

carried out every autumn according to Lavrov (1959). The figures in our text refer to the reserve territory only (without surrounding buffer zone).

Over the past 10 years (2008–2017) in the reserve an average of 43 beavers per year lived in 12 settlements. Two peaks were noted: in 2009 there were 54 individuals in 12 settlements and in 2014–49 individuals in 13 settlements. There was 1 minimum (2013, 34 beavers, 11 settlements). Droughts of 2010 and 2015 practically did not affect the course of numbers. Small amplitude of number fluctuations, a smooth decline in population, a sharp rise and a 6-year cyclical period are close to the predictions of the mathematical model (Petrosyan et al., 2016).

After a minimum of 2013 there was a change in the beaver distribution in the reserve. In 2009–2012 there was an average of 38 beavers a year in the basin of the Tadenka, in 2014–2015–26. In Ponikovka, on the contrary, growth was registered: 4 and 11 beavers, respectively. As a result, the percent of number of Tadenka Basin beavers from their total number in the reserve decreased from 82 % to 62 %. The growth of the role of the Ponikovka beaver population is connected by events only in this river (changes in the water regime and the restructuring of the population structure).

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ADAPTATION OF SEMIAQUATIC RODENTS (RODENTIA) TO CONDITIONS OF HYPOXIA/REOXYGENATION

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Adapted to oxygen deficiency, semiaquatic mammals can serve as a convenient model for studying the processes of hypoxia and reoxygenation. Both oxygen deficiency and its increased intake directly after diving can lead to enhanced generation of reactive oxygen species

(ROS) and therefore to imbalance between the formation of oxygen radicals and antioxidant protection. The antioxidant system is involved in maintaining ROS at the stationary level, and lactate dehydrogenase (LDH) and its isoenzymes play a role in the adaptive changes in the energy of the organism.

The aim of this study was to analyze the antioxidant status and the distribution of LDH isoenzymes and its total activity in tissues of rodents. The objects of the research were semiaquatic European beaver (*Castor fiber*), muskrat (*Ondatra zibethicus*) and water vole (*Arvicola amphibius*). Samples of Wistar rat (*Rattus norvegicus*) tissues were used for comparison.

As a result of the study, it was revealed that the closely related species of rodents formed species-specific features of adaptation to hypoxia/reoxygenation in the course of evolution. Like marine mammals, semiaquatic rodents, in comparison with terrestrial species, are characterized by the increased activity of antioxidant enzymes mediated indirectly in redox signaling processes. Our results demonstrate that the enhanced utilization of circulating lactate loads as the adaptation for recovery from a diving period is achieved through either involving most of the examined tissues (heart, kidney, lung and spleen) in this process as in the case of beaver, or increasing LDH activity in tissues (heart, liver and skeletal muscle) as in the case of muskrat.

Thus, the observed differences between the studied parameters in semiaquatic and terrestrial rodent species should probably be considered as a reflection of the evolutionarily developed needs of the organism, which ensure a high efficiency of the functioning of metabolic systems.

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