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A POPULATION SURVEY OF RHESUS MACAQUES AND HANUMAN LANGURS IN DHENKANAL DISTRICT, ORISSA

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INTRODUCTION

The religious and philosophical beliefs and tolerance towards the monkeys by the people for their sacred status lead to their protection for centuries in India. At present, the breaking down of these taboos, and due to rapid cultural changes and urbanization are the factors that majority people do not consider the monkeys as sacred rather consider the monkeys as pest and destructive agents to the crops and household properties. Hopefully, the sacred status is still enjoyed by the monkeys in Orissa. Field studies on the non-human primates of Orissa carried out by Tiwari and Mukherjee (1992). Behura *et al.* (1969) reported the wild life fauna of Orissa; Tiwari *et al.* (1997) published the sightings of monkeys at Chandaka Wild life Sanctuary, Khurda district. A comprehensive faunal account of Simlipal Biosphere Reserve was recorded by Ramakrishna *et al.* (2006). Chaudhuri *et al.* (2007) published the non-human primates of Nayagarh district; Ramakrishna *et al.* (2008) reported the Hanuman langur population of Baleswar district, Orissa. The two common species of monkeys that are found in Orissa are rhesus macaque (*Macaca mulatto*) and Hanuman langur (*Semnopithecus entellus*). These two monkeys are found in many parts of India and occupy diverse habitats, ranging from dense forests to open lands, montane region and near human settlements.

The early history of Dhenkanal is locally derived from an aboriginal name "Dhenka" to the "Dhenkanal Raj" a group of Princely States in the middle of 17th century. This district came into existence on 1st January 1948 after the merger of two ex-states of Dhenkanal and Hindol, with the province of Orissa. This report deals with the information regarding distribution, abundance and social composition of Rhesus macaques and Hanuman langurs of Dhenkanal district.

STUDY AREAS

Dhenkanal district is located at central Orissa. It lies between 20°29'–21°11' N and 85°10'–86°2' E with an area of 4330 Km². The human population of this district is 10,65,983 (2001) and

