

Common Food plants of Barking deer in Bonai Forest Division, Odisha, India: a conservation aspect

Ilarani Pradhan, BL Manjula, Arvind Kumar, Sheelpa Hindlekar*, Sanath Kumar N, Sanjeet Kumar and Sugimani Marndi*

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ABSTRACT

Bonai Forest Division holds an abundant floral and faunal diversity due to untouched biodiversity rich forest. Among the faunal species, the survey is carried out on the food plants of barking deer. As per survey, barking deer particularly consumed shrub and herb species like *Ageratum conyzoides*, *Flemingia chappar*, *Flemingia macrophylla*, *Synedrella nodiflora*, *Curculigo orchoides*, *Dioscorea puber*, *Molineria capitulata*, *Pueraria tuberosa*, *Smilax perfoliata*, and *Wattakaka volubilis*. They consumed the upper part of the plant and tuber. Barking deer is one of the important constituents of food chain of carnivorous species. Diminishing of barking deer can result in unbalanced ecology. Conservation of food plants of barking deer is equivalent to conservation of biodiversity. Therefore, an attempt has been made to evaluate the food plants of barking deer and present study suggest a conservation plan for near future.

Keywords: Food chain, conservation, biodiversity, faunal species, barking deer

INTRODUCTION

Bonai Forest Division (BFD) is situated towards the North — Western boundary of the Odisha state in Eastern India. The division comes under Sundargarh district of Odisha. It includes mining areas, enjoys beautiful landscapes, untouched biodiversity rich forests, and dry to moist deciduous forests. There are seven forest ranges in this division namely Bonai, Kuliposh, Barsuan, Koira, Tamra, Jarda, and Sole. Each range holds abundant & unique floral and faunal diversity. Conservation of herbivores is of equal importance to the conservation of carnivore species and forest ecology. In the Forest Division the faunal species namely Elephant, Indian Giant Squirrel, Barking deer, Wild boar, Sloth bear, Porcupine and Leopard etc., are found. For the study of food plants of Barking deer, indirect evidence survey was carried out in BFD, Odisha, India. Barking deer, *Muntiacus muntjak* (Figure 1) is relatively common throughout its wide distribution range. It usually lives alone or in pairs. They are especially found in thick vegetation and bamboo patches. As per IUCN list, it comes under least concern category. Among the faunal species in BFD, Barking deer is one of the faunal species which is common in the ranges and facing habitat loss that show decline in population. As per survey, Barking deer particularly consume species like *Ageratum conyzoides*, *Flemingia chappar*, *Flemingia macrophylla*, *Synedrella nodiflora*, *Curculigo orchoides*, *Dioscorea puber*, *Molineria capitulata*, *Pueraria tuberosa*, *Smilax perfoliata*, and *Wattakaka volubilis*. Diminishing of such plant species can result in diminishing of food plants of barking deer and ultimately result in loss of this species in BFD. Diminishing of food plants is mainly caused by anthropogenic activities like poaching, mining in their habitat and deforestation. Decline in the population of barking deer results in loss of carnivores and an unbalanced ecology. Keeping the importance of food plants of Barking deer and the negative impact on population, an attempt has been made to enumerate the food plants of Barking deer from Bonai Forest Division, Odisha to make the restoration plan and its conservation strategies.

METHODOLOGY

A field survey was conducted for the enumeration of food plants of barking deer in Bonai Forest Division during 2021- 2022. For the study, indirect & direct evidences were taken. The enumerated plants were identified by Dr. Sanjeet Kumar, Ambika Prasad Research Foundation, Odisha.

