Utilization of forest flora by Phayre’s Leaf-Monkey

Trachypithecus phayrei (Primates: Cercopithecidae) in semi-evergreen forests of Bangladesh

M.A. Aziz 1 & M.M. Feeroz 2

1 Lecturer, Department of Zoology, Jahangirnagar University, Savar, Dhaka 1342, Bangladesh
2 Professor, Department of Zoology, Jahangirnagar University, Savar, Dhaka 1342, Bangladesh
Email: 1 wildsamaa@yahoo.com; 2 feerozmm@yahoo.com

Date of online publication 26 May 2009
ISSN 0974-7907 (online) | 0974-7893 (print)
Editor: Mewa Singh

Manuscript details:
Ms # c1868
Received 09 October 2007
Final received 13 November 2008
Finally accepted 01 May 2009


Copyright: © M.A. Aziz & M.M. Feeroz 2009. Creative Commons Attribution 3.0 Unported License. JoTT allows unrestricted use of this article in any medium for non-profit purposes, reproduction and distribution by providing adequate credit to the authors and the source of publication.

Author Details: MOHAMMAD ABDUL AZIZ is currently teaching students, undertaking and supervising various research activities. With background training in Wildlife Biology, his research endeavor includes human-wildlife interactions, bidirectional zoonotic disease transmission, mammalian ecology and conservation, sustainable protected area management approaches, etc. MOHAMED MOSTAFA FEEROZ PhD is currently teaching students and developing, coordinating, and collaborating research design and activities with different educational and research institutions at home and abroad. His current research interest includes bidirectional zoonotic disease transmission, primate population genetics, ecology and conservation, avian influenza transmission and sustainable livelihood and protected area management.

Author Contribution: MAA conducted research in the field, analyzed data and wrote the manuscript. MMF helped design the study and provided necessary suggestions during manuscript preparation and write up.

Acknowledgments: Jahangirnagar University Authority awarded a research scholarship for the study. Department of Forest, Government of Bangladesh provided permission and necessary help during the study. Authors acknowledge their generous help. Wildlife Rescue Centre provided some logistical help.

Abstract: Trachypithecus phayrei was observed to use 29 floral species belonging to 14 plant taxa for feeding, resting and sleeping in the semi-evergreen forest of Bangladesh. Principal food items were young and mature leaves (47%), shoots (19%), flowers and buds (16%), fruits and seeds (14%) and petioles (4%). T. phayrei preferred leaves in December (76%), fruits and seeds in June (57%) and flowers and buds in April (41%), respective lowest preferences were in April (49%), February (10%), and January (9%). There were two feeding peaks: early morning (0600-0800 hr) and late afternoon (1400-1600 hr). The studied group of T. phayrei divided into sub-troops during foraging and feeding.

Keywords: Bangladesh, forest flora, Lawachara National Park, utilization, Trachypithecus phayrei.

INTRODUCTION

Phayre’s leaf-Monkey Trachypithecus phayrei (Blyth 1847) is one of the three colobids found in Bangladesh. It is also found in Myanmar, China, India, Thailand, and Vietnam (Roonwal & Mohnot 1977; Gupta & Kumar 1994; Ruggeri & Timmins 1995/1996; Srivastava 1999). In Bangladesh, it is found in semi-evergreen and semi-deciduous forests (Gittins & Akonda 1982; Feeroz et al. 1995a; Feeroz 1999). Detailed studies have been conducted on various aspects of biology of this species in India (Mukherjee 1982; Choudhury 1987, 1988, 1994, 1996; Gupta & Kumar 1994; Raman et al. 1995; Srivastava 1999), Vietnam (Nisbett & Cicohon 1993), Laos (Ruggeri & Timmins 1995/1996), China (MacKinnon & MacKinnon 1987; Xu & Tang 1990; Ye et al. 1989; Yuan et al. 1990) and in some parts of South Asia (Roonwal & Mohnot 1977). In Bangladesh, several studies have been carried out on other available primate species found in Lawachara National Park (Feeroz 1991, 1999, 2001; Kabir 1991; Feeroz & Islam 1992; Feeroz et al. 1994; Alshon 1994, 2000; Hasan et al. 2005) as well as other areas of the country (Akonda 1979; Khan 1981; Islam & Husain 1982). However, as yet no ecological study has been carried out on this critically endangered species. The present study was taken up to explore the utilization of forest flora by T. phayrei in Lawachara National Park, Bangladesh.

Methods

The study was conducted between September 2005 and June 2006 in Lawachara National Park (LNP), Bangladesh using the focal animal sampling method, as used by Altman (1974), Werschkul (1979, 1982), Begum (2000) and Sultana et al. (2004). An individual of T. phayrei was followed throughout the day from dawn to dusk. When the animal was observed to eat parts of any plant species, the name and eaten parts were recorded. The plant parts used by the animal were categorized and recorded as mature and young leaves, shoots, flowers and buds, mature or ripe fruits, unripe or green fruits, seeds and pods, and petioles. Proportion of time spent on feeding of each food item was used to calculate the percentage of food items eaten at different hours of the day. The plant species used by the animal were also ranked on the basis of their categorical uses (feeding, resting, sleeping) and access to food sources in the respective study period (food availability in the studied months).

