

Case Study

MAN-MONKEY CONFLICT IN KHOWAI DISTRICT, TRIPURA, NORTH-EAST INDIA: A CASE STUDY

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Abstract

Conflict with humans poses one of the greatest threats to all wildlife. Though Rhesus macaques *Macacamulatta* are protected by schedule I of Wildlife (Protection) Act of India, they are losing conservational support with the rapid increase in their number as well nuisance activities. To investigate over the matter, a one year long study on their population structure and man-monkey conflict was conducted in five selected sites of Teliamura subdivision, Khowai district, Tripura, Northeast India during August 2013 to July 2014. Population survey was conducted to find out the total population of rhesus macaques in the study sites using total count method. Data regarding man-monkey conflict were collected using a pre prepared questionnaire. It was found that considerable number of rhesus macaque populations was present in all the study sites which was divided into several groups. Total number of juveniles and infants were much higher than adult males and females in all the groups indicating fast growing populations. From the questionnaire survey, the five categories of conflicting behavior by *M mullatta* were identified based upon the frequency of occurrence, with the highest being stealing (28.5%), followed by messing up garbage can and littering (24.6%), aggressive threats (19.8%), damaging facilities (19.6%) and finally biting (7.5%). The present study suggests that an improved management system, enforcement of wildlife acts and awareness programs are urgently needed for unhindered movement of monkeys across the landscape and promote man-monkey coexistence.

Key words: Man-monkey conflict, *Maccacamulatta* ,population structure, Tripura, Northeast India.

INTRODUCTION

Man-monkey association is as old as since time immemorial. The Rhesus macaque (*Macacamulatta*) is one of the species of non-human primates found in India which is a 'Least Concern' species (IUCN, 2015) and has been put in the schedule-I, Part I in the wildlife (Protection) Act of India, 1972 (amended up to 2002). In India, 86% of the total rhesus monkey population resides near human habitations [1] and monkey menace is prevalent in many parts of the country. The rhesus macaque is widely distributed in Northeast India and lives in close proximity to humans in this part of India. They are highly adapted to human proximity and have learned to exploit human habitation [2]. The rapid increase in the number of Rhesus monkey population in recent times has led to increased competition for food and space between human

and monkeys [2, 3]. Extensive urbanization and recruitment of forestlands for cropping have led to intense human primate conflict in rural areas in Northeast India. The forest cover in Northeast India is disappearing at an alarming rate. More than 1000 km² of forests are destroyed annually [4]. This has resulted in increasing incidents of man-monkey conflict to alarming proportions in this region in recent times and has emerged as the main threat for the survival of rhesus macaque across their range. Man-monkey conflict represents a widespread, complex and intractable challenge to conservation. As a result of this conflict rhesus monkeys have become more aggressive and they are creating problems to humans by supplementing their natural diet with food stolen from people or with garbage found around forest reserves, picnic sites and suburban areas. In later cases, monkeys have reduced fear and sometimes become aggressive towards humans.

Although large population of monkeys are found in Northeastern India, very little systematic efforts have been made to know why the monkeys invade human settlement areas which lead to human-monkey conflict [5]. The Khowai district of Tripura harbors a large and variable population of *Macacamulattawhich* are distributed in patches in different parts of the district and they are in intense conflict with humans. They brought lot of problems to the local people. Indeed, complaints have been reported regularly to the forest department officials by the residents of nearby villages. Keeping this background in mind the present study was designed to record the pest behavior of rhesus monkeys and nature of damage caused by them. Efforts have been made to find out probable cause of increased man-monkey conflict and finally to suggest possible measures to minimize the problem for the sake of both man and monkeys.

