

HABITAT PREFERENCE OF ASIATIC ELEPHANT (*ELEPHAS MAXIMUS*) IN PERIYAR TIGER RESERVE, SOUTH INDIA

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Introduction

Asiatic Elephant (*Elephas maximus*) though enjoyed once a wide distribution in India, has become an endangered species in the sub-continent (Krishnan, 1975).

Periyar Tiger Reserve supports the largest population of the Asian Elephants in South India. Some preliminary studies were done on this species in the reserve [Kurup, 1971; Vijayan *et al.*, 1979; Nair *et al.*, 1985; papers presented in a Symposium at Trichur (1989) and at Trivendrum (1990)]. But detailed information on the habitat preference of this species in various seasons and its movement patterns in Periyar are still lacking.

A study of the Asiatic Elephants was conducted in and around Periyar Tiger Reserve from September 1991. The objective of this study was to gather information on the habitat preference of the species during various seasons which is essential for the management of Elephants in the reserve.

Study Area

Periyar Tiger Reserve is situated on the Western Ghats in the Idukki District of Kerala between Lat. 9°18' and 9°40'N and

Long. 76°55' and 77°25' E. The terrain is undulating. The average height of the reserve is 900m, though several peaks rise above 1500m. The total area of the reserve is 777 km². The reserve has an approximate 90 km long border with Tamil Nadu in the North, North-East, East and South-East. The slopes of the Western Ghats on the Tamil Nadu sides do not get much rainfall which is reflected in the vegetation of the area.

Climate

Periyar has a cool climate. The temperature ranges from 14° to 33°C. It has an average rainfall of 2500 mm. March to April is comparatively dry and June to August is the monsoon season when the area gets major portion of rains.

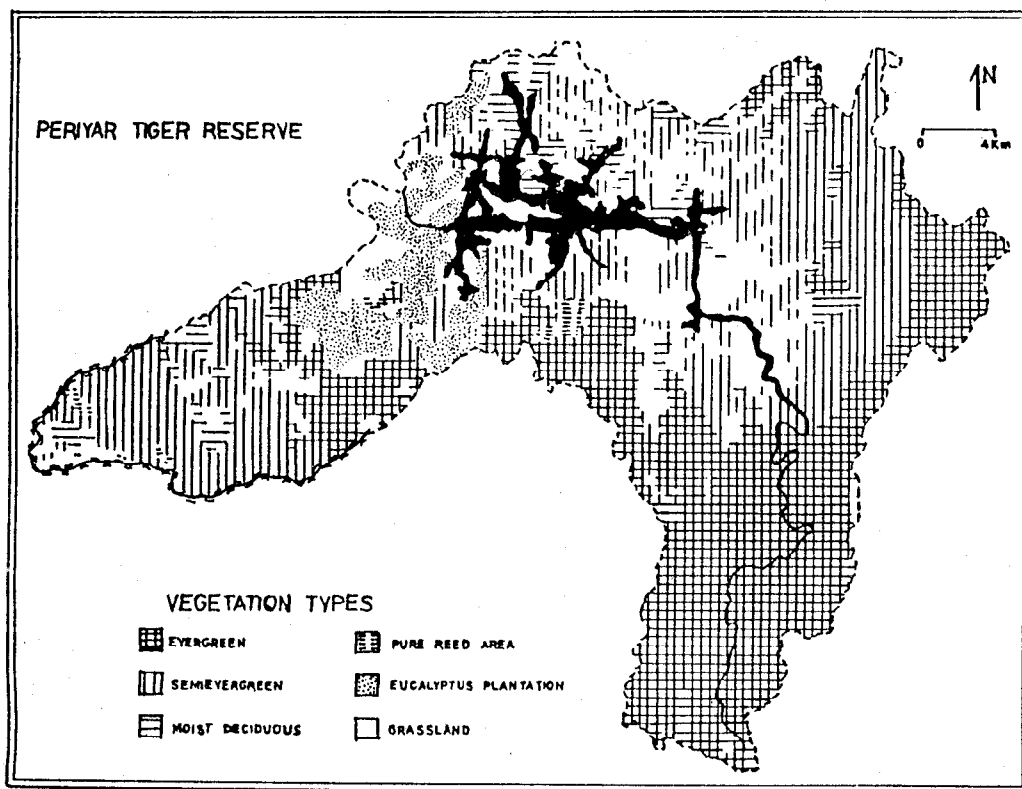
Vegetation

The types of vegetation recognised in the reserve (Chandrasekharan, 1933) are (1) West Coast Tropical Evergreen (305 km²), (2) West Coast Semi-evergreen (275 km²), (3) Southern Secondary Moist Deciduous Forest (98 km²), (4) South Indian Tropical Hill Savannah, (5) Southern Montane Wet Grassland (12 km²), (6) Reed brakes (10 km²) and (7) *Eucalyptus*

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Fig. 1



plantation (55 km²). Vegetation on the Tamil Nadu side (rain shadow region of the Ghats) is semi-evergreen in the hills, gradually changing to moist deciduous, dry deciduous and scrub as one goes down the Ghats there.

Methods

Study was started on September 1991. Four areas were selected on the basis of habitat types, for regular monitoring. In each of these areas 4 transects, each having 8-10 km length were monitored once every month. Plots (100 m x 100 m) were also marked in these areas and counting of

Elephant dung was done in the plot areas. Observations were carried out by using binoculars. Habitat types, time of observation, herd size, sex ratio, age class, behaviour etc were recorded. Dung counting was done in the plot areas in the four seasons viz., Monsoon (June-August), Post-monsoon (September-November), Winter (December-February) and Pre-monsoon (March-May). Details of Elephant movements in the Tamil Nadu area were collected directly (once in two months) and indirectly from the forest staff, estate workers and tribal people. Data collected over a period of 3 years was pooled and compared.