RESULTS AND DISCUSSION

During the present investigation, results revealed that about 12 plant species of 7 families were consumed by Barking deer in study areas. According to the results, it revealed that the plants belonging to Fabaceae family are consumed more than the plants belonging to families like Asteraceae, Thelypteridaceae, Hypoxidaceae, Dioscoreaceae, Smilacaceae and Apocynaceae. The most common enumerated species were *Ageratum conyzoides*, *Christella dentata*, *Curculigo orchioides*, *Dioscorea puber*, *Flemingia chappar*, *Flemingia macrophylla*, *Flemingia nana*, *Molineria capitulata*, *Pueraria tuberosa*, *Smilax perfoliate*, *Synedrella nodiflora*, and *Wattakaka volubilis* (Table 1; Plate 1). They mainly consumed the plant parts like apical portions, leaves, and tubers (Plate 2). It was noticed that shrubs are consumed more than herbs (Plate 2; Figure 2). Some researchers have also reported the food plants of Barking deer from different regions. In 2007, Nagarkoti and Thapa reported 22 plant species consumed by Barking deer. Habiba et al. (2021) have reported the food plants consumed in summer and winter from Pakistan. In summer 27 plant species are available in their habitats as compared to winter (19 plant species). It was observed that there is a need for further study on food plants of Barking deer for making the conservation strategies in near future.

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Botanical description of food plants of barking deer

Ageratum conyzoides

It belongs to the family Asteraceae. It is locally known as Pokosunga. Annual herb; stem terete, aromatic. Leaves ovate, cuneate at base, crenate along margins, acute to subacute at apex, hairy on both sides. Flower is white to pale blue, terminal, dense, corymbose heads; corolla tubular, lobes 5 and hairy.

Christella dentata

It belongs to the family Thelypteridaceae. It is a fern. Rhizome short — creeping, indistinctly suberect or erect. Fronds varying considerably in length, usually 60-90 cm long, dark green, herbaceous. Stipe 20-50 cm long, shortly hairy. Lamina ovate to somewhat obovate and pinnae.

Curculigo orchioides

It belongs to the family Hypoxidaceae. It is locally known as Talamuli. It is herbaceous, tuberous, perennial with a short or elongate root stock bearing several fleshy lateral roots. Leaves sessile or petiolate, linear or linear lanceolate, tips sometimes rooted, scape very short, clavate. Flower is golden yellow at the leaf base. Fruit oblong. The plant grows naturally in sandy areas, moist areas, with good amount of moisture and well decayed manure (Plate 1d).

Dioscorea puber

It belongs to the family Dioscoreaceae. It is locally known as Kukari sanga. Stem twining to the right, densely pubescent. Root stock woody, directly producing cylindrical tuber. Bulbils axillary, potato like, with greenish skin. Leaves are opposite, broadly ovate or sub orbicular. Petiole half to as long as the blade, pubescent. Stamens 6, perfect, small adnate to the inner perianth lobes. Female spikes densely pubescent, long, solitary, axillary or mostly in short axillary panicles. Perianth long, thickened at base with age, outer perianth lobes ovate rounded, inner rather smaller. Ovary densely pubescent, not beaked. Seeds winged all around (Plate 1a).

Flemingia chappar

It belongs to the family Fabaceae. It is locally known as Rani kathi. Shrub, 10 — 15 cm in height on a woody rootstock. Stem unbranched, mature terete, hairy. Leaves broadly ovate, base cordate, margins entire, apex mucronate. Flowers in axillary racemes, calyx tube short, lobes unequal, corolla slightly exserted, white. Pods oblong and turgid (Plate 1c).

Flemingia macrophylla

It belongs to the family Fabaceae. It is locally known as Thutokur. It is under shrub. Leaves trifoliolate; leaflets elliptic — ovate, base oblique, margins entire, apex acuminate, sub coriaceous. Flowers in axillary sub — spicate racemes, purplish — yellow;

calyx lobes white silky, prominently dotted with black glands; corolla obovate, standard petals auricled at base, wings adnate to keel. Pods oblong and rusty tomentosa.

Flemingia nana

It belongs to the family Fabaceae. Undershrub, branches terete, brown tomentose. Leaves 3 — foliate; petioles winged; leaflets broadly elliptic, ovate or rhomboid, lateral leaflets very oblique, margins entire, apex acute. Flowers in axillary, panicked racemes, appearing before the leaves; calyx clothed with viscid, bright red glands; corolla pinkish, purple veined. Pods oblong, tomentose, reddish gland dotted.

