

The Effect of Environmental Conditions on Evaporative Water Loss Rates of Native Dtellas

Some species can adjust their bodily processes to adapt to different environmental conditions. The amount of water lost passively through the skin through evaporation ('evaporative water loss') is one such factor which can be changed. Evaporative water loss was measured in native geckos to investigate differences in rates of water loss between species and across varying habitats. Results showed that the investigated species can adjust the amount of water lost passively through their skin to adjust to environmental changes, showing a strong seasonal response. When environmental conditions change from Wet to Dry season, geckos can reduce the amount of water lost through the skin by up to 75%. This ability to adjust biology to adapt to different conditions allows species to persist in a variety of environments, which increases their likelihood of survival in a changing climate. This information advances the knowledge of newly described and unresearched reptile species.

Abstract

Physiological plasticity reflects a species' ability to persist despite environmental fluctuations- a factor which can determine the likelihood of survival. This is especially important to consider in a changing climate. Native dtellas (reptiles of the *Gehyra* genus) are widespread across Australia and inhabit a variety of environments and range sizes. Physiological traits are compared between species and these qualities are investigated in relation to the environment to provide insight into how species might be restricted in their distribution or respond to climatic changes.

18 species of dtella were sampled from sites across Western Australia and the Northern Territory under varying seasonal conditions. An open-flow system was used to measure rates of evaporative water loss (EWL) of the dtellas immediately after collection. Results were then compared across species, season, aridity, and distribution patterns to test for any association between EWL rates and these factors.

EWL rates of dtellas sampled from locations of varying aridity showed no significant difference despite contrasting climates. Seasonal conditions strongly influence the rate of EWL, with all species experiencing a 25-75% reduction in EWL rates in the Dry season. Results indicate that dtellas' can readily physiologically adapt to local environmental changes, negating the need to specialise for broader climatic conditions.

These findings provide new knowledge about recently described *Gehyra* species and advance current understandings of reptile ecophysiology. Results can benefit approaches to environmental management and species conservation by offering insight to the relation between the physiology of dtellas', their environment, and anticipated climatic changes.