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SÉMINAIRE

Costs of compensatory and accelerated growth in a hibernating mammal

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Yellow-bellied marmots (*Marmota flaviventris*) live in highly seasonal environments and have limited time for development and fat accumulation. An increase in body mass is a strong determinant of overwinter survival, thus immature marmots (juveniles and yearlings) starting the active season with low body mass may exhibit compensatory growth. Additionally, adults may exhibit accelerated fat accumulation to compensate for mass loss during hibernation. We investigated the potential costs of accelerated growth in a wild population of yellow-bellied marmots, using individual survival and longevity as proxies for fitness. Mass measurements from 2002-2015 were used to calculate individual seasonal growth rates. We estimated annual survival from 130 adults, 239 yearlings and 643 juveniles and longevity from 76 females. Individuals were distributed in two areas that differ in elevation, down- and up-valley, where the latter is an overall harsher environment. As results, juvenile survival increased with growth rate, with location and initial body mass changing the shape of this association. For yearlings, both location and initial body mass influenced the relationship between growth rate and survival. Yearlings exhibiting compensatory growth had had lower survival up-valley, and higher survival down-valley. No significant effect was found for longevity or adult annual survival. Thus, yearlings appear to represent the development stage in which the costs of rapid growth are the highest, and compensatory growth may be beneficial depending on the environmental conditions. Juveniles benefit from accelerated growth, which suggests that the conflicting demands of structural growth and fat accumulation vs. body maintenance may be less drastic at this developmental stage. Overall, the benefits and costs of rapid growth are age- and site- dependent and the costs of compensatory growth be seen in the short-term in this species, instead of paid later in life.