

## 10. DOMINANCE BEHAVIOUR

### 10.1. INTRODUCTION :

Rational distribution of various activities among the group members is a characteristic feature of group living animal. Dominance and leadership are not the same phenomenon. The study of dominance behaviour is essential to understand a species ecological adaptation to the environment. It is also an important factor to be considered when examining the relationship between ecology and sociological problems. Rhesus macaque groups are characterised by strong dominance hierarchies within which individual's ranks are strongly determined by genealogical relationship (Sade, 1967). These animals exhibited a stable linear dominance order (Kawamura, 1965). In most cases aged adult males dominate the groups. Rhesus groups, however, were occasionally dominated by adult females.

The present discussion deals with dominance phenomenon among rhesus at Baikunthapur Forest. The major objectives of this section is to determined the social interactions within the group and among the groups. This chapter also focuses the phenomena of social dominance and dominance strategy.

### 10.2. METHODS :

Dominant activity comprised of adopting priority in feeding, resting and locomotion of individuals as well a-groups. Sub-ordinate activity consisted less priority in feeding, resting and locomotion. Only those interactions involving distinct wins, loses and adoption of priority were used in analysing rank order. Long term association and observation, enabled me to identify the individuals of Basanti basti groups, B1 and B 2 (Table 10.1) as well as the Laltong groups, A, B, C, D, E and F (Table 10.2) with naked eyes and binoculars.

Dominant and sub-ordinate activities were systematically collected

by time sampling method (Altmann, 1974). The observation period was 5 minutes. In each 5 minutes scan (period) I included both those animals immediately visible and those which came into my range of vision while I moved around the groups (Clutton-Brock, 1975). Observations on this study were made from February, 1987 to June 1987 and August, 1987 to January, 1988. The groups were observed for 150 hours and a total of 1800 sightings were recorded.

Dominance relations and ranks were determined in the manner as described by Bernstein (1970) and Southwick (1977) by the outcome of aggressive encounters which were subsequently ordered into a ratio,  $R$  (frequency of threats received,  $r$  / frequency of threats given,  $g$ ).

### **10.3. RESULTS AND DISCUSSION :**

#### **10.3.1. Dominance within Group :**

Within a group, dominance relations among adult males were rather complex and considerable aggression occurred. Sub-adult males occupied peripheral position in the group. The central area of the group was generally occupied by dominant males, the females and infants. Sub-ordinate males also stayed at the periphery of the group. The social organization within a group was maintained by adult male-dominance. Spatial displacements and priority over food and feeding bouts provided reliable measures of dominance among members in a group under natural environment. Moreover, noisy fightings which occurred periodically in a variety of situations also indicated as dominance interaction.

Observations on dominance behaviour within a group was carried out in Basantibasti. The size and composition of group B1 and group B2 are represented in Table - 10.1.

### 10.3.1.1. Dominance Hierarchy :

During feeding a threat might stop the threatened individuals from feeding or prevented it from approaching the feeding area (Plate 10.1) of dominant individual. In 40% of all threats during feeding, the dominant displaced the sub-ordinate and consumed the food that the sub-ordinate had discovered. The relative rank order among individuals of group B1 and group B2 with respective age-sex classes are listed in Table - 10.3. In the group B1 adult males, e.g., M1, M2, M3, and M4 showed an organised linear dominance hierarchy while M5 was found to be sub-ordinate to F1, an adult female. M5 occupied a peripheral position. Similar observation was also reported by Southwick and co-workers (1965) in this species. In group B2, adult males, e.g, M1, M2, and M3 were dominant in sequence is over rest of the individuals. Aggression between males was infrequent. Interactions between them were regulated by avoidance, withdrawal and display of appeasement signals.

### 10.3.1.2. Role of Individuals within a Group :

The social organization of rhesus groups depend upon the activity of different individuals with respect to age and sex. dominance behaviour is important in maintaining stability of the group. Adult males performed important role in socialization of groups. Two dominant males of the group B1 were seen to maintain considerable distance to each other while the third lower ranking one carefully watched from a distant place within the central area of the group (Plate - 10.2). Avoidance of dominant males by other individuals possibly helped maintaining stability of the group (Mondal, 1964 and Lindburg, 1971). Infants were tolerated by the dominant males (Plate - 10.3). On several occasions in group B2, the M2 male ( $R=0.13$ ), defeated M1 male in encounters. However, despite this M1 male ( $R = 0.09$ ) maintained its top position in the group. So, the change of rank order within a group was occasional. The present observation on change of social rank within a group was similar to Neville's (1968) observation in India.

