significant differences in levels of tolerance to habitat disturbances between mussel species occurring in this floodplain lake.

In the third paper (III) I described the impact of a change in the water regime of Lake Pińczów on the recruitment (presence and number) of young mussels. I found that a slight increase in the discharge from this waterbody, following the construction of an additional outflow pipe, positively influenced recruitment in three of the five mussel species inhabiting the lake. I also found that after this additional outflow had been built, the niches of *A. cygnea* and *Unio* spp. juveniles changed, revealing differences in their hydrological requirements.

The above results suggest that the number of broods is one of the factors strongly affecting the fitness of individual mussels. To date, this factor has not been described even for individual species; it is extremely variable, because of the interaction between mussels and their host-fish species. Although the impact of environmental factors on the occurrence and biology of bivalve molluscs is known at a very general level, these three papers identify direct factors: the impact of sudden changes in the physicochemical properties of water on mortality, as well as changes in hydrological conditions on recruitment, a key factor in population dynamics.