

# Age-sex composition based Population status of rhesus macaque (*Macaca mulatta*) in Chitrakoot, India

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## Abstract

The present study deal with the population Status of rhesus macaque (*Macaca mulatta*) in Chitrakoot area. Population status of *Macaca mulatta* estimated in twenty five troops of Chitrakoot on the basis of ecological condition and the presence of rhesus monkey. The study survey was conducted on March 2016 to February 2018 with season wise and age sex composition of troops. The age-sex composition terms defined the different age and gender of monkey, i.e., infant, juvenile stage of monkey and adult stage of male and female. In twenty five Selected Sites there were total 2312 rhesus macaque were noted. The maximum population were well-known on Satianusuiya temple and minimum record on Hanumandhara.

## Keywords

Biodiversity, Troops, Threatened, Rhesus, Population, Conservation.

## Introduction

India has a broad range of biodiversity, and biodiversity of India support variety and distribution of flora and fauna. *Macaca mulatta* is the species of old world primates and 15 variety of monkey found in India. It's sorted as lowest concern in the red data book of endangered species. In the list of wild life protection act rhesus monkey is protected by schema III (Imam, E. *et al.* 2013). Surya Kant *et al.* 2018 worked on the census study of Rhesus (*Macaca mulatta*) in Chitrakoot, India. Rhesus macaques are found in various habitats i.e. in grass land to arid, deciduous, mixed-deciduous and temperate forest as well as in mangroove marsh, and tropical forest, but also close to human Settlement. It's found at the elevation of 2000m. Fur colour is the identification features of their categorization. Rhesus macaque has black or brown colour fur and face rumps are pink and it's gestation Period is an average of 164 days and adult female gives birth to single newborn or twins newborns. Its tail length between 20.6 to 22.9 C.m., and weight of adult male is 7 to 9 kg and adult female weight 5 to 8 kg. According to Sultana, R. (2012). reported State and Distribution of Rhesus, *Macaca mulatta* in

Metropolitan Dhaka City and the population study of Rhesus macaques and investigation of their distribution is very significant. According to Southwick *et al.* 1994.



### Zoological Classification

Kingdom -Animalia

Phylum -Chordata

Class - Mammalia

Order- Primates

Family - Cercopithecidae

Genus - *Macaca*

Species - *M. mulatta*

Rhesus macaque is a quotidian species of India, which occurs in various habitats, occupying terrestrial and arboreal and inhabits the Rajasthan deserts, agricultural region of the Ganga basin, Southeastern tropical forest, and the Himalayan temperate forest. In Chitrakoot region it is mostly found near of temple because Chitrakoot is a religious place of India, and rhesus monkey also inhabits, roadside, riverside, forest and habitat near human settlement.

### Study area

The study area Chitrakoot is located in the southern area of Satna district of Madhya Pradesh and northern part of the Karwi district of Uttar Pradesh and it is situated on 80°51' 25.416 " E longitude and 25°9' 4.026" N latitude. Chitrakoot consists of many wonder hills and falls in the north Vindhya mountain and holy river Mandakini. Chitrakoot is famous for its beautiful chronological caves, hill ranges, streams and various flora and fauna. The total area of study is 17.803 hectare, and all troops of rhesus macaques found on 147 meter altitude of study area. The Drainage System of Study area is exhausted through some river like Chakra, Jhuri, Valmiki, Jhuri, Gunta, Gedua and Mandakini river. In Chitrakoot area Limestone, Ochre, Sandstone, bauxite minerals are restrained by hill ranges. The survey was conducted on twenty five troops of Chitrakoot, that area was Raghuveer Mandir(S1), Jankikund Hospital(S2), Pramodvan(S3), Arogyadham(S4), Hanumandhaara(S5), Satiansuiya(S6), Guptgodavari(S7), Sphatikshila(S8), Siyaramkuteer(S9), KaamtanathMukhyadwaar(S10), SecondMukharbind(S11), Shabriashram(S12), SeetaramBaaba(S13), Tulsidas(S14), Brijakund(S15), RestingHanuman(S16), Suragau(S17), ThirdMukharbind(S18), Barha(S19), Peelikothi(S20), Saryudhara(S21), Kaamadvaatika(S22), Biharimandir(S23), Sakshigopal(S24) and Ramghat(S25), and this study period was surveyed for two years from March 2016 to February 2018.

