

## Tree species diversity of Bhadohi District, Uttar Pradesh and a note on their Conservation

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### Abstract

The present paper describes for the first time an illustrated account of some trees of Bhadohi district. A total of 61 species under 52 genera under 32 families have been described with brief notes on salient features of each species including the phenology, and conservation.

**Key words:** Herbaria, Keystone, Carbon sequestration, Trees

### Introduction

India represents one of the twelve centers of megabiodiversity in the world (Cox et al. 2010). The country occupies a geographical area of about 7500 km along with its rich natural resources like flora and fauna, minerals, water and fertile land. The total number of species of flowering plants in India known so far are about 21,730 (Dash & Mao, 2020, Singh & Ranjan, 2021). Trees are conspicuous elements in many terrestrial landscapes world-wide and have been considered to be “keystone structures” for biodiversity. These trees occur in natural areas and human-dominated areas. Scattered trees have many ecological functions in landscapes, offering shelter and food sources for animals, enhancing landscape connectivity by acting as stepping stones, and functioning as nuclei for plant regeneration in disturbed landscapes (Anonymous 1986). Trees may enhance the provision of ecosystem services that might benefit farmers and owners of rural properties, such as pollination of crops, shading for cattle, regulation of nitrogen dynamics and carbon sequestration, herbaceous production, and wood provision.

Bhadohi represents as one of the eastern district of Uttar Pradesh. It is one of the largest carpet industry of India. This District has huge geographical significance and position attached to it, due to its location between two culturally important and rich heritage cities of Prayagraj

and Varanasi. Ganges Varuna and Morva are the main rivers of the Bhadohi. It is surrounded by Jaunpur district to the north, Varanasi district to the east, Mirzapur district to the south, and Prayagraj district to the west. With an area of 1055.99 km<sup>2</sup> Bhadohi is the smallest district of Uttar Pradesh area wise. This district is divided into three tehsils viz. Aurai, Bhadohi and Gyanpur tehsil (Fig –1), with six blocks, Bhadohi, Suriyawan, Gyanpur, Deegh, Abholi and Aurai.

The immense diversity of trees lies due to the varied climate, topographical, rainfall, terrestrial heterogeneity and ecological habitats in the Bhadohi district. The inhabitants of this district and its adjoining areas, used these trees product extensively as a source of food, fodder, fruit, timber and other material for construction of housing, clothing, medicine (Mishra et al. 2016 a,b, 2017 a,b, 2019, 2021, Tiwari et al. 2016, 2017, 2021), fiber, gum, resin and oil, and many other miscellaneous purposes. Studies helped in the documentation and illustration of some important trees of Bhadohi district. Very little work had been done in this regard on the biodiversity of Bhadohi district, (Lal & Singh 2000). The medicobiodiversity of Gyanpur region, Bhadohi has been discussed in detail (Mishra et al. 2016 a). The present work has been taken therefore to fulfil the gap in this regard for the first time.



**Figure 1. Map of Study Area Showing Bhadohi District**

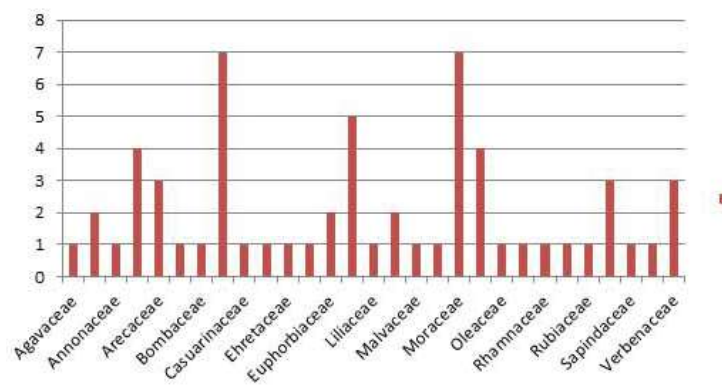
**Materials and methods**

The tree species have been collected from different parts of Bhadohi district, namely Bhadohi, Suriyawan, Gyanpur, Deegh, Abholi and Aurai covering three seasons, summer, winter and rainy season. Collected plants were processed and their herbaria were prepared by standard Lawrance methods (Lawrance, 1951) with slight modifications. Plants were properly dried up by changing a number of newspapers and poisoned with mercuric chloride solution in alcohol. Later on, the dried specimens were mounted on standard herbarium sheets, labelled properly and arranged alphabetically according to their botanical names. For identity of species, digital herbaria (eFloras 2008, WCSP 2012,

The Plant List 2013, POWO 2019, GBIF 2020, JSTOR 2020, The Herbarium Catalogue 2021) were thoroughly examined and relevant literature was consulted. All the identified and voucher specimens were deposited in the Department of Botany KN Governmentt. PG college Gyanpur, Bhadohi District.

**Observation**

In the present study, nearly 61 tree species belonging to 32 families and 52 genera, collected from various parts of the Bhadohi district, have been enumerated and documented, see Table – 1. Some of the significant trees are described, tabulated and illustrated below with their botanical name, vernacular name, family, habit, phenology. See Figure- 1 & 2 and Plates 1 & 2.



