Ethnomedicinal plants potentially used in treatment of skin diseases in Bhandara district (MS), India

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Research

Abstract

Background: The Bhandara district in eastern Vidarbha, Maharashtra, India, remains underexplored in terms of its ethnobotanical heritage, despite being rich in floristic diversity. This represents the first systematic documentation of ethnomedicinal plants used in the treatment of skin diseases in the region. The study aims to preserve traditional knowledge that is rapidly declining among the older generation of healers.

Methods: Ethnomedicinal data were collected from 24 informants (19 males and 5 females; aged 51-80 years) using structured questionnaires and semi-structured interviews. Information recorded included vernacular names, plant parts used, preparation methods, dosages, and associated precautions. Quantitative ethnobotanical indices, including Use Value (UV), Relative Frequency of Citation (RFC), Informant Consensus Factor (ICF), and Fidelity Level (FL), were calculated to assess the relative importance of species and agreement among informants.

Results: A total of 261 angiosperm species, representing 218 genera and 85 families, were documented for use against 24 categories of dermatological or skin ailments. Fabaceae (34 spp.), Malvaceae (15 spp.), Apocynaceae (14 spp.), Asteraceae (12 spp.), and Euphorbiaceae (10 spp.) were the most represented families. The highest UV and RFC values were recorded for *Azadirachta indica* (UV 2.04, RFC 1.00), *Curcuma longa* (UV 2.0, RFC 1.00) and *Butea monosperma* (UV 1.92, RFC 1.00). Leprosy, wounds, and boils were the categories with the highest informant consensus (ICF=0.94-0.98). Of the 261 species recorded, 12 exhibited ICF values greater than 0.9, indicating strong agreement among informants on their dermatological efficacy. Leaves were the most frequently used plant part (132 citations), typically prepared as paste or decoctions for topical application.

Conclusions: Indigenous healers in Bhandara district maintain extensive knowledge of plant-based skin remedies, but this knowledge is at risk of being lost as intergenerational transmission declines. The plant species with high UV and FL should be prioritized for phytochemical and pharmacological validation. The findings contribute significantly to the regional ethnomedicinal record and highlight the importance of scientific validation before these remedies are incorporated into evidence-based healthcare systems.

Keywords: Ethnobotany, Traditional medicine, Skin diseases, Quantitative indices, Bhandara district, Maharashtra.

Background

Medicinal plants, revered for their cultural and therapeutic importance, form an integral part of traditional healthcare systems across the world. Passed down through generations, the use of herbal remedies has witnessed a resurgence in recent decades as part of a broader global interest in natural and holistic healing (Khumbangmayum *et al.* 2005, Humane 2020). Since ancient times, humans have depended on nature for their basic needs, including food, clothing, shelter, and especially medicine (Cragg & Newman 2005). The use of plants in healing practices dates back thousands of years, originating in times when treatment was often steeped in spiritual or mystical traditions (Pardal 1937, Lain-Entralgo 1982).

The renewed global interest in traditional medicine, including that shown by the World Health Organization (WHO 2022), has led to intensified efforts to document and preserve indigenous medicinal knowledge, particularly in developing nations where such practices remain central to primary healthcare (Dhar *et al.* 1968). Ethnomedicinal practices continue to play an essential role in healthcare, particularly among rural and tribal populations (Naqvi *et al.* 2022, 2023, Humane *et al.* 2025). In recent years, dermatological ethnomedicine has emerged as a significant subfield of inquiry (Anand *et al.* 2022, Singh *et al.* 2023). Recent national-scale reviews highlight India's exceptional ethnobotanical diversity while emphasizing the need for region-specific studies that combine documentation with quantitative analysis (Channaveeraiah & Entoori 2022).

The skin, as the body's largest and most exposed organ, is vulnerable to infections, environmental stresses, and hereditary disorders (Gupta *et al.* 2009). Common skin conditions in India include acne, eczema, scabies, tinea, psoriasis, and leucoderma (Sardana *et al.* 2009). These ailments are especially prevalent in tropical regions (Fabricant & Farns Worth 2001) and are broadly categorised as contagious (bacterial, fungal, viral, or parasitic) or non-contagious (Kshirsagar & Singh 2000). Traditional remedies, often derived from plants, remain the primary resource for many indigenous populations in addressing these conditions. Specific causes range from mites (scabies) to irritants such as nettles (rash and itch), with hereditary factors implicated in chronic conditions such as eczema (Perumal Sami & Ignacimuthu 2000).

