Form and Function

Torpor in dwarf hamsters, *Phodopus campbelli* and *Phodopus roborovskii*: a comparative study

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Torpor is characterized by a reduction of core body temperature (CBT) and metabolic rate, and in comparison with hibernation lasts less than one day. Comparative analysis of this phenomenon in closely related species may provide useful information to clarify its regulatory mechanisms and evolution. Species of the *Phodopus* genus provide an excellent opportunity for comparative analysis. Two of three *Phodopus* species we used in this study - desert hamsters (*Phodopus roborovskii*) (DH) and Campbell's hamsters (*Phodopus campbelli*) (CH) originated from different parts of the range. Adult males provided with temperature transponders implanted intraperitoneally to record CBT from September to May were kept in an outdoor enclosure under natural light and temperature. Substantial within- an intraspecific difference in torpor expression were observed. Some hamsters never demonstrated torpor as others had multiple regular torpor bouts. In CH the torpor incidents were timed to the beginning of the photophase, as DH demonstrated multiple bouts of torpor during the whole day. The lowest CBT in CH was 11.5 °C as in DH it did not drop below 23 °C. At that, in DH CBT at the majority (about 90%) of torpor incidents was in the range of 30-32 °C. The results indicate that there are remarkable differences in response to low ambient temperatures between CH and DH. DH demonstrated a shallow torpor with CBT that is much higher not only than that in CH, but also in other daily heterotherms. We may assume that such differences in response to winter conditions reflect species-specific physiological adaptations to the different environment. Supported in part by RFBR-GFEN: #17-54-53206.

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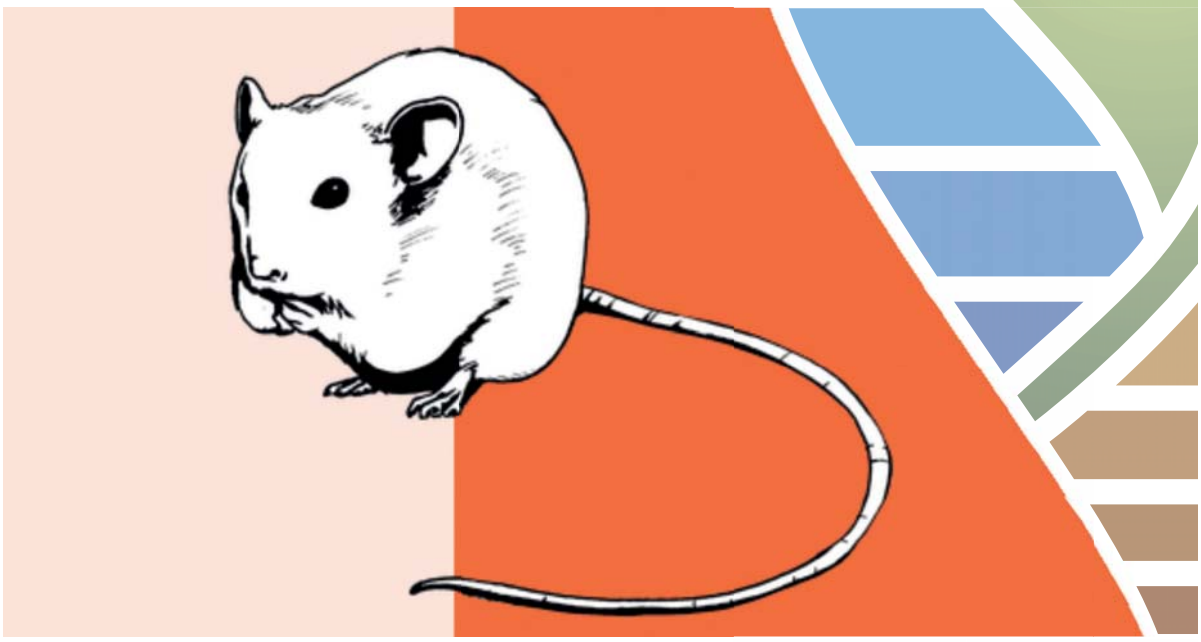

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