Selection of Sleeping Sites by Hanuman Langurs in Chitrakoot Forest Range of Madhya Pradesh, India

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Abstracts: Selection of sleeping sites by Hanuman langurs (Semnopithecus entellus) were studied in Chitrakoot forest range Madhya Pradesh India, from January 2012 to December 2012. For this study we selected three troops (two bisexual and one all male bands). The entire studied troop used large tree species, with have numerous branches straight trunk and dense canopy, for roosting. Total 16 plant species were used by langurs for sleeping site. During rainy and cold season the Hanuman langurs sleep in cave and old heritage building and temple. During rainy and cold season the Hanuman langurs sleep in cave and old heritage building and temple.

Key words: Hanuman langurs, altitude, troops.

1. Introduction

Langurs are leaf-eating, tree-residing, forest-dwelling monkeys. They are regarded as among the most arboreal of all Old World monkeys. They are active throughout the tree canopy and can be found in both primary and secondary forests.

Langurs are one of the most fascinating non-human primates. Besides their importance in the fields of agriculture and medicine, the study of these animals has a close bearing on the understanding of human, social and psychological problems. The non-human primates are represented with 63 genera and about 600 species or subspecies in some 92 countries of the 25 species of these animals recorded from the Indian sub-continent, three, namely, the rhesus macaque (Macaca mulatta), the bonnet macaque (Macaca radiata) and the Hanuman langur (Semnopithecus entellus) have become urbanized (Rajpurohit, 2005). They occupy geographically vast areas and adapt to diverse habitats ranging from thick forest to human-dominated landscapes and thus are considered ‘least concern’ species in India (IUCN, 2003). Recently, habitat loss and degradation through human encroachment, overgrazing, building roads through forests, logging, deforestation, agriculture, fire, unavailability of food, predation by carnivores and attack of several viral and bacterial diseases.

The Hanuman langurs are found in a wide range of habitats from desert edge to rainforest and mountain scrub at 4,000m. Because they are considered sacred there they are found even near urban areas in northern India, they usually only move on the ground when trees are scarce. They forage during the morning and late afternoon. The troop returns to the same sleeping tree every night. They sleep at the ends of branches, where it's hard for a large predator to get at them. Sometimes, they sleep in caves. They spend a lot of time foraging on ground, but prefer sleeping in the trees during night to protect themselves from predators. They produce various sounds like grunting, panting, honking, hiccup, rumbling, coughing etc to communicate and alarm other members.

2. Material and Methods

2.1 Study Area

The study site is situated in the border of Chitrakoot District of U.P. in North and East and partially West; while Majhgawan Range of Satna District of M.P. in South; Barondha Range of Satna District M.P. in West. Chitrakoot is the most historical and religious Hindus place of India, and surrounded by lush green hills of legendary Vindhyachal range. In Chitrakoot have many natural historical caves, streams, lakes and different types of flora & fauna. Therefore the Chitrakoot has been sacred place of worship for sages and hermits since antiquity. The general topography of Chitrakoot is hilly and undulating cut off by numerous reveres and rivulets. Chitrakoot is situated in the close vicinity of the tropic of cancer is land locked, so in this places a typical tropical climate condition occur. In Satna districts there are about 170201.46 hectare forest area, out of them about 34% forest areas in Chitrakoot region. The forest area is Chitrakoot is mainly mixed. In this type of forest most of their trees remain leafless for several weeks in dry season.

