

## SHORT COMMUNICATIONS

### Social Grooming Between Squirrel Monkeys and Uakaris in a Seminatural Environment

ENRIQUE J. ABORDO, *Queens College*

RUSSEL A. MITTERMEIER, *Harvard University*

JEROME LEE and PAUL MASON, *Bucknell University*

**ABSTRACT.** Young squirrel monkeys (*Saimiri sciureus*) were reported grooming an adult female uakari (*Cacajao calvus rubicundus*) on four different occasions. Furthermore, the uakari was noted grooming two squirrel monkeys in separate instances. These observations took place in a seminatural rainforest (The Monkey Jungle; Goulds, Florida, U.S.A.) where provisions are provided. Some possible hypotheses tendered to account for this unusual behavior included (a) the unaverted interaction of food-seeking and fur-cleaning behavior, and (b) the compatibility of play-curiosity activities by squirrel monkeys with the uakaris' need for social contact.

Reports concerning intergeneric grooming in New World monkeys have been limited to observations involving capuchin monkeys (*Cebus capucinus*) and spider monkeys (*Ateles geoffroyi*) on Barro Colorado Island, Canal Zone. The direction of grooming has been unilateral, with adult male *Cebus* grooming adult male *Ateles* (MITTERMEIER, 1973) and female *Ateles* (OPPENHEIMER, 1968). *Ateles* females have also been attended by young *Cebus* (OPPENHEIMER, 1968) as well as *Cebus* of unspecified age and sex (RICHARD, 1970). The present paper describes six occasions of intergeneric grooming between squirrel monkeys (*Saimiri sciureus*) and a red uakari (*Cacajao calvus rubicundus*) and proposes an interpretation of such behavior. The observations were made over a 13-day period (January 22-February 3, 1973) in the rainforest area of The Monkey Jungle (Goulds, Florida, U.S.A.).

The rainforest is a 1.6 hectare parcel of land composed of indigenous sub-tropical jungle hardwood and ground cover, modified by a variety of flora introduced from various parts of the world (for a more complete description, see DUMOND, 1968). Within this naturalistic setting live small colonies of red howler monkeys (*Alouatta seniculus*) and white-lipped tamarins (*Saguinus fuscicollis*) in addition to the small colony of uakaris and the predominant squirrel monkeys which number over 150 individuals. Successful adaptation and reproduction in this environment has resulted in groups which vary in age from infancy to adult.

Previous observations of the rainforest population have dealt primarily with the social behavior of the squirrel monkeys (BALDWIN, 1968, 1969, 1971; DUMOND, 1968; DUMOND & HUTCHINSON, 1967). BALDWIN (1971) characterizes the behavior patterns of the colony as age-sex class oriented. In addition to activities such as traveling and resting, most social interactions occur in clusters of monkeys of the same sex and age, although frequent interactions do take place between the classes. BALDWIN suggests that class compatibility is a function of the activity levels and



**Fig. 1.** Squirrel monkey grooming the adult female uakari on top of the feeding platform. This single groomer was later joined by the second squirrel monkey partially hidden above the uakari's form. The episode lasted 10 minutes.

common behavioral repertoires within age-sex groups. Animals with different levels of activity were observed to avoid or threaten each other; while those with similar behavior output exhibited prolonged bouts of interaction, usually without avoidance or threats.

The natural group size of uakaris may vary from 10–30+ individuals (MITTERMEIER, preliminary field observation), however little is reliably known about their social behavior and organization (see NAPIER & NAPIER, 1967). At the time of the present observations, the rainforest colony was composed of four adult females and one young adult male, who were not necessarily related through birth. FONTAINE (1972) provides a detailed description of the development of the colony over the previous 11 years and the familial relationships of its members.

All six cases of intergeneric grooming occurred between 900 and 1200 hours. The primary recipient of the grooming activity was a female uakari that had lived in the jungle for 12 years. Although she was observed copulating with the young adult male, she appeared to be a peripheral member of the uakari group and was usually seen alone. Her imperfect social integration may perhaps be attributed to the fact that she had been kept as a pet prior to her release into the jungle, or to the fact that she has no familial relationship to the other uakaris.

In four of the grooming sessions, three to four squirrel monkeys, estimated to be late juveniles, groomed the female uakari for 1 to 5 minutes. In two of these sessions, the animals were located on a feeding platform some 5 meters above the ground (see Figs. 1 & 2); in the other two, they were on an empty wood-frame wire cage about 3 meters high. In three of these four cases, the squirrel monkeys initiated the grooming while the uakari was sitting near them; in the fourth, the uakari appeared to solicit grooming by lying on its side directly in front of the

squirrel monkeys. At any one time during the grooming sessions, as many as three squirrel monkeys participated. They inspected the head, shoulders, back, sides, and tail of the uakari and occasionally removed particles of unidentified material from the hair and ingested them. Attention was directed primarily to the hair itself and not to the underlying skin. Two of the grooming sessions were terminated by the uakari when a squirrel monkey climbed onto its head. On one of these occasions, the uakari gently shoved the squirrel monkey away with a slow lateral movement of its arm; in the second, the uakari stood up and walked away. The other two sessions were terminated by the squirrel monkeys, though the uakari still lay on its side.