**Figure 2. Tree Species representation within each Family**

**Table 1: Showing Trees of Bhadohi District**

S.No	Botanical Name	Vernacular Name	Family	Habit	Phenology
1	<i>Acacia arabica</i> (Benth.)	Babul	Fabaceae	Tree	Aug -Sept
2	<i>Aeglemarmelos</i> (L)	Bel	Rutaceae	Tree	April - Aug
3	<i>Agave Americana</i> L.	Gwarpatha	Agavaceae	Tree	Jan- April
4	<i>Aloe arborescence</i> L.		Liliaceae	Tree	Feb - Mar
5	<i>Annonasquamosa</i> L.	Sharifa	Annonaceae	Tree	Mar- May
6	<i>Anthocephaluscadamba</i> (Lamk.)	Kadamb	Rubiaceae	Tree	July - Nov
7	<i>Artocarpusheterophylla</i> Lamk.	Kathal	Moraceae	Tree	Sept - Jan
8	<i>Azadirachtaindica</i> A. Juss.	Neem	Meliaceae	Tree	Feb - Aug
9	<i>Bauhinia variegata</i> L.	Kachnar	Caesalpiniaceae	Tree	April - Jun
10	<i>Bombaxcieba</i> L.	Semal	Bombaceae	Tree	Mar - July
11	<i>Borassusflabellifer</i> L.	Taad	Arecaceae	Tree	Nov - Feb
12	<i>Buteamonosperma</i> (Lam.)Taub.	Dhak	Fabaceae	Tree	Jan - July
13	<i>Caesalpinniaesculenta</i> L.	-	Caesalpiniaceae	Tree	Jan - Dec
14	<i>Callistemon lanceolata</i> Skeels	Bottle brush	Myrtaceae	Tree	Jan - Aug
15	<i>Cassia fistula</i> L.	Amaltas	Caesalpiniaceae	Tree	Mar - July
16	<i>Cassia javonica</i> L.		Caesalpiniaceae	Tree	Mar - July
17	<i>Casuarinaequisetifolia</i> L.	Janglisaru	Casuarinaceae	Tree	Sept - Jan
18	<i>Citrus limonia</i> L.	Neebu	Rutaceae	Ttree	Jan - Sept
19	<i>Citrus medica</i> L.	KagziNeebu	Rutaceae	Tree	Jan - Sept
20	<i>Cordiadicotoma</i> G.Forst	Lasoor	Ehretiaceae	Tree	Oct - Feb
21	<i>Crataevareligiosa</i> Candolle	Temple plant	Capparidaceae	Tree	Nov - Mar
22	<i>Dalbergiasissoo</i> Roxb. Ex DC	Shisham	Fabaceae	Tree	Oct - Feb
23	<i>Delonixregia</i> (Bojer) Raf.	Gulmohar	Fabaceae	Tree	July - Oct
24	<i>Diospyrosmalabarica</i> Kostel	Tendu	Ebenaceae	Tree	Feb - July
25	<i>Eucalyptus citriodora</i> Mitchell.	Safeda	Myrtaceae	Tree	Nov - Mar
26	<i>Eucalyptus rostrata</i> Desf.	Neelgiri	Myrtaceae	Tree	Dec - Feb
27	<i>Eugenia jumbolana</i>	Jamun	Myrtaceae	Tree	June - Aug
28	<i>Ficusracemosa</i> L.	Gular	Moraceae	Tree	Mar - Aug
29	<i>Ficusbenghalensis</i> L.	Bargad	Moraceae	Tree	Jun- mar
30	<i>Ficuscarica</i> L.	Anjeer	Moraceae	Tree	Jan- Apr
31	<i>Ficusreligiosa</i> L.	Peepal	Moraceae	Ttree	Apr - Sept
32	<i>Ficusvirens</i> Dryander	Pakri	Moraceae	Tree	Whole year
33	<i>Grewiaasiatica</i> L.	Phalsa	Malvaceae	Tree	May- June
34	<i>Jacaranda mimosifolia</i> D.Don	Nupur	Bignoniaceae	Tree	June- Sept
35	<i>Lagerstroemia flos</i> L.	Pride of India	Lythraceae	Tree	April - June
36	<i>Lagerstroemia parviflora</i> Roxb.	Pride of India	Lythraceae	Tree	April- June
37	<i>Madhucaindica</i> Gmel	Mahua	Sapotaceae	Tree	Feb- Sept
38	<i>Mangiferaindica</i> L.	Aam	Anacardiaceae	Tree	Feb - May
39	<i>Moringaoleifera</i> Lamk.	Sahjan	Moringaceae	Tree	Jan - June
40	<i>Morus alba</i> L.	Shahtut	Moraceae	Tree	Feb - June
41	<i>Neriumodorum</i>	Kaner	Apocyanaceae	Tree	Whole year
42	<i>Nyctanthusarbor-tristis</i> L.	Parijaat	Oleaceae	Tree	Sept - Nov
43	<i>Oreodoxaregia</i>	Bottle Palm	Arecaceae	Tree	Feb - June
44	<i>Pandanustectorius</i>	Ketki	Pandanaceae	Tree	Mar - June
45	<i>Parkinsoniaaculeata</i> L.	VilayatiKikar	Caesalpiniaceae	Tree	Jan - March

