

Differences in circulating corticosterone levels associated with elevation of breeding sites in Rufous-collared Sparrows *Zonotrichia capensis*

Poblete, Y.
Gutierrez, V.
González-Gómez, P.L.
Wingfield, J.C.
Vásquez, R.A.

Abstract

To facilitate breeding and any energetically costly activity, individuals of the same species can substantially vary their circulating corticosterone (CORT) levels to cope with local environmental conditions at different elevations. We compared baseline and the stress-induced plasma CORT levels during the parental care stage between free-living Rufous-collared Sparrows (*Zonotrichia capensis*) that breed at high (~ 2500 m) and low (~ 500 m) elevations in central Chile. We found that baseline CORT levels at different elevations were similar and that stress-induced levels were significantly lower in birds breeding at high elevation; however, we detected no sexual dimorphism in CORT levels related to elevation. We found that larger individuals had higher stress-induced CORT levels at low elevation regardless of sex. Our results show that environmental conditions at high elevation seem to be not severe enough to promote more elevated baseline CORT levels. However, breeding Rufous-collared Sparrow must still deal with both shorter breeding seasons and increased exposure to unpredictable events. Thus, a reduced stress response during the parental care stage would be more favorable for supporting breeding activities at high elevations. Future studies should focus on describing the life-history traits of these populations and the effects that other stressors, such as predation pressure and food availability, may have on the adrenocortical response in these environments to evaluate the consequences for survival and reproductive success. This information is important for enhancing our understanding of the ecological and evolutionary mechanisms that modulate variation in the adrenocortical response among populations of the same species.

Author keywords

Adrenocortical stress response
Altitudinal differences
Southern Andes
Zonotrichia capensis