Study area: Lawachara National Park, a part of the West Bhanugach Forest Reserve, is located approximately 160 km northeast of Dhaka and 60 km south of the city of Sylhet in the civil administrative units of Kamalgonj Police Station and Maulivibazar District of Sylhet Forest Division. It lies in the Bio-ecological zone of 9h-Sylhet Hills (Nishat et al. 2002). The park is situated within 24°03′00″-24°03′22″N & 91°03′27″-91°03′59″E.
Utilization of forest flora by *Trachypithecus phayrei*

M.A. Aziz & M.M. Feeroz

---

**Image 1.** *Trachypithecus phayrei* sitting on *Artocarpus chaplasha* at Lawachara National Park

**Image 2.** *Trachypithecus phayrei* feeding on *Albizia lebeck* at Lawachara National Park
The current notified area of the park covers an area of 1250 hectares and proposed area includes 281 hectares of West Bhanugach Reserved Forest (FSP, 2000a). The forest type in this region is semi-evergreen (Craig 1991). The floral diversity in the area includes 89 species of plants (Feeroz 1999; 107 species were recorded by Leech & Ali 1997). The canopy height varies from 10 to 30 metres (Ahsan 1995; Feeroz 1999). The top canopy comprises mainly Tectona sp., Artocarpus chaplasha, Tetrameles sp., Hopea odorata, Toona ciliata, Pygnum sp, the second canopy primarily includes Quercus spp., Syzygium spp., Gmelina arborea, Dillenia pentagna, Grewia cowa, Ficus spp. and the underneath is comprised mainly of Bambusa spp., Alsophila sp., Geodorum sp., Eupatorium odoratum with several ferns and epiphytes (Feeroz & Islam 1992, 2000). The average tree density was recorded as 271 trees/ha with average species diversity 11.2 species/ha (Feeroz 1999). Average maximum temperature (33.6°C) was recorded in March and average minimum temperature of 10°C was recorded in January. The highest rainfall (456mm) was recorded in June during the study period.

**Results**

**Food plants:** *T. phayrei* consumed a variety of plant species as its food during the study period. It obtained food from 29 plant species in 14 botanical families. Among the recorded plant taxa, Leguminosae and Moraceae provided the highest proportion (32%) of their food plants. The Graminae provided mostly the leaves and shoots while the Leguminosae provided flowers, pods, leaves, and seeds. Ranking analysis revealed that plant species of Leguminosae and Graminae ranked top in high usage category while most of fruit trees were used moderately.

**Diet composition:** The study revealed that young and mature leaves along with shoots provided the highest portion (47%) of diet followed by flowers and buds (19%), and fruits and seeds (14%; Fig. 1). The flowers and buds of two leguminous species, *Albizia procera* and *A. chinensis* provided a large amount of food during April (30%). The young and mature leaves along with shoots of *Melocanna baccifera, M. bambusoides, Bambusa tulda, Toona ciliata, Chickrassia tabularis, Mikania corda, Gmelina arborea, Tectona grandis, Terminalia catappa* and *Acacia mangium* provided supplemental food throughout the study period.

