

## POPULATION SURVEY OF NON-HUMAN PRIMATES (MAMMALIA) OF TRIPURA

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### INTRODUCTION

A variety of primate species inhabit the northeastern and southern India and some of the species are restricted in their distribution in these areas. Rhesus macaque and hanuman langur are widely distributed in India and are found in a variety of habitats and have been intensively studied in the field. The other species of non-human primates that are found in northeastern and southern India have not been received attention so far. The field studies of non-human primates of Tripura have been initiated by Mukherjee in the year 1976 and it resulted in a series of papers and scientific reports. In 1990 a fresh census was conducted under a joint venture involving the Forest Department of Tripura and the Zoological Survey of India to find out the trend of population changes in the non-human primates in this state.

The small state of Tripura is inhabited by three species of macaques *viz.* rhesus macaque (*Macaca mulatta*), stump-tailed macaque (*Macaca arctoides*) and pig-tailed macaque (*Macaca nemestrina*), two species of leaf monkeys *viz.* capped langur (*Presbytis pileatus*) and Phayre's leaf monkey (*Presbytis phayrei*), one species of ape, the hoolock gibbon (*Hylobates hoolock*), and slow loris (*Nycticebus coucang*). In recent years golden langur (*Presbytis geei*) has been introduced in Sepahijhola and Trishna Wildlife Sanctuaries.

### STUDY METHOD

The present report is based on the survey conducted in February 1990. The census were conducted in all the possible habitat of monkeys in the forests, villages, towns and cities. In this state the non-human primates inhabited mostly in the forests. The observations were carried out on foot and by a vehicle. The surveys were conducted from morning to late evening. The methods that were applied to census the areas were roadside, transect and point methods. For transect, forest roads and trails were used and at places the forest routes were also cut. The point methods was used to locate the groups occupying the undulating and hilly tracts. In the forest the procedure adopted was to move slowly with least noise and stop at regular intervals or at suitable places and scan the areas for the presence of monkeys. For survey of roadside, villages, towns and cities a slow moving vehicle (Jeep) was used. Three to four observers were engaged to conduct the survey. The disturbance caused by the

movement of the monkeys and the calls were also utilised for locating the monkeys. Once a group was observed, notes on their social structure, habitat, interaction, etc., were noted down. The mechanical aids that were used in the field were binoculars and camera.

### RESULTS

The survey reveals that unlike other places in India the non-human primates in Tripura are inhabited the forested areas and are totally depended upon the forest produce for their food and shelter. The rhesus macaque invade cultivated fields and causes damage to the crops. Table I and II show the distribution and social structure of non-human primates that were recorded during the survey in the three districts.

The rhesus macaque, *Macaca mulatta*, was recorded from all the three districts of the state. A total of 23 groups were encountered out of which the maximum number of 15 groups with 280 monkeys were recorded from the south district. Three groups with 50 and five groups with 46 rhesus were recorded from north and west

TABLE I. Non-human primates sighted and counted in the censusing districts.

Common name & Scientific name	District	Total No. of groups	Total No. of monkeys	Group size	Total No.		Total No. JJ	Total No. II
					♂	♀		
Rhesus macaque ( <i>Macaca mulatta</i> )	South	15	280	2-33	37	138	57	48
	North	3	50	1-33	8	28	7	7
	West	5	46	4-19	7	26	7	6
Pigtailed macaque ( <i>Macaca nemestrina</i> )	South	1	16	—	1	10	3	2
Phayre's leaf monkey ( <i>Presbytis phayrei</i> )	South	8	75	5-14	11	39	14	11
	North	5	41	4-12	7	26	5	3
	West	8	148	7-42	15	82	31	20
Capped langur ( <i>Presbytis pileatus</i> )	South	10	62	3-14	12	36	7	7
	North	1	15	—	2	6	4	3
	West	5	31	5-8	5	17	4	5
Hoolock gibbon ( <i>Hylobates hoolock</i> )	North	2	6	3	2	2	1	1
	West	2	5	2-3	2	2	1	—

TABLE II. Total number of groups and total number of sex and age class of different non-human primates.