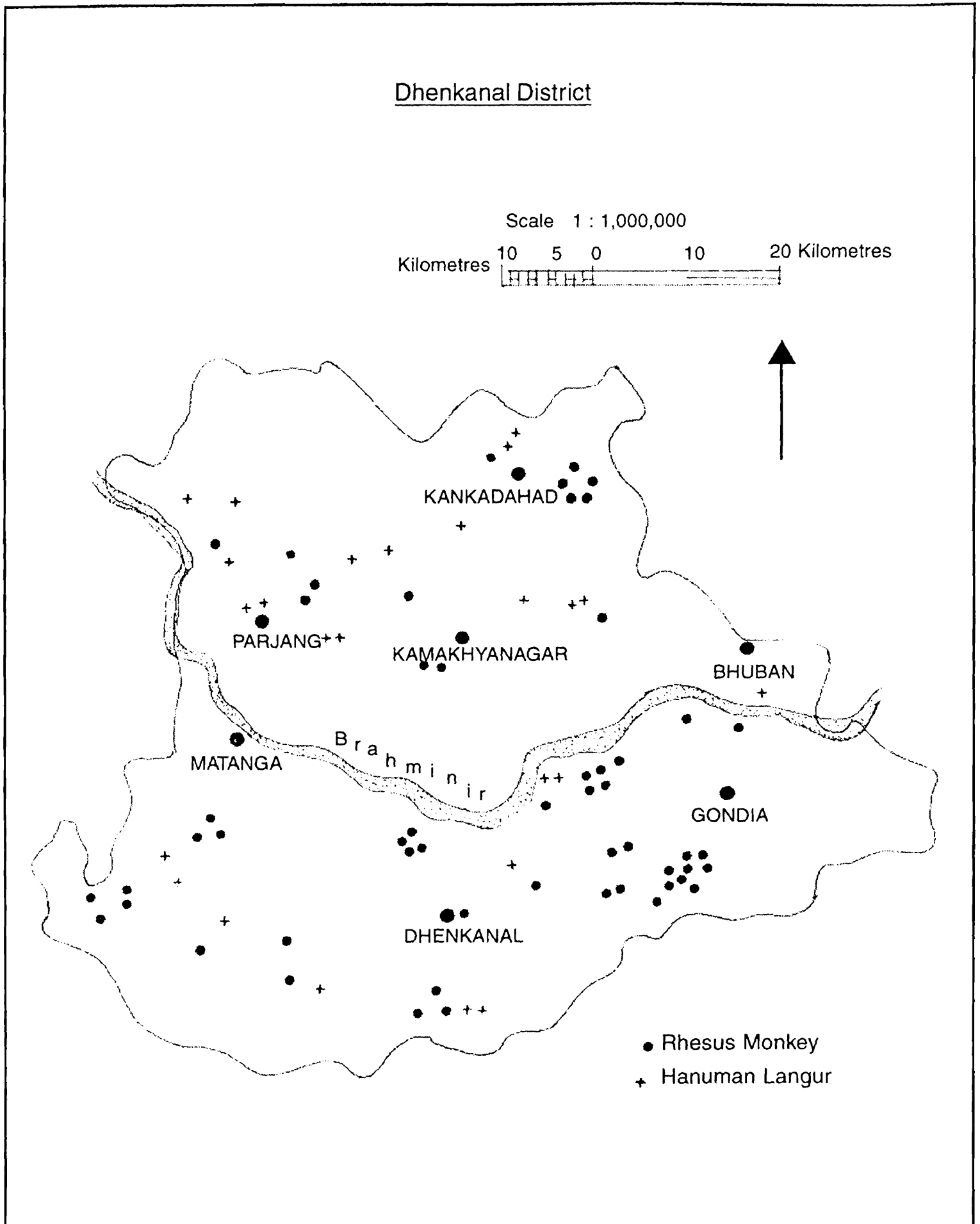


Fig. 1 : Distribution of Rhesus monkey and Hanuman Langur.

during 1991 census it was 947,670 persons. The demographic pattern of this district has increased over a period of two years from 218.8 persons/km² to 246.1 persons/km². The district has sub-division as Dhenkanal (Headquarter), Bhuban and Kamakhanagar. The district is connected by road with adjoining Cuttack and Angul districts of Orissa and very few train services on Talcher-Cuttack sector provide rail connection. The lack of sufficient communication is the main problem in the development of the district.

GEOMORPHOLOGY

Geomorphologically the district forms 3 sub-division *viz* northern and southern hill ranges and intervening Brahmini river basin. Northern hill ranges are situated to the north of Brahmini river with a stretch of 32 km. Southern hill ranges running in a direction of west northeast to east southwest in western part and to south SE to east NE in eastern region. Central Brahmini river valley has a moderately plain land to undulating topography with few scattered hillocks. The soil groups consisted of laterite, alluvial red loamy and black clay. Geological formation is composed of Gondwana sand stones, semi-consolidated tertiary laterite and unconsolidated alluvium river basin. The minerals that are available are good quality coal, graphite of high grade, chromite, kyanite, chinaclay, variants of granite. Semi-precious stones like garnet, moonstone, pink sapphire, pink corundum, rock crystals are also available in this district.

Climate of the district is warm and humid and it enjoys a sub-tropical monsoon climate, with 3 seasons- winters, summer and monsoon. May is the hottest month with a mean daily temperature of 41°C and January is the coldest having a mean daily temperature of 13°C. Mean annual temperature is 24.4°C and average annual rainfall is about 1420 mm. The rainfall is declining from 2000 AD, during 2000 it was 898 mm and in 2002 it was 797 mm annually, which was 56% of the normal. Now it is about around 1200–1300 mm annually. Brahmini is the main river that divides the district into almost two equal halves in a semicircular manner. The river Brahmini and few of its tributaries are major perennial water source in this district. Relative humidity in the Dhenkanal district is fairly high throughout the year, in contrast to the neighbouring district Angul. Maximum relative humidity is in the month of October and minimum in May. Humidity is high in the eastern and southeastern parts of the district.

FOREST TYPE

Four major types of forest are found in Dhenkanal district, *viz* Orissa Tropical semi evergreen forest; Laterite semi-evergreen forests; North Indian Tropical moist mixed deciduous forests and North Indian tropical moist peninsular sal forests. There are number of hills and hill ranges covered

with good forest throughout the district and the highest peak is Kanaka (751 m). Total reserve forest of the district is 1107 Km². The other types of forested areas comprised of village forest, Debottar forests, unclassified forests, and the total forested areas of the district including reserves is calculated around 1341 Km². This provides forested areas of the District are around 31%, which is fairly good.

