A study on active and passive behavioural pattern of Macaca silenus (Lion Tailed Macaque) on and off display in Aringnar Anna Zoological Park

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Abstract

Behaviour is the range of actions and mannerisms made by individuals in conjunction with themselves or their environment, which includes the other systems or organisms around as well as the physical environment. Studying the behaviours of the Lion-tailed macaque (LTM) is especially pertinent because it is highly endangered. Of worlds 21 species of Macaques, lion-tailed macaques (Macaca silenus) are one among the most rare species. The Lion-tailed macaque (Macaca silenus) is a flagship species for the many endemic and threatened animal of the Western Ghats, Southern India, and a high priority species in captive propagation. Focal-animal sampling technique was adopted for recording the Active and Passive behaviour of LTM. The following behavioural observations in relation to time spent on Active (Moving, Social, Grooming, Foraging) and Passive (Resting or Sleeping and Sitting Simply) preference are studied with the aim to assess the diurnal active time spent on behavioural patterns of capped lion-tailed macaques. Of 340 hrs of observation (170x2), 170 hrs for On-display and 170 hrs for Off-display were observed. The On-display M. silenus young male totally spent 136 hrs for active and 34 hrs for passive behaviour, the adult male totally spent 109 hrs for active behaviour and 61 hrs for passive behaviour and the older male spent 64 hrs for active and 106 hrs for passive behaviour. The On-display M. silenus young female totally spent 123 hrs for active and 47 hrs for passive behaviour, the adult female totally spent 99 hrs for active behaviour and 71 hrs for passive behaviour and the older female spent 58 hrs for active behaviour and 112 hrs for passive behaviour. The Off-display M. silenus young male totally spent 127 hrs for active and 43 hrs for passive behaviour, the adult male totally spent 97 hrs for active behaviour and 73 hrs for passive behaviour and the older male spent 61 hrs for active and 109 hrs for passive behaviour. The Off-display M. silenus young female totally spent 119 hrs for active and 51 hrs for passive behaviour, the adult female totally spent 91 hrs for active behaviour and 79 hrs for passive behaviour and the older female spent 56 hrs for active behaviour and 114 hrs for passive behaviour.

Key words: LTM, Active and Passive behaviour in LTM, Macaca silenus, AAZP.

INTRODUCTION

The Lion-tailed Macaque or the wanderoo, is an Old World monkey. The Macaca silenus is also commonly known as Lion-tailed Macaque. The Macaca silenus are the smallest and most endangered of the macaque species of the monkey [1]. Presently it is estimated that 3000 to 4000 LTM survive in the wild in the three South Indian states of Kerala, Karnataka and Tamil Nadu. The coat is shiny and black apart from an impressive mane of grey hair framing the face [2]. Face is furless and black in colour. Small tuft of hair at the end of the tail (Animal Diversity Web March, 2003) like a Lion and hence the name.

The Lion-tailed macaques are omnivores. They feed on fruits, flowers, young leaves, buds, even fungi and insects [3]. Most of their time is spent in exploring and gathering food. Males have large and prominent canines than female. Cheeks are like pouches to carry food (Animal Diversity Web March,
In the wild, food is highly dispersed and many food items require processing, which makes foraging very time consuming. Individuals are highly dispersed during foraging [4-8]. Lion-tailed macaques are polygynous. Groups typically contain one male and several females and juveniles. In group behaviour, it is much like other macaques; it lives in hierarchical groups of usually 4 to 30 animals [9] and [10], which consist of few males and many females. Sex determination is difficult among the LTM.

Females can produce their first offspring around the age of about 80 months in the wild and 48 months in captivity [11-12]. Male LTM reach maturity at different ages, till late at 8 years of age and females attain maturity at 5 years of age. The IUCN Red List ranks the lion-tailed macaque (Macaca silenus) as Endangered [13]. It is protected under Indian Wildlife protection act, 1972 (SCHEDULE – I: Rare and endangered species which are totally protected).

