HIBERNATION IN THE UNDERGROUND

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Abstract: Choosing a hibernation strategy appropriate to environmental conditions enables bats to survive in adverse conditions. Through heterothermy, bats are able to economize energy from reserves accumulated during periods of activity. Heterothermy allows bats to survive the long seasonal period of decreasing outdoor temperatures and lack of food in hibernation. During this period, with body temperature values close to ambient temperature, metabolism in bats is reduced to minimum values.

The influence of underground infrastructure on hibernation and the process of entering hibernation was investigated. The effects of air temperature (T), relative air humidity (Hr) and airflow speed (v) were studied, as well as thermal conductivity (α) - heat transfer coefficient [W/m^2*K]. For the first time, attention was paid to infrastructure elements (rods, metal rails, rubber elements). They are used as elements that allow heat exchange with the environment for faster or slower heat transfer.

Observations show that a bat can increase or decrease the amount of heat it gives off using underground infrastructure by changing the surface area of its body in contact with surrounding objects. Heat emission from the bat's body to the environment is by convection, conduction, radiation and evaporation, to varying degrees..

Keywords: Chiroptera; hibernation; thermoregulation; microclimate selection