ETHNOBOTANICAL STUDIES IN TALODA FOREST AREA OF NANDURBAR DISTRICT, MAHARASHTRA

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ABSTRACT

The current study was aimed to conduct an ethnobotanical survey of the Taloda forest Area of Nandurbar district of Maharashtra, India. The study lays an emphasis to highlight the floral and ethnic diversity of the study area. Nandurbar district lies in the northwestern part (Khandesh region) of Maharashtra. Taloda taluka is situated within the satpuda mountain range, an area characterized by its remote forested regions where tribal communities reside in hamlets. The satpuda mountain range is notable for its well-preserved forests, which exhibit a high level of species diversity. The area hosts a rich diversity of flora and is abundant in medicinal plants. The current study confirmed the presence of 82 plant species from 74 genera under 46 families, which are used as food, fodder, and for various medicinal purposes.Notably,64out of 82 of these plant species were recognized for their ethnomedicinal use, employed by traditional healers and indigenous communities to treat various ailments. The study documented the rich floral diversity with the vernacular nomenclature and highlighted the various plant parts used in the treatment of various ailments by tribal people.

Key Words: Ethnobotany,Traditional knowledge,Medicinal plants,Taloda forest,Nandurbar

INTRODUCTION:

India has been rich in ethnobotanical knowledge since ancient times, as found in ancient texts. Ethnobotanical knowledge has deep historical roots. The term "ethno" refers to the study of human cultures, while "botany" pertains to the examination of plant life. Ethnobotanical research plays a crucial role in enhancing our understanding of the plant species utilized by local rural and tribal communities. This discipline, often referred to as ethnomedicine, investigates the traditional knowledge possessed by various ethnic groups

concerning their health-related practices. The interaction between indigenous people and local flora can be strengthened through the use of ethnobotanical studies when combined with botanical surveys. Plants have been utilized for food, fuel, fodder and medicine since prehistoric times. The term “ethnobotany" was initially introduced by the botanist John William Harshberger in 1895[1.] The utilization of plants by humans for diverse purposes is documented in ancient literature through ethnobotanical practices. In India, Dr. S.K.Jain (1986), known as the Father of Indian Ethnobotany, from NBRI, Lucknow, made pioneering investigations in the field of Indian Ethnobotany and has contributed significantly to ethnobotanical research, revealing new perspectives on traditional medicine[2-4].Nandurbar district is situated in the northwesternpart (Khandesh region) of Maharashtra state in India. It was crafted out of the Dhule district on 1stJuly 1998. The total area of Nandurbar is 5955 sq. kmand comprisessix talukas with Taloda taluka having a total population of 159,654 as per the census of 2011.Out of the total population, 77.4% of inhabitantsbelong to scheduled tribe[5].

The Taloda forest areais rich in flora with ethnobotanical aspects. This taluka is situated within the Satpuda mountain range and is characterized by the presence of tribes residing in remote forested regions, often in small villages or hamlets. The tribal healers, elders,and rural people of the Taloda area possess extensive knowledge regarding the medicinal properties of indigenous plants. The major tribes residing in the Taloda area are Bhil, Pawara and Padvi. These communities have developed their own system of herbal medicine, drawing from their understanding; they use various plant parts for the treatment of different ailments.

Taloda forest area is recognized as a tropical dry deciduous forest, which is situated within the Mewasi forest division of Nandurbar district. This forest area encompasses a total geographical expanse of 16,077.14 hectares.The Taloda forest area has many sacred sites like the Kondeshwar temple, Dindanayaha temple, and Hadamba Mata temple and bears principal trees like teak, tendu, sag, bondara, bamboo, khair, etc., with a tree cover of 0.5 (canopy density)[6].

The landscape of the region features steep hills interspersed with both open spaces and thick clusters of dry deciduous forests[7]. The most common soil types found in the Taloda forest area are hill red soil and black regur soil.