2.2 Methods

We used visual focal sampling method to record on sleeping site of hanuman langurs. With the help of direct observation method we identified their sleeping site and trees used by them and made atable in the field. Overall 15 plant species were utilized by Hanuman langurs during the study period. The focal groupperiodically from morning till the timethey settled on specific locations andby recording presence of fresh fecal pellets of langurs under such locations. Each focal group of Hanuman langurs was followed for three consecutive days each month from January 2012 to December 2012. Of the total 125 days, sleeping sites could be identified only on 28 occasions of monitoring official groups from morning till evening. On rest of the days, particularly during monsoon season, the observer lost the sight of focal groups and hence data regarding their sleeping sites could not be obtained. Whether or not the same sleeping site was used for consecutive nights could be discerned on the basis of the amount of faecal patches and characteristics of faecal...
distribution. The geographical location of sleepingsite was determined with hand heldGPS and the height of trees used as ‘sleeping sites’ was measuredwith Hypsometer.

2.3 Study group

Initially, a thorough survey of Chitrakoot forest range was carried out and in all, 14 troops of Hanuman langur (13 Bisexual groups, & 1 all male band) were found. Of these, three groups, i.e., Kamthanath hill troop (S1), Hanumandhara Troop (S2) and Semariya turn Band (S3) were selected for the detailed study. The troops S1 and S2 were ‘multi-male bisexual’ troops while S3 was an ‘all male’ band. These troopshabitated different habitats withinsame range of climate, rainfall, topography, but different in altitude, plantation and with respect to human interference.

Table 1: Location of types of langur troops, habitats used with / without human interference by them, predominant trees and availability of their possible predators in Chitrakoot Forest Range

<table>
<thead>
<tr>
<th>Types of troops &amp; its size</th>
<th>Type of habitat occupied with/without human interference (Altitude (m) Latitude, Longitude)</th>
<th>Dominant tree</th>
<th>Predator presence in the study troop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisexual troop S1 (59)</td>
<td>Forest area having crop land nearby (with Temple and human interference) 190m 80°50’39.3” &amp; 25°10’24.1”</td>
<td>Anogeissus pendula, Mitragyna parvifolia, Ficus benghalensis, Ficus racemosa, Ficus religiosa, Diospyros melanoxylon, Terminalia arjuna, Bauhinia racemosa, Anogeissus latifolia, Pinus roxburghii, Madhuca indica</td>
<td>Dhol, Jakal, Dog</td>
</tr>
<tr>
<td>Bisexual troop S2 (102)</td>
<td>Forest area having crop land nearby (with Temple &amp; human interference) 206m 80°53’0.3” &amp; 25°09’24.1”</td>
<td>Dendrocalamus strictus, Acacia catechu, Boswellia serrata, Madhuca indica, Mangiferina indica, Diospyros melanoxylon, Azadirachta indica</td>
<td>Dhol, Jakal, Dog</td>
</tr>
<tr>
<td>Bisexual troop S2 (102)</td>
<td>Forest area having crop land nearby (with no human interference) 157m 80°50’31.7” &amp; 25°07’31.7”</td>
<td>Acacia nilotica, Indica, Azadirachta indica, Ficus religiosa, Mangiferina indica, Aegle marmelos, Ziziphus mauritiana, Ziziphus nummularia, Ficus benghalensis</td>
<td>Jakal, Dog, Fox</td>
</tr>
</tbody>
</table>

