

On the relationship between baseline corticosterone levels and annual survival of the thorn-tailed rayadito

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Abstract

Baseline concentrations of glucocorticoids (i.e., cortisol and/or corticosterone) can moderately increase with the degree of energy demands that an individual faces. This could be a mechanism based on which glucocorticoids (GCs) can mediate life history trade-offs, and therefore fitness. The 'cort-fitness hypothesis' predicts a negative relationship between GCs and fitness, meanwhile the 'cort-adaptation hypothesis' predicts the opposite pattern. Field studies on the relation between baseline GCs and survival rate have shown mixed results, supporting both positive and negative effect. These ambiguous results could be partially consequence of the short time frame in that most of the studies are carried on. In this study, we tested the predictions of the 'cort-fitness hypothesis' and 'cort-adaptation hypothesis' by using long-term data (eight-year of capture-mark-recapture) of Thorn-tailed Rayadito (*Aphrastura spinicauda*) in two populations at different latitudes. We assessed whether survival varied as a function of Cort levels and whether it varied in a linear (positive: 'cort-adaptation hypothesis' or negative: 'cort-fitness hypothesis') or curvilinear way. The two populations in our study had different baseline Cort levels, then we evaluated whether the association between baseline Cort and survival probability varied between them. In the high latitude population (i.e., lower baseline Cort levels), we observed a marginally quadratic relationship that is consistent with the cort-fitness hypothesis. In contrast, in the low altitude population we did not find this relation. Our findings suggests that the association between baseline Cort and survival probability is context-dependent, and highlights the importance of comparing different populations and the use of long-term data.

Author keywords

Capture-mark-recapture
Fitness
Long term data
Small passerine bird