



## **Fighting Between Two Females for a Male in the Hoolock Gibbon**

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*I observed fighting between two adult females for an adult male in a group of hoolock gibbons (*Hylobates hoolock*) during fieldwork conducted between November 1988 and December 1990 at Lawachara in the West Bhanugach Reserve Forest, Sylhet, Bangladesh. I discuss the history of the episodes and the consequences of fighting.*

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**KEY WORDS:** gibbon, *Hylobates hoolock*; female–female fighting.

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### **INTRODUCTION**

Gibbons are arboreal, monogamous, and territorial. Intragroup competition occurs between members of the same sex, which results in the emigration of subadults from the family group. Researchers have recorded mostly intrasexual conflicts between and within groups. For instance, Tenaza (1975) reported male–male fighting in Kloss gibbons, during which he heard high-pitched quivering squeals through obstructing vegetation. But he observed fighting directly in only two cases. Ellefson (1968, 1974) observed one lar male catch and bite another, while Palombit (1992, 1993) observed one fight between males of two groups, which resulted in a fatal wound to one of them. I report the occurrence of fighting between two adult females for an adult male in the same group.

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## STUDY ANIMALS AND METHODS

I studied behavioral ecology of hoolock gibbons (*Hylobates hoolock*) in two forests in Bangladesh during November 1988 and December 1990. The fighting occurred in one (L1) of the two groups studied intensively at Lawachara of West Bhanugach Reserve Forests (24°21'N and 91°47'E) in Sylhet. The forest is mixed evergreen/semievergreen (Ahsan, 1994). Group L1 had one adult male (M), two adult females (one was lighter in color, F<sub>1</sub>, and the other darker, F<sub>2</sub>), and one juvenile I male (J) from the beginning of the study (November 1988). I followed the group for a 5-day span each month to note 10-min scan samples and *ad libitum* observations (Altmann, 1974).

## OBSERVATIONS AND DISCUSSION

From November 1988 until 6 September 1989 the intragroup relationship of L1 was mysterious. During diurnal activities, F<sub>1</sub> was dominant over F<sub>2</sub>. The male consorted with both females separately. Frequently he made off with either female about 50–100 m or so apart from the other two members of the group. He mostly groomed the female and sat close to her for an hour or so. This occurred especially during the warmer hours of the day. In this consort behavior no copulation occurred, but he mated with both the females separately, even the same day. During copulation the pair was always apart from the other members. F<sub>1</sub> always either initiated or was close to M or both during duetting, while F<sub>2</sub> was 5–10 m away, but she frequently, and the juvenile occasionally, joined the duetting chorus; F<sub>2</sub> never initiated the call. M always slept with F<sub>2</sub>, and F<sub>1</sub> with J, although F<sub>1</sub> was dominant in the group.

On 9 September 1989, I first noticed that F<sub>2</sub> was absent, though she was in the group on 6 September. On the following days M slept alone in a separate tree, while F<sub>1</sub> slept with J, though J was always afraid of M diurnally. F<sub>1</sub> was the decision maker of the group, especially during group progression. When M was leading group progression he always looked behind and waited for the F<sub>1</sub> to follow him; if not, he returned to the group, but the opposite and reverse were rare.

On 3 October 1989, while I was following group L2, I saw F<sub>2</sub> with group L1, very close to M, with F<sub>1</sub> distant from M. Then I switched to group L1 to watch their unusual behavior. F<sub>2</sub> chased F<sub>1</sub> and kept M away from F<sub>1</sub>. On that day the group called six times, all initiated by F<sub>2</sub>, which was unusual. For the first time, I noticed that F<sub>2</sub> was initiating and duetting with rich harmonics like an adult female's voice [as observed by Tilson

(1981) in Kloss gibbons] and was close to M;  $F_1$  was also duetting with the group, but she was 10–15 m away from the pair ( $MF_2$ ). Once  $F_2$  chased  $F_1$ ; both of them dropped to the ground because a branch about 10 m high broke under their weight. Then the group moved about 200 m to the north, but  $F_1$  remained there and rested for 10 min. On that day both the females (mostly  $F_2$ ) tried to expel each other from the group and to be accompanied by the male. Hence they spent less time feeding and delayed going to the sleeping trees. On the next day (4 October 1989) the group called seven times, which was most unusual—the highest number of calls recorded for a group in 1 day. Both  $F_2$  and  $F_1$  did the same as on the previous day. Once again, they dropped to the ground from about 7 m while fighting, but I did not see any sign of injury on either occasion. In the evening, I lost the group when they went to the separate sleeping trees and it was too dark to locate them. Similar observations were made by Tenaza (1975) and Tilson (1981) for Kloss gibbons, among which Tenaza reported fighting between males of two groups. In one Kloss group a subadult male was involved to support his father. The victim male retreated twice to the ground, and both times he was followed and apparently attacked by the other male, which was supported by his son. Tenaza (1975) was unable to watch the actual encounter, but noisy rustling of ground vegetation and high-pitched quivering squeals suggested that they were fighting. He reported no injury.

