

PHYSIOLOGICAL RESPONSES OF FOSSORIAL PINE VOLES
(*MICROTUS DUODECIMCOSTATUS* AND *MICROTUS LUSITANICUS*)
TO LIFE UNDERGROUND

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Here we describe an ongoing study focusing on diverse aspects of the commitment of the fossorial pine voles occurring in Portugal (the Mediterranean pine vole – *Microtus duodecimcostatus* – and the Lusitanian pine vole – *Microtus lusitanicus*) to a subterranean way of life.

In spite of the investigation carried out in several subterranean taxa, the adaptative solutions employed by both pine vole species in response to physiological stresses imposed by the subterranean ecotope remains to be understood. In this study we have assumed that i) *M. duodecimcostatus* lives more strictly dependent underground life than *M. lusitanicus*; ii) due to the moderately high soil thermal conductivity, subterranean mammals avoids high ambient temperatures by moving deeper into the soil; iii) the cost of burrowing varies with soil type and burrow length, and will investigate the influence of type of soil, ambient temperature and humidity in burrowing activity of voles and in the patters of thermoregulation and blood oxygen transport in both species.

Expected results will allow us to understand the physiological adaptative solutions of both species to the challenges imposed by underground habitats, namely the influence of physical characteristics of inhabited soils (regulating gas diffusion) in the burrowing behaviour of voles across the year, as well as the respiratory properties of blood enabling both species to remain underground for long periods.