Major trees of the district *Acacia auriculiformis*, *Acacia niotica*, *Acacia catechu*, *Acacia leucophloca*, *Albizia procera*, *Albizia lebbeck*, *Anthocephalus cadamba*, *Artocarpus integrifolia*, *Azadirachta indica*, *Butea monosperma*, *Rombax ciba*, *Bauhinia variegata*, *Cassia fistula*, *Dalbergia sissoo*, *Dalbergia lalifolia*, *Diospyros sylvatica*, *Kncalyptrss* spp. *Fiats bengalensis*, *Ficus religiosa*, *Ficus hispida*, *Emhlica officinalis*, *Grewia tiliifolia*, *Gmelina arborea*, *Kydia calycona*, *Michelia champaca*, *Mahnca indica*, *Mangifera indica*, *Mesua fenea*, *Pongamia pinnata*, *Pterocarpus mansupium*, *Polyalthia simiamm*, *Saraca asoca*, *Schleichere naxvomica*, *Schleichera oleosa*, *Shorea robusta*, *Syzygium chmini*, *Terminalia arjuna*, *Terminalia tomentosa*, *Terminalia bellerica*, *terminalia chebula*, *Termanalia indica* etc. There are number of bamboo species and other shrubs, herbs are on the forests floors.

METHODOLOGY

The survey was conducted on roadsides and in forests. The roadside survey methods applied in Dhenkanal district were the same that was adopted in Nayagarh district survey in Orissa (Chaudhuri *et al.*, 2007). The roadside survey was made from a slow moving vehicle, while the forest roads and trails were surveyed both on foot and vehicle. Transect and point methods were applied to locate the monkeys in forests and hills. Transect method in the forest path was accomplished by slow walking and waiting for 5–6 minutes in every 200 m for visual and auditory signals for presence of monkeys and other animals (Southwick *et al* 1961). Point method was adopted in the hills where elevation exceeds 200m and above. Total count and sweep sampling techniques were used to estimate the primate population.

Two surveys were conducted in this district, one during summer (June 2007) and other in winter (January 2008). Result of the survey discussed in this report based on January 2008 survey, when the entire district was resurveyed. The fieldwork conducted mainly in the forenoon (0700–1100 hr) and afternoon (1500–1800 hr) in summer and whole day during the winter. A total of 140 hours were spent in the census work. About 1650 km² areas was surveyed. Groups when located, their social structure, habitat, inter-intra group interaction were recorded. Individuals of a group were broadly classified for both the monkey species as adult males, adult females, juveniles and infants. The juveniles were those more than one year or less than three years old and infants were those carried by mothers, pre-weaned and less than one year old.

RESULT

In this district about 1650 km² was surveyed which comprised 38% of the total geographical area. 55 groups of rhesus macaques and 26 groups of Hanuman langurs were recorded. Out of 26 groups of Hanuman langur, 25 were bisexual groups and 1 was all male band. Both the species inhabited in the forests and villages.

Rhesus macaque : In Dhenkanal district 55 groups of rhesus monkeys were recorded of which 35 were forest groups and 20 were village groups. The 55 groups contained 2132 monkeys in the surveyed area of the district. Almost all the monkey habitable areas were surveyed and only the inaccessible hills with forest areas were left out. This provides a population estimate of 0.03 groups/km² and 1.29 individuals/km². The areas and the distribution of monkeys are shown in Fig 1. Out of these 55 groups, social composition of 3 forests groups containing 114 monkeys could not be ascertained, hence these groups were not taken into as social groups and not figured in the table for calculation. The 52 social groups contained 2018 monkeys and the composition consisted of 263 adult males; 975 adult females; 288 juveniles and 492 infants (Table 1, Fig. 2). The mean group size was 38.8 ± 2.67 individuals per group. The mean density of rhesus monkeys of Dhenkanal district is shown in Fig. 3. The group size varied from 6 to 78 monkeys. Out of 52 groups, 15 groups contained more than 50 monkeys each; 18 groups having 30–48 monkeys; 11 groups consisted of 20–29 monkeys and remaining 8 groups contained less than 20 monkeys in each