MATERIALS AND METHODS

STUDY AREA

A field study of *Macaca* sp. was conducted in five selected sites of Teliamura subdivision, Khowai district for a period of 1 year starting from August 2013 to July 2014. The selected sites have observable Rhesus Macaque populations as per reports available from the district forest department. The study site I was Gamaibaria crowded semi town area, study site II Khasia Mangal, a hilly village adjacent to evergreen and wet deciduous forest area with natural vegetation, Site III Moharchera a village in the plains with predominant crop lands. Site IV Hawaibari, a small village near National high way 44 with mixed cultivations and natural vegetations. Site V Dakshin Krishnapur a village in plain land with agro forestry plantations and a river Khowai flowing through it. Study sites were selected after consultation with the district forest department officials based on the commonly noticeable places of rhesus macaques with high reported cases of man-monkey conflict. All the study sites lie between 23.72°N latitude and 91.74°E longitude and on average 75 feet above mean sea level. The river Khowai flows through this area. Total forest cover under this sub-division is 49573 hectares that includes wide varieties of habitats such as ever green and semi-evergreen forests, moist mixed deciduous forests, shrub lands etc. The average annual precipitation of the area is about 300cm. These diverse habitats make the study area most important site for animals to feed, roost and breed.

METHODS OF STUDY

The study was divided into two parts:

1. Population Survey

A population survey was conducted to find out the total population of rhesus macaques in the study sites using total count method described by [6]. Direct observations were made from 07.00 hours until 18.00 hours once a week and 4 observations a month for a total of one year from 1st August 2013 to 31st July 2014.

2. Collection of record by Questionnaire

Data regarding man-monkey conflict were collected using a pre prepared questionnaire (Appendix 1) as described by Devi and Saikia, 2008 [5] with some modifications. The pest behavior categories were recorded based on studies by [7]. Five categories of pest behaviors were recorded: (i) messing up garbage can and littering (ii) aggressive threats (iii) biting (iv)

stealing of foods and house hold products (v) damaging facilities such as lamp posts, electric wires, cloths, crop-field damage and so on.

RESULTS AND DISCUSSION

From the population survey it was found that considerable number of rhesus macaque populations was present in all the study sites (Table 1-5). Highest population of *M. mulata* was recorded in site V DakshinKrishnapur. It was also found that the populations were divided into several groups ranging from 4 to 6. Each group was represented by adult males and females along with juveniles and infants. In all the groups adult males were least in number. Total number of juveniles and infants were much higher than adult males and females in all the groups indicating fast growing populations.

From the questionnaire survey, the five categories of conflicting behavior by *M. mullatta* were identified based upon the frequency of occurrence (Figure 1), with the highest being stealing (28.5%), followed by messing up garbage can and littering (24.6%), aggressive threats (19.8%), damaging facilities (19.6%) and finally biting (7.5%). Messing up garbage can and littering were highest (35.4%) in site I which is a crowded semi town area. Incidence of aggressive threats and biting was highest in site II which is a hilly village area. Stealing of food materials and house hold goods was highest in site IV located near National high way. Highest number of damaging facilities was recorded from site V plain land with agro forestry.

During the questionnaire survey, most of the respondents claimed that *M. mullatta* came to their residential areas in both in the morning (07.00 till 10.00 hours) and in the evening (14.00 till 18.00 hours), but the time slightly varied at different study sites. With respect to the negative aspects of *M. mullatta* most of respondent agreed that their presence led to defacing of the residential areas and also can reduce the health level of the residents, especially the children and increasing disturbances at alarming rates. In most of the cases *M. mullatta* entered the houses to steal food items, but other items such as cloths, stationeries, drinks etc. was also targeted in some cases. By eating and damaging cultivated fruits, especially bananas, mangoes and crops they render huge economic loss to the farmers.