The district has a mostly dry climate with the exception of the southwest monsoon season. Winds are usually light to moderate; rainfall is heavier in the hills of the Western Ghats and the Satpuda range. Over the past five years (2019-2023), the average rainfall in the Taloda

taluka has been 828.92 mm. Except during the southwest monsoon season, when the humidity is above 70%, the air is rather dry in the taluka during the year.The humidity is high during the monsoon season. Temperatures begin to rise consistently from the latter half of February and continue to do so until May, which is recognized as the hottest month of the year. During this period, the average daily maximum temperature reaches 40.3°C, while the average daily minimum temperature stands at 25.8°C.In April and May, hot and dry winds prevail, contributing to the extreme heat, with maximum temperatures occasionally soaring to 46°C on certain days[8].In the present investigation, an attempt is made to document the floral diversity of Taloda forest area with ethnomedicinal uses.

MATERIALS AND METHODS

Area of study: The research was conducted in the Taloda forest area of the Nandurbar district in the state of Maharashtra, India. The research was conducted to investigate the angiosperm flora within the designated site of this forest area, located in the Mawasi forest division of the Nandurbar district. This area is notable for its rich floral diversity, particularly in relation to ethnobotanical characteristics. In the current investigation, field surveys were carried out in the Taloda forest area, encompassing various villages. These involved personal interviews with traditional healers, spiritual leaders, and elderly tribal members. The findings were corroborated through multiple inquiries conducted across different seasons and in various villages.

Survey Methodology: The survey was carried out in the years 2023 to 2024 by field studies across various seasons to gather ethnobotanical data. Interviews were held with tribal and rural populations to elicit their traditional knowledge concerning plant usage. Data collection employed multiple methods, including observation, interviews, inquiries, participationand open discussions with tribal communities. Throughout this timeframe, local residents were interviewed to obtain information regarding the medicinal applications of various plant specimens, along with their local names. Plant species were identified by referring to various floras like Flora of Dhule and Nandurbar Districts (2003)[9], Flora of Nashik District (1991)[10], The Flora of Presidency of Bombay[11], and Flora of Maharashtra State: Dicotyledons[12].

RESULTS AND DISCUSSION

Various localities were visited periodically for field observations of ethnobotanically important plants. The survey revealed the record of 82 plant species that belong to 74 genera falling under 46 families, as shown in table no. 1. The documented plant species were

tabulated in alphabetical order based on their generic names with their local names, family, local name, habit, parts used, and purpose of use. Plant species were categorized based on habit (Dig.1), distribution based on genera, species and family (Dig.2). The survey revealed the traditional medicinal use of various plant parts (Dig.3).Sukha is a musical instrument used by tribal peoples. Dhudhi bhopda(*Lagenaria siceraria*)and bamboo (*Bambusa arundinacea*) sticks are used to make the sukha instrument (Fig.1).

The study presents an extensive compilation of these plant species, detailing their botanical names, family, local name, habit and the plant parts utilized for the treatment of various ailments and their other applications. The survey revealed that mohu trees (*Madhuca longifolia*) flowers are one of the financial sources of the common people. The flowers of the mohu tree are collected and sold in the market, thereby generating income for the local people. Further, the current study also revealed that people of Taloda taluka rely on available plants for the construction of the raw houses and tents. The large leaves of palas, mohu, sag, and bamboo chips are used for house building. 'Kude' which means the walls, made from bamboo sticks, is used for the construction of raw houses. A house roof is made of dried grass with large leaves. Wood is used for agricultural tools, bullock carts, and house frames. The study confirmed that among the 82 plant species documented for ethnobotanical purposes,23 are herbs, 13 are shrubs, 36 are trees, 2 are grasses and 8 are climbing plants. Notably, 64 out of 82 species were recognized for their ethnomedicinal uses, employed by traditional healers and indigenous communities to treat various ailments (Tab.1).The study further revealed that many plant species have religious importance like Astamba yatra (*Cymbopogon martinii).* Medicinal plants with significant therapeutic value include *Butea monosperma, Bambusa arundinacea,Kalanchoe pinnata, Morinda pubescens, Ocimum species, Madhuca longifolia, Tamarindus indica,Vitex negundo.*These plants are utilized by practitioners of ayurveda as well as by indigenous communities.