Table - 10.3 shows organized social rank among adult females of group B1 and B2 respectively. Similar clear linear hierarchy was reported among adult females during breeding season by Loy (1971). Except on several occasions the adult females never dominated the group. Aggressive interactions among females were low. On several occasions in smaller groups consisting of 10 to 15 individuals on average adult females dominated the group (Plate - 10.3). Moreover, adult females were found in close social association within a group (Plate - 10.4). Plate - 10.4, shows intimate social grooming among three female individuals of group B1. This also revealed strong social bond among females within a group. Similar social behaviour was also observed by Wall et al., (1986), among adult females in rhesus monkey groups. The juveniles were also found to play important role in formation of social structure. They mostly occupied peripheral position but occasionally were seen at the central area within the group during feeding bouts. The F8 female ( $R= 1.57$ ) was found to be sub-ordinate to the J1 juvenile ( $R = 1.45$ ) in the B1 group while the F6 female ( $R=3.47$ ) was sub-ordinate to the J1 ( $R= 2.40$ ) and J2 ( $R= 2.60$ ) in group B2. Infants were found at the central area within the group. Infants of low ranking mothers were also found at the peripheral zone in the group (Plate 10.5). It may be stated that age, physical strength and seniority were three important factors which maintain dominance within the group. Southwick and Siddiqi (1967) reported that physical strength and social tradition played a role in the maintenance of dominance within a group.

### 10.3.2. Dominance among the Groups :

Marked intergroup interactions were observed at Baikunthapur Forest. Six groups were identified, i.e., A,B,C,D,E, and F respectively. Though no group occupied specific areas within their home ranges but each group had preferred resting and nesting trees. Initially group D was found to be dominant over other groups but at the end of study period group E established its dominance over other groups. Each group tried to avoid each other without any direct encounter. The sub-ordinate groups avoided direct conflict by withdrawing themselves when a dominant group appeared. Intergroup encounter was seen many times during the course of observation. At the time of intergroup fighting although

adult males initiated most of the conflicts, often the juveniles more involved in the actual fighting. The intergroup dominance was studied among six groups of Baidkunthapur Forest (Table -10.2) as determined by threat received and given. The dominant one took priority during feeding time, displacing or preventing sub-ordinate ones in doing so.

### 10.3.2.1. Dominance Hierarchy :

Dominance hierarchy among the groups in wild populations is complex and varied. Identification of dominance among the 6 groups was based on variation in group movement, strategy of taking possession of food and kind of aggression. Threat behaviour was considered as a key factor in calculating relative social rank of the groups. Number of threat among the groups is summarized in Table - 10.4. Dominance was measured according to the ratio of threat received and given per group. The group with the smallest R-value was considered to be dominant to all other groups. Similarly the group with the largest R-value was the most sub-ordinate one. Thus value of the ratio correlated inversely with social rank. Group E, was the most dominant group ( $R=0.1$ ). While group F, was the least dominant ( $R=6.67$ ). Relative social rank of the groups was also listed in Table 10.4. Group E, was the largest group (50), consisting of 12 males and 20 females . The relative social rank of group F was lowest it also was smallest in size (18), with only 4 males and 8 females . Therefore, group-size and number of adult males and females may play an important role in determining the relative social rank of the group. Vassey (1968) is of opinion that dominance hierarchy among the groups of rhesus, is directly related to group size, whereas, Drickamer (1973) reported that the adult sex ratio has effective role in inter-group dominance. Gabow (1973) reported that presence of larger number of males in a group is an important factor in controlling inter-group dominance hierarchy . Group C, occupied 2nd position among the groups. It had 45 members including 10 adult males and 18 adult females. The R-value of the group was estimated as 0.15 which is close to 0.1 of group, E. Transient reversal of dominance between E and C was found occasionally during the study period. This was probably due to the fact that both the groups were large in group-size and with large number of adult males. Vassey (1968) and Gabow (1973), reported reversal of dominance among groups.

Table - 10.1 : Group size and composition of Basanti Basti group B1 and B2

| Age-sex Class | No. of individuals |    |
|---------------|--------------------|----|
|               | B1                 | B2 |
| Adult Male    | 05                 | 03 |
| Adult Female  | 08                 | 06 |
| Juvenile      | 04                 | 03 |
| Infant        | 05                 | 03 |
| Total         | 22                 | 15 |

Table - 10.2 Group size and composition of Laltong block groups.

| Age-sex Class | Name of the group |    |    |    |    |    |
|---------------|-------------------|----|----|----|----|----|
|               | A                 | B  | C  | D  | E  | F  |
| Adult Male    | 05                | 06 | 10 | 04 | 12 | 04 |
| Adult Female  | 12                | 18 | 18 | 10 | 20 | 08 |
| Juvenile      | 04                | 04 | 07 | 02 | 07 | 02 |
| Infant        | 07                | 08 | 10 | 06 | 11 | 04 |
| Total         | 28                | 36 | 45 | 22 | 50 | 18 |

Table - 10.3 : Ratio of threats received (r) to those given (g) per individuals within the group B1 and B2 of Basanti Basti during feeding time.

