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[Hydrobiological Journal](https://www.dl.begellhouse.com/journals/38cb2223012b73f2.html) [Volume 59, 2023 Issue 3](https://www.dl.begellhouse.com/journals/38cb2223012b73f2,1ba3419f4f695ecd.html) Peculiarities of *Unio tumidus* and *Unio Pictorum* (Unionidae) Adaptive Reactions to the Water Temperature Increase in the Microcosm



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**Peculiarities of *Unio tumidus* and *Unio Pictorum* (Unionidae) Adaptive Reactions to the Water Temperature Increase in the Microcosm**

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**ABSTRACT**

The paper deals with adaptive reactions of the freshwater bivalve mollusks of the family Unionidae under water temperature increase to the critical values in the model ecosystem - the microcosm. It was found that the water temperature increase resulted in changes of the metabolic processes, namely decrease of the total protein and glycogen content in gills of *Unio tumidus* and *U. pictorum.* Under critical temperatures (30±0.5°C), high activity of LDHase and decrease of K+/Na+-ATPase activity was registered, as well as increase of the filtration rate and oxygen consumption. Considerable need for oxygen was conditioned by oxidation of the energy substrates for instant production of energy for the adaptive processes. However, prolonged impact of increased temperature and thus high rate of metabolic processes in the mollusks can result in exhaustion of the energy resources available for key biological processes, such as growth and reproduction. These results confirmed that over the water temperatures rise owing to the global climate change, many populations of the freshwater bivalves can appear dangerously close to the upper limit of the thermal tolerance.

**KEY WORDS:** [freshwater bivalves](https://search.begellhouse.com/index.php?word_search=freshwater+bivalves&facet_search=&facet=all&site=dl), [water temperature](https://search.begellhouse.com/index.php?word_search=water+temperature&facet_search=&facet=all&site=dl), [gills](https://search.begellhouse.com/index.php?word_search=gills&facet_search=&facet=all&site=dl), [glycogen](https://search.begellhouse.com/index.php?word_search=glycogen&facet_search=&facet=all&site=dl), [total protein](https://search.begellhouse.com/index.php?word_search=total+protein&facet_search=&facet=all&site=dl), [model ecosystem.](https://search.begellhouse.com/index.php?word_search=model+ecosystem.&facet_search=&facet=all&site=dl)