SHORT COMMUNICATION

Father-son Recognition in Hanuman Langurs
(*Presbytis entellus*): A Field Experiment
in India

**VOLKER SOMMER**
University of California, Davis

**ABSTRACT.** A juvenile male langur, about 15 months old, was removed from his natal one-male-multi-female troop and reintroduced after 3.3 weeks. In attempts to protect the juvenile, his presumed father, the troop’s resident male, charged the primatologist who removed and released the individual. After the second removal, the juvenile was introduced into a neighboring male band. The resident male attacked the band members to keep them away from his females. However, after 3.4 weeks of separation, the father and the son recognized each other, because the resident male showed no aggression towards his son and the latter did not run away from him. Kin-recognition is considered to be a mechanism in structuring coalitions within langur male bands.

Key Words: *Presbytis entellus*; Kin recognition.

**INTRODUCTION**

Hanuman langurs (*Presbytis entellus* DUFRESNE, 1797), South Asian colobines, form two types of social organization: bisexual troops (one-male-multi-female or multi-male-multi-female) and all-male bands. Nonadult males (at least at one-male sites) transfer into male bands, usually as juveniles (e.g. SUGIYAMA, 1967; HRDY, 1977; MOHNOT, 1978). “Paternalistic” behaviour from older towards younger male band members probably reflects genetic father-son relationships (MOORE, 1984, 1985) and can influence a young emigrants’ chance of survival (RAJPUROHIT & SOMMER, 1993). However, nepotism depends on the ability to discriminate kin from non-kin, especially if fathers and sons join a male band at different times. This paper presents evidence that langur fathers and sons can recognize each other after weeks of separation.

**MATERIAL AND METHODS**

Near Jodhpur (Rajasthan, India) a geographically isolated population of about 1300 langurs has been studied by various researchers since 1967. In the open scrub habitat, langurs spend an average of 66% of their feeding time on natural food and 33% on food provided by local people for religious reasons. The langurs are well habituated due to the provisioning. The population comprises 27 – 29 one-male-multi-female troops (average 38.5 members, range 7 – 93) and 13 all-male bands (average 11.8 members, range 2 – 47). The harem structured social organization ensures a high degree of paternity certainty. Therefore, the relationship between males sired during the tenure of a given adult resident male is
described in terms of "sons" and "father" (see Sommer et al., 1992, for details).

The life history of 79 juvenile males born in nine troops was followed over 12 years (Rajpurohit & Sommer, 1993). They emigrated with 2.5 ± 1.2 yrs (range 1.2 – about 6.6 yrs) into bands whereas females were philopatric. Fifty-nine percent of the males emigrated with their father during his ousting as resident. However, fathers and sons became separated in the remaining cases: 12% of sons emigrated while their father was still a troop’s resident and 29% emigrated after his replacement. Forty-two percent of the latter joined the same band their father had joined earlier. Males living with their father in the same band had a higher probability to survive during the first six months after emigration, compared to males without their father. Possibly, the lower mortality is due to nepotism shown by fathers, who e.g. sometimes defend their sons during encounters with rival bands.

The possibility to test if fathers and sons can discriminate each other from non-kin after periods of separation arose at Jodhpur, when a juvenile was removed from his natal troop and later confronted with his father.

RESULTS

At Jodhpur, India, the author removed a juvenile langur male from the wild and released him later, twice. In both cases, the juvenile was found in a gorge out of which he could not climb back because his legs were apparently paralyzed. The juvenile recovered in the field camp. At all four occasions (i.e. during the two removals and releases) the resident male of the juvenile’s natal Troop Canal displayed protective behaviour and signs of kin-discrimination. It is very likely that the resident fathered the juvenile during his tenure in the troop, which began at least 4.0 years before the events took place. Details are provided in the following account.

First Removal from the Natal Troop
November 13, 1986, 17:00.

A juvenile male (about 15 months old) which was unable to move was discovered at the bottom of a 10 m-deep-gorge in the home range of his natal troop. Attempts to recover the juvenile were discontinued, because the adult male, an adult multiparous female, a nulliparous female, and a juvenile of unknown sex threatened the author through head-bobbing and bare-teeth-displays. One day later, the individual was removed after dusk (18:45).

Reintroduction into the Natal Troop
December 8, 1986, 08:30.

The physically recovered juvenile (weight: 4.8 kg) was returned to his troop which consisted of 16 members including 1 adult male, 5 adult females, 5 young adult females, 1 juvenile female, 1 juvenile male, 2 infant males, and 1 infant female. The juvenile was placed near the troop’s sleeping site in a sack of the kind used by local people to transport food for provisioning the monkeys. Several langurs curiously inspected the sack. The juvenile’s appearance triggered considerable excitement as indicated by screams, jumping displays, scratching, and self-grooming. The adult male resident along with bare-teeth threats and head-bobbing immediately charged the author. At 08:34, 08:47, and 10:02, the juvenile approached the adult male within arm-length. He tolerated it without signs of affiliation or aggression.
Other interactions within 2 hrs after the release included: (a) an adult female, presumed to be the juvenile’s mother, approached, embraced, and groomed him for 10 min, however, any nipple contact was not observed; (b) the juvenile was groomed by a second adult female for some sec; (c) by a young adult female for 4 min; and (d) the second juvenile male interacted by mutual mountings and embraces.