From 5 October 1989,  $F_1$  was absent from the L1. On 9 October 1989, I followed L1 again and observed that  $F_2$  was leading the group. J was still fearful of M and even  $F_2$  threatened J several times. Most nights, M and  $F_2$  slept together, while J slept in a separate tree, except on 1 night when M slept separately and  $F_2$  and J were together.

In November 1989 after completing the 5-day block of following group L2, I was searching for L1 and found  $F_2$  isolated. I followed her to a sleeping tree. The next morning (8 November 1989) I was following  $F_2$  from the sleeping site, while my temporary local assistant (Muslimuddin) found group L1 with M,  $F_1$  and J together. At 0800  $F_2$  growled loudly several times and M and J appeared within 10 min. M went close to  $F_2$  and tried to convince her to join him. After several attempts he succeeded. They duetted while J was about 15 m away and  $F_1$  was absent. On the following days,  $F_2$  was the supreme member in the group. For instance, when M was aggressive toward  $F_2$  during feeding on a common food,  $F_2$  showed him more intense aggression and chased M for a while.

Until 15 March 1990, M,  $F_2$  and J lived together and  $F_1$  was absent. On April 1990, I found that  $F_2$  had been replaced by  $F_1$ . After that,  $F_2$  lived peripherally until the end of this study (15 December 1990). By that time, on 3 days  $F_2$  came close to L1, and  $F_1$  always chased her and simul-

taneously guarded M and kept M away from her. J was always afraid of M but lived in L1 with him. In July 1990, I inferred that  $F_1$  was pregnant, from the condition of her nipples and breasts. She spent the night with J and M in a separate tree. July was the last month that I monitored the groups systematically.

$F_1$  had a single birth in September 1990 (between 15 and 25) and the group size increased from three to four. From the history of this study along with my previous study, the following history of group L1 can be summarized.

- (1) I presumed that the four members (M,  $F_1$ ,  $F_2$ , J) of group L1 were siblings. In September 1981, I observed a group of five gibbons comprised of one mated pair and three other black members whose sexes were not obvious. This group sang in the territory of L1.
- (2) I assumed that the mated pair had possibly died due to senility after producing another infant, which was most likely J, and the group size stabilized to four.
- (3) At the beginning of the 1988–1990 study, the parapepial hair tufts of the adult male were black and not so prominent. Later, in 1990, they turned brown–red, but the tufts of other adult males in the area were silver–white. This indicates that the adult male of L1 was younger than the other adult males.
- (4) It is not clear whether it is the male that decides which female will remain in the same territory and become his mate, or whether it is the female with which he pairs that expels the other female and occupies the territory.
- (5) The demographic history of this group (L1) is presented based on the present study and above discussion (Fig. 1).

Now questions arise: (1) How did I confirm that L1 group members are siblings? (2) What is the possibility of the male being an immigrant? (3) Why did J always remain with the group in which M was present? and (4) Was it a matter of territory or maintaining social association for J?

Hoolock gibbons become sexually mature at the age of about 10 years, and the longevity of gibbons in general is 25–30 years (Tilson, 1981). The first birth may occur at 12 years because it takes quite long periods for two subadults to form a family (Aldrich-Blake and Chivers, 1973; MacKinnon and MacKinnon, 1977). The interbirth period for hoolock gibbons is  $\geq 3$  and may be 3–4 years (Ahsan, 1994). If a female hoolock produces four offspring during her lifetime, with an interbirth period of 3 years, and rears the last offspring for 3 years (up to the juvenile I stage) before her death, then she will attain the age of 24 years. By that time her male mate will be the same age. The adult pair may live another few