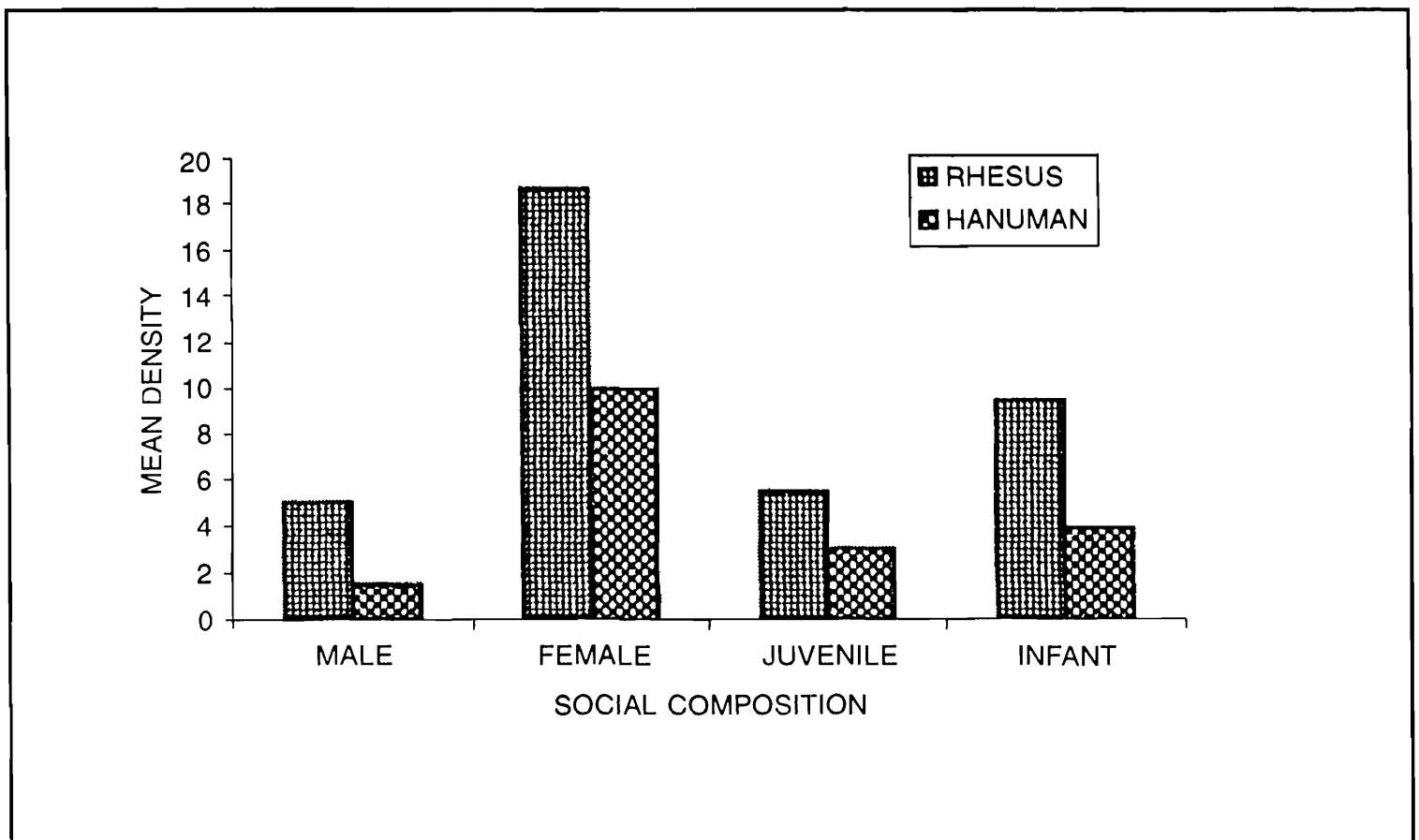


Fig. 2 : Rhesus macaque and Hanuman langur population of Dhenkanal.

group. The adult male to adult female ratio was 1 : 3.7 and adult female to sub-adults ratio was 1:0.8. About 50% females were carrying infants. The entire rhesus population of this district is distributed in two habitat categories- forests and villages.

Forest : The 32 forest group contained 1204 monkeys. The social composition consisted of 153 adult males, 588 adult females, 167 juveniles and 296 infants with a mean group size of 37.66 ± 3.51 individuals per group (fig. 3). The percentage composition in the population consisted of 12.7% adult males; 48.8% adult females; 13.8% juveniles and 24.7% were infants. Adult males to adult females ratio was 1 : 3.8 and adult females to sub-adults ratio was 1 : 0.78.

