

promoción de alternativas de desarrollo sustentable y hacer copartícipes de los programas a los habitantes locales.

En este taller participaron 38 personas de 17 instituciones, que contribuyeron con su experiencia y entusiasmo. El borrador del informe de este taller será distribuido por el CBSG en fecha próxima, esperando como respuesta los comentarios de otros colegas, a fin de perfeccionar el análisis y las recomendaciones en favor de este taxón.

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## RESOURCE DISTRIBUTION AND SOCIALITY IN WHITE-FACED CAPUCHINS, *CEBUS CAPUCINUS*

White-faced capuchins (*Cebus capucinus*) at Barro Colorado Island, Panama, appear to have a flexible foraging strategy. Typically, foraging party size is small and individuals feed dispersed from one another. When seasonal fruiting of large volume trees occurs, the majority of the group forages simultaneously. As *C. capucinus* do not display a rigorous dominance structure and there are few indications that individuals or coalitions monopolize food patches, individuals were expected to display scramble strategies instead of high frequencies of contest competition. Foraging party size (simultaneous foragers), the total number of animals to feed successively, and the diameter at breast height (DBH) of fruit trees used, were recorded in two habituated troops. Individuals in each group spent a substantial amount of time (65% and 48% of foraging time for each group) foraging in a party size of one. Monkeys predominantly foraged alone in small trees (0 - 20 cm DBH), successively in medium trees (21-60 cm DBH), and simultaneously in large trees (>51 cm DBH). Small trees were used more frequently than all other size classes. In medium-sized trees, although fruit was plentiful, space was limited. *Cebus* foraged successively in these trees. In large volume trees, space and fruit were abundant and several individuals fed together. As the DBH of fruiting trees increased, the average foraging party size increased exponentially. *Cebus capucinus* at Barro Colorado modify their foraging party size to adapt to seasonal patterns of fruit production.

Data was also collected on rates of aggressive interactions in clumped and dispersed resource contexts. Individual

fruiting trees with separate crowns were considered separate food patches, and the distribution of fruit within a tree was classified as occurring in clumps or dispersed evenly throughout the tree. Insects were considered dispersed resources. The overall rates of resource-based aggression and affiliation were low (aggression: 0.86 events per hour); affiliation: 1.66 events per hour). Although the majority of foraging bouts (82%) occurred on dispersed resources, aggressive and affiliative interactions were significantly more likely to occur in clumped resource contexts than in dispersed resource contexts. Females performed more affiliative behavior than males. However, females were not shown to associate preferentially with other females. Males and females did not differ in the rate of aggression performed, and no sex difference for recipient was detected for either male or female targets of aggression. The combination of low rates of affiliative and aggressive interactions, the predominant use of dispersed resources, and weak social relations lead to the conclusion that scramble competition prevails, and association patterns are individualistic.

This study comprised a PhD. thesis for the University of Georgia, Athens. It was supervised by Dr Irwin S. Bernstein, and supported in part by the University of Georgia.

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## Reference

Phillips, K. A. 1994. Resource Distribution and Sociality in White-Faced Capuchins, *Cebus capucinus*. Unpublished Ph.D. dissertation University of Georgia, Athens.

## ECOLOGY AND FEEDING BEHAVIOR OF MASKED TITI MONKEYS

Klaus-Heinrich Müller, research assistant at the German Primate Center (DPZ), Göttingen, Germany, completed his doctoral thesis 'Ecology and Feeding Behavior of Masked Titi Monkeys (*Callicebus personatus melanochir*, Cebidae, Primates) in the Atlantic Rain Forest of Eastern Brazil' in May 1995 at the University of Berlin. The research was supervised by Prof. Dr. H. -J. Kuhn, and made possible through collaboration between the Rio de Janeiro Primate Center (CPRJ/FEEMA), Director Dr. Alcides Pissinatti, and the German Primate Center, Director Prof. Dr. H. -J. Kuhn. It was supported by the Deutscher Akademischer Austauschdienst (DAAD) and the Deutsche Forschungsgemeinschaft (DFG). The following is a summary of the thesis:

A short term study of six complete days, published by Kinzey and Becker (1983), was the first attempt to collect data on *Callicebus personatus*. The aim of the thesis was to obtain further data on the ecology of masked titis through a long-term study. The research was carried out in a forest area of about 100 ha, located in the Lemos Maia Experimental Station (CEPLAC) near the town of Una in southern Bahia. The project was started in June 1991. Due to the difficulty of following the masked titis, radio-telemetry was used in order to locate the groups for habituation. After chemical immobilization, a transmitter was attached to one of the group members. The animals then became habituated after six weeks. Details of the methods involved in capture and radio-tracking were reported by Müller (1994). Between October 1992 and September 1993, two groups of titi monkeys were observed during 101 days. The total observation time was 1030 hours.

Masked titis are active for an average of 10 hours and 12 minutes during the day, with a maximum of 11 hours and three minutes (March) and a minimum of 8 hours and 40 minutes (July). Budgets for the principal activities are shown in the table.

Activity	Duration	%
Locomotion	3 h 24 min.	32.1
Feeding	2 h 48 min	27.1
Resting	3 h 54 min.	40.0
Playing	6 min.	0.8

Masked titis are predominantly frugivorous: 76.6% of the diet consisted of fruits, 17.2% leaves. Other components included flowers, buds, stems, insects and soil, totalling 1.8% of the diet. A seasonal difference in food intake was observed: during the warm season, a greater proportion of the diet consisted of fruits, whereas this was true for leaves in the cooler season. Fruits and leaves of 11 species eaten by the titis comprised 60% of the diet. This contrasts with the information available for other *Callicebus* species, where three to six plant species took up 60% of the diet. Masked titis are as such more eclectic feeders.

The distance between food patches used during the day averaged 109 m. In addition, 81.6% of the trees used by the monkeys had a crown diameter of less than 10 m. The relatively long food patch distance compared with other primates, and the large number of small-crowned trees used, would indicate that nutritional resources are small and uniformly dispersed in their habitat. This might indicate why *Callicebus personatus* form small family groups. Furthermore, as discussed in the thesis, it might explain their monogamous mating system.

The project was continued, beginning in October 1993, by two DPZ doctoral students under the supervision of myself and Dr Alcides Pissinatti. The focus of their study

includes aspects of optimal foraging strategies and their social behavior. It will continue until July 1995. Other primatologists interested in studying these animals for a Master's or Doctoral degree should contact Dr Müller or Dr Pissinatti.

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## References

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## CYTOGENETIC STUDIES IN THE FAMILY ALOUATTINAE

*Alouatta* is the single genus within the subfamily Alouattinae of the Neotropical family Cebidae (Napier and Napier 1967). The six species currently recognized by most authorities have a widespread distribution from southern Mexico to northern Argentina (Wolfheim, 1983; Crockett, 1986).

Although previous karyological studies of this genus are scarce, many interesting rearrangements have been reported, with inter- and intraspecific chromosomal variations detected. Five species have been analyzed for their karyotypes, and the diploid number ranged from 43 in *A. seniculus* to 54 in *A. palliata*. Different translocations have been reported in four of the five species analyzed: *A. palliata* (v. Ma *et al.*, 1975), *A. belzebul* (v. Armada *et al.*, 1987), *A. seniculus* (v. Yunis *et al.*, 1976; Minezawa *et al.*, 1985; Lima and Seuánez, 1992), and *A. fusca* (v. Koiffmann, 1977). Studies of the *A. caraya* karyotype have shown a constant diploid number of 52, and translocations or other rearrangements have not been found to date (Mudry *et al.*, 1992).

Due to these facts and the confused taxonomic relationships within this group, research into the chromosomal and phylogenetic relationships of the