## Methodology

Population Survey estimated on 25 free ranging rhesus macaque troops, which inhabiting temple, roadside, riverside, village, forest habitat and human settlement areas of the Chitrakoot. Census of all rhesus groups was carried out by visual inspection of the entire area facilitated. To categorize the troops of rhesus applied pilot survey method with the help of map. This study investigated the group composition and field study of rhesus macaque for two years from March 2016 to February 2018. At each site special consideration to made whole count of Rhesus group sizes and age-sex composition as per Seth, 1986. Study was noted with the age wise stage and gender of rhesus macaque, that were infant, juvenile, adult male and adult female. The rhesus macaques were counted from early morning 5.30 am to 8am and from 3.30 pm to 6pm, in the evening. The population count of rhesus were continual for three times to decrease the fault element. Group Size of rhesus also noted with the resting, Sleeping and Feeding behaviour on Various types of tree Species i.e., Bargad (*Ficus benghalensis*), Jaamun (*Syzygium cumini*), Neem (*Azadirachta indica*) Mango (*Magnifera Indica* etc.

**Table 1: Age-Sex Composition Identification Key**

| Age-group Composition | Identification Key   |
|-----------------------|--|
| Infant                | From birth to 1 year (Included New born Stage) Blackish and Brown Colour fur |
| Juvenile              | From 1 to 4 year (Included Sub adult stage), Active movement                 |
| Adult male            | From 4 to 7 year, Testes and canine teeth developed                          |
| Adult Female          | From 3.5 to 5 Years and Nipples Visible                                      |