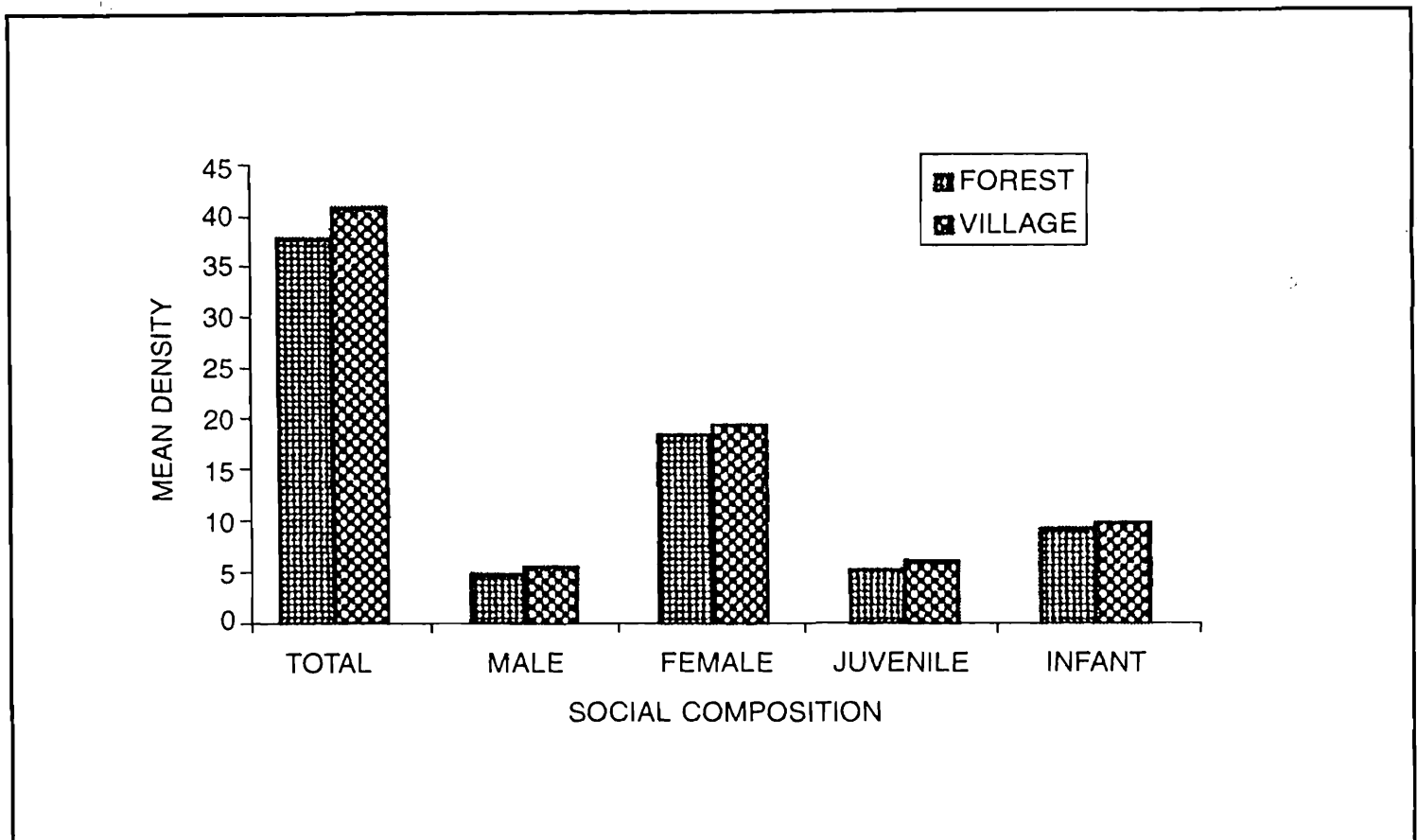


Fig. 3 : Mean density of Rhesus macaque of Dhenkanal.

The rhesus groups that were recorded at Kapilas R.F. and Khalpal R.F. consisted of 114 monkeys. Two groups were seen at Kapilas. The social composition of these three groups could not be ascertained as these monkeys disappeared quickly in the undergrowth of the forests. The 2 Kapilas groups contained 103 monkeys and the Khalpal group with 11 monkeys, apart from these groups a large group of monkeys inhabiting near the Kapilas temple which was not been recorded as those monkeys scattered over a large areas, hill tops, staircase and in trees. Though it was harbouring in forest but became semi-provisioned as pilgrims came to visit the temple and offer food items to these monkeys.