Molineria capitulata

It belongs to the family Hypoxidaceae. It is commonly known as Palm grass. It is a tuberous herb with thick rhizomes and thin stolons. Leaves are palm — like, leaves are held on long stalks. Leaf blades are oblong — lance shaped to sublong with pointed tips and surface pleated lengthwise. The inflorescence is buried amid the leaf bases and concealed by the leaves. Flower racemes, densely flowered with headlike to subovoid shape. The flower bracts are lanceolate. The bracts are usually brown, green colour and are covered by hair. The ovary is hairy with style longer than stamens. The seeds are black and are irregular in shapes.

Pueraria tuberosa

It belongs to the family Fabaceae. It is locally known as Handiphuta. It is a large perennial climber with large tuberous root. Leaves are divided into 3 leaflets. The leaflets are egg — shaped, with round base and unequal sides. Flowers blue or purplish blue, long racemes. Pods are flat and long, densely clothed with long, silky, bristly brown hairs. Stamens vexillary apically fused, free at base. Ovary long, oblong and densely brown hirsute.

Smilax perfoliata

It belongs to the family Smilacaceae. Stout climbing shrubs. Leaves broadly oblong, ovate, apex obtuse, basally 5-7 nerved; petiole stout, angled, sheathing to the middle, tendrils coiled. Umbels on axillary cymes; bracts ovate; female flowers — staminodes 6 linear. Female flowers; tepals slightly smaller than male ones; ovary 2 mm, globose, stigma 3 and recurved.

Synedrella nodiflora

It belongs to the family Asteraceae. Erect herbs. Leaves ovate to elliptic, cuneate at base, shallowly crenate along margins, acute at apex, hairy. Flower is very small and yellow in colour, axillary, and terminal, solitary or clustered.

Wattakaka volubilis

It belongs to the family Apocynaceae. It is commonly known as green milkweed climber. It is a twining shrub. Leaves ovate, base cordate, apex acuminate, glabrous. Umbels long, axillary; calyx lobes unequal, lanceolate; corolla rotate, tube 3mm, lobes 4x 4 mm, orbicular; staminal with 2 globular masses above anthers (Plate 1b).

Table 1: Food plants of barking deer in Odisha, India

Plant name	Family	Common name	Parts consumed by barking deer
<i>Ageratum conyzoides</i>	Asteraceae	Pokosunga	Upper part
<i>Christella dentata</i>	Thelypteridaceae	Nil	Leaves
<i>Curculigo orchioides</i>	Hypoxidaceae	Kali musli	Tuber
<i>Dioscorea puber</i>	Dioscoreaceae	Kukei sanga	Tuber
<i>Flemingia chappar</i>	Fabaceae	Rani kathi	Leaves
<i>Flemingia macrophylla</i>	Fabaceae	Thutkur	Leaves
<i>Flemingia nana</i>	Fabaceae	Thutkur	Leaves
<i>Molineria capitulata</i>	Hypoxidaceae	Palm grass	Tuber

<i>Pueraria tuberosa</i>	Fabaceae	Handiphuta	Tuber
<i>Smilax perfoliata</i>	Smilacaceae	Mutri	Leaves
<i>Synedrella nodiflora</i>	Asteraceae	Nil	Upper part
<i>Wattakaka volubilis</i>	Apocynaceae	Green milk weed climber	Leaves



Plate 1: Food plants of Barking deer in Bonai Forest Division, Odisha, India a) *Dioscorea puber*, b) *Wattakaka volubilis*, c) *Flemingia chappar*, d) *Curculigo orchioides*



Plate 2: Barking deer has consumed the leaves and upper parts of the plants

CONCLUSION

The present study highlights the importance of common flora in a breeding habitat of Barking deer. The most common observed food plants in Bonai Forest Division are *Flemingia chappar*, *Pueraria tuberosa* and *Smilax perfoliata*. These three plants are

commonly consumed by the Barking deer in study areas. Therefore, a thorough analysis is needed on available threats on these species for the conservation of Barking deer in study areas.



