

We found a significant difference between control and manipulated groups in the proportion of *A. fatima* with debris in their eyes ($X^2 = 19.8$; $p < 0.001$). All butterflies whose palpi were removed had debris in their eyes. However, we found debris in the eyes of only 36% of the control butterflies with palpi still intact (Figure 1).

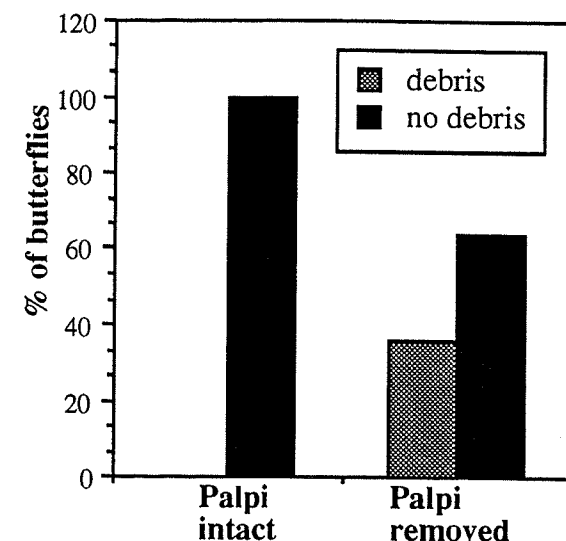


Figure 1. Percentage of butterflies with and without eye debris for both control (palpi intact) and manipulated (palpi removed) groups.

Our results support the hypothesis that palpi affect the surface condition of the eye in *A. fatima*. As predicted, when palpi were removed more debris occurred on the eye. Increased debris load in the eye may potentially impair vision. Thus, if palpi serve the function of grooming and cleaning, they may be pivotal in the overall fitness of an individual, in which case natural selection would favor developed and efficient palpi.

The question remains whether palpi play the same role in other Lepidoptera foraging niches (i.e., frugivores and/or dung feeders) which encounter potentially different types of debris (e.g. mites). Perhaps further examination of palpi structure in additional foraging guilds would reveal possible divergence of function among these guilds.

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TROOP ACTIVITY AND AGGRESSIVE DISPLAYS IN THE SPIDER MONKEY
ATELES GEOFFROYI

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ABSTRACT (DJG)

The spider monkey, *Ateles geoffroyi*, maintains home ranges that they may aggressively defend. We hypothesized that groups would be more likely to display aggressively if they were already established at a site, i.e. when foraging and/or resting, as opposed to travelling. We encountered 13 troops of *A. geoffroyi* in Corcovado National Park and noted troop activity, presence or absence of aggressive displays, type of displays, and presence or absence of mother/infant pairs. Aggression was displayed in 83% of the encounters when groups were foraging/resting versus 29% when they were travelling. There was no significant difference in aggressive displays with or without mother-infant pairs present and similar types of displays were seen regardless of troop activity. There was no difference in aggressive behavior between groups with and without mother/infant pairs.

Key Words: *Ateles geoffroyi*, spider monkey, mother-infant pairs, aggressive behavior

INTRODUCTION (AEL)

Troops of spider monkeys (*Ateles geoffroyi*) ranging from 15-20 individuals divide into smaller groups to forage on fruits and young leaves and then reconvene at sleeping sites. The size of the subgroups changes frequently, but generally varies from one to five, and may consist of all males or a mixed group containing one or more mother/infant pairs (Eisenberg, 1989). It has been suggested that all members share a home range which boundaries they may defend (Chapman, 1989).

Groups at Corcovado National Park often display aggressive behavior (e.g. scratching, branch-shaking, urination/defecation, and vocalizations) toward people encountering them on hiking trails. We hypothesized that aggressive displays would vary depending on troop activity. We predicted that groups that have established a territory for foraging or resting would be more likely to display aggressively

than groups travelling through an area. We also predicted that groups containing mother/infant pairs would also be more likely to display as a means of protecting the infant.

METHODS (DKS)

We conducted this study near Estacion Sirena, Corcovado National Park, Costa Rica on 31 January -2 February, 1994. We frequented the following trails: Ollas, Espaveles, Guanacaste, Sirena, Skyway, Rio Claro (between the station and Skyway), and Naranjo.

During 17 hours of observation, we encountered 13 troops of spider monkeys. From the time of sighting, we recorded the activity interrupted (foraging, resting, or travelling). We took scan samples at 30s intervals and recorded the number of individuals exhibiting aggression. Branch shaking and displacement scratching were considered aggressive acts, including when performed in conjunction with

defecation, urination and vocalizations. We conducted scans until 3 minutes elapsed with no aggression in any individuals, or until the troop dispersed. Once we had spotted the troop, we only advanced towards the animals if we could not adequately assess group size from our initial location. We noted how many mother/infant pairs were in the group. It is probable that some troops were observed more than once, however, not likely on the same day.

RESULTS (AEL)

We found no significant difference between the mean number of aggressive displays by six foraging/resting groups compared to seven traveling troops (mean \pm SE = 0.11 ± 0.08 vs. 0.16 ± 0.07 ; $t = 0.48$, $df = 11$, $p > 0.25$). However, five of six foraging/resting groups displayed some aggression while only two of seven traveling groups displayed aggression ($p = 0.07$, Fisher exact test). There was no difference between the mean number of aggressive displays of troops with and without mother/infant pairs (mean \pm SE = 0.15 ± 0.08 vs. 0.12 ± 0.08 ; $t = 0.33$, $df = 11$, $p > 0.05$). Similar types of aggressive displays were seen regardless of troop activity or presence of a mother/infant pair (i.e. scratching, branch-shaking, vocalization, urination/defecation).

DISCUSSION (JLB)

A. geoffreyi displayed greater aggressive behavior in defense of established sites (foraging/resting) than when travelling through an

area. Regardless of troop activity, aggressive encounters were comprised of the same types of display.

Chapman (1990) has shown that spider monkey mothers with infants often travel in smaller subgroups, away from the perimeter of the territory, to minimize conspecific confrontations. We did not find a significant relationship between aggressive displays and mother/infant groups, suggesting that it may be better at times to not attract attention to the mother/infant pair.

Because grouping behavior of spider monkeys enhances mate selection (Chapman 1990) it could be that the ratio of males to females is related to aggressive displays. We were unable to determine whether aggressive displays were initiated more often by males or females. Other factors that may affect the amount of aggressive display are the distance of the group from the intruders and the abundance of resources remaining in the area. Any comprehensive study of primates needs an extended time period to locate and observe the sub-groups. Our data were not sufficient to provide satisfying tests of our hypothesis.

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