Village : The villages contained 814 monkeys of which 110 were adult males; 387 were adult females; 121 were juveniles and 196 infants with a mean group size of 40.70 ± 4.17 individuals per group (Fig. 3). Adult males to adult females ratio was 1:3.5 and adult females to infants and juveniles ratio were 1 : 0.5 and 1 : 0.3 respectively. The percentage composition consisted of 13.5% adult males, 47.5% adult females, 14.9% juvenile and 24.1% infants. Village groups normally inhabited the villages but in many villages occasionally they moved to hills situated in village areas nearby.

Hanuman langur : 26 groups of Hanuman langurs were sighted in this district, out of which 25 were bisexual groups and 1 was all male band. The 26 groups contained 669 langurs. One all male group with 5 langurs inhabiting at Khalpal village, not being shown in population density and distribution table. The 25 bisexual groups contained 464 langur and consisted of 38 adult males; 250 adult females; 77 juveniles and 99 infants. The distribution of Hanuman langur is shown in Table 2, Fig. 2. This provides a population estimate of 0.015 groups/km² and 0.28 individuals/km². The group size varied from 9 to 45. The mean group size was 18.5 ± 1.6 . The adult males to adult females ratio were 1 : 6.5 and adult females to infants and juvenile's ratio was 1 : 0.4 and 1 : 0.7 respectively. The langurs were distributed in two habitat categories- forests and villages.

Forest : The 14 forest groups having 271 langurs with a mean group size of 19.36 ± 2.6 individuals. The social composition consisted of 23 adult males, 140 adult females, 47 juveniles and 61 infants (fig 4). Percentage composition in the population was 8.5% adult male; 51.7% adult

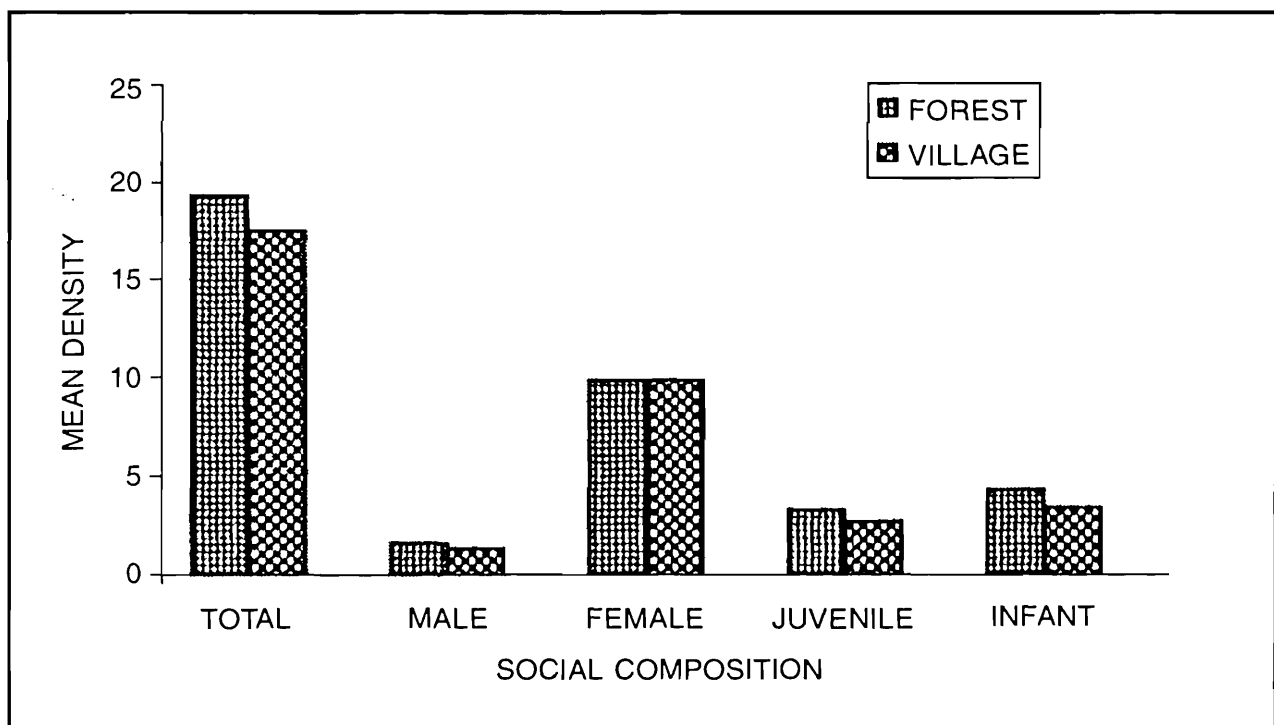


Fig. 4 : Mean density of Hanuman Langur of Dhenkanal.

females; 17.3 juveniles and 22.5% infants. About 43.5% adult females were recorded carrying infants, adult females to infants ratio was 1 : 0.4.

