



**Corlatti L., Palme R., Lovari S. (2014)**

**Physiological response to etho-ecological stressors in male Alpine chamois: timescale matters!  
Naturwissenschaften, 101: 577-586.**

#### Abstract

From a life history perspective, glucocorticoids secreted by the neuroendocrine system, integrating different sources of stress through an adaptive feedback mechanism, may have important consequences on individual fitness. Although stress responses have been the object of several investigations, few studies have explored the role of proximate mechanisms responsible for the potential trade-offs between physiological stress and life history traits integrating social and environmental stressors. In 2011 and 2012, we collected data on faecal cortisol metabolites (FCM) in a marked male population of Alpine chamois, within the Gran Paradiso National Park (Italy). Using a model selection approach we analysed the effect of potential etho-ecological stressors such as age, social status (territorial vs. non-territorial males), minimum temperature, snow depth and precipitation on FCM variation. To correctly interpret environmentally and socially induced stress responses, we conducted model selections over multiple temporal scales defined a priori: year, cold months, spring, warm months, mating season. Over the year, FCM levels showed a negative relationship with minimum temperature, but altogether, climatic stressors had negligible effects on glucocorticoid secretion, possibly owing to good adaptations of chamois to severe weather conditions. Age was negatively related to FCM during the rut, possibly due to greater experience of older males in agonistic contests. Social status was an important determinant of FCM excretion: while both the 'stress of subordination' and the 'stress of domination' hypotheses received some support in spring and during the mating season, respectively, previous data suggest that only the latter may have detrimental fitness consequences on male chamois.