Despite rapid ethnobotanical advances, the Bhandara district of eastern Vidarbha remains largely uncharted in terms of dermatological ethnomedicine. To date, no systematic inventory of medicinal plants used for skin diseases has been compiled from this region, leaving a critical gap in the ethnobotanical record of Maharashtra. This study addresses this gap by documenting the traditional knowledge of local healers and tribal practitioners, quantifying the relative importance of each species through established ethnobotanical indices, and situating the findings within a broader comparative framework. The findings provide a foundation for future phytochemical and pharmacological research while preserving valuable indigenous knowledge. The outcomes not only preserve a rapidly vanishing body of indigenous knowledge but also provide a scientific baseline for future phytochemical and pharmacological investigations.

Materials and Methods

Study area

The research was conducted in Bhandara district, located in eastern Vidarbha region of Maharashtra, India (21.17° N and 79.65° E), spans 3,717 square kilometres comprising seven administrative tahsils (Fig. 1). The district is recognized for its extensive rice cultivation and numerous natural and man-made lakes, which have earned it the epithets "*Rice Bowl*" and "*Lake District*" of Maharashtra. The region experiences an average annual rainfall of 1,373 mm, with precipitation gradually increasing from the western to the northern parts of the district. Its diverse topography and climatic conditions support a rich floristic composition, making Bhandara district an ecologically significant and ethnobotanically promising area for field investigation.

Sampling design

Fieldwork was conducted over ten years (2005-2015), covering all seasons and habitats within the study area. During this period more than 950 angiosperm species were documented in floristic surveys. Ethnomedicinal data were gathered concurrently through field interviews with 24 informants (19 males and 5 females; ages 51-80 years), including traditional healers, farmers, and housewives. Informants were identified via purposive and snowball sampling methods (Asiimwe *et al.* 2021, Tabuti *et al.* 2023). Inclusion criteria required demonstrable knowledge of medicinal plants. Data saturation was considered when no new species or uses were recorded.

