

Ecological aspects of thermoregulation at high altitudes: the case of andean *Liolaemus* lizards in northern Chile

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Abstract

We document activity field temperatures, daily activity patterns, and extent of thermoregulation in four species of *Liolaemus* lizards inhabiting at high altitude (above 3500 m) in the Andes of northern Chile. These four species have similar activity field temperature (T_b near 29°C) despite their being distributed at different altitudinal belts. However, conspicuous differences exist between higher-altitude (*L. alticolor* and *L. jamesi*) and lower-altitude (*L. islugensis* and *L. ornatus*) lizards regarding extent of thermoregulation and activity period. Some differences in morphology, behavior, and patterns of microhabitat occupancy are also apparent among these four species and are seemingly related to the thermal environment to which they are subjected. In comparison to eight low-altitude *Liolaemus* species in central Chile (T_b near 35°C) the four high-altitude species in northern Chile have lower activity field temperature. The latter is apparently due to the constraints imposed by the harsh Andean thermal environment, a hypothesis supported by the fact that high-altitude *Liolaemus* lizards under laboratory conditions demonstrate body temperatures that exceed by 5°C or more, those recorded in the field.

Keywords Andes, *Liolaemus*, Thermal environment, Activity temperature, Thermoregulation