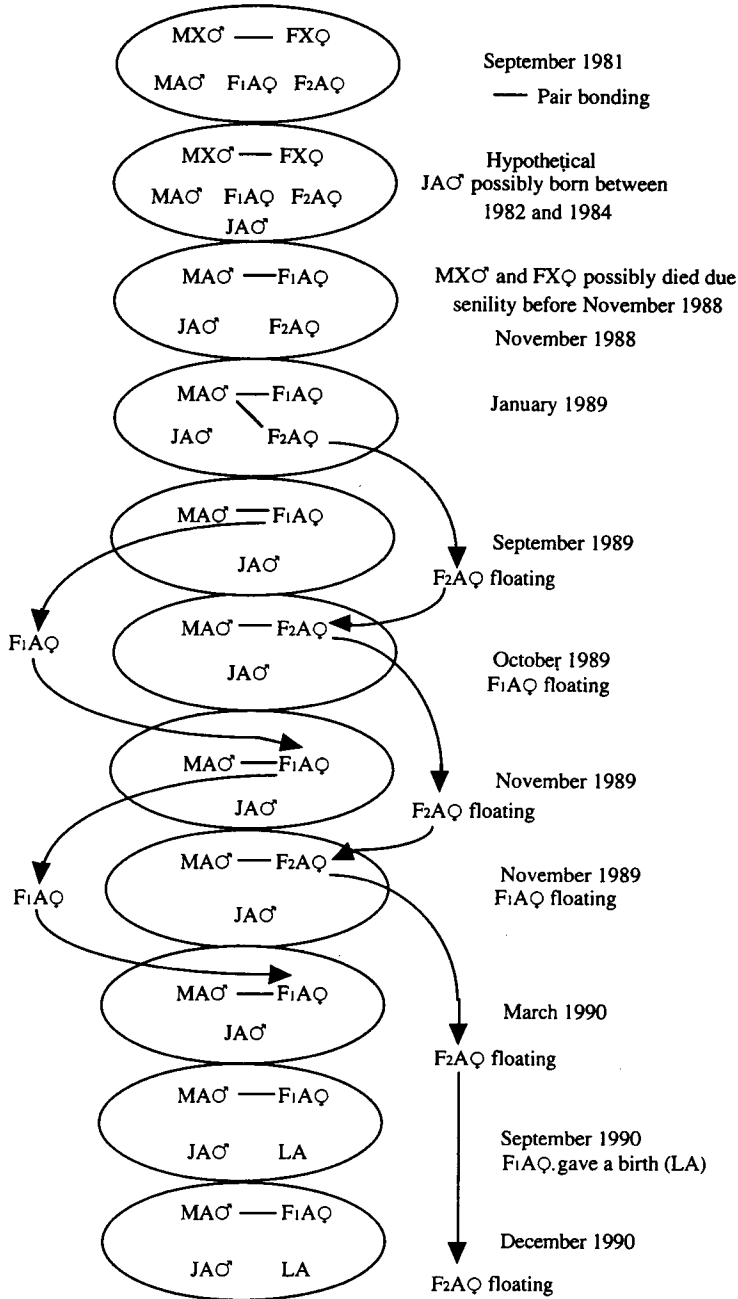


Fig. 1. Demographic history of group L1.

years before their death due to senility. Theoretically, Tilson (1981) stated that an adult gibbon pair may produce five offspring during their lifetime, with an interbirth period of 2.5 years, when offspring mortality is negligible. Hence, it is regarded that at 24 years of age of the parents, in the present case, the first offspring (female  $F_1$ ) was 14 years, the second (male M) 11 years, the third (female  $F_2$ ) 8 years, and the fourth (juvenile I male, J) was 5 years. In view of Tilson's (1981) observation and previous knowledge on maturity and mating in gibbons, my prediction is reasonable. The emerging adult has a tendency to remain with the natal group, if there is any chance, filling the gap or replacing the like-sex parent and occupying the parents' territory, especially when there is a shortage of space, which is the situation at Lawachara. The above factual assumptions led me to infer that L1 group members are siblings. Tenaza (1975) and Tilson (1981) observed peripheralized male-male fightings in Kloss gibbons that tried to occupy an abandoned territory; they were supported by their natal groups.

Quantitative observations suggest that mated pairs of gibbons are aggressive toward their own-sex subadult offsprings, but not toward the juvenile I. The L1 adult male was almost always aggressive toward J when they met within 5 m. The possibility that the adult male is not an immigrant in the group is suggested by the solitary female in the area, most possibly since 1984, whose home range overlapped with that of L1 (Ahsan, 1994); the male could have paired with her and stayed in her territory.

Obviously, J was not mature enough to form a group with one of the females of the group and to establish a new territory. On the other hand, neither female took that initiative. However, in May 1991, a pair was within the home range of L1 and L2 (S. M. D. Hossain and M. S. Huda, personal communication). It was not confirmed whether that pair was the juvenile male of L1 and the expelled subadult female of L2. On the other hand, Feeroz and Islam (1992) reported that the juvenile of L3 (which is my L1 group) and a solitary female that lived on the southern side of the railway line stayed together in the solitary female's territory for a few days. During that period, Feeroz and Islam (1992) observed one ventroventral mating between them. After a while, the juvenile returned to the natal group. These sorts of temporal pairings and copulations also occur in siamangs (MacKinnon and MacKinnon, 1977; Palombit, 1992), in Kloss gibbons (Tilson, 1981), and in lar gibbons (Palombit, 1992). Thus, it is reasonable to assume that every member of L1 was trying to remain in the territory where it grew up because of the shortage of space, and especially for J, it may be for both space and sociality.

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