Table 1: A list of ethnobotanical plants with their uses.

Sr. No.	Botanical Name	Local Name	Family	Hb	Part used	Purpose of use
1	*Abelmoschus manihot* (L.) Medik	Ranbhendi	Malvaceae	H	Root	Reduce body heat, Fever,
					Seed	Cure abdominal pain
2	*Abutilon indicum* (L.) Sweet.	Atti	Malvaceae	S	Leaves	Scabies
					Flower	Headache

3	*Acacia catechu* (Roxb.et.Rottl.) willd.	Khair	Mimosaceae	T	Wood	Katha as a dyeing
4	*Acacia nilotica* (L.) Del.	Babhul	Mimosaceae	T	Seed,Pod	Pest control, Fodder
5	*Achyranthes aspera* L.	Aghada	Amaranthaceae	H	Leaves	Skin diseases, Sores, Scorpion bits
6	*Aegle marmelos* (L.) Corr.	Bel	Rutaceae	T	Leaves	Itcha, Religious purposes
7	*Adhatoda vasica* Nees.	Adulsa	Acanthaceae	S	Leaves	Cough,Nasalcongestion
8	*Ailanthus exceisa* Roxb.	Mahanimb	Simarubaceae	T	Bark	Fracture, Cure fever
9	*Alangium salvifolium* (L.f.) Wang.	Akol	Alangiaceae	T	Leaves	Skin disorder
10	*Allium cepa* L.	Kanda	Amaryllidaceae	H	Bud Juice	Sunstroke,Epileptic seizures, Earache
11	*Aleo vera* L.	Korphad	Asphodelaceae	H	Leaves pulp	Face pimples-dark spot remove, Skin burn.
12	*Amaranthus hybridus* L.	Rajgira	Amaranthaceae	H	Seed	Use in cooking
13	*Amaranthus spinosos* L.	Katamata	Amaranthaceae	H	Root	Stomach ache, against insect poison
14	*Annona reticulata* L.	Ramphal	Annonaceae	T	Fruit	Edible, Tonic, Sedative.
15	*Annona squamosa* L.	Sitaphal	Annonaceae	T	Leaves Fruit	Toothache, Diabetes Edible
16	*Argemone mexicana* L.	Pivala dhotra	Papaveraceae	H	Seed	Hand pain,
17	*Azadirachta indica* A. Juss.	Neem	Meliaceae	T	Twing	Tooth decay,
					Leaves	Dandruff, Wound
18	*Bambusa arundinacea* (Retz.) Willd.	Bomboo	Poaceae	G	Stem	Furniture, Mats,Toys,Construction purposes
19	*Bauhinia racemose* Lamk.	Apta	Caesalpiniaceae	T	Leaves	Religious significance, Headache.
					Bark	Making ropes
20	*Bauhinia purpurea* L.	Rakta chandan	Caesalpiniaceae	T	Bark	Asthma
21	*Bixa Orellana* L.	Sanduri	Baxiaceae	T	Seed	Sindur

