

Tentative Plan and Different Active and Inactive Behaviour in Hanuman Langur, *Semnopithecus entellus* around Jodhpur, Rajasthan (India)

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ABSTRACT: Hanuman langur systematically arranges their activity budget depending upon the availability of food in the habitat. They spend more time feeding in habitats with rich food then resting. Throughout the course of this study, during 2017-18 data suggest that, *Semnopithecus entellus* spent 55.42% of their time as 'active' (feeding, grooming, locomotion, sexual and others) and the remaining 45.19% of their time engaged in 'inactive' behaviours (dozing and monitoring). The annual activity patterns showed that the langur in and around Jodhpur spent 23.77% in monitoring, followed by 23.16% in feeding, 21.42% in dozing, 19.86% in grooming, 9.07% in locomotion and 2.7% time in sexual and others behaviour.

KEYWORDS: *Semnopithecus entellus*, Activity pattern, Behaviour, Bisexual troop

I. INTRODUCTION

Behavioural word use by different researchers for study of primate behaviour. Different researchers coat different definition for define the word. Activity pattern means how much time is spent by langurs for performing certain activities. Activity pattern is a vital part of behaviour in which animal make the activity of daily life, i.e. resting, eating, foraging, travelling and various social activity.

Focusing on animal behaviour in the appropriate social structure will help the determining the management of wildlife animal. By studying the animal behaviour we can better understand what they need and how we achieve. Daily activity pattern in different primate species have been studied earlier in both, wild and in captivity (Lindburg, 1971; Southwick et al., 1982; Malik, 1986; Chalise, 1999). In the present paper we provided data on tentative plan and different behaviour of bisexual troops near Jodhpur Rajasthan.

The Hanuman Langur, *Semnopithecus entellus* (Dufresne, 1797), is the most widely distributed of 19 non-human primate species found in the Indian subcontinent (Roonwal and Mohnot, 1977; Wolfheim, 1983). Social units in common langurs include one male bisexual troops, multi-male bisexual troops and all-male bands. Multi male condition mainly found during residential male replacement. Dominantly unimale bisexual troop and AMB are found in Jodhpur langur population. In the western parts of the habitat in India (i.e. Jodhpur), langur usually forms unimale bisexual troops (Mohnot, 1974). Bisexual troops are commonly matrilineal, with females' residual for life in their natal troops and with males emigrating, usually as juveniles, to join the all-male band.

II. MATERIAL AND METHODS

The study was carried out in three different sites near Jodhpur Rajasthan. The Jodhpur city (altitude 241m, latitude 26° 18'N and longitude 73° 08'E) is situated on the eastern edge of the Great Indian Desert.

The current investigations are the part of a field study on langurs during PhD thesis work. Data collected based on ad libitum and scansampling (Altman, 1974) during 2017-2018. The habitat used by the langurs contains open scrub forest, farms and orchids (Mohnot, 1974). Water is available to all groups throughout the year from man-made water holes as well as natural source. The diet consists of different parts from approximate 190 plant species (Mohnot, 1974). Jodhpur langurs are well habituated, are considered sacred and are never been hunted due to spiritual point of view. They are easy to observe since animals are not shy and spend most of the daytime on the plan ground and trees. Data on different activity pattern in Hanuman langur were collected by using *ad libitum*, scanned and focal animal sampling methods (Altmann, 1974).



III. OBSERVATION AND RESULTS

Tentative Plan of Active during day time

Entellus are usually more active in the early morning time and evening. And less so at noon and in the afternoon. Both on the ground and in trees a favourite resting position is to sit on its sub caudal pods, with the tail hanging limp or stretched on the ground behind, the hind legs stretched out in front and raised, resting on some support. In winter, however, they are comparatively more active at midday and in the afternoon (Ali et al., 2019).

The locomotion activity of langur’s fluctuation base on resource availability. If the availability of food in higher in particular area then locomotion is less in troop and if food is less available then area of fundamental niche in higher as compare to other troops.

Activity pattern of Hanuman langur

Activity pattern means how much time is spent performing certain activities. Activity pattern is an essential part of behaviour in which animal perform the activity of daily life, i.e. resting, eating, foraging, travelling and various social activity.

