

ENSO-associated response of field urine osmolality in the insectivorous marsupial *Thylamys elegans*

C. Tirado, A. Cortés, F.M. Jaksic, F. Bozinovic

Abstract

From 1991 to 1994, we assessed physiological responses in field urine osmolality (Uosm) of an insectivorous marsupial (*Thylamys elegans*) of semiarid Chile faced with a complete cycle of El Niño Southern Oscillation (ENSO). El Niño phase of ENSO determined the initial 2 wet years at the study site, while La Niña phase determined the 2 subsequent dry years. The marsupial showed marked temporal fluctuations in field Uosm values, with both seasonal and between-year patterns of physiological variability. Indeed, Uosm values during wet years were: 2.7197405 mOsm/kg in summer versus 2.2467209 mOsm/kg in winter. During dry years in summer, Uosm values were: 3.3407384 mOsm/kg versus 2.4817293 mOsm/kg during winter. There were significant effects of dry versus wet years and between dry and wet seasons on Uosm values, as well as a statistical interaction year season. We discuss how the integration of flexible physiological mechanisms enable an insectivorous marsupial to cope with seasonal and yearly water variability in a semidesert, and also the importance of using ENSO climate effects as a proxy for the study of future climate change in natural communities and its subsequent impact on field physiological performance of desert mammals.

Keywords: Climate change, El Niño, Field physiology, La Niña