					Leaves	Dysentery
22	*Bombex ceiba* L.	Sawari	Bombacaceae	T	Flower	Vegetables
					Bark	White discharge
23	*Bougainvillea spectabilis* Willd.	Boganwel	Nyctaginaceae	Cl	Wp	Ornamental plant
24	*Butea monosperma* (Lamk.) Taub.	Palas	Fabaceae	T	Flower Info.	Reduced fever, Sunstroke
					Leaves	House roof
25	*Caesalpinia bouduc* (L.) Roxb.	Kachakda	Caesalpiniacea e	S	Seed	Stomachache,Indigestion
26	*Cassia fistula* L.	Girmala	Caesalpiniacea e	T	Leaves	Ringworm, Scabies
					Fruit	Pulp -purgative
27	*Canna flaccida* Rose.	Kardali	Cannaceae	H	Flower	Ornamental plant
28	*Canscora diffusa* (Vahl)R.Br.	Kilwar	Gentianaceae	H	Wp	Powder-hand pain
29	*Celosia argentea* L.	Kardu	Amaranthaceae	H	Seed	Reduce body heat
30	*Cissus quadrangula* L.	Kandwel	Vitaceae	Cl	Stem	Bone fracture,Piles,
31	*Clerodendrum chinense* (Osbeck) Mabb. Fam.	Hazari mogra	Verbenaceae	S	Flower	Ornamental plant
32	*Clitoria ternatea* L.	Gokarna	Fabaceae	S	Leaves	Joint pain, Treat burns,
					Seed Root	Purgative, Dyspepsia
33	*Cocos nucifera L.*	Nariyal	Aracaceae	T	Bark	Making rope
34	*Cymbopogon citratus* L.	Gavati chaha	Poaceae	H	Leaves	Oil, Flavoring
35	*Cymbopogon martinii* (Roxb.) Wats.	Roisha	Poaceae	G	Leaves	Joint pains,
					Wp	Religious significance, Prevents mosquitoes
36	*Cucurma longa* L.	Halad	Zingiberaceae	H	Rh.	Cough, Cold,Pimples,Health promoting, Ulcer
37	*Dalbergia sissoo* Roxb.ex.DC.	Sisam	Fabaceae	T	Bark Root	Itch, Asthma
38	*Emblica officinalis* Gaertn.	Awala	Euphorbiaceae	T	Fruit	Triphala churn,Blood purifier, Tonic
39	*Euphorbia neriifolia* L.	Nevagunda	Euphorbiaceae	S	Wp	Protection of farmyards

						from animals
40	*Ficus racemose* L.	Umbar	Moraceae	T	Fruit	Edible, Cure weakness
					Leaves	Skin diseases
41	*Hemidesmus indicus* (L.)R.Br.	Anantmul	Asclepiadaceae	Cl	Root	Anaemia, Cure ringworm
42	*Hibiscus rosa sinensis* L.	Jaswand	Malvaceae	S	Flower	Hair problem
43	*Hibiscus sabdariffa* L.	Lalambadi	Malvaceae	S	Flower	Vegetable,
					Leaves	Cure ringworm infection
44	*Impatiens balsamina* L.	Tiwarya	Balsaminaceae	H	Flower	Mehndi-dying hands
45	*Jatropha gossypifolia* L.	Ratandi	Euphorbiaceae	S	Seed	Minor burns
46	*Kalanchoe pinnata* (Lamk.)Pers.	Panfuti	Crassulaceae	H	Leaves	Kidney stone, Acidity
47	*Lagenaria siceraria* (Molina) Stendl.	Dhudhi bhopada	Cucurbitaceae	Cl	Fruit	Tonic,Diabetes, Musical instrumentSukha
48	*Lagerstroemia parviflora* Roxb.	Bondara	Lythraceae	T	Stem	Fever, Construction huts
					Bark	Skin tumours
49	*Limonia acidissima* L.	Kaith	Rutaceae	T	Fruit	Edible, Cardiac tonic
50	*Luffa cylindrica*(L.)	Gelaka	Cucurbitaceae	Cl	Fruit	Vegetables
51	*Madhuca longifolia* (Koen.) Macbr.	Mahua	Sapotaceae	T	Flower	Vegetables, Liquors
					Seed	Skin diseases, Headache
52	*Mangifera indica* L.	Amba	Anacardiaceae	T	Seed Leaves	White discharge, Vomiting,
					Twing	Abdominal pain, Marriage ceremony
53	*Martynia annua* L.	Wagh nakhye	Myrtyniaceaea	H	Seed	Scabies
					Leaves	Pimples
54	*Mentha spicata* L.	Pudina	Laminaceae	H	Leaves	Vegetable,Juice
55	*Mimosa pudica* L.	Lajalu	Mimosaceae	H	Leaves	Sores,Skin infections
56	*Morinda pubescens* J.E.Smit.	Aal	Rubiaceae	T	Fruit Bark	Green fruits are edible, Piles.
57	*Moringa oleifera* Lamk.	Shevaga	Moringaceae	T	Fruit	Vegetables, Tonic