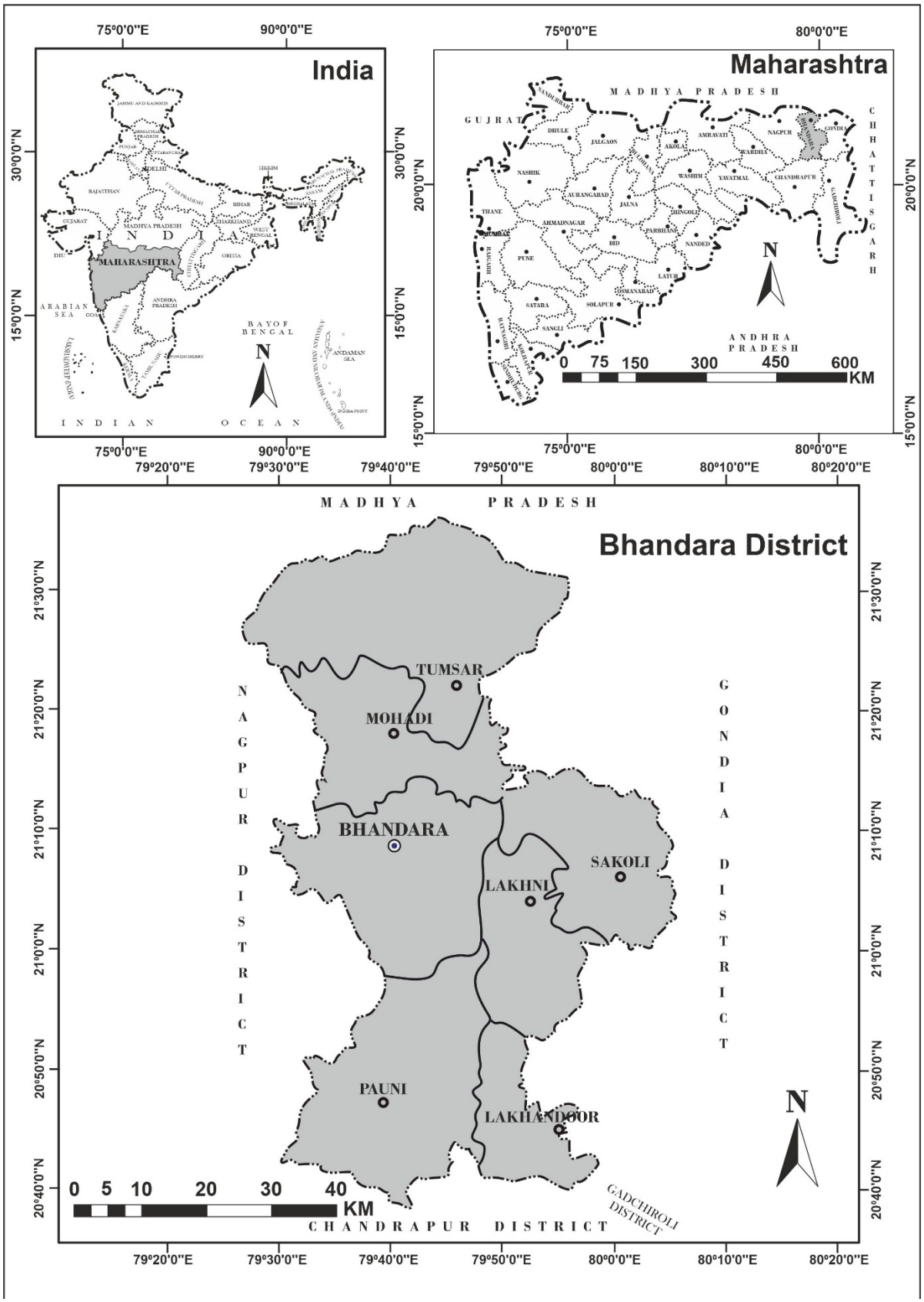

Figure 1. Location map of study area Bhandara district, (Maharashtra, India)

Data Collection

A structured questionnaire adapted from Jain and Goel (1995) was used to guide semi-structured interviews covering local or vernacular names, plant parts used, methods of preparation, dosage, route of administration, and any perceived

contraindications or side effects. Oral consent was obtained, and ethical considerations followed the International Society of Ethnobiology Code of Ethics and Nagoya Protocol. All participants provided prior informed oral consent, and the study adhered to the International Society of Ethnobiology (ISE) Code of Ethics (2006) and the Nagoya Protocol on Access and Benefit Sharing. The data were anonymized to protect informant identity and privacy. All personal information was kept confidential to preserve cultural integrity and informant privacy.

Plant Identification

Plants were identified using authoritative standard floras (Cooke 1958, Ugemuge 1986, Naik 1998) and taxonomic verification was performed using the World Flora Online (WFO) and International Plant Name Index (IPNI), following APG IV taxonomy to ensure nomenclatural accuracy. Voucher specimens were deposited in the Herbarium of the Department of Botany, Dharampeth M. P. Deo Memorial Science College, Nagpur, for future reference and verification.

Ethnobotanical Analysis

Ethnobotanical importance was quantified using four indices: Use Value (UV), Relative frequency of Citation (RFC), Informant Consensus Factor (ICF) and Fidelity Level (FL). These indices assessed species importance, consensus, and cultural relevance (Singh & Rawat 2020). Descriptive statistics were generated in MS Excel 2021, while comparative interpretations drew on national and regional ethnobotanical literature. The following formulae were applied to quantify these parameters:

1) Use Value (UV) = ΣUi/N
2) Relative frequency of Citation (RFC) = FC/N
3) Informant Consensus Factor (ICF) = (Nur-Nt)/(Nur-1)
4) Fidelity Level (FL%) = (Np/N) x 100

Where: Σ - Summation; Ui - Number of uses mentioned by each informant for a given species; N - Total number of informants; FC = Number of informants who mentioned the species; Nur - Total number of use-reports in a particular category; Nt - Number of species used for that category; Np - Number of informants who cited the plant for a specific ailment.

A chord diagram was also used to visualize the relationship between plant parts and ailment categories, generated using OriginPro software.

Results and Discussion

Demographic profile of informants

The ethnodermatological data were collected from 24 informants (19 men, 5 women) representing all seven tahsils of Bhandara district. The majority (22.7%) were between 61-70 years of age, followed by 7.6% in the 71-80 years group, while only 6% were between 51-60 years (Table 1). The dominance of elderly participants indicates that ethnomedicinal knowledge is largely preserved among older community members. This pattern aligns with findings from other Indian regions (Malik *et al.* 2015; Naqvi *et al.* 2022), where cultural wisdom is transmitted orally among tribal and rural populations. The under-representation of younger age groups highlights the erosion of intergenerational knowledge transfer and the urgent need for systematic documentation.

