

FEEDING ON PHYTOESTROGENS: IMPLICATIONS FOR UGANDAN RED COLOBUS MONKEY (*PROCOLOBUS RUFOMITRATUS TEPHROSCELES*) PHYSIOLOGICAL ECOLOGY

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Phytoestrogens are present in domesticated foods of many human societies and have been shown to influence reproductive and stress physiology in captive animals. However, little information exists on the prevalence of such compounds in wild tropical plant species and their effects on the ecology of free-ranging, non-human primates. To address this, I investigated the relationship between ingestion of phytoestrogens and steroid hormone levels in Ugandan red colobus monkeys (*Procolobus rufomitratu tephrosceles*). From August 2007 to June 2008, 1327 hours of behavioral observation and 1210 fecal samples were collected from one group of red colobus in Kibale National Park, Uganda. I screened food and non-food plant species for compounds with estrogenic structure via radioimmunoassay and quantified steroid hormone content of fecal samples using immunoassays. Of 15 plant species/part combinations examined, 11 showed appreciable binding to the estrogen antibody, with leguminous species having the highest amount of phytoestrogens. Therefore, I used proportion of time spent eating legumes compared to total time spent feeding as an index of phytoestrogen consumption. Legumes were consumed most during November 2007 (40.7% of diet) and least during January 2008 (15.9%). In adult males, fecal estradiol and cortisol levels were significantly higher during November compared to January (estradiol: $t = -3.0953$, $P = 0.0017$; cortisol: $t = -2.5047$, $P = 0.0072$). However, a significant relationship with percent of diet from legumes was found only for fecal cortisol when all months of the study were analyzed (cortisol: $F = 16.43$, $P = 0.0001$, $R^2 = 0.0394$). These results show that phytoestrogens do occur in red colobus foods and suggest they influence steroid hormone levels, with possible impacts on reproductive and stress physiology, health, and potential fitness.

Keywords: environmental endocrinology, plant chemistry, steroid hormones, Kibale