58	*Morus alba* L.	Tuti	Moraceae	T	Fruit	Sora throat
					Leaves	Anti-inflammatory
59	*Murraya koenigii* (L.) Spreng.	Kadhipatta	Rutaceae	T	Leaves	Cooking, Digestion, Cold, Dog bites
60	*Nicotiana tabacum* L.	Tamaku	Solanaceae	T	Leaves	Headache
61	*Ocimum basilicum* L.	Subja	Lamiaceae	H	Leaves	Cold,Cough,
					Seeds	Paste- reduce body fever
62	*Ocimum sanctum* L.	Tulas	Lamiaceae	H	Leaves	Throat infection, Cold, Cough, Skin diseases
					Wp	Fever, Religious purposes
63	*Phyllanthus emblica* L.	Awala	Phyllanthaceae	T	Fruit	Edible, Weakness, tonic
64	*Pithecellobium dulce* (Roxb.) Benth.	Vilayati chinch	Mimosaceae	T	Fruit	Edible
65	*Piper nigrum* L.	Kalimiri	Piparaceae	Cl	Seed	Fever, Cough
66	*Ricinus communis* L.	Erandi	Euphorbiaceae	S	Leaves Seed	Cureabdomen pain, Extract the oil
67	*Rungia repens*(L.) Nees.	Ghati pitpapra	Acanthaceae	H	Root	Muscle catch
68	*Senna alata*(L.)	Shimai agase	Fabaceae	S	Leaves Bark	Ringworm infection, Fish poison.
69	*Sida acuta* Burma fa.	Janglimathi	Malvaceae	S	Root	Cureweakness
70	*Syzygium cumini* L. Skeels.	Jambhul	Myrtaceae	T	Fruit	Edible, Blood purifier,
					Seed	Useful for diabetes
71	*Tamarindus indica* L.	Chinch	Caesalpiniaceae	T	Leaves Fruit	Scorpion bites Edible, Juices -Panhe
72	*Tectona grandis* L.f.	Sagwan	Verbenaceae	T	Leaves Wood	Roof of house, Agricultural tools
73	*Terminalia bellirica* (Gaertn.)Roxb.	Beheda	Combretaceae	T	Fruit	Sores in mouth
74	*Terminalia catappa* L.	Jangali Badam	Combretaceae	T	Bark	Dysentery
75	*Tinospora cordifolia* (Willd.) Miers.	Gudwel	Menispermaceae	Cl	Leaves Stem	Fever, Jaundice, Cure fever

76	*Trichosanthes cucumerina*L.	Jangli padvel	Cucurbitaceae	Cl	Fruit	Reduce inflammation
77	*Tridex procumbens* L.	Ghavpala	Asteraceae	H	Leaves	Stopbleeding,Wound
78	*Trichodesma indicum* (L.) Lehm.	Undanfuli/chotakalpa	Boraginaceae	H	Leaves	Scabies
79	*Typha domingensis* Pers.	Pankanis	Typhaceae	H	Fruit	Hand small injury
80	*Vitex negundo* L.	Nirgudi	Verbenaceae	S	Leaves	Itch, Joint pain
81	*Wrightia tinctoria* R.Br.	Kalakuda	Apocynaceae	T	Leaves	Aching teeth
82	*Ziziphus mauritiana* Lamk.	Bor	Rhamnaceae	T	Fruit	Edible

Abbreviation:Hb-Habit,H-Herb, S-Shrub,Cl-Climber,G-Grass, T-Tree,Info-Inflorescence, Rh-Rhizome, Wp-Whole plant.