Table 1: Socio-demographic profile of the informants

Factors	Category	No. of Informants	Percentage (%)
Age	40-50	0	00.0
	51-60	4	06.06
	61-70	15	22.73
	71-80	5	07.58
Gender	Male	19	28.79
	Female	5	07.58
Profession	Healers	11	16.67
	Farmers	8	12.12
	Housewives	5	07.58
Marital Status	Married	14	21.21
	Unmarried	2	03.03
	Divorced	3	04.55
	Widow	5	07.58

Gender distribution also revealed a male dominance (79%), consistent with previous Central-Indian reports (Humane 2020) that identify men as primary custodians of ethnomedicinal practices, while women contribute mainly to domestic or household-level treatments. Professionally, 11 were healers (45.8%), 8 were farmers (33.3%), and 5 were housewives (20.8%), reflecting a balanced mix of specialized and experiential knowledge. The dominance of healers demonstrates the continuing vitality of folk medical practice withing the district.

Floristic diversity and ethnodermatological use

The total of 261 angiosperms species representing 218 genera and 85 families recorded for dermatological applications (Table 2). Of these, 230 taxa belong to dicots and 31 taxa from monocots belonging to 218 genera and 85 families including 27 genera and 18 families of monocots (Fig. 2).

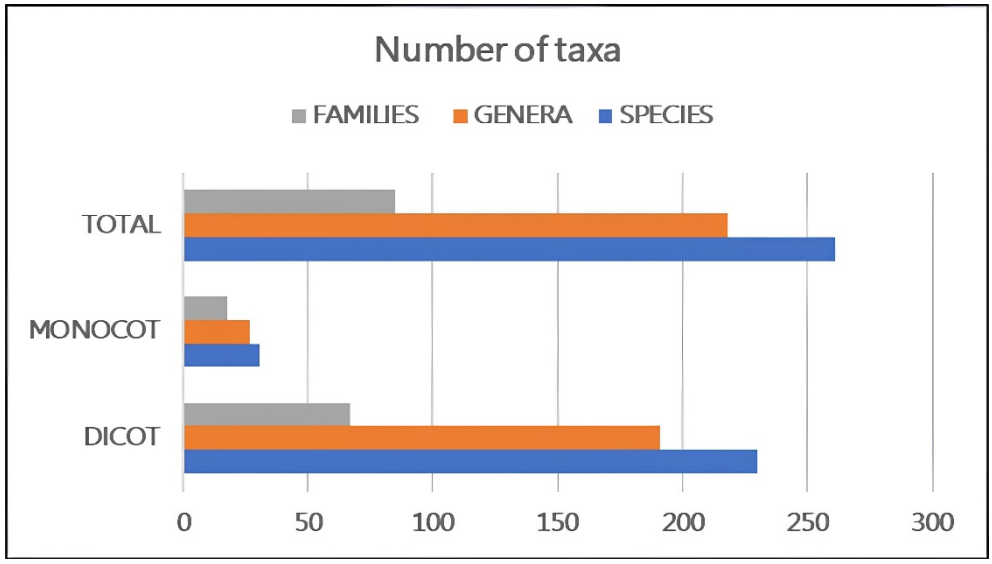

Figure 2. Number of Species and genera used

The ethnomedicinal plants studied are found in all types of habit; herbs, shrubs, trees, climbers and twiners. Out of these plant species 111 are herbs and 80 trees while 35 are shrubs and 35 are climbers-twiners, indicating that herbs and trees constitute the principal source of remedies (Fig. 3).

