

ENERGETICS AND STRESS: CLIMATIC VARIATION AND GLUCOCORTICOID LEVELS IN FOREST-LIVING WEST AFRICAN BABOONS

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The physiological stress response, involving the mobilisation of energy and its delivery to essential body areas in response to stressors, is adaptive in a range of circumstances, including the demands of seasonal environmental variation. Previous studies of baboons and gelada in different geographical areas and habitats have shown seasonal increases in faecal glucocorticoid levels associated with seasonal temperature extremes, both low and high, and with a marked dry season. Here we present the results of analysis of faecal glucocorticoid levels taken from 5 studies over 6 years for adult males and females in two groups of West African baboons from Gashaka Gumti National Park, Nigeria. These forest-living animals inhabit one of wettest baboon habitats with a mean of nearly 2000mm rainfall per annum, mostly falling in the wet season (April-October). Although rainfall is very low from November to March, water is probably not a limiting resource at any time. Daily minimum temperatures are lower in the dry season; maximum temperatures are highest in February to April, but vary relatively little. Humidity levels are generally high, and higher in the rainy season. Results from mixed models, controlling for individual identity, group and reproductive state, demonstrate that, in this environment, variation in glucocorticoid levels is positively associated with mean monthly rainfall, with some additional effect of minimum temperature. Other climatic variables have no independent association. We discuss the results, together with those of previous studies, in terms of the adaptability of baboons to diverse habitats, environmental stressors and energetic demands.

Keywords: baboon, glucocorticoid, stress, seasonality