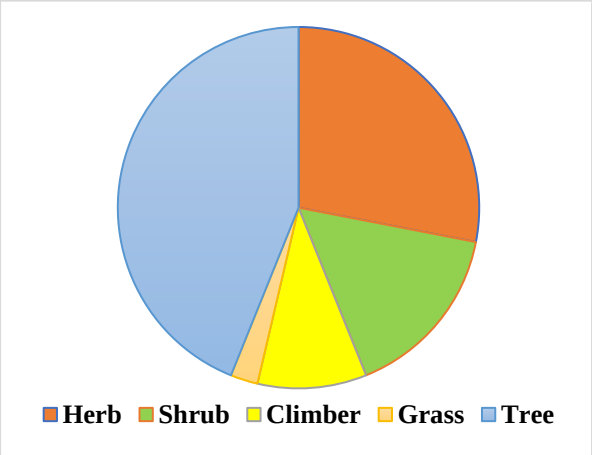

Figure 1: Habit wise distribution of plants

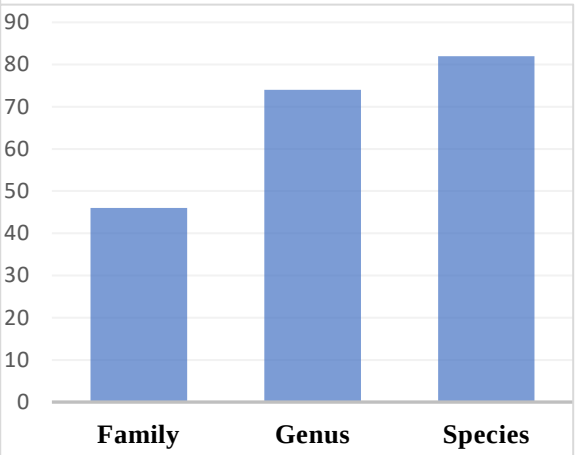

Figure 2: Distribution of genus, species and family

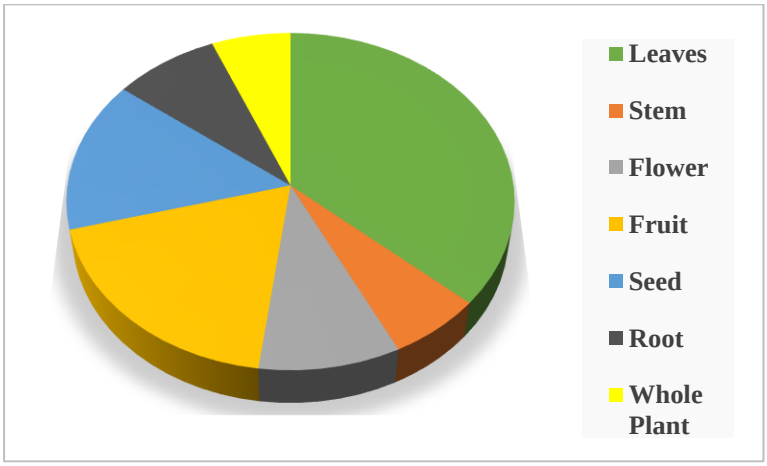

Figure 3: Parts of the plants used for different purposes

Figure 4: Sukha

CONCLUSION:

The study led to the documentation of the flora of the Taloda forest area with an emphasis on ethnobotanical studies. The study confirms the reliance of the tribal people on plants for medicinal purposes, agriculture, household use, and as a source of income. The survey revealed 82 plant species from 74 genera, categorized under 46 families. The habit-wise distribution of plants is shown in Fig.1, in which trees are 44%, herbs 28%, shrubs 16%, climbers 10%, and grasses 2%. The distribution of genus, species, and family is shown inFig.2, in which family is 23%, genus is 37%, and species is 40%, respectively. The uses of different parts of plants are shown inFig.3, in which leaves are 37%, fruit 19%, seeds 15%, flowers 9%,roots 8%, stems 6%, and whole plants 6%.The documentation of the ethnomedicinal knowledge holds the key significance, as the orally transmitted knowledge might get lost in the future. Knowledge of traditional medicine systems is encouraging for further phytochemical and pharmacological studies. Further, analytical studies need to be carried out to validate the traditional medicinal uses, which may pave a way for novel drug development.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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