

## Thermal ecology of the Pyrenean *Lacerta vivipara*: Testing null hypotheses in a GIS environment

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Lacertid lizards in temperate regions are usually reported to be active thermoregulators using solar radiation as their main heat source. Several studies based on operative temperature procedures have demonstrated active thermoregulation in lacertids. However, lizards stopped in the open are assumed to be basking whereas those not visible are considered inactive and this may not be always the case. Because of its inconspicuous activity attached to the vegetation, the common lizard, *Lacerta (Zootoca) vivipara* could be a good model for testing cryptic activity. Here we analyse the thermal ecology of a high mountain population of oviparous common lizards sited at 1800 m in the Pyrenees. Two general null hypotheses were tested: random activity and activity only determined by thermoregulation. Normalised continuous transects in search of lizards were carried out in a plot of 1 ha. (100 x 100 m) throughout the whole period of diel and annual activity. The whole study plot was mapped in a GIS considering the different microhabitats and the associated operative temperatures estimated using copper models and data-loggers. Each lizard observation was georeferenced in the plot and assigned to a class (adult males, adults females, pregnant and non-pregnant, immatures) and microhabitat. Preferred temperatures ( $T_p$ ) for each lizard class were already known. The times and areas of activity were modelled by interpolation and compared with the thermal availability. Activity patterns differed from random both temporally and spatially indicating thermoregulatory capabilities. However, common lizards spent a considerable time in thermally suboptimal conditions, even considering the environmental constraints of high altitudes. This was especially true for adult males in spring. During the hottest hours (summer, midday) operative temperatures inside the bushes (*Calluna vulgaris*) were closer to  $T_p$  than those in the open which suggest cryptic activity. These results are discussed in the light of the ecology of the common lizard and directions for the analysis of similar patterns in other lacertids are suggested.

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