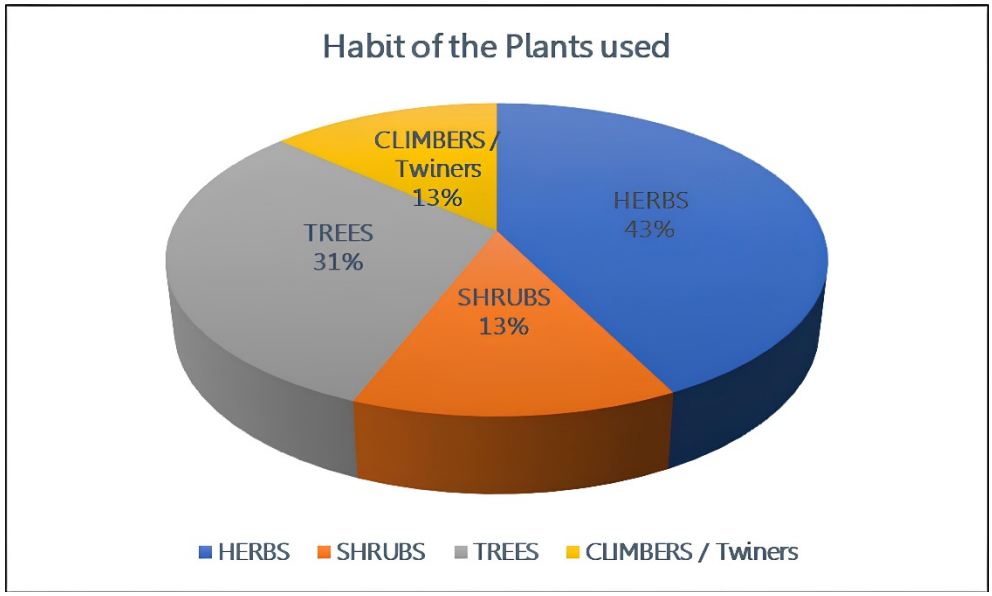

Figure 3. Habit of the plants used

Table 2. List of ethnomedicinal plants with ethnobotanical analysis used in treatment of skin diseases (FC= Frequency of Citation, UV=Use Value, RFC=Relative frequency of Citation, ICF= Informant Consensus Factor and FL= Fidelity Level)

Specimen No.	Scientific Name	Vernacular Name	Family	Part used	Disease type	Uses Reported	Specific Uses	FC	UV	RFC	ICF	FL
PTH0761	*Abelmoschus moschatus* Medik.	Kasturi Bhendi	Malvaceae	Seeds	Scabies	27	13	17	1.13	0.71	0.94	76.47
PTH0021	*Abrus precatorius* L.	Gunja	Fabaceae	Leaves	Pruritus / Itching	42	19	23	1.75	0.96	0.94	82.61
PTH0188	*Abutilon indicum* (L.) Sweet	Petari	Malvaceae	Leaves	Boils	23	13	19	0.96	0.79	0.94	68.42
PTH0289	*Acalypha indica* L.	Khokli	Euphorbiaceae	Leaves	Scabies / Wounds	20	12	16	0.83	0.67	0.94	75.00
PTH0003	*Acanthospermum hispidum* DC.	Gokhru	Asteraceae	Whole plant	Antifungal	19	15	17	0.79	0.71	0.94	88.24
PTH0189	*Achyranthes aspera* L.	Kutri	Amaranthaceae	Roots	Wounds	37	21	22	1.54	0.92	0.94	95.45
PTH0927	*Acorus calamus* L.	Yakand	Acoraceae	Rhizome	Pimples	39	20	23	1.63	0.96	0.95	86.96
PTH0880	*Adina cordifolia* (Roxb.) Brandis	Haldu	Rubiaceae	Bark	Wounds	24	20	20	1.00	0.83	0.94	100.00
PTH0115	*Aerva lanata* (L.) Juss.	Kapuri-madhuri	Amaranthaceae	Whole plant	Boils	18	10	14	0.75	0.58	0.94	71.43
PTH0438	*Agave americana* L.	Kantala	Asparagaceae	Leaves	Carcinoma	22	14	18	0.92	0.75	0.95	77.78
PTH0817	*Ailanthus excelsus* Roxb.	Maharukh	Simaroubaceae	Bark	Pimples	34	21	23	1.42	0.96	0.95	91.30
PTH0311	*Alangium salviifolium* (L. f.) Wangerin	Akval	Cornaceae	Roots	Leprosy	27	18	19	1.13	0.79	0.94	94.74
PTH0900	*Albizia lebbeck* (L.) Benth.	Siras	Fabaceae	Bark (Seeds)	Leprosy / Wounds / (Leprosy)	18	14	15	0.75	0.63	0.94	93.33
PTH0402	*Albizia odoratissima* (L. f.) Benth.	Chichva	Fabaceae	Bark / Seeds	Leprosy	21	12	16	0.88	0.67	0.94	75.00
PTH0936	*Allium sativum* L.	Lahsoon	Amaryllidaceae	Bulb	Lupus	24	10	15	1.00	0.63	1.00	66.67
PTH0947	*Aloe vera* (L.) Burm. f.	Korphad	Asphodelaceae	Leaf	Burns / Wounds	31	17	18	1.29	0.75	0.94	94.44
PTH0896	*Alstonia macrophylla* Wall. ex G. Don	Saptaparni	Apocynaceae	Bark	Leprosy	19	10	14	0.79	0.58	0.94	71.43
PTH0035	*Alternanthera sessilis* (L.) DC.	Patur	Amaranthaceae	Whole plant	Leprosy / Burns	24	17	21	1.00	0.88	0.94	80.95
PTH0252	*Amaranthus spinosus* L.	Kate-math	Amaranthaceae	Whole plant	Boils / Burns / Eczema / Leprosy	26	18	19	1.08	0.79	0.94	94.74
PTH0126	*Ammannia baccifera* L.	Bhar-jambhal	Lythraceae	Leaves	Ringworm	21	15	19	0.88	0.79	0.94	78.95
PTH0355	*Anacardium occidentale* L.	Kaju	Anacardiaceae	Gum	Leprosy / Ringworm	33	19	23	1.38	0.96	0.94	82.61
PTH0258	*Argemone mexicana* L.	Utati	Papaveraceae	Roots / (Leaves)	Leprosy / Pruritus / (Wounds)	39	20	22	1.63	0.92	0.94	90.91
PTH0230	*Argyreia nervosa* (Burm. f.) Bojer	Samudra shok	Convolvulaceae	Roots	Wounds	37	17	18	1.54	0.75	0.94	94.44
PTH0919	*Aristida adscensionis* L.	Burgi	Poaceae	Flowers	Ringworm	22	14	17	0.92	0.71	0.94	82.35
PTH0613	*Artocarpus heterophyllus* Lam.	Phanas	Moraceae	Leaves	Wounds / Boils	24	12	16	1.00	0.67	0.94	75.00