3. Result and Discussion

During the study period, the sleepingsites and plant species used for roosting by Hanuman langurs (Semnopithecus entellus) were recorded. At the evening when sunset, all individuals of each troop would gatheraround the ground and at theonset of darkness, they would climb the trees for sleeping. All the individuals of studied troop used large tree species, with numerous branches straight trunk and dense canopy, for roosting. Total 16 tree species, namely, Mahua (Madhubalangifolia), Neem (Azadirachta indica), Tendu (Diospyros melanoxylon), Bargad (Ficus benghalensis), Aam (Mangiferaindica), Safeda (Eucalyptus globulus), Khair (Acacia catechu), Siris (Albizziadobbe), Jamun (Syzygium cumini), Salai (Boswellia serrata) Imli (Terminalia arjuna), Vilaytibabool (Prosopis julifolia) Cheed (Pinus roxburghii) Peepal (Ficus religiosa) and Umar (Ficus racemosa) were used as sleeping trees (Table 2). To study the table it was show that the Hanuman langurs of different focal troop used different plant species for roosting but it was similar to all troop they used tallest plant species for sleeping. Average height of sleeping tree was 17.3m (range 7-28m). The individuals of a troop usually used one large tree combination of some high trees and 2-3 small trees close to each other. This combination play an important role in protection of the troop during attack by predator as the langurs can jump from one branch to another branch and thus protect itself from natural predator. During rainy and cold season the Hanuman langurs sleep in cave and old heritage building and temple. It is possible that variation in microclimate affect choice of sleeping sites in langurs. Strong wind also disturb them. The sleeping trees of Hanuman langurs were well protected from strong wind and that changes in wind direction could influence choice of sleeping site. During summer months, the langurs ‘used to sleep on high trees to avoid the excessive heat during the months of May and June. In present investigation it was observed that the Hanuman langur’s troop of Kamthanath hills selected the same tree for 5 nights of observation. Many factors influence the selection of sleeping site by Hanuman langurs such as protection from predators, accessibility to food and water sources, physical comfort in terms of shelter from cold wind and rain, avoidance of biting insects, parasite avoidance and human disturbance. In Kamthanath hill (S1) and Hanumandhara (S2) langurs troop during rainy season used tree near temple or in which place where permanent shelter constructed. At the time of crop harvesting, S3 troop living in the vicinity of crop fields, shifted to the trees near the crops fields to raitthem for food. When chased by the farmers and their pet dogs, the individuals repeatedly reverted to the roosting sites. During extreme hot weather it was observed that all study troopshopped to the trees around

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natural or man-made water sources. It was concluded that the Hanuman langurs usually changed our sleeping site due to the disturbance by the predators and human being.

Table 2: Sleeping sites, sleeping trees and their heights for the three focal troops in Chitrakoot forest range

<table>
<thead>
<tr>
<th>Types of troop</th>
<th>Sleeping site</th>
<th>No. of trees in sleepingsite</th>
<th>Plant Species used as sleepingsites</th>
<th>Approximate height of trees/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kmantanahills (S1) Troop</td>
<td>A</td>
<td>3</td>
<td>Anogeissuspendulafolia, Anogeissuslatifolius, Ficusbenghalensis</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>3</td>
<td>Mitragnopyramifolia, Madhuacangifolia, Ficusreligiosa</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>2</td>
<td>Ficusracemosa, Tamaramindisinda,</td>
<td>13</td>
</tr>
<tr>
<td>Hanuman--ndhara Troop(S2)</td>
<td>D</td>
<td>3</td>
<td>Mangiferaindica, Azadirachta indica, Diospyromelanoxylon</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>3</td>
<td>Boswelliaserrata, Acacia catechu,</td>
<td>13</td>
</tr>
<tr>
<td>Semariyaturm Troop (S3) AMB</td>
<td>F</td>
<td>2</td>
<td>Ficus benghalensis, Mangiferaindica, Ziziphusnummularia</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>2</td>
<td>Azadirachta indica,</td>
<td>12</td>
</tr>
</tbody>
</table>

Ramakrishnan and Coss (2001) also observed that Bonnet macaqueands Hanuman langurs preferentially selected sleeping trees close to human settlements to reduce the risk of nighttime attacks from predators that tend to avoid humans but Nilgiri Langurs did not appear to choose sleeping sites close to human settlement. Similar observation found in present study in case of Hanuman langurs.

Chhangani and Mohnot (2006) observed that temporary shifts in sleeping sites of hanuman langurs near to crops fields to raid mature crops in Rajasthan. In present study it was also observed that at the time of crop harvesting, S3 troop living in the vicinity of crop fields, shifted to the trees near the crops fields to raid them for food.


Chhangani and Mohnot (2006) also have observed temporary shifts in sleeping sites of hanuman langurs near to crops fields to raid mature crops in Rajasthan.


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