

OBSERVATIONS ON DEBARKING OF TREES BY ELEPHANTS IN BILIGIRI RANGASWAMY TEMPLE WILDLIFE SANCTUARY, KARNATAKA

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Abstract

Elephants play an important role in the dynamics of forest vegetation by trampling and debarking. Indirect observations on debarking of trees in Biligiri Rangaswamy Temple Wildlife Sanctuary were made in three vegetation types along transects for one month. The study indicated that 14 species were commonly debarked by elephants among which the maximum number of debarked trees were from dry deciduous forests (68) followed by moist deciduous (46) and scrub jungles (12). Depending upon the extent of debarking the mortality rate of trees may vary.

Keywords

Elephants, debarking, Biligiri Rangaswamy Temple Wildlife Sanctuary (BRT)

Introduction

Large mammals like Elephants (*Elephas maximus*) and Gaurs (*Bos gaurus*) play an important role in the vegetation dynamics of forests (Sukumar, 1989). They also influence forests by trampling and debarking (Hoft & Hoft, 1970; Sheil, 1996; Strushsaker *et al.*, 1996; Wing & Buss, 1970). In the absence of leaves during the dry season they consume bark and in the process inflict heavy damage to the trees (Sukumar, 1989). In this paper I present the results of my observations carried out to determine the tree species which were more prone to debarking by elephants in Biligiri Rangaswamy Temple Wildlife Sanctuary (BRT). I also examined if there was any preferential damage to trees in the three forest types and related it to its availability in three vegetation types.

Study site

Biligiri Rangaswamy Temple Wildlife Sanctuary which is about

540km² in area, is located between 11°40'N and 77°15'E of Western Ghats in Karnataka. The elevation ranges from 1400-1800m and the average rainfall is about 1500mm. Scrub jungle, dry deciduous, evergreen and shola are the major forest types within this reserve. Deciduous and scrub jungles are the dominant forest types. Dry forest is more open and associated with species like *Pterocarpus marsupium*, *Anogeissus latifolia* and *Dalbergia latifolia*. At higher altitudes the understorey of the dry deciduous trees are with grasses such as *Themeda cymbaria*, *Themeda triandra*, *Cymbopogon* sp. and various papilionaceous shrub species. Scrub jungles occur along the periphery of the BRT and is dominated by *Acacia sundra*, *Albizia amara*, *Anogeissus latifolia* and *Euphorbia antiquorum*. Evergreen forest is found in higher elevation and along streams. BRT is also rich in herbivores like Elephant, Gaur, Sambar, Barking Deer and Cheetal. About 1200 elephants inhabit BRT and adjoining forests (Sukumar, 1989).

Methods

Forest trails were used in three forest types (dry deciduous, moist deciduous and scrub forests) to record species that had been debarked by elephants. Signs of debarking by elephants were recorded in > 30cm girth class along transects (n=3) measuring 10m x 6km over a period of one month at the end of summer (July 2000). The maximum or minimum of choice for particular food plants in a habitat type was recorded to explain preferential nature of food habits of elephants. The list of species that were damaged by elephants in the three vegetation types are presented in Table 1.

Result and Discussion

In the observed area 14 tree species were debarked by elephants. The most commonly debarked tree species were from nine families namely, Malvaceae, Tiliaceae, Leguminosae, Combretaceae, Rhamnaceae, Anonaceae, Lecythidaceae, Verbenaceae and Euphorbiaceae. *Grewia tiliaefolia*, *Kydia calycina*, *Careya arborea* and *Bauhinia variegata* were the species that suffered heavy damage. Larger branches were broken or sometimes the whole tree was pulled down and

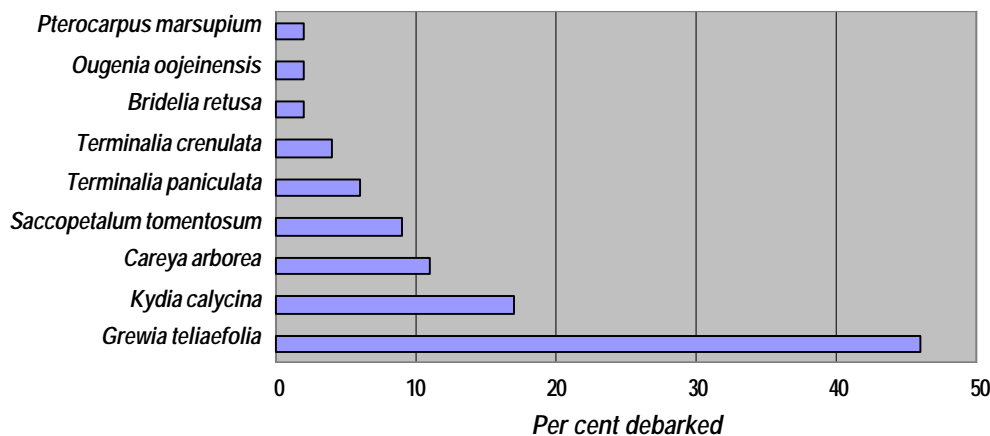
Received 24 October 2000

Accepted 20 April 2001

Table 1. List of debarked trees encountered in Biligiri Rangaswamy Temple Wildlife Sanctuary, Karnataka and the number of debarked trees in moist deciduous forest (MDF), dry deciduous forest (DDF) and scrub jungle (SJ).