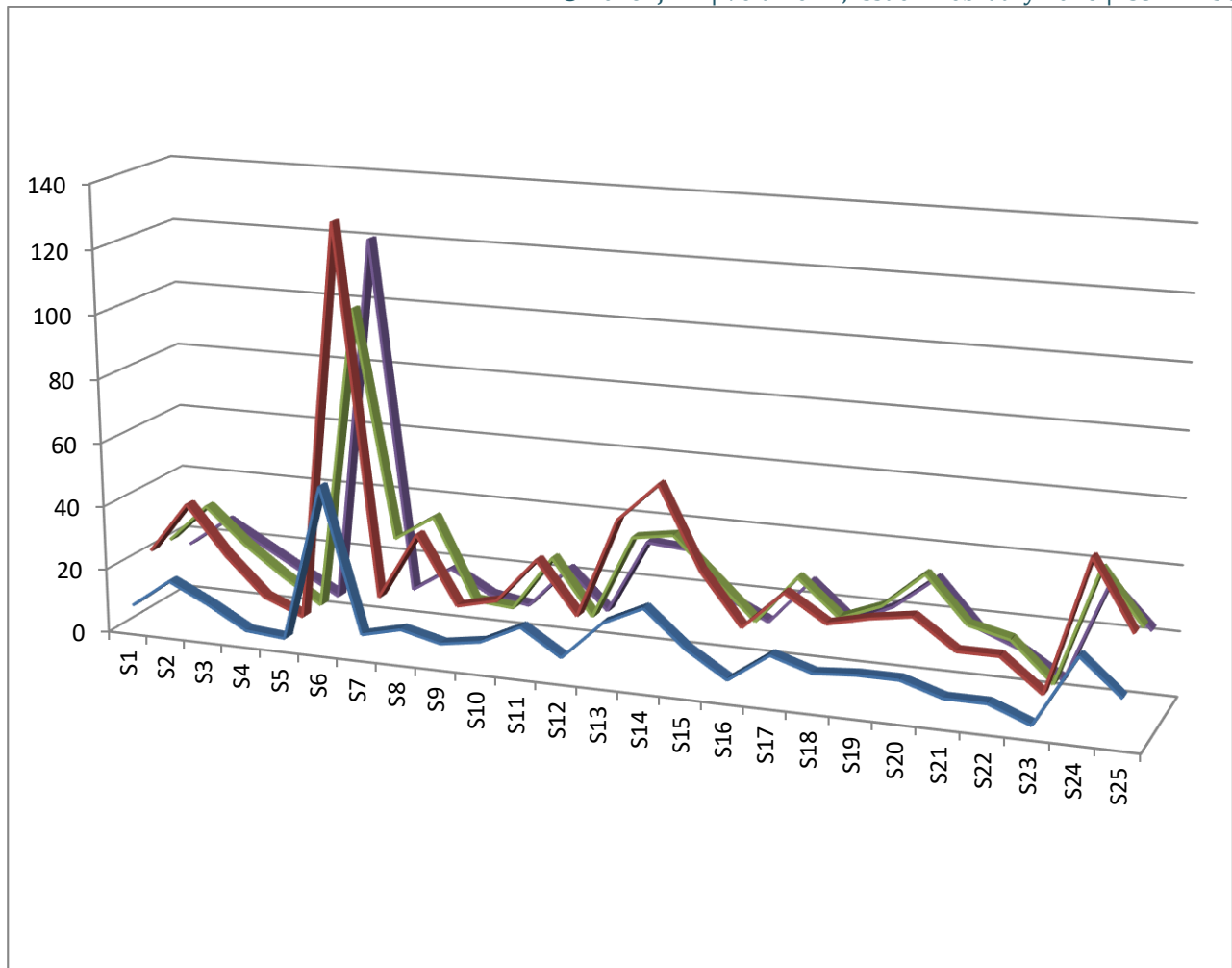
## Result

The Survey of rhesus population was estimated in twenty five troops of Chitrakoot. The present study comprises about 500 day's observation for behaviour and population of all troops. Inspection was approximately equally distributed for 4 to 5 hours for season wise and troop Wise. Census of rhesus noted on summer, Rainy and winter season. Rhesus macaques are dimorphic and different workers have used different age-sex classification. Individuals were classified into extensive age-sex classes based on physical features. In this present study adopted age-sex categorization in *Macaca mulatta* by Seth, 1986; with little adjustment. It's exist in multi male and female troops that have an average but the present study there are little adjustment in age-sex composition, infant, juvenile, adult male and adult female regardless of habitat type in Chitrakoot area. In Selected sites total 2312 rhesus were documented in 25 troops of Chitrakoot habitat. Among 2312 rhesus macaques, 14% were adult males 32% were adult females, 24% were infants, 30% were juveniles noted.

Presence of lots of trees and rich source of water from the Mandakini river is the cause of highest rhesus population in Satiansuiya.

**Table 2: Rhesus macaque, (*Macaca mulatta*) population average of various habitat of Chitrakoot, India**

| Study Site | Adult Male | Adult Female | Juvenile | Infant | Troop Size |
|------------|------------|--------------|----------|--------|------------|
| S1         | 8          | 22           | 22       | 17     | 69         |
| S2         | 17         | 38           | 34       | 26     | 115        |
| S3         | 11         | 23           | 23       | 19     | 76         |
| S4         | 4          | 11           | 14       | 12     | 41         |
| S5         | 3          | 6            | 6        | 5      | 20         |
| S6         | 52         | 130          | 101      | 120    | 403        |
| S7         | 7          | 15           | 30       | 10     | 62         |
| S8         | 10         | 36           | 38       | 18     | 102        |
| S9         | 7          | 15           | 13       | 11     | 46         |
| S10        | 9          | 18           | 12       | 9      | 48         |
| S11        | 15         | 32           | 29       | 22     | 98         |
| S12        | 7          | 16           | 12       | 10     | 45         |
| S13        | 19         | 47           | 38       | 33     | 137        |
| S14        | 25         | 59           | 40       | 32     | 156        |
| S15        | 14         | 34           | 28       | 18     | 94         |
| S16        | 6          | 18           | 16       | 12     | 52         |
| S17        | 15         | 30           | 31       | 26     | 102        |
| S18        | 11         | 22           | 20       | 15     | 68         |
| S19        | 12         | 25           | 25       | 21     | 83         |
| S20        | 12         | 27           | 36       | 31     | 106        |
| S21        | 8          | 18           | 22       | 17     | 65         |
| S22        | 8          | 18           | 19       | 12     | 57         |
| S23        | 3          | 8            | 7        | 4      | 22         |
| S24        | 25         | 50           | 43       | 35     | 153        |
| S25        | 14         | 29           | 27       | 22     | 92         |