Figure 1: Barking deer in wild, Bonai Forest Division, Odisha

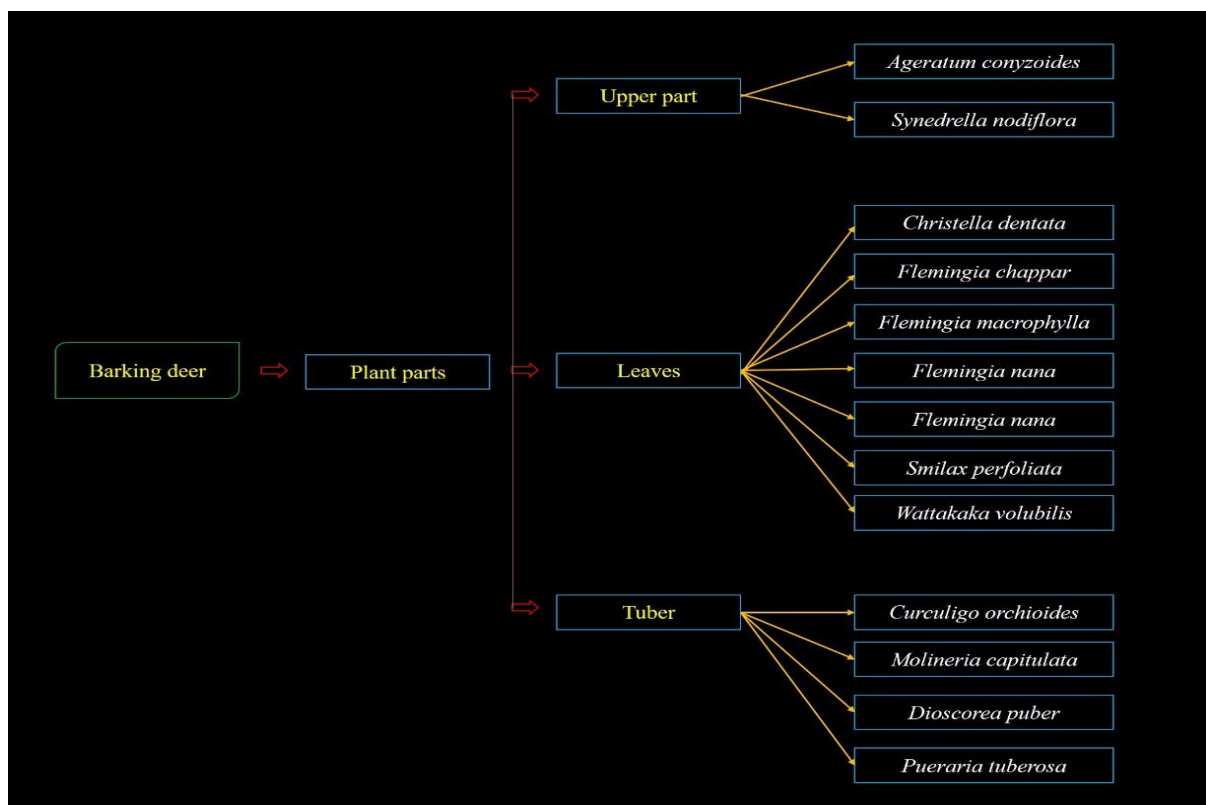


Figure 2: Plant parts consumed by the Barking deer in study areas

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REFERENCES

Habiba U, Anwar M, Khatoon R, Hussain M, Khan KA, Khalil S, Bano SA, Hussain A. (2021). Feeding habits and habitat use of barking deer (*Muntiacus vaginalis*) in Himalayan foothills, Pakistan. PLOS ONE. 16(1): 1-14.

Nagarkoti A and Thapa TB. (2007). Food habits of barking deer (*Muntiacus muntjac*) in the middle hills of Nepal. Hystrix It. J. Mamm. (n.s) 18(1): 77-82.

AUTHORS

Ilarani Pradhan, GIET University, Gunupur, Rayagada, Odisha, India

BL Manjula, Department of Botany, Sri Jagadguru Renukacharya College of Science, Arts and Commerce, Bengaluru, India

Arvind Kumar, Department of Botany, LND College, Motihari, Bihar, India

Sheelpa Hindlekar, Government College of Arts, Science and Commerce, Quepem, Goa, India; Email-Id: phadtegausha@gmail.com

Sanath Kumar N, Divisional Forest Office, Bonaigarh, Odisha, India

Sanjeet Kumar, Ambika Prasad Research Foundation, Odisha, India

Sugimani Marndi, Institute of Biological Sciences, Cuttack, Odisha, India; Email-Id: sugimani2marndi@gmail.com