PTH0552	*Asclepias curassavica* L.	Haldi kunku	Apocynaceae	Leaves / (Latex)	Carcinoma / (Warts)	23	16	18	0.96	0.75	0.95	88.89
PTH0139	*Asparagus racemosus* Willd.	Marbat	Asparagaceae	Roots	Leprosy	47	20	21	1.96	0.88	0.94	95.24
PTH0320	*Azadirachta indica* A. Juss.	Neem	Meliaceae	Bark / (Leaves)	Leprosy / Wounds / (Eczema / Wounds / Boils / Pruritus)	49	21	24	2.04	1.00	0.94	87.50
PTH0393	*Bacopa monnieri* (L.) Wettst.	Nira-bramhi	Plantaginaceae	Whole plant	Leprosy	37	20	21	1.54	0.88	0.94	95.24
PTH0469	*Balanites aegyptiaca* (L.) Del.	Hingu	Zygophyllaceae	Seeds	Burns	32	22	23	1.33	0.96	0.94	95.65
PTH0923	*Bambusa bambos* (L.) Voss	Bamboo	Poaceae	Roots / (Leaves / Sprouts)	Ringworm / (Wounds)	21	15	18	0.88	0.75	0.94	83.33
PTH0245	*Barleria prionitis* L.	Kate-koranti	Acanthaceae	Roots	Boils	18	10	14	0.75	0.58	0.94	71.43
PTH0525	*Barringtonia acutangula* (L.) Gaertn.	Tiwar	Lecythidaceae	Fruits	Wounds / Leprosy	23	16	17	0.96	0.71	0.94	94.12
PTH0187	*Basella alba* L.	Dalbhaji	Basellaceae	Leaves	Leprosy	27	17	20	1.13	0.83	0.94	85.00
PTH1292	*Bergia ammannioides* B. Heyne ex Roth	Chandiri	Elatinaceae	Whole plant	Wounds	19	12	16	0.79	0.67	0.94	75.00
PTH0161	*Bidens biternata* (Lour.) Merr. & Sherff.	Chirchita	Asteraceae	Leaves	Wounds	17	11	15	0.71	0.63	0.94	73.33
PTH0032	*Biophytum sensitivum* (L.) DC.	Lajwanti	Oxalidaceae	Whole plant	Wounds	22	18	19	0.92	0.79	0.94	94.74
PTH0772	*Blumea eriantha* DC.	Nimurdi	Asteraceae	Leaves	Antifungal	20	14	17	0.83	0.71	0.94	82.35
PTH0605	*Bombax ceiba* L.	Sawar	Malvaceae	Flowers / Prickles / (Bark)	Pimples / (Wounds)	31	22	23	1.29	0.96	0.95	95.65
PTH0095	*Borassus flabellifer* L.	Tad	Arecaceae	Fruits	Leprosy / Burns	29	18	21	1.21	0.88	0.94	85.71
PTH0863	*Boswellia serrata* Roxb.	Salai	Burseraceae	Bark	Wounds	33	21	22	1.38	0.92	0.94	95.45
PTH1453	*Brassica juncea* (L.) Czern.	Mohari	Brassicaceae	Seeds	Pruritus	19	15	16	0.79	0.67	0.94	93.75
PTH0302	*Brassica nigra* W. D. J. Koch.	Kali mohari	Brassicaceae	Seeds	Pimples / Itching	17	12	14	0.71	0.58	0.95	85.71
PTH0840	*Brassica oleracea* var. *capitata* L.	Pattakobi	Brassicaceae	Leaves	Warts	18	10	15	0.75	0.63	0.94	66.67
PTH0504	*Bridelia retusa* (L.) A. Juss.	Kateyan	Phyllanthaceae	Bark	Wounds	28	19	22	1.17	0.92	0.94	86.36
PTH0327	*Buchanania cochinchinensis* (Lour.) Almeida	Char	Anacardiaceae	Roots / Leaves	Leprosy	38	22	23	1.58	0.96	0.94	95.65
PTH0315	*Butea monosperma* (Lam.) Kuntze	Palas	Fabaceae	Gum / Flowers / (Bark / Leaves / Seeds)	Leprosy / (Wounds / Pimples / Ringworm)	46	23	24	1.92	1.00	0.94	95.83

