Living in a changing world: Physiological and behavioural flexibility of juvenile Garden Dormice

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Abstract

Heterothermy, or torpor, allows individuals to save energy by active reduction of metabolism and decreased body temperature. Social thermoregulation or huddling allows individuals to minimize energy needs while maintaining a relatively high body temperature. The Garden Dormouse (*Eliomys quercinus*), a highly endangered European rodent, uses both strategies of torpor and huddling, which are particularly beneficial for young individuals to cope with environmental fluctuations. Since juveniles are an important component of population renewal, determining the flexibility of energy-saving strategies and its consequences on somatic integrity of young individuals is key to protecting this species. We measured individual torpor patterns, body mass gain and structural growth, and assessed telomere dynamics in male and female juvenile Garden Dormice according to housing condition (singly or groups of four individuals) and food availability (fed *ad-libitum* or energy-limited) before and during hibernation. During development, juveniles used more frequent, longer and deeper torpor when housed singly than in groups. Torpor was encouraged by lower food availability. Juveniles showed similar body mass gain and growth, irrespective of experimental conditions. During hibernation, huddling dormice showed similar hibernating patterns and mass loss compared to single individuals regardless of food availability. Telomere lengthened across all individuals before hibernation, with larger elongation in males, which also experienced greater telomere loss than females during hibernation. We conclude that the use of torpor and huddling allows juvenile Garden Dormice to cope successfully with energetic bottlenecks, without major effects on somatic integrity. Future studies will need to confirm such findings under natural environmental conditions.

Keywords

global change, phenotypic flexibility, energy-saving, hibernator, survival

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