The observation made day time for observation of various activity pattern of focal group. All behaviors were recorded daily per focal animal for 30 minutes. Incidences of aggression, coalitions, scrounging, and food sharing was recorded continuously; all other behaviors were recorded at 1-min intervals using focal sampling. The percentage of each activity/behavior was obtained as follows:

$$\text{Percentage of activity} = (n1 * 100) / N$$

Where n1 is the number of scans in which each activity was recorded.

N- Total number of sampling.

Percentage of the total activities are calculated for each activity.

Observation made by two broad behavioural categories:-

- (i) Inactive behaviour including resting, alert and sleeping
- (ii) Active Behaviour including locomotion, feeding, grooming and other activity.

Annual distribution of activity

Total time spent by Hanuman langur in inactive behaviour by troop B-01 is 46.21%, troop B-04a is 41.3%, and troop B-06 is 48.09. Duration of time spent by langur in active behaviour by troop B-01 is 53.79%, troop B-04a is 58.7%, and troop B-06 is 51.91 (Table 1 & Figure 1, 2 and 3).

Table 1: Annual distribution of main activities in the bisexual troops of Hanuman langur during 2017-18 (activity mean value)

Broad behavioural categories	Activities	Percentage of total activity (%) for Bisexual troops		
		Troop B-01	Troop B-4a	Troop B-06
Inactive behaviour	Dozing	22.10	19.19	22.99
	Monitoring	24.11	22.11	25.10
Active behaviour	Feeding	22.30	25.10	22.10
	Grooming	20.19	19.10	20.30
	Locomotion	9.00	11.20	7.01
	Sexual and others	2.30	3.30	2.50

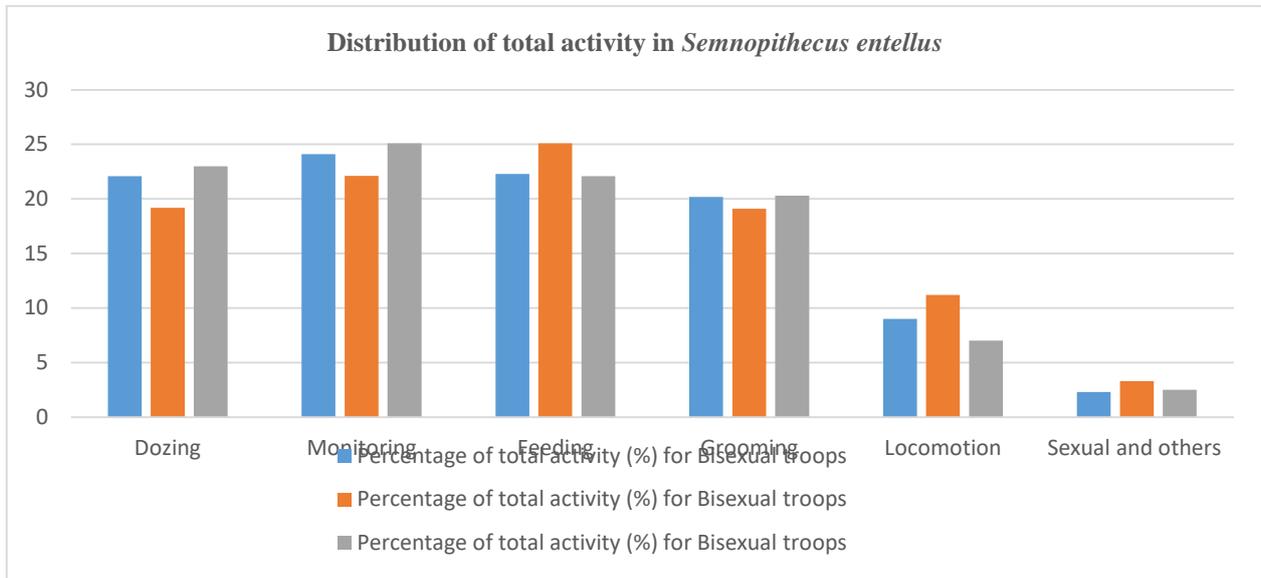


Figure 1: Graph showing the annual distribution of main activities in the bisexual troops of Hanuman langur

Dozing

Time spent in dozing was found highest in troop B-06 (22.99%) followed by troop B-01 (22.10%) and troop B-4a (19.19%).

Monitoring

Time spent in monitoring was found highest in troop B-06 (25.10%) followed by troop B-01(24.11%) and troop B-4a (22.11%).

Feeding

Time spent in feeding was found highest in troop B-04a (25.10%) followed by troop B-01(22.30%) and troop B-06 (22.10%).

