

FORAGING AND SCANNING BEHAVIORS IN MALE AND FEMALE MANTLED HOWLER MONKEYS (*ALOUATTA PALLIATA*)

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Abstract: Grouping in social animals has costs and benefits, which typically differ by gender. We predicted that female howler monkeys (*A. palliata*) would forage more than males due to increased nutritional requirements associated with reproduction, while males would scan more than females to maintain dominance and access to mates, and to protect themselves and their kin from predators. In the early morning (0600-0900) when total troop activity was greatest, females foraged more than males and males scanned more than females, supporting our hypotheses.

Key words: primate behavior, time allocation, social groups, Palo Verde, Costa Rica

INTRODUCTION

Costs and benefits associated with group aggregation in social animals are often gender-specific. Generally, males benefit by controlling access to females, but exert energy to protect the group. Females gain protection from males, but bear the primary burden of caring for offspring.

We focused on the differential behavior of male and female mantled howler monkeys (*A. palliata*) in Palo Verde National Park, Costa Rica. Howler troops consist of 3-44 individuals of mixed age and sex (Eisenburg 1989) who spend their day foraging, resting, calling, traveling from tree to tree, and scanning for potential threats (Fierce et al. 2004). We predicted that males would scan more since their

reproductive success is linked to the protection of offspring and potential mates (Robinson 1981), while females would forage more due to greater nutritional requirements associated with reproduction, including the care and provisioning of offspring (Milton, 1980).

METHODS

Starting at sunrise on 16 and 17 January 2008, we sampled the *A. palliata* group most accessible from the OTS field station in Palo Verde National Park, Costa Rica. We determined troop composition, counting all adult males, females, and juveniles. From 0600 until 1100 we conducted two-minute observations of all visible individuals at 10 min intervals, recording time spent foraging,

traveling, grooming, resting, or scanning. An individual was considered to be resting if it was still and oriented in one direction, and scanning if it was moving its head and looking around at its surroundings.

For both foraging time and time spent scanning, we averaged data for each troop by sex, treating troops as independent samples ($n=2$). We analyzed behavioral counts for the morning (0600-0900) and for the entire observational period (0600-1100) separately based on our observation that resting strongly dominates behavior after 0900.

RESULTS

Males and females did not differ in foraging behavior across the entire sampling period ($t = 1.13$, $df = 1$, $P = 0.27$), but females spent significantly more time foraging than males from 0600-0900 ($t = 3.99$, $df = 1$, $P = 0.042$; Fig. 1). Males and females did not differ in scanning behavior across the entire sampling period ($t = 3.11$, $df = 1$, $p = 0.097$). From 0600-0900, males spent more time scanning than females, though statistical significance was marginal ($t = 5.52$, $df = 1$, $P = 0.057$; Fig. 1).

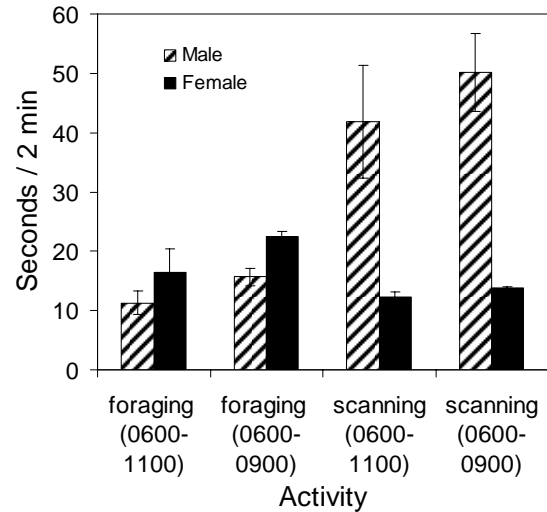


Figure 1. Mean time spent foraging and scanning (± 1 SE) for male and female howler monkeys in Palo Verde National Park, Costa Rica.

DISCUSSION

Female howler monkeys foraged more than males in the early morning, supporting our predictions. Our test of this hypothesis was conservative, as males may need to forage more than females given their typically larger size (adult males weigh 6-7 kg; females weigh 4-5 kg; Janzen 1983).

We believe that the lack of solid statistical support for our hypothesis is mainly due to small sample size and our inability to use repeated measures, which would have been possible if individuals were tracked throughout the sampling period. However, we consider our results to be biologically significant since each sample represented 20 hours of observations.

Our results do not explain why males were not more vigilant than females during the whole sampling period (0600-1100). We suggest that during the late morning, activity levels may be lower among potential predators and encroaching howler monkey troops, decreasing the need for males to scan during this time.

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