Table 1*Habitat preference of Asiatic Elephants, observed frequencies in different season*

Habitat	Post-monsoon	Winter	Pre-monsoon	Monsoon	Total	Percentage
Grassland	28	12	12	27	79	39.69
Savannah	28	2	14	9	53	26.63
Moist Deciduous	1	4	4	10	19	9.54
Evergreen	2	8	3	-	13	6.53
Semi-evergreen	7	7	8	7	29	14.57
Plantation	-	-	2	4	6	3.01

Table 2*Percentage of occurrence of Asiatic Elephants (*Elephas maximus*) in various habitats*

Habitat	Post-monsoon	Winter	Pre-monsoon	Monsoon
Grassland	35.44	15.18	15.18	34.17
Savannah	52.83	3.77	26.41	16.98
Moist Deciduous	5.26	21.05	21.05	52.63
Evergreen	15.38	61.53	23.07	00.00
Semi-evergreen	24.13	24.13	27.58	24.13
Plantation	00.00	00.00	33.33	66.66

Results and Discussion

During the period of study, 199 herds were observed in different habitats out of which 79 herds were observed in grasslands (39.69%), 53 in Savannah (26.63%), 19 in Moist Deciduous Forests (9.54%), 13 in Evergreen Forests (14.57%) and 6 in Plantation areas (3.10%) (Table 1).

The study shows that in monsoon and post-monsoon period, Elephants preference to grasslands was 34.17% and 35.44% respectively. Preference to Savannahs was 52.83% in the post-monsoon season. Utilisation of Moist Deciduous Forest was 52.63% in rainy season, while in winter and dry season it was 21.05% (Table 2).

Evergreen and Semi-evergreen

habitats were used more in winter and dry season (Pre-monsoon). In evergreen, habitat utilisation was 61.53% in winter and 27.58% in Pre-monsoon, where as in Semi-evergreen, percentage of utilisation was 27.58 in Pre-monsoon and 24.13 in Winter. The Elephants however spend considerable time in plantations during Pre-monsoon and monsoon seasons.

Habitat use of animals was influenced by food, water, shelter, climate factors and physiographic features of the habitat. This study shows that Elephants utilised grasslands throughout the year. The availability of grasses is an important factor since grass constitutes 50% of the diet of Asian Elephant (Vacuylenberg, 1977). Their preference to grasslands is high in monsoon (June-August) and Post-monsoon

(September-November) seasons in Periyar. Altogether they showed little preference to plantations (Table 1). But during monsoon and pre-monsoon seasons, they spent considerable time in the plantations. This seems to be related to the availability of grasses in plantation areas and, Elephants in Periyar took grasses mostly during this period. In addition, species like *Grewia tiliaefolia*, *Helicteres isora* which are the mostly preferred food plants of Elephants also occur in and around the *Eucalyptus* plantation areas in Periyar.

With the onset on monsoon and subsequent availability of palatable forage, Elephants use grasslands to a greater extent in the reserve. Use of tall grasses like *Cymbopogon contortus*, *C. confertiflorus* and *C. citratus* in grassy hills and their upper

slopes and *Panicum repens* along lake bed were regular and extensive in monsoon and post-monsoon seasons in Periyar.

At Periyar, fire and water level in the lake are also influencing habitat use of Elephants. During fire season when grasslands were burnt, Elephants dispersed and moved into forest areas. When water level rises in the lake they moved uphill for tall grassy areas for foraging.

During winter and pre-monsoon season, Gaur, Sambar and Wild Boar share grasslands with Elephants giving some pressure on the habitat. On a couple of occasions, Gaur and Wild Boar were observed being chased away by the Elephants from the lake shore.

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SUMMARY

A study of the Asiatic Elephants (*Elephas maximus*) was conducted in and around the Periyar Tiger Reserve on the habitat preference of the species during various seasons for the management of Elephant.

पेरियार बाघ संरक्षित क्षेत्र, दक्षिण भारत में एशियाई हाथी (एलिफस मैक्सिमस)
की प्राकृतावास पसंदगी

के०के० श्रीवास्तव, वी०जे० जकरियास, ए०के० भारद्वाज व एस०वी० अब्दुल हमीद

सारांश

हाथियों का प्रबन्ध करने के लिए विभिन्न मौसमों में इस जाति की प्राकृतावास पसंदगी जानने के लिए एशियाई हाथी (एलिफस मैक्सिमस) का एक अध्ययन पेरियार बाघ संरक्षित क्षेत्र और इसके आस-पास के क्षेत्रों में सम्पन्न किया गया।

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Snippets

CHLORINE

Lousiana-Pacific announced in February that it completed the conversion of its Samoe, Calif., bleached kraft pulp mill to totally chlorine-free production. It is the first mill of its kind in North America to eliminate chlorine from its process. The conversion is in response to questions about environmental and health impacts of byproducts, which include dioxins, formed when pulp mills use chlorine as a bleaching agent. Eliminating chlorine allows the plant to recycle more of its process water. The mill hopes to develop a system for recycling all water used in bleaching by the end of 1996. For information contact Lousiana-Pacific, P.O. Box 158, Samoe, CA 95564, 707-443-7511, Fax 707-443-0522

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