Grooming

Time spent in grooming was found highest in troop B-06 (20.30%) followed by troop B-01(20.19%) and troop B-04a (19.10%).

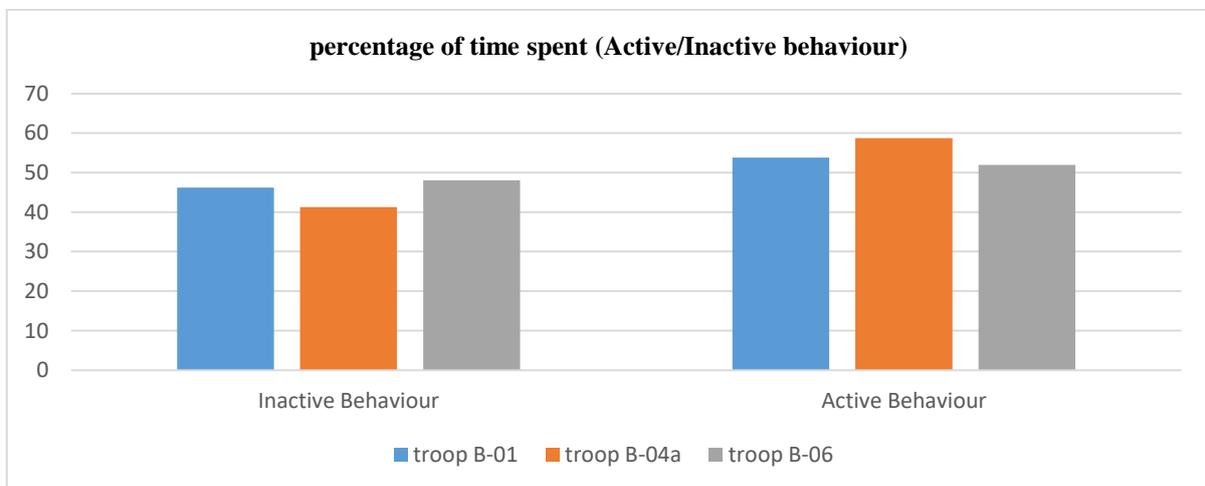


Figure 2: Graph showing the percentage of time spent by *Semnopithecus entellus*

Locomotion

Time spent in Locomotion was found highest in troop B-04a (11.20%) followed by troop B-01 (09.00%) and troop B-06 (07.01%).

Sexual and others

Time spent in sexual and other activities was found highest in troop B-04a (03.30%) followed by troop B-06 (02.50%) and troop B-01 (02.30%).



Figure 3: Different behaviour shows by *Semnopithecus entellus*

IV. DISCUSSION

An assessment of the results obtained in this study with other studies of *Semnopithecus entellus* is difficult because of differences in sampling techniques employed by different researches during a different time. However, it does appear that entellus spend more time about 55.42 % in active behaviour (including 23.16% in feeding, 19.86% in grooming, 9.07% in locomotion and 2.7% in sexual and others) and 45.19% in inactive behaviour (including 21.42% in dozing and 23.77% in monitoring) as found in the present study. Kumawat (2018) found out of total time 20.11% in feeding, 26.29% in dozing, 22.11% in monitoring, 20.19% in grooming, 9.0% in locomotion and 2.30% time in sexual and others activity spent by langurs.

Langurs in the forested environments spend 30 to 60% of their activity in feeding (Yoshiba, 1967). Of the total daily activity, feeding at Simla was 40% (Sugiyama, 1976) and at Singer 30% (Oppenhimer, 1973; 1977).

In *Macaca radiata*, the general pattern appears to be the same as in *Macaca mulatta*. Rahman and Parthasarthy (1969) studied in this species about 50% of the time is spent in sleeping and grooming, 40% in feeding and 10% in locomotion. While daily activity budget of *Presbytis thomasi* of north Sumatrashowed that resting in the most common activity (54 to 66%) followed by feeding (24 to 40%) and movement (6 to 9%). Parallel results were obtained by Post (1981) for yellow baboons, by Harding (1976) and Rose (1977) for *Papio anubis*.

These results suggest that Hanuman langur systematically arrange their activity budget depending upon the availability of food in the habitat. They spend more time feeding in habitats with rich food then resting. In habitats with reduced food availability, they spend more time resting then feeding to maintain the balance between energy demand and energy supply for different activities.

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