Village : The 11 village groups contained 193 langurs with a mean group size of 17.55 ± 1.64 individuals. The social composition was 15 adult males; 110 adult females; 30 juveniles and 38 infants (fig 4). The percentage of different class consists of 7.8% adult males, 57% adult females, 15.55% juveniles and 19.7% infants. Only 27% adult females were having infants, the ratio of adult females to infants was 1 : 0.3.

DISCUSSION

The present survey revealed that the rhesus monkey population was more than the Hanuman langur in Dhenkanal district. Both the simians were reported more in the forested areas of the district than in villages. In this district, apart from reserved forests there were also village forest, Debottar forest and unclassed forest. Total forested area is about 31% of the total geographical area of Dhenkanal. Villages provide food and shelter to the monkeys throughout the year. Small and medium hills and hill ranges scattered over the entire district with good vegetation support the monkey populations to great extent.

The Hanuman langurs at Dhenkanal, mostly harbour hill forests. The survey party encountered only 26 groups and it appeared that more groups were left out in the inaccessible hill areas. Local enquire, however, revealed that in any case the rhesus population in this district is fairly higher than the langurs. Rhesus monkey populations were, one of the most common and widely distributed monkey species, is fast depleting at many parts of India. The result of the present survey indicates that the rhesus population is quite encouraging in Dhenkanal with 50% adult females having infants, whereas in case of Hanuman langur it is about 35.3%. In reserved forest like Saptasajya, Kopilas and Ranjagarh a good number of monkeys were sighted, 3 groups at Saptasajya, 7 groups at Kapilas and 5 groups at Ranjagarh. Karmal and Barda villages recorded a number of rhesus groups (Table 1). At Kopilas forest there is a very old Shiva temple on a hilltop amidst good forest. A motorable ghat road of 5 km leads to the temple. On the other side of hill a staircase of 1365 steps leads to the temple. The rhesus monkeys inhabited both in ghat roads and the steps leading to the temple. The rhesus inhabiting on ghat road were true forests groups and retreat into the forests on seeing the people. The monkeys found on the steps and near the temple were thin, and unhealthy, suffering from malnutrition. The adult females looked like the size of juveniles but almost all females were carrying infants or gravid. These monkey groups mostly depended on provision food items from pilgrims and non-viable population.

The other district surveyed in Orissa was Nayagarh (Chaudhuri *et al.* 207) where 40% of the total area was surveyed and 10 groups of rhesus monkeys with 292 individuals were recorded. The

Table-1. Group size and distribution of Rhesus macaque of Dhenkanal

Sl. No.	Locality	Habitat	Total	Ad. Male	Ad. Fem.	Juvenile	Infant
1	Saptasaja	DLF	52	8	22	10	12
2.	Saptasajya	DLF	64	7	29	12	16
3.	Saptasajya	DLF	67	11	30	8	18
4.	Bhagbanpur	DLF	41	6	20	5	10
5.	Karala	DLF	78	11	36	11	20
6.	Berikunti	DLF	13	1	7	2	3
7.	Berikunti	DLF	35	4	16	8	7
8.	Karmal	DLF	38	6	21	3	8
9.	Kopilas	DLF	53	5	24	8	16
10.	Kopilas	DLF	41	3	20	8	10
11.	Kopilas	DLF	75	8	35	12	20
12.	Kopilas	DLF	54	6	25	6	17
13.	Kopilas	DLF	24	3	13	2	6
14.	Kopilas	DLF	10	1	6	0	3
15.	Kopilas	DLF	34	4	16	6	8
16.	Kopilas	DLF	25	3	13	3	6
17.	Siblapasi	DLF	30	4	16	3	7
18.	Bariapur	DLF	7	1	4	0	2
19.	Bariapur	DLF	35	4	16	6	9
20.	Khalpal	DLF	21	4	13	0	4
21	Rajnagarh	DLF	73	9	39	9	16
22.	Rajnagarh	DLF	39	3	20	6	10
23.	Rajnagarh	DLF	43	6	22	6	9
24.	Rajnagarh	DLF	29	4	10	7	8
25.	Rajnagarh	DLF	60	11	24	7	18
26.	Bangura	DLF	6	1	4	0	1
27.	Kai	DLF	36	4	19	4	9
28.	Kai	DLF	26	3	13	5	5