46	<i>Phoenix dactylifera</i> Roxb.	Khajur	Arecaceae	Tree	Feb- June
47	<i>Phyllanthusemblica</i> L.	Amla	Euphorbiaceae	Tree	Sept- Feb
48	<i>Plumeria alba</i> L.	SafedChampa	Apocyanaceae	Tree	June - Sept
49	<i>Plumeriaacutifolia</i> F.	LalChampa	Apocyanaceae	Tree	July - Oct
50	<i>Populous sp. L.</i>	-	Salicaceae	Tree	Nov- May
51	<i>Prunusamygdalus</i>	Aaru	Rosaceae	Tree	Jan - March
52	<i>Psidiumgujava</i> L.	Amrood	Myrtaceae	Tree	Sept - Dec
53	<i>Pterocarpusindicus</i> Willd.	Mahogani	Fabaceae	Tree	Feb - May
54	<i>Ricinuscommunis</i> L.	Arandi	Euphorbiaceae	Tree	Whole year
55	<i>Saracaindica</i> (Roxb.)	Ashok	Caesalpiniaceae	Tree	Mar - April
56	<i>Spondiaspinnata</i> (L.f.) Kurz.	Aamra	Anacardiaceae	Tree	Mar - April
57	<i>Tamarindusindica</i> L.	Imli	Caesalpiniaceae	Tree	May - June
58	<i>Tectonagrandis</i>	Sagon	Verbenaceae	Tree	July - Aug
59	<i>Thevetiaperuviana</i> (Pers.)	Pilli Kaner	Apocynaceae	Tree	Whole year
60	<i>Terminaliabellirica</i> Gaetn.	Bahera	Combretaceae	Tree	Feb - May
61	<i>Ziziphusmaritiana</i> Lamk.	Ber	Rhamnaceae	Tree	Sept - feb

## Results and Discussion

In the present study a total number of 61 tree species belonging to 32 families and 52 genera have been collected from various parts of the Bhadohi district, during the field surveys in different seasons of the year and identified. In this district tree plants have been used by mankind as a source of food, fodder, fruit, timber and other material for construction of housing, clothing, medicine, fiber, gum, resin and oil, etc. Tree Species of *Acacia*, *Azadirachta*, *Dalbergia*, *Diospyros*, *Eucalyptus*, *Lagerstroemia*, *Madhuca*, *Mangifera*, *Tectona*, *Terminalia* are timber yielding trees. *Bauhinia* leaves and shoots are cooked. used for cooking, *Madhuca* and *Moringa* flowers are cooked. *Aegle*, *Annona*, *Artocarpus*, *Diospyros*, *Ficus*, *Grewia*, *Mangifera*, *Moringa*, *Tamarindus*, *Zizyphus* are used for fruits. *Butea monosperma* flowers used for dyeing for carpets as Bhadohi district is a hub of carpet industries. *Azadirachta*, *Butea*, *Cassia*, *Phyllanthus*, *Tectona*, *Terminalia* etc used as a source of medicines. *Madhuca* sp used for beverages, *Eucalyptus* sp used as a paper pulp. Due to high population density, over-exploitation, trees have been reduced regularly from few decades. State government should take urgent initiative to conserve the tree diversity by adopting suitable measures for their ex-situ and in-situ conservation.

## Conclusion

Biodiversity conservation can be sustained only if peoples involvement, awareness and concern are substantially heightened. Action to conserve biodiversity must be planned and implanted at a scale determined by ecological and social criteria. The focus of activity must be in the vicinity where people live and work as well as in wild land areas. Cultural diversity is closely linked to biodiversity. Collective knowledge, increased public participation, respect for basic human rights, improved popular access to education and information via new technological advancements and greater institutional accountability are essential elements of biodiversity conservation.

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A.



B.



C.



D.



E.



F.



G.



H.

PLATE 1 . A.*Acacia arabica* auct.non(Lam.)Willd., B.*Aegle marmelos*(L.) Correa.C.*Artocarpus hysterophorus*,  
D.*Azadirachta indica* L.,E.*Bauhinia variegata*, F.*Butea monosperma* (Lamk) Taub, G.*Carica papaya* L.,H. *Dalbergia sisoo*



I.



J.



K.



L.



M.



N.



O.



P.

PLATE 2 . I.*Ficus benghalensis.*,J.*Ficus religiosa.*,K.*Grewia asiatica.* L. Mant,L..*Mangifera indica* L, M.*Moringa oleifera* Lamk.,O.*Tamarindus indica* L., P.*Terminalia arjuna* (Roxb. Ex DC)Wt&Arn

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