### Table 1. Plants species used by *Trachypithecus phayrei*

<table>
<thead>
<tr>
<th>Species</th>
<th>Local name</th>
<th>Family</th>
<th>Plant parts eaten*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia auriculiformis</td>
<td>Akashmoni</td>
<td>Leguminosae</td>
<td>ml, yl</td>
</tr>
<tr>
<td>Acacia mangium</td>
<td>Akashmoni</td>
<td>Leguminosae</td>
<td>ml, yl</td>
</tr>
<tr>
<td>Albizia chinensis</td>
<td>Shirish</td>
<td>Leguminosae</td>
<td>fl, pl, sd</td>
</tr>
<tr>
<td>Albizia procera</td>
<td>Sil Koroi</td>
<td>Leguminosae</td>
<td>fl, pl</td>
</tr>
<tr>
<td>Anacardium occidentale</td>
<td>—</td>
<td>Anacardiaceae</td>
<td>—</td>
</tr>
<tr>
<td>Artocarpus chaplasha</td>
<td>Chapalish</td>
<td>Moraceae</td>
<td>yf, bd</td>
</tr>
<tr>
<td>Artocarpus heterophylla</td>
<td>Kathal</td>
<td>Moraceae</td>
<td>bd, ml</td>
</tr>
<tr>
<td>Artocarpus lakoocha</td>
<td>Deowa</td>
<td>Moraceae</td>
<td>yf, bd</td>
</tr>
<tr>
<td>Bambusa tulda</td>
<td>Miltinga</td>
<td>Graminae</td>
<td>yl, ml, sh</td>
</tr>
<tr>
<td>Chitravasia tabularis</td>
<td>Chickrass</td>
<td>Meliaceae</td>
<td>yl, sh</td>
</tr>
<tr>
<td>Clerodendrum sp.</td>
<td>—</td>
<td>Verbenaceae</td>
<td>pl</td>
</tr>
<tr>
<td>Dillenia indica</td>
<td>Chalta</td>
<td>Dilleniaceae</td>
<td>pl</td>
</tr>
<tr>
<td>Dillenia pentagna</td>
<td>Hargoja</td>
<td>Dilleniaceae</td>
<td>pl</td>
</tr>
<tr>
<td>Dioscorea bulbifera</td>
<td>Chupri alu</td>
<td>Dioscoreaceae</td>
<td>yl, sh</td>
</tr>
<tr>
<td>Ficus hispida</td>
<td>Kaakdumur</td>
<td>Moraceae</td>
<td>yf</td>
</tr>
<tr>
<td>Ficus benjamina</td>
<td>Chuta Dumur</td>
<td>Moraceae</td>
<td>yf</td>
</tr>
<tr>
<td>Ficus racemosa</td>
<td>Bot</td>
<td>Moraceae</td>
<td>yf</td>
</tr>
<tr>
<td>Garcinia cowa</td>
<td>Kao</td>
<td>Guttifereae</td>
<td>yf, bd</td>
</tr>
<tr>
<td>Gmelina arborea</td>
<td>Gamari</td>
<td>Verbenaceae</td>
<td>bd</td>
</tr>
<tr>
<td>Mangifera sylvestica</td>
<td>Uriam</td>
<td>Anacardiaceae</td>
<td>yf, bd</td>
</tr>
<tr>
<td>Melocana baccifera</td>
<td>Tenga muli</td>
<td>Graminae</td>
<td>yl, sh</td>
</tr>
<tr>
<td>Melocanna bambusoides</td>
<td>Jhai bansh</td>
<td>Graminae</td>
<td>yl, sh</td>
</tr>
<tr>
<td>Mikania cordata</td>
<td>Taralata</td>
<td>Compositae</td>
<td>yl, sh</td>
</tr>
<tr>
<td>Syzygium fructicosa</td>
<td>Khuji jam</td>
<td>Myrtaceae</td>
<td>yl, ml, rf, yf</td>
</tr>
<tr>
<td>Syzygium cumini</td>
<td>Jam</td>
<td>Myrtaceae</td>
<td>yf, rf</td>
</tr>
<tr>
<td>Syzygium grande</td>
<td>Banjam</td>
<td>Myrtaceae</td>
<td>yf, rf</td>
</tr>
<tr>
<td>Tectona grandis</td>
<td>Segun</td>
<td>Verbenaceae</td>
<td>yl, ml, sh</td>
</tr>
<tr>
<td>Terminalia catappa</td>
<td>Kat badam</td>
<td>Combretaceae</td>
<td>yl, ml, sh</td>
</tr>
<tr>
<td>Toona ciliata</td>
<td>Rangi</td>
<td>Meliaceae</td>
<td>yl, ml</td>
</tr>
</tbody>
</table>

* yl - young leaves; ml - mature leaves; yf - young fruits; rf - ripe fruits; sh - shoots; bd - buds; pl - petioles

![Figure 1. Diet composition of *Trachypithecus phayrei*](image-url)
Utilization of forest flora by Trachypithecus phayrei

M.A. Aziz & M.M. Feeroz

Figure 2. Monthly variation of feeding of Trachypithecus phayrei

Figure 3. Diurnal variation of feeding and foraging of Trachypithecus phayrei
Use of forest flora by Trachypithecus phayrei and Acacia chinensis for further challenges to their survival. Disturbances created by tourist activities, plantation crops pose a threat to this and other primate species. The survival of this species depends on the continued availability of shoots, petioles, leaves, flowers and buds. Some plant species used several plant species for resting purposes during daytime (Table 1). They selected resting plants with extensive shoots, petioles, leaves, flowers and buds. Some plant species provide food throughout the year, others are seasonal. Thus, survival of this species depends on the continued availability of food trees, and replacement of indigenous flora with exotic plants poses a threat to this and other primate species. Disturbances created by tourist activities, plantation encroachment, trains and motor vehicles passing through the park provide new challenges to their survival.

References


Bose, J. & P.C. Bhattacharjee (2002). Behavioural profile of a troop of Phayre’s leaf monkey (Trachypithecus phayrei) in a fragmented and disturbed habitat, northeast India. (abstract) XIX Congress of the International Primatological Society, Beijing, China, 0287.