The present study is in agreement with such other studies conducted in different parts of India where man-monkey conflict has become serious problem [5, 8,9,10] Although the Rhesus macaque is widely distributed in Tripura including Khowai district, their prevalence in certain areas is relative to the local topography, vegetation types and agricultural practices. Extensive cutting of forest trees, replacement of natural forests by monoculture of rubber plantation in place of the natural food plants, illegal encroachment of forest lands by tribal people have forced the Rhesus macaques to invade human settlement areas for the sake of their own survival. Most of the villagers inhabiting in the study sites expressed their grievance over the presence of the monkey population in their localities. Authors fully agrees with the views of Devi and Saikia, 2008[5] that due to their intolerable activities, people now view them as a enemy rather than a species of conservation importance. They often call the forest department staffs to catch the monkeys from their localities. Further studies in selected habitats are needed to monitor the rates of population increase among the Rhesus macaques in the affected areas to assess probable future implications and formulate future management strategies. An improved management system, enforcement of wildlife acts and awareness programs would facilitate unhindered movement of monkeys across the landscape and promote human-monkey coexistence in the state.

Appendix-I: Questionnaire used for Data collection during survey

1. How often monkeys visit your place? Do the monkeys come in groups or in single?
2. If they come in groups, how many monkeys form a group (approx.)?
3. Is the group lead by a single dominant male or by a group of males? Can you identify them?
4. What are the problems you all are facing from the monkeys?
5. Where did they come from? What did they do after entering the village?
6. Is there any specific time for their arrival?
7. Is there any particular item they generally target? If yes, specify.

8. Did the monkeys ever attack you or any of your family members? If yes, please explain what happened?
9. What do you think the reason behind such behavior of monkeys?
10. What might be the possible causes of the monkey's invasion in this area?
11. Can you suggest any solution to resolve the problem?

Table 1. Population of Rhesus macaque on the basis of age and sex at study site-I

Group	Adult male	Adult female	Juvenile	Infant	Total
I	12	26	15	18	71
II	10	25	13	17	65
III	16	37	24	19	96
IV	12	19	13	22	66
Total	50	107	65	76	298

Table 2. Population of Rhesus macaque on the basis of age and sex at study site-II

Group	Adult male	Adult female	Juvenile	Infant	Total
I	07	14	17	22	60
II	13	27	23	24	87
III	18	23	26	31	98
IV	11	16	23	29	79
Total	49	80	89	106	324

Table 3. Population of Rhesus macaque on the basis of age and sex at study site-III

Group	Adult male	Adult female	Juvenile	Infant	Total
I	11	18	13	12	54
II	17	24	29	24	94
III	14	25	23	19	81
IV	12	13	21	18	64
Total	54	80	86	73	293

Table 4. Population of Rhesus macaque on the basis of age and sex at study site-IV

Group	Adult male	Adult female	Juvenile	Infant	Total
I	08	13	13	17	51
II	12	17	21	24	74
III	09	16	20	28	73
IV	14	16	19	30	79
Total	43	62	73	99	277

Table 5. Population of Rhesus macaque on the basis of age and sex at study site-V

Group	Adult male	Adult female	Juvenile	Infant	Total
I	12	16	23	32	83
II	06	13	21	24	64
III	7	18	17	09	51
IV	23	27	24	13	87
V	12	16	23	26	77
VI	11	15	23	26	75
Total	71	105	131	130	437

Table 6. Different types of conflicting behaviors shown by Rhesus macaque (*M. mulata*) in the five study sites during the study period

Study Site	Total <i>M. mulata</i> population	Total No of conflicting incidences	Messing up garbage can and littering	Aggressive threats	Biting	Stealing	Damaging facilities
I	298	212	75 (35.4)	35 (16.5)	13(6.1)	61(28.8)	28 (13.2)
II	324	218	45 (20.6)	48 (22)	22 (10.1)	73 (33.5)	30 (13.8)
III	293	223	49 (22)	44 (19.7)	17 (7.6)	55 (24.7)	58 (26)
IV	277	183	44 (24)	38 (20.8)	11 (6)	65 (35.5)	25 (13.7)
V	437	318	71 (22.3)	63 (19.8)	24 (7.5)	75 (23.5)	85 (26.7)
Total	1629	1154	284 (24.6)	228 (19.8)	87 (7.5)	329 (28.5)	226 (19.6)

Parenthesis of the table indicates % of total conflicting behaviors.

