



share was about 87-88%. According to the surveys of 2004-05, it could be found in all districts and its contribution to the total abundance of 21 100 animals of the two species reached 95%.

In Vologda Region, the American mink appeared in 1983-84 along the border with Karelia and Leningrad Region. Within 10 years, it populated most of the forest rivers in the region's north-western districts. By the beginning of the 21<sup>st</sup> century, the American mink has expanded even further eastwards, thus occupying the whole western part of the study area. In the year 2000 the immigrants contributed 44% to the total of 7 500 minks inhabiting the region. Within the next 5 years the total abundance increased to reach 8 600 individuals, and the share of the American mink in it grew to 48%.

Thus, the expansion of the American mink in the territories in question continues, thus causing major concerns about the future of the native species – the European mink, which has become rare throughout its range.



## ROLE OF ISOENZYMES OF LACTATE DEHYDROGENASE IN TISSUES IN ADAPTATION OF GAME ANIMALS

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It is known that the level of energy metabolism depends on ecological characteristics of species (Sokolov, 2003). Isoenzymes of lactate dehydrogenase (LDH) are connected to bioenergy processes and play an important role in adaptive responses of the organism (Kozhevnikova et al., 2004).

Our researches have revealed significant interspecies differences between isoenzymatic spectra of LDH of mountain hare and beavers.



The isoenzymatic spectrum in the liver of hare was dominated by hybrid fractions vs. the cathode fractions which prevail in *Rodentia*. We found that the mountain hare with its terrestrial life habit has a much lower quotient of anaerobiosis in the liver (tissue with anaerobic type of energy production) than wild semi-aquatic beavers.

The information obtained as the result of research into LDH isoenzymatic spectra in mammalian organs broadens the understanding of biochemical characteristics of the animals living in various environments.



## IS MINK A SENTINEL SPECIES?

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In the Laboratory of Ecological Animal Physiology we use biochemical tests which provide important information on the degree of deflections from the reference index to assess the health of fur-bearing animals including minks. Monitoring of the physiological condition of animals and humans is an issue where there is influence of environmental factors, including anthropogenic impact.

The concept of "sentinel species" has been proposed for the study of the relationship between the state of the environment and human health (O'Brien et al., 1993; Basu et al., 2007; Schmidt, 2009). The term "sentinel" is derived from the French word 'sentinelle', which means watch tower. Species which could in one way or another warn us of coming dangers to human health are selected from the whole variety of the fauna (O'Brien et al., 1993). A typical example of animals serving as sentinel objects is the case when cats got poisoned with fish with high content of mercury caught by Japanese fishermen in the Minamata Bay, which was heavily polluted with methyl mercury. Unusual