METHODS AND MATERIALS
In the present study the behavioural pattern of M. silenus (On and Off-display) was conducted in Aringnar Anna Zoological Park (AAZP), India. The Arignar Anna Zoological Park, also called as the Vandalur Zoo is situated in Vandalur, a suburban town, which is 31 kilometres away from the City of Chennai. The zoo was founded in Chennai in 1855 and was recognized by the Central Zoo Authority of India as the first public zoo in India. It is affiliated with the Central Zoo of India. It is spread over an area of 1,490 acres and is the largest zoological garden in India.

The observation of active and passive behaviour of Macaque silenus at AAZP was surveyed for a period of 3 months (i.e. from the Month of 8th November to the month of 8th February). During the month of November and December the Active and Passive behaviour of On-display LTM were observed. During the month of January and February the Active and Passive behaviour of Off-display LTM were observed. The observation period ranges from 10:00 a.m. to 05:00 p.m. for about (7 hours) in weekends and 1:00 p.m. to 05:00 p.m. (4 hours) in week days. The observation of Active and Passive behaviour of the animal in On and Off display were recorded.

The Active (Moving, Social, Grooming and Foraging) and Passive (Resting/Sleeping and Sitting simply) behaviour of the animal in On and Off display were accomplished.

The On-display troop was composed of 4 males, 3 females and 2 young ones (Table-1). The Off-display troop composed of 7 males, 6 females and 3 young ones (Table-1). The On-display troops were considered as Group-1 and Off-display troops were considered as Group-2.

Fig 2,3,4 and 5 shows the Population for each groups during On and Off display.

### Table 1. The population of adults, sub-adults, juveniles and infant Macaca silenus, in on and off display in AAZP

<table>
<thead>
<tr>
<th>Group</th>
<th>Adult</th>
<th>Sub-adult</th>
<th>Juvenile</th>
<th>Infant (Sex undetermined)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>On display group-1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Off display group-2</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>-</td>
<td>16</td>
</tr>
</tbody>
</table>

*AAZP – Aringnar Anna Zoological park*

RESULTS
The overall behaviour of M.silenus is classified into two, namely Active and Passive behaviour. The active behaviour includes Moving, Grooming, foraging (searching for food), and Social behaviour (interacting with others). The passive behavior includes Resting and Sitting simply.

ACTIVE BEHAVIOUR (MALE)
In the present study it has been inferred that the On-display (Group-1) young males found to be more active than the adult and older macaques. The young ones (male) remain active for about 136 hours, whereas the adult macaques remain active for about 109 hours and the older LTM remain active for about 64 hours (Table-2, fig.6).
The Off-display (Group-2) young male LTM found to be active for about 127 hours whereas the adult macaques remain active for about 97 hours and the older (male) LTM remain active for about 61 hours. This shows that the older Macaques exhibits minimum time in active behaviour than the young and adult macaques (Table-2, Fig.6). The different age group of macaques spend their maximum time in different activities.

ACTIVE BEHAVIOUR (FEMALE)
Among the On-display (Group-1) females, young ones remain active for about 123 hours, whereas the adults remain active for about 99 hours and the older LTM remain active for about 58 hours (Table-2, figure-7).

The Off-display young female LTM found to be active for about 119 hours whereas the adults remain active for about 91 hours and the older LTM remain active for about 56 hours. This reflects that the males are found to be more alive or effective than the females (Table-2, figure-7). The passive behaviour includes Resting/Sleeping and Sitting simply.

PASSIVE BEHAVIOUR (MALE)
In the present study it has been inferred that the On-display (Group-1) older males found to be more passive than the young and the adult macaques. The young ones remain passive for about 34 hours, whereas the adult LTM remain passive for about 61 hours and the older (male) LTM remain passive for about 106 hours (Table-2, figure-8).

The Off-display (Group-2) young male LTM found to be passive for about 43 hours whereas the adult LTM remain passive for about 73 hours and the older (male) LTM remain passive for about 109 hours. This shows that the older macaques exhibit maximum time in passive behaviour than the young and adult macaques (Table-2, figure-8).

