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PECULIARITIES OF THE *UNIO TUMIDUS* (PHILIPSSON 1788) ADAPTIVE REACTIONS TO THE TEMPERATURE REGIME OF THE ENVIRONMENT CHANGES

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Aquatic organisms adapt to the effects of climate change, in particular, an increase in the temperature of the aquatic environment, by connecting the metabolic processes of the body. Bivalve molluscs were selected to study the adaptive reactions of the organism to the temperature factor of the aquatic environment.

It is known that bivalves have a high ability to withstand adverse conditions. They can switch to anaerobic respiration in adverse conditions and block communication with the environment [6, pp. 121–130; 7, pp. 615–617; 8].

This work is devoted to the study of the adaptive responses of bivalve mollusks *Unio tumidus* (Philipsson 1788) to changes in the temperature regime of water by studying the activity of lactatedehydrogenase (LDH), which plays a decisive role in supporting the production of ATP as a final enzyme in anaerobic glycolysis.

The objects of research were bivalves *U. tumidus* collected in the Kyiv reservoir coastal shallow waters zone (Lutezh) natural conditions.

Sampling and further determination of the bivalve mollusks species were carried out according to the generally accepted methods [1; 11, p. 208].

The temperature regime in the experiment is close to the summer natural conditions of the coastal shallow water zone of the Kiev reservoir, when the water areas are intensively warming up. In the control, the temperature was 23 ± 0,5°C, and in the experiment, the temperature regime was characterized by the following stages: 1) an increase in temperature by 1°C/day; 2) an increase in temperature to a value of 29 ± 0,5°C (6th day of observation); 3) decrease in temperature to the initial value 23 ± 0,5°C (12th day of observation); 4) temperature stabilization at the initial value of 23 ± 0,5°C (14th day of observation).

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The mollusks' gill tissue (where an intensive respiratory process takes place in the animal organism), was used for the investigation of bivalves metabolic reactions in response to the environmental conditions changes.

The activity lactatedehydrogenase, were determined in the mollusks *U. tumidus* gill tissue using generally accepted approaches described in the scientific literature [10].

Water temperature increasing in the experimental aquarium from 23 ± 0,5°C to 29 ± 0,5°C led on the 6th day of observations in the gill tissue of specimens of the mollusks *U. tumidus* to an 18% increase in LDH activity.

The lactatedehydrogenase activity increasing in the mentioned above conditions may reflect adaptive reaction development in the mollusks organisms, obviously. In this context it is necessary to note that the most poikilothermic animals are adapted namely to a certain range of habitat, and the deviation of environmental conditions parameters from optimal values, especially significant deviations, lead to manifestation of stress responses and respective protective mechanisms activation in the animal organism also [4, pp. 33–62; 5, pp. 115–122; 9, pp. 15–22].

At the same time, for many aquatic animals behavioral reactions that allow them to avoid adverse living conditions (critically increased water temperature) by moving to areas with favorable ones are typical of. If aquatic animals are unable to avoid unfavorable environmental conditions, then, first of all, the development of adaptive reactions occurs in response to a critical increase in water temperature [13; 14, pp. 68–72].

The LDH activity increases in aquatic organisms. Note that such stimulation of enzyme activity is an indicator of the transition of the body's metabolism from aerobic to anaerobic mode as a compensatory mechanism for obtaining energy resources in adverse environmental conditions [2, pp. 103–187; 3, pp. 133–168; 12, pp. 161–165].

At the stage of water temperature decreasing from 29 ± 0,5°C to the initial value 23 ± 0,5°C (12th day of observation) and further stabilization at this value, yet on the 14th day of observation the lactatedehydrogenase activity content in the gill tissue of mollusks were similar to the respective control levels.

In general, specimens of bivalve mollusks *U. tumidus* demonstrated the ability to adapt to an increase in the temperature of the aquatic environment to a high value (29 ± 0,5°C) by regulating the rational use of internal energy resources; switching metabolic processes to the anaerobic pathway can be considered a contributing factor. This preserves the organism's ability to respond to temperature changes in the environment.

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