Common name & Scientific name	District	Total No. of groups	Total No. of monkeys.	Total No. of ♂	Total No. of ♀	Total No. of JJ	Total No. of II	♂ : ♀	♀ : I
1	2	3	4	5	6	7	8	9	10
Rhesus macaque ( <i>Macaca mulatta</i> )	South	15	280	37	138	57	48	1 : 3.72	1 : 0.34
	Mean	—	18.66	2.46	9.20	4.75	4.00		
	S. D.*	—	10.16	1.06	5.07	1.60	2.66		
	North	3	50	8	28	7	7	1 : 3.50	1 : 0.25
	Mean	—	16.66	2.66	9.33	2.33	2.33		
	S. D.	—	16.01	1.52	10.69	2.52	2.08		
	West	5	46	7	26	7	6	1 : 3.71	1 : 0.23
	Mean	—	9.20	1.40	5.20	1.40	1.20		
	S. D.	—	6.10	0.55	3.83	0.55	1.64		
Pigtailed macaque ( <i>Macaca nemestrina</i> )	South	1	16	1	10	3	2	1 : 10.00	; 0.20
Phayre's leaf monkey. ( <i>Presbytis phayrei</i> )	South	8	75	11	39	14	11	1 : 3.54	1 : 0.28
	Mean	—	9.38	1.37	4.88	1.75	1.38		
	S. D.	—	3.38	0.52	2.03	1.28	0.51		
	North	5	41	7	26	5	3	1 : 3.71	1 : 0.11
	Mean	—	8.20	1.40	5.20	1.00	0.60		
	S. D.	—	3.19	0.55	2.95	1.00	0.55		
	West	8	148	15	82	31	20	1 : 5.46	1 : 0.24
	Mean	—	18.50	1.87	10.25	3.87	2.50		
	S. D.	—	11.07	1.36	5.39	2.90	2.39		
Capped langur. ( <i>Presbytis pileatus</i> )	South	10	62	12	36	7	7	1 : 3.00	1 : 0.19
	Mean	—	6.20	1.20	3.60	0.70	0.70		
	S. D.	—	3.58	0.42	2.11	0.67	1.06		
	North	1	15	2	6	4	3	1 : 3.00	1 : 0.50
	West	5	31	5	17	4	5	1 : 3.40	1 : 0.29
	Mean	—	6.20	1.00	3.40	0.80	1.00		
	S. D.	—	1.30	0.00	1.14	0.44	0.71		
	North	2	6	2	2	1	1	1 : 1.00	1 : 0.50
	Mean	—	3.00	1.00	1.00	0.50	0.50		
S. D.	—	—	—	—	0.71	0.71			
Hoolock gibbon ( <i>Hylobates hoolock</i> )	West	2	5	2	2	1	—	1 : 1.00	—
	Mean	—	2.50	1.00	1.00	0.50	—		
	S. D.	—	0.71	—	—	0.71	—		

\* S. D.—Standard Deviation

districts respectively. The groups in south district on an average contained 18.67 individuals, with 2.47 adult males, 9.20 adult females, 3.80 juveniles and 3.20 infants. The groups of the north district on an average contained 16.66 individuals with 2.67 adult males, 9.33 adult females, 2.33 juveniles and 2.33 infants. The smallest group size with an average of 9.20 individuals with 1.40 adult males, 5.20 adult females, 1.40 juveniles and 1.20 infants were recorded from the west district. The sex ratio of adult male to adult female in south, north and west districts was 1 : 3.72, 1 : 3.50 and 1 : 3.71 and the ratio of adult female to infant was 1 : 0.34, 1 : 0.25 and 1 : 0.23 respectively.

