The Influence of Light Intensity and Temperature on Microhabitat Selection in Two Anolis Lizards

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Abstract

1. Although basking behaviour has been widely cited as a thermoregulatory mechanism in reptiles, few previous researchers have studied how lizards select basking sites in nature. 2. We conducted field and laboratory studies to determine whether two species of Anolis lizards in Puerto Rico use light intensity as a proximal cue for recognizing the thermal properties of microhabitat patches. 3. Under natural conditions Anolis cristatellus, a behavioural thermoregulator that we sampled in an open woodland, frequently occupied microsites that were more brightly illuminated than randomly sampled microsites. In contrast, A. gundlachi, a behavioural thermoconformer that we sampled in a shaded forest, occupied perch sites randomly with respect to light intensity. Operative temperatures were significantly correlated with light intensity at all times of day in the A. cristatellus habitat; in the A. gundlachi habitat, however, operative temperatures and light mtensity were significantly correlated only at the higher and more variable light intensities prevalent at midday. 4. We therefore hypothesized that A. cristatellus, using light intensity as a proximal cue, would perch in brightly lighted microsites to raise its body temperature and more shaded microsites to lower its body temperature; we also hypothesized that A. gundlachi would not use light intensity as a cue for selecting thermally appropriate microsites. 5. We tested these hypotheses in a laboratory experiment in which light intensity and operative temperature were uncoupled. Lizards were offered a gradient of light intensities under three constant temperature conditions: 10°C below acclimation temperature, the acclimation temperature (set equal to the mean field-active body temperature) and 4°C above the acclimation temperature. 6. Microhabitat selection in the light gradient confirmed our hypotheses: light intensity at microsites selected by A. cristatellus varied inversely with experimental temperature but light intensity at microsites selected by A. gundlachi did not vary with experimental temperature.