Between 17:45–18:15, the troop occupied its sleeping site at a steep part of the gorge. The juvenile tried to maintain contact with his presumed mother, the other male juvenile, and the adult male. He directed contact-calls towards the adult male whenever the latter moved too far away. The adult male changed his direction twice in response to these vocalizations and came closer.


The juvenile tried again to maintain close spatial contact with his presumed mother and father at the sleeping site.

Second Removal from the Natal Troop
January 8, 1987, 17:45.

The juvenile was again discovered in the gorge, unable to move. His presumed mother attacked the author when he approached.

January 10, 1987, 21:00.

The adult male and an adult female uttered alarm vocalizations when they discovered the author in the bright moonlight, who attempted to remove the juvenile.


The juvenile was removed while other troop members were out of sight. He recovered in the field camp. It was decided to introduce him into a male band whose home range did not include the gorge.

Introduction into an All-male Band (AMB)

The juvenile (weight: 5.5 kg) was released near his natal troop’s home range at the sleeping site of AMB Machiya which included three young adults and six juvenile males. The AMB members did not originate from the juvenile’s troop. Within 105 min, all juveniles interacted with the introduced individual through mutual mountings and embraces. The young adults did not exhibit any aggressive or affiliative behaviour.

09:15.

The juvenile climbed on a widely visible pole. Triggered by the sight of a non-troop male, long-distance-calls (“whoops”) were heard in the vicinity from the residents of Troop Canal and Troop Kallana-1 as well as from neighbouring AMB Canal. The highest ranking member of AMB Machiya responded.

10:12.

AMB Machiya was foraging. Suddenly, the resident of Troop Canal appeared. He had quietly approached over a distance of 600 m and immediately attacked the male band (such events occur regularly at Jodhpur). All members ran helter-skelter, scattered, and hid behind vegetation and hillocks. However, the introduced juvenile neither ran away nor
showed signs of fear. His father chased another screaming juvenile into thin branches of a tree and chased a young adult for about 400 m.

10:17.

The returning troop resident passed his son, who approached him within 5 m. The father did not exhibit any aggression.

10:19.

The resident ran back towards Troop Canal. His son, emitting mild squeals, followed but could not catch up with, and fell behind, uttering contact-vocalization for another 8 min. Thereafter, five juveniles reappeared from hidings. Mutual mounting and embracing with the introduced juvenile followed. The latter scanned frequently into the direction where his father left.

11:16.

The juvenile followed his age-mates towards the direction where the young adult males fled from the troop male's attack.

The introduced juvenile remained in AMB Machiya until he disappeared (March 26/27, 1987).

DISCUSSION

Adult male langurs very rarely show a direct caregiving behaviour to infants such as holding, grooming, or carrying, whereas an indirect care such as chasing away potential predators has been frequently reported (e.g. Sugiyama, 1965a; Hrdy, 1977; Dolhinow, 1980). Protective behaviour of adult males is especially common in one-male-troops where paternity certainty is relatively high. Adult resident males also frequently defend infants from attacks of conspecifics during inter-troop encounters and intrusion of other males when the risk of infanticide is high (Sugiyama, 1965b; Hrdy, 1977; Sommer et al., 1992).

However, langur males do not necessarily have to know their offspring individually in order to protect them. In a one-male-situation, it would be sufficient to simply protect all individuals that are spatially associated with the troop. In fact, it is unlikely that males know offspring individually at least until the age of 3 months as demonstrated by Sugiyama (1965a): A 2-week-old infant was captured, handraised for two and a half months, and shown to the resident of its natal troop. He attacked the primatologist conducting the field experiment, but so did all other troops' resident males to whom the infant was shown. Therefore, kin-recognition does not have to be invoked (unless one assumes that only the presumed father of the infant wants to protect it, whereas all other males want to attack it).

The first part of the present field experiment was in this regard likewise not decisive: the protection displayed by the adult male towards his son when removed from the troop as well as when reintegrated after 3.3 weeks could be based on the pattern of spatial association.

However, this assumption was rendered unlikely by the second part of the field experiment when the father and the son encountered each other after 3.4 weeks of separation following the juvenile's introduction into a male band. Since the juvenile did not run away
from his father who charged other males and since the father did not show aggression towards his son, it is safe to assume that in langurs, fathers can individually recognize their 15-month-old sons, and that sons of this age can discriminate their fathers from non-fathers.

Kin-recognition occurred after 23 – 24 days of separation. It is unknown, for how long males can maximally remember each other. There are strong indications, however, that resident troop males who lived in the same male band before taking over a troop are able to recognize each other after several months or even years when they are ousted and encounter again (Rajpurohit & Mohnot, 1988). There can be little doubt that the ability to discriminate close kin from non-kin is advantageous for both fathers and sons living in the same male band.

Acknowledgements. The study was supported by the Feodor-Lynen-Programme of the Alexander von Humboldt-Foundation.

REFERENCES


Received: October 27, 1992; Accepted: November 19, 1992

Author’s Name and Address: Volker Sommer, Department of Anthropology, University of California, Davis, CA 95616, U. S. A.