Only one group of pigtailed macaque, *Macaca nemestrina*, was observed at Paratia in the south district during the present survey. The group contained a total of 16 monkeys with 1 adult male, 10 adult females, 3 juveniles and 2 infants. The adult female to infant ratio was 1 : 0.20. However, pigtailed monkey was reported to be present at Sepahijhola, Trishna and Gumti forests. Similarly stump-tailed macaque, *Macaca arctoides*, though not observed in the present survey but was reported to be present in certain forests of Tripura by local people and the staff of the forest department.

The Phayre's leaf monkey, *Presbytis phayrei*, is found in Tripura and in certain areas of south Cachar district of Assam in India. In the present survey this monkey was recorded from all the three districts of Tripura. A total of 21 groups were recorded out of which south and west districts each contained 8 groups and the remaining 5 groups were encountered in the north district. The average group size in the south, north and west districts were 9.38, 8.20 and 18.50 respectively. The average group size in the west district was much more than the other two districts. The adult male to adult female and the adult female to infant ratios in the south, north and west districts were 1 : 3.54, 1 : 3.71, 1 : 5.46 and 1 : 0.28, 1 : 0.11, 1 : 0.24 respectively. There are more adult females in proportion to adult males in the west district.

The other leaf monkey, the capped langur, *Presbytis pileatus*, which is widely distributed in northeastern India and is sympatric with Phayre's leaf monkey (Mukherjee, 1982b) was recorded from all the three districts of the state in this survey. It is apparent from Table I that they are more common and abundant on south district than in other two districts. The average group size in south, north and west districts were 6.20, 15.00 and 6.20 respectively. The sex ratios of adult male to adult female in south, north and west districts were 1 : 3.00, 1 : 3.00 and 1 : 3.40 respectively. The average group size of the south and west districts were the same and the sex ratio of adult male to female in all the three districts were almost the same. However, the average group size in the north is much more than the other two districts.

The only ape that is found in India is the hoolock gibbon, *Hylobates hoolock*, and is distributed to south and southeast of Brahmaputra river in the states of Assam, Meghalaya, Manipur, Tripura, Mizoram and in the districts of Tirap, Lohit and Dibong

(east of Dibong river) in Arunachal Pradesh. In the present survey this ape were encountered in the forests of Atubtang, Baramura and Juri. They were also reported to be present at Trishna, Gumti and New Kamti Bari. The group size varies from 2.50 to 3.00.

### DISCUSSION

In the present survey the non-human primates that were recorded from Tripura are rhesus and pigtailed macaques, Phayre's leaf monkey, capped langur and hoolock gibbon. The stumptailed macaque was not recorded in the present survey. In the earlier survey (Mukherjee, 1982b) 5 groups of stumptailed macaque with 62 monkeys and one group of pigtailed monkey with 16 members were observed. Mukherjee (1982b) recorded 6 groups of hoolock gibbon. It is apparent from these surveys that the two macaques, stumptailed and pigtailed and hoolock gibbon are rare and threatened in Tripura and needs immediate protection. The three species of non-human primates *viz.* rhesus macaque, Phayre's leaf monkey and capped langur are common and are found in all the three districts. However, when the present survey is compared with the earlier survey (Mukherjee, 1982b) it is noticed that the group number and the populations of all these three species have declined to great extent.

The total number of 376 rhesus monkeys were recorded in 23 groups whereas in earlier survey a total of 931 rhesus monkeys were recorded in the 28 groups. In all the districts the groups contained immature population much less than 50%. For long term maintenance of population 50% immature are necessary (Southwick and Siddiqi, 1977, Southwick *et al*, 1980, 1982 and Teas *et al* 1980).

The decline in population of capped langur is also apparent from the present survey. In the earlier survey 15 groups with 138 langurs were recorded. In the present survey a total of 16 groups with 108 monkeys were observed. The average group size has come down from 9.20 to 6.20, The concentration of this langur is more in the south district. The adult female to infant ratio varies from 1 : 0.19 to 1 : 0.50. The colour on the ventral side and the tip of the hands and legs and the tail varies from population to population and from season to season. The ventral parts are brownish yellow or orange and the tip of the tail, legs and hands may be blackish. At times the local people confuse this species with that of the common langur.