Sl. No.	Locality	Habitat	Total	Ad. Male	Ad. Fem.	Juvenile	Infant
29.	Sapua	DLF	25	3	15	3	4
30.	Ramai	DLF	31	4	18	3	6
31.	Ramai	DLF	18	2	10	2	4
32.	Aswakhola	DLF	21	3	12	2	4
33.	Kuttum	DLV	69	8	32	14	15
34.	Ranjagore	DLV	28	5	14	3	6
35.	Tarkabera	DLV	44	4	24	6	10
36.	Tarkabera	DLV	29	3	14	4	8
37.	Jangkhira	DLV	55	8	23	12	12
38.	Joranda	DLV	35	6	18	3	8
39.	Karmal	DLV	62	8	28	10	16
40.	Karmal	DLV	17	2	10	1	4
41.	Kamal	DLV	63	9	27	9	18
42.	Ganeshkhole	DLV	25	3	12	4	6
43.	Barda	DLV	32	3	16	5	8
44.	Barda	DLV	45	5	20	8	12
45.	Barda	DLV	48	9	22	7	10
46.	Barda	DLV	65	12	30	8	15
47.	Kaulo	DLV	21	3	12	2	4
48.	Bangura	DLV	65	6	32	10	17
49.	Bangura	DLV	45	7	21	6	11
50.	Kadaripu	DLV	10	1	5	2	2
51.	Bundabanpur	DLV	44	6	21	6	11
52.	Dhenkanol	DLV	12	2	6	1	3
	Total		2018	263	975	288	492
	Mean		38.8	5.06	18.75	5.54	9.46

Table-2. Group size and distribution of Hanuman Langur of Dhenkanal

Sl. No.	Locality	Habitat	Total	Ad. Male	Ad. Fem.	Juvenile	Infant
1.	Saptasajya	DLF	14	1	8	2	3
2.	Saptasajya	DLF	23	2	11	4	6
3.	Bhagbanpur	DLF	25	2	15	3	5
4.	Karanda	DLF	13	1	7	2	3
5.	Karala	DLF	14	2	7	2	3
6.	Punakote	DLF	45	4	22	9	10
7.	Jangkhira	DLF	15	1	8	2	4
8.	Parjang	DLF	22	2	10	6	4
9.	Parjang	DLF	14	1	8	2	3
10.	Khalpal	DLF	9	1	5	1	2
11.	Kusumdia	DLF	11	1	6	2	2
12.	Kusumdia	DLF	11	1	5	2	3
13.	Jamunakote	DLF	24	2	12	4	6
14.	Jamunakote	DLF	31	2	16	6	7
15.	Sukhiabanti	DLV	9	1	5	2	1
16.	Kamagara	DLV	20	1	14	2	3
17.	Kamagara	DLV	21	1	13	3	4
18.	Khuntibati	DLV	11	1	7	2	1
19.	Siblapasi	DLV	20	1	11	3	5
20.	Shiarimaria	DLV	24	2	13	4	5
21.	Bariapur	DLV	15	1	8	2	4
22.	Bariapur	DLV	14	1	7	3	3
23.	Kualo	DLV	21	2	12	3	4
24.	Naupal	DLV	13	2	7	2	2
25.	Nilakantapur	DLV	25	2	13	4	6
	Total		464	38	250	77	99
	Mean		18.56	1.52	10	3.08	3.96

topography of Nayagarh closely resembled that of Dhenkanal. It has undulating, precipitous rocky peaks, and a number of hills in the villages, and good forests. In Dhenkanal, 38% of the total area was surveyed and 55 groups consisting of 2132 (2018 + 114 unclassified monkeys) monkeys were recorded. In contrast to rhesus, Nayagarh district contained 30 groups of langur with 748 individuals.

The langurs and the rhesus monkeys were reported to invade orchards and mohua trees of the villages seasonally, and also during paddy harvest. At Karmal and Barda, the two big villages, we heard from the villagers that the rhesus monkeys were causing damage to the household foodstuff and considerable loss to the standing crops. These monkeys even scared the boys and kids. However, no biting and scratching to the people by the monkeys in this district were reported. Man-monkeys conflict in the district is negligible. Good mixed forest both reserved and village forest support sustainable primate population. Like Nayagarh in this district of Orissa too, the primates did not face any threat from the people.

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