Table 2. Active and Passive behaviour of Macaca silenus (LTM) on-display and off-display in hours

<table>
<thead>
<tr>
<th>BEHAVIOUR</th>
<th>MALE (Hrs)</th>
<th>FEMALE (Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YOUNG</td>
<td>ADULT</td>
</tr>
<tr>
<td>Active Behaviour On-display</td>
<td>136</td>
<td>109</td>
</tr>
<tr>
<td>Active Behaviour Off-display</td>
<td>127</td>
<td>97</td>
</tr>
<tr>
<td>Passive Behaviour On-display</td>
<td>34</td>
<td>61</td>
</tr>
<tr>
<td>Passive Behaviour Off-display</td>
<td>43</td>
<td>73</td>
</tr>
</tbody>
</table>

Fig 1. Experimental animal (LTM) location map in AAZP

Fig 2. Population of adult Macaca silenus, on and off display in AAZP
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Fig 3. Population of sub adult Macaca silenus, on and off display in AAZP

Sub-adult Population

Fig 4. Population of juvenile Macaca silenus, on and off display in AAZP

Fig 5. Population of infant (sex undetermined) Macaca silenus, on and off display in AAZP

Infant (Sex Undetermined)

Fig 6. Active behaviour in males (hrs) during on and off display

Fig 7. Active behaviour in females (hrs) during on and off display

Fig 8. Passive behaviour in males (hrs) during on and off display
DISCUSSION

According to Chalmers, 1979 [14], primates are social animals and most of them interact with each other[15]. Primates attract attention of many researchers because they are closely related to human in terms of human social behaviour. Studies have shown that primate active behaviour is more or less similar to human behaviour such as eating, playing, fighting, keeping the baby and so on [16]. The current investigation that have been carried out in lion-tailed macaques provides sample information regarding their active and passive etiquette pattern in both On and Off-display Macaques. The On-display young male macaque executed their maximum time to perform active behaviour (136 hrs), when compared to the older males (64 hrs), similarly the female young LTMs remains active for about (123 hrs) when compared to the older females (58 hrs). In case of the Off-display the same trend has been followed. The young males spend (127 hrs) for active behaviour and the older males spend (61 hrs), whereas the Off-display females, the young ones shared (119 hrs) and the older females shared (56 hrs) in active behaviour. The current study coincides with the work carried out by Kipper and Todt, 2002.

The On-display young male macaque implemented their minimum time to perform passive behaviour (34 hrs), when compared the older males (106 hrs) similarly the female young LTMs remains passive for about(47 hrs) when compared to the older females (112 hrs). In case of the Off-display the same trend has been followed. The young males spend (43 hrs) for passive behaviour and the older males spend (109 hrs), whereas the Off-display females, the young ones shared (51 hrs) and the older females shared (114 hrs) in passive behaviour the time consumed by LTMs is considerably increased in older and adults. The expression of such result may be due to the fluctuations in temperature. In India November to January considered to be the colder months, as the temperature is dropped and the study area ambience is chill so the older LTMs preferred passive behavioural pattern than active. This behavioural change is also recorded by Jaman and Huffman, 2008 [17].

This study is important in order to understand clearly the daily activity budgets of macaques in the study area which can leads to the effective management and conservation of this species in the future.

CONCLUSION

The manual dexterity (active and passive behaviour) of primates helps us to understand their social relationship with intra-group members and inter-group members, moreover this social grooming behaviour is adopted as a tool to manipulate their survival pattern and to attract the opposite sex for reproduction. The current study has thrown light on the On and Off-display behaviour of Macaque. The present study reveals that the On-display LTMs were found to be more aggressive and able to understand most of the human sings than the Off-display LTMs.

In conclusion, active behaviour is recorded as the most common affinitive behaviour in Macaque silenus. This behaviour helps the individual to established a cohesive relationship among the members.
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The active behaviour maintains group integrity and personal relationships between LTMs. The passive behaviour is also an essential tool expressed in LTMs to save their energy whenever needed under crucial conditions. Unlike other macaques, it avoids humans. The lion-tailed macaque has become endangered mainly because of the loss of habitat and poaching.

The current study has thrown light on the behavioral difference between On-display and Off display Macaques (LTM) and also it paves way for conserving the Lion Tailed Macaque.

REFERENCE
11. Lindburg DG, Lyles AM and Czekala NM. Status and reproductive potential of Lion-tailed Macaques in captivity. Zoo Biology (Supplement), 1989, 8(S1), 5-16.