The Phayre's leaf monkey population has also declined. In the earlier survey 36 groups with 409 monkeys were counted whereas in the present survey 21 groups with 264 langurs were recorded. The reduction of population was more on the south district.

Hoolock gibbon groups have also declined. The groups at Khasi Bari, Pechartal, Baramura and a group at Longthorai which were encountered in the earlier surveys were not seen in the present survey and appeared to have been lost.

TABLE—III. Comparative table of social structure of non-human primates of Tripura recorded during two surveys.

Species	Total No. of groups	Total No. of monkeys	Average group	Total No. of adult Males	Total No. of adult Females	Total No. of Juveniles	Total No. of Infants	Year of Survey
Rhesus macaque	28	931	33.2	123 (4.4 ± 2.6)	432 (16.0 ± 10.8)	203 (7.8 ± 4.6)	173 (7.2 ± 5.5)	1982
	23	376	16.3	52 (2.26 ± 1.0)	192 (8.7 ± 5.5)	71 (3.7 ± 2.0)	61 (3.6 ± 2.0)	1990
Pigtailed macaque	1	9	—	1	4	3	1	1982
	1	16	—	1	10	3	2	1990
Stumptailed macaque	5	62	12.4	6 (1.2 ± 0.2)	34 (7.2 ± 2.8)	15 (3.0 ± 1.2)	7 (1.4 ± 0.9)	1982
	36	409	11.36	73 (2.0 ± 0.2)	169 (4.7 ± 0.4)	92 (2.5 ± 0.4)	75 (2.1 ± 0.3)	1982
Phayre's leaf monkey	21	264	12.5	33 (1.5 ± 0.9)	147 (7.4 ± 4.5)	50 (2.7 ± 2.2)	34 (2.0 ± 1.6)	1990
	15	138	9.2	26 (1.7 ± 0.7)	63 (4.8 ± 1.1)	31 (2.6 ± 1.6)	18 (1.8 ± 1.0)	1982
Capped langur	16	108	6.75	19 (1.2 ± 0.4)	59 (3.7 ± 1.8)	15 (1.3 ± 0.9)	15 (1.6 ± 0.8)	1990
	5	16	3.2	5 (1.0 ± 0.0)	5 (1.0 ± 0.0)	4 (1.0 ± 0.0)	2 (1.0 ± 0.0)	1982
Hoolock gibbon	4	11	2.75	4 (1.0 ± 0.0)	4 (1.0 ± 0.0)	2 (1.0 ± 0.0)	1 (1.0 ± 0.0)	1990

Forests destruction due to illicit felling, 'Jhuming' and encroachment are the main factors for the loss of habitat of the non-human primates at Tripura.

Leaf eating monkeys and hoolock gibbon are affected much due to the loss of potential food trees and disruption of their canopy pathways. The loss of habitat is the main factor for the decline in group density and group size.

#### CONCLUSION

In the present survey the non-human primates that were recorded in Tripura are rhesus macaque, pigtailed macaque, Phayre's leaf monkey, capped langur, and hoolock gibbon. The presence of stumptailed macaque and slow loris have been reported by local people. The golden langur has been introduced in Sepahijhola and Trishna Wildlife Sanctuaries. When compared with the earlier survey (Mukherjee, 1982b) all the species show a decline in population and group size. The three species of non-human primates *viz.* pigtailed and stump tailed macaques and hoolock gibbon are now rare and are in danger of extinction in Tripura. The decline in the population of Phayre's leaf monkey which is mostly found in Tripura, has also been noticed. The main factor for the decline of different species of non-human primates is the destruction of their habitats.

#### SUMMARY

A survey of non-human primates of Tripura was conducted in the year 1990. The present survey when compared with the survey of 1982 revealed the decline in population of all the species. The three species, the pigtailed and stumptailed macaques and hoolock gibbon, are now rare and are in danger of extinction in this state. The population of Phayre's leaf monkey has also shown a decline in population.

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