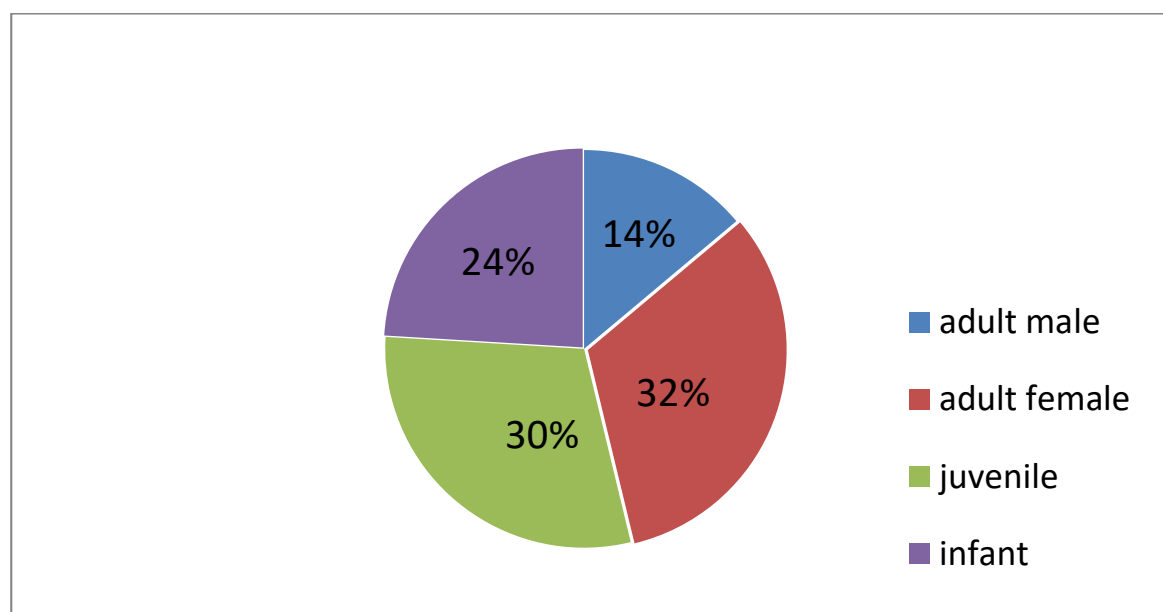


This graph shows the population status of rhesus macaque (*Macaca mulatta*)

Table 2: Age-Sex composition

| Age- Sex Composition | Population     |
|----------------------|----------------|
| Infant               | 556.90         |
| Juvenile             | 690.50         |
| Adult male           | 321.92         |
| Adult female         | 750.09         |
| <b>Troop Size</b>    | <b>2319.48</b> |

## Composition of *Macaca mulatta*



## Discussion

Before seven year Chaturvedi and Tomar selected the twenty five troops of rhesus macaque for census Study, which also Selected in this study to know the prosperity of biodiversity in seven year. According to past study entire 1811 rhesus noted but in this study 2318.48 rhesus were observed. In Seven years 28% *Macaca mulatta* census percentage raise Observation was approximately equally circulated throughout the day. Individuals were classified into extensive age-sex classes based on physical characteristics. Present study adopted age-sex classification in *Macaca mulatta* by Seth,1986; with little alteration, and age-sex is classify into adult male, adult female, juvenile, infant but in earlier study of age-sex composition organize into newborn, adult male, adult female, juvenile, infant and sub adult stage of male and female. Before seven years highest and lowest census observed in Satiansuiya and Bihari Mandir but in Present study the maximum and minimum population average noted in Satiansuiya and Hanumandhara. In ancient Study among 1811 rhesus macaques, 14.01% were adult males 34.41% were adult females, 9.01% newborn, 14.62% were infants, 14.45% were juveniles, 5.56% were sub adult males, 7.93% were sub adult females recorded but in this study sub adult stage of male and female census also noted in juvenile stage and newborn integrated in infant stage. Among 2318 rhesus the average percentage of age-sex classification 30% were juvenile ,32% were adult female, 24% were infant and 14% were adult male.

## Conclusion

Rhesus macaque protected by chart III of red data book. And this study shows 2319.48 rhesus population status in Chitrakoot and shows Chitrakoot is the land of rich forest diversity in fauna and flora. Biodiversity participate a significant role in life cycle of rhesus monkey and provide a place for protection and provisions

for continued existence. This study shows how primates are strongly related to humans and the Prosperity of rhesus is good sign of general health of ecology and helpful in planning of Protection strategies.

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