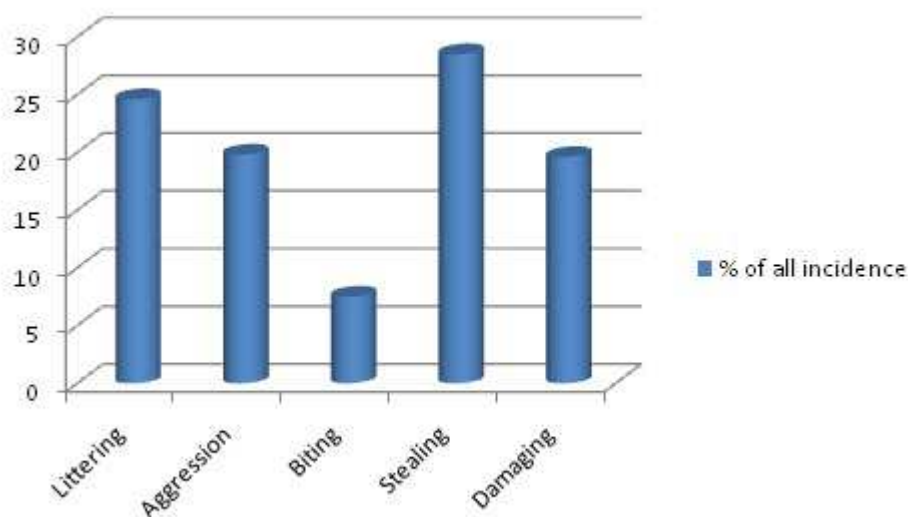


Figure 1: Graphical representation of different types of conflicting behaviors showed by Rhesus macaque (*M. mulata*) in the five study sites during the study period

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REFERENCES

- [1] Southwick, C. H. and Siddiqi, M. F., 1988, Partial recovery and a new population estimate of rhesus monkey populations in India, *American Journal of Primatology*, 16 (3), 187-197.
- [2] Srivastava, A., 1999, A Text Book on Primates of North East India, Rajasthan. Megadiversity Press, Pp 1-202.
- [3] Gumert, M. D., 2008, In The International Primatological Society XXII Congress, Edinburgh, Scotland, 3-8 August 2008, Abstract.
- [4] Choudhary, A, 2004. Human-elephant conflicts in Northeast India. *Human Dimensions of Wildlife*, 9, 261-270.
- [5] Devi, O.S. and Saikia,P.K., 2008, Human-monkey conflict: a case study at Gauhati University Campus, Jalukbari, Kamrup, Assam. *Zoos' Print*, 23(2), 15-18.
- [6] Bibby, C.J., Neil, Burgess, N.D. and Hall, D.A., 1992. Bird Census Techniques. Academic Press, London, New York, San Deigo, Boston etc. pp.1-248.
- [7] Md-Zain, B.M., Tuan-Zaubidah, B.T.H. and Zuraidah, B., 2004, Kajiankelakauanganguankera (*Macacafascicularis*) di kawasankediaman. Prosiding Seminar Bersama FST, UKM-FMIPA, UNRI Ke-3. pp. 149-155.
- [8] Sharma, G., Ram, C., Devilal and Rajpurohit, L.S., 2011. Study of man-monkey conflict and itsmanagement in Jodhpur, Rajasthan, India. *Journal of Evolutionary Biology Research*, 3 (1), 1-3.
- [9] Shing, V. and Thakur, M.L., 2012, Rhesus macaque and associated problems in Himachal Pradesh - India, *TAPROBANICA*, 4 (2), 112-116.
- [10] Imam, E and Ahmad, A, 2013, Population status of Rhesus monkey (*macacamulatta*) and their menace: A threat for future conservation, *International Journal of Environmental Sciences*, 3 (4), 1279-1289.