| *Group B1                   |  |                           | *Group B2                 |  |                           |
|-----------------------------|--|---------------------------|---------------------------|--|---------------------------|
| Name and number of Animal** | Ratio of threats received/given ***<br>(r/g) | Position within the group | Name and number of Animal | Ratio of threats received/given<br>(r/g) | Position within the group |
| (1)                         | (2)  | (3)                       | (1)                       | (2)                                      | (3)                       |
| M <sub>1</sub>              | 0.04   | 1                         | M <sub>1</sub>            | 0.09                                     | 1                         |
| M <sub>2</sub>              | 0.10   | 2                         | M <sub>2</sub>            | 0.13                                     | 2                         |
| M <sub>3</sub>              | 0.15   | 3                         | M <sub>3</sub>            | 0.25                                     | 3                         |
| M <sub>4</sub>              | 0.21   | 4                         | F <sub>1</sub>            | 0.63                                     | 4                         |
| M <sub>5</sub>              | 0.47   | 6                         | F <sub>2</sub>            | 0.78                                     | 5                         |
| F <sub>1</sub>              | 0.33   | 5                         | F <sub>3</sub>            | 1.10                                     | 6                         |
| F <sub>2</sub>              | 0.55   | 7                         | F <sub>4</sub>            | 1.55                                     | 7                         |
| F <sub>3</sub>              | 0.65   | 8                         | F <sub>5</sub>            | 2.37                                     | 8                         |
| F <sub>4</sub>              | 0.74   | 9                         | F <sub>6</sub>            | 3.47                                     | 11                        |
| F <sub>5</sub>              | 0.90   | 10                        | J <sub>1</sub>            | 2.40                                     | 9                         |
| F <sub>6</sub>              | 1.01   | 11                        | J <sub>2</sub>            | 2.60                                     | 10                        |
| F <sub>7</sub>              | 1.27   | 12                        | J <sub>3</sub>            | 4.76                                     | 12                        |
| F <sub>8</sub>              | 1.57   | 14                        | I <sub>1</sub>            | 5.22                                     | 14                        |
| J <sub>1</sub>              | 1.45   | 13                        | I <sub>2</sub>            | 5.15                                     | 13                        |
| J <sub>2</sub>              | 1.80   | 15                        | I <sub>3</sub>            | 8.22                                     | 15                        |
| J <sub>3</sub>              | 2.76   | 16                        | --                        | --                                       | --                        |
| J <sub>4</sub>              | 5.20   | 17                        | --                        | --                                       | --                        |
| I <sub>1</sub>              | 6.40   | 18                        | --                        | --                                       | --                        |
| I <sub>2</sub>              | 7.07   | 19                        | --                        | --                                       | --                        |
| I <sub>3</sub>              | 8.23   | 20                        | --                        | --                                       | --                        |

Contd....

Table 10.3 Contd.

| Name and number of Animal** | *Group B1                                    |                           | Name and number of Animal | *Group B2                                |                           |
|-----------------------------|--|---------------------------|---------------------------|--|---------------------------|
|                             | Ratio of threats received/given ***<br>(r/g) | Position within the group |                           | Ratio of threats received/given<br>(r/g) | Position within the group |
| I <sub>4</sub>              | 8.88   | 21                        | --                        | --                                       | --                        |
| I <sub>5</sub>              | 9.50   | 22                        | --                        | --                                       | --                        |

\* B1 = Group 1, B2 = Group 2

\*\* M = Adult male, F = Adult female, J = Juvenile and I = Infant.

\*\*\* The value of the ratio correlates inversely with social rank.

Table - 10.4 : Ratio of threats received (r) to those given (g) per group among the groups at Laltong block during feeding period.

| Name of the group | Frequency of threats given | Frequency of threats received | Ratio *R=(r/g) | Position among the groups |
|-------------------|----------------------------|-------------------------------|----------------|---------------------------|
| A                 | 204                        | 535                           | 2.62           | 4                         |
| B                 | 265                        | 306                           | 1.15           | 3                         |
| C                 | 305                        | 56                            | 0.15           | 2                         |
| D                 | 175                        | 665                           | 3.8            | 5                         |
| E                 | 340                        | 34                            | 0.1            | 1                         |
| F                 | 52                         | 348                           | 6.7            | 6                         |

\* The value of the ratio correlates inversely with social rank.

**Plate - 10.1 : Movement of a dominant adult male at feeding zone while two individuals of the same group avoided feeding and carefully watched the dominant.**

**Plate - 10.2 : Two dominant adult males of same group sitting close to the feeding area while at extreme right a lower ranking male carefully watched the two maintaining considerable distance.**

**Plate - 10.3 : Infants and infant accompanied by adult female (red faced) tolerated by two dominant males, extreme right and left at feeding site.**



*Plate – 10.1*



*Plate – 10.2*



*Plate – 10.3*

**Plate-10.4 : Adult female grooms adult male which allowed her infant in front of him, while on the ground.**

**Plate-10.5 : Infant of a lower ranking mother associated with an old ex-dominant male and a peripheral male of a small group at the edged of a river.**



Plate – 10.4



Plate – 10.5