The uakari was seen grooming an unidentified late juvenile squirrel monkey on two occasions. The first incident occurred at 1150 hours and lasted 20 seconds. The squirrel monkey sat on top of the wood-frame wire cage in a hunched over position, its head on its chest, while the uakari groomed the back of its neck with an index finger. The uakari did not remove anything from the squirrel monkey's fur. Four minutes later, another squirrel monkey groomed the nape and lower back of this same juvenile. In the second instance of the uakari grooming a squirrel monkey, the session lasted only 5 seconds with the uakari's attention appearing generally superficial.

Unlike many species of primates' intraspecific allogrooming plays a minor role in the social behavior of squirrel monkeys (e.g. THORINGTON, 1968), and generally limited to mother-infant interactions (BALDWIN, 1969). In the presence of numerous conspecifics, *Saimiri's* need for social contact may be satisfied through a variety of other social behaviors such as play. Thus, the significance of the present observations lies in the consistency with which the squirrel monkeys directed their uncommon behavior to the uakari and in the ready acceptance and reciprocation, however fleeting, by the uakari.

The observations might be interpreted as a nonaversive outcome of the compatible interaction of food-seeking and fur-cleaning activities. The uakari was frequently observed foraging through the underbrush, where it inadvertently accumulated debris and small invertebrates in its fur. Hence, the grooming activities of the squirrel monkeys provided the uakari a means of removing the foreign matter from the fur, especially from those areas which it could not reach and are usually attended to during bouts of social grooming (FONTAINE, 1972). Moreover, the squirrel monkeys were observed to occasionally ingest the material. While the nature of the particles is unknown, *Saimiri* do consume insects as part of their diet.

Play and/or curiosity may also have been responsible for the squirrel monkey's behavior. The squirrel monkeys often wrestled with one another before, during, and after the grooming sessions, suggesting that the time during which they groomed the uakari was part of a general play period. In the Monkey Jungle, young *Saimiri* have been observed playing with young uakaris, sometimes riding on their backs (DUMOND, 1968). In the present observations, they had also been seen leaping on and off the back of another uakari, although it did not reciprocate in a positive fashion. Furthermore, the squirrel monkeys appeared to show no fear of the uakaris, though they did flee at the approach of an adult female red howler monkey (*Alouatta seniculus*). In conjunction, since the uakari displayed neither normal grooming nor



**Fig. 2.** Adult female uakari grooming an unidentified squirrel monkey. The episode lasted 5 seconds.

play relationship within the social structure of its group of conspecifics, perhaps the behavior of the squirrel monkeys satisfied some of the uakari's need for social contact.

More field work is necessary to determine the extent of intergeneric grooming, as well as other interactions, under natural conditions. The observations in the Monkey Jungle must, of course, be considered in light of the "seminatural" conditions and the fact that the animals are brought together by provisioning.

**Acknowledgements.** The authors wish to thank Mr. FRANK DUMOND, Director of the Monkey Jungle, for use of the facilities and for suggestions during the study. Reprint requests should be directed to Dr. E. J. ABORDO. The study was conducted during the tenure of a National Science Foundation Graduate Fellowship to R. A. MITTERMEIER, and while Dr. ABORDO was associated with the Psychology Department at Bucknell University.

## REFERENCES

- BALDWIN, J. D., 1968. The social behavior of adult male squirrel monkeys (*Saimiri sciureus*) in a seminatural environment. *Folia primat.*, 9: 281-314.
- , 1969. The ontogeny of social behavior of squirrel monkeys (*Saimiri sciureus*) in a seminatural environment. *Folia primat.*, 11: 35-79.
- , 1970. The social organization of a semifree-ranging troop of squirrel monkeys. *Folia primat.*, 14: 23-50.
- DUMOND, F. V., 1968. The squirrel monkey in a seminatural environment. In: *The Squirrel Monkey*, L. A. ROSENBLUM & R. W. COOPER (eds.), Academic Press, New York.
- & T. C. HUTCHINSON, 1967. Squirrel monkey reproduction: the 'fatted' male phenomenon and seasonal spermatogenesis. *Science*, 158: 1067-1070.
- FONTAINE, R. P., 1972. The individual nonsocial behavior of *Cacajao rubicundis* in a seminatural environment. Unpublished master's thesis, Bucknell University.
- MITTERMEIER, R. A., 1973. Group activity and population dynamics of the howler monkey on Barro Colorado Island. *Primates*, 14: 1-19.
- NAPIER, J. R. & P. H. NAPIER, 1967. *A Handbook of Living Primates*, Academic Press, New York.

- OPPENHEIMER, J. R., 1968. Behavior and ecology of the white-faced monkey, *Cebus capucinus*, on Barro Colorado Island, C. Z. Unpublished doctoral dissertation, University of Illinois.
- RICHARD, A., 1970. A comparative study of the activity patterns and behavior of *Alouatta villosa* and *Ateles geoffroyi*. *Folia primat.*, 12: 241-263.
- THORINGTON, R. W., JR., 1968. Observations of squirrel monkeys in a Columbian forest. In: *The Squirrel Monkey*, L. A. ROSENBLUM & R. W. COOPER (eds.), Academic Press, New York.

—Received *June 13, 1974*; Accepted *September 7, 1974*

Authors' Addresses: ENRIQUE J. ABORDO, *Department of Psychology, Queens College, Flushing, New York 11367, U.S.A.*; RUSSELL A. MITTERMEIER, *Museum of Comparative Zoology, Harvard University, Cambridge, Mass. 02138, U.S.A.*; JEROME LEE & PAUL MASON, *Department of Psychology, Bucknell University, Lewisburg, Pa. 17837, U.S.A.*