Species	Family	MDF	DDF	SJ
<i>Saccopetalum tomentosus</i>	Anonaceae	4	0	0
<i>Terminalia crenulata</i>	Combretaceae	2	0	0
<i>Terminalia paniculata</i>	Combretaceae	3	1	1
<i>Bridelia retusa</i>	Euphorbiaceae	1	0	0
<i>Careya arborea</i>	Lecythidaceae	5	0	0
<i>Ougeinea oojeinensis</i>	Leguminosae	1	14	0
<i>Pterocarpus marsupium</i>	Leguminosae	1	6	4
<i>Bauhinia variegata</i>	Leguminosae	0	22	0
<i>Acacia</i> sp	Leguminosae	0	0	1
<i>Kydia calycina</i>	Malvaceae	8	6	0
<i>Zizyphus xylopyrus</i>	Rhamnaceae	0	2	0
<i>Grewia hirsuta</i>	Tiliaceae	0	0	6
<i>Grewia tiliaefolia</i>	Tiliaceae	21	16	0
<i>Gmelina arborea</i>	Verbenaceae	0	1	0
Total		46	68	12

Fig 1. Relative preference among debarked trees in moist deciduous forest.



debarked. *Zizyphus xylopyrus*, *Terminalia crenulata* and *Ougeinea oojeinensis* also suffered damage by elephants. The maximum number of trees debarked were from dry deciduous (68) and moist deciduous forests (46) followed by scrub jungle (12).

In moist deciduous forests, *Grewia tiliaefolia*, *Kydia calycina*

and *Careya arborea* (Fig. 1) were highly debarked by elephants, whereas in dry deciduous forests *Bauhinia variegata* and *Ougeinea oojeinensis* were debarked (Fig. 2). In scrub forests *Grewia hirsuta* and *Pterocarpus marsupium* were preferred (Fig. 3). Small trees such as *Saccopetalum tomentosum*, *Acacia* sp. and *Gmelina arborea* were rarely eaten by elephants.

Fig 2. Relative Preference among debarked trees in dry deciduous forest.

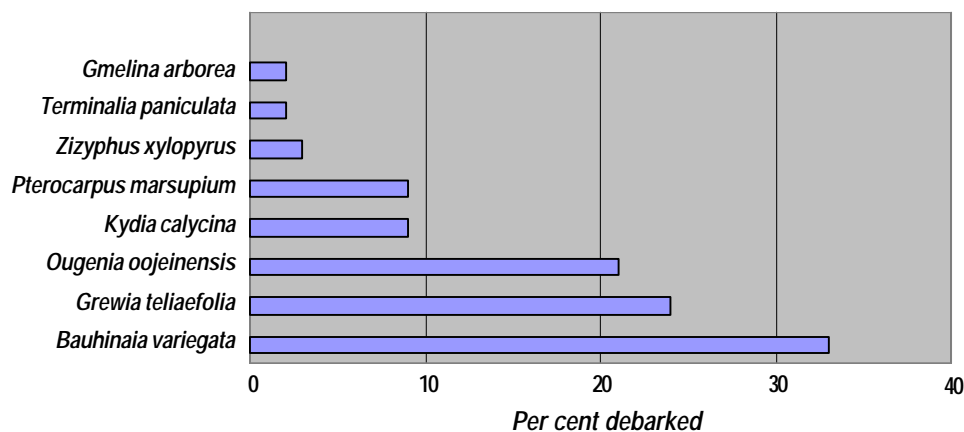
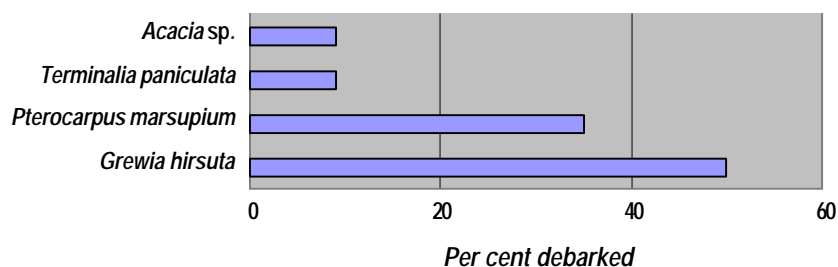


Fig 3. Relative preference among debarked trees in scrub jungle.



In moist and dry forests, *Bauhinia variegata* was often damaged by elephants. This species incidentally does not suffer damage in the forests of Mudumalai (Sukumar, 1989). It can be seen that certain species are potential food sources for elephants, irrespective of vegetation types. The consequence of debarking can vary. Low level of damage may not kill the tree, whereas, high level debarking can affect conductance of nutrients and water which eventually could lead to death of the tree. It would be interesting to investigate the relationship between damage level and mortality rates of trees.

Acknowledgements

This work was supported by Centre for International Forest Research (CIFOR), Indonesia, grant to Ashoka Trust for Research in Ecology and the Environment, Bangalore, India. I thank Drs. K.N. Ganeshiah and R. Uma Shanker for their encouragement and support.

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