PTH0411	*Calycopteris floribunda* Roxb.	Baguli	Combretaceae	Fruits / (Leaves)	Pruritus / (Wounds / Leprosy)	36	17	21	1.50	0.88	0.94	80.95
PTH0112	*Canavalia gladiata* (Jacq.) DC.	Khadsheng	Fabaceae	Fruits	Wounds	28	17	20	1.17	0.83	0.94	85.00
PTH0103	*Canscora alata* (Roth) Wall.	Kilvar	Gentianaceae	Whole plant	Leprosy	22	16	18	0.92	0.75	0.94	88.89
PTH0598	*Careya arborea* Roxb.	Kumbhi	Lecythidaceae	Bark	Small pox	35	20	21	1.46	0.88	0.96	95.24
PTH0099	*Carica papaya* L.	Papaya	Caricaceae	Fruits latex	Leprosy	27	14	17	1.13	0.71	0.94	82.35
PTH0315	*Carissa carandas* L.	Karvand	Apocynaceae	Roots / (Fruits)	Pruritus / Scabies / (Scabies)	32	17	19	1.33	0.79	0.94	89.47
PTH0063	*Cassia absus* (L.) H.S.Irwin & Barneby	Chimar	Fabaceae	Seeds	Wounds	17	11	14	0.71	0.58	0.94	78.57
PTH0397	*Cassia fistula* L.	Bahava	Fabaceae	Bark / (Roots / Leaves / Flowers)	Leprosy / Boils / Ringworm / (Burns / Leprosy / Wounds)	38	19	20	1.58	0.83	0.94	95.00
PTH0495	*Celastrus paniculatus* Willd.	Dhiwarvel	Celastraceae	Seeds	Leprosy / Pruritus	34	22	23	1.42	0.96	0.94	95.65
PTH0316	*Chloroxylon swietenia* DC.	Bhira	Rutaceae	Leaves	Antifungal / Wounds	42	23	23	1.75	0.96	0.94	100.00
PTH1100	*Chrysopogon zizanioides* (L.) Roberty	Khas	Poaceae	Roots	Wounds	35	14	15	1.46	0.63	0.94	93.33
PTH0350	*Citrus aurantiifolia* (Christm.) Swingle	Nimboo	Rutaceae	Fruit	Scabies	24	15	19	1.00	0.79	0.94	78.95
PTH0865	*Citrus limon* (L.) Osbeck	Idlimboo	Rutaceae	Fruit	Scabies	17	10	14	0.71	0.58	0.94	71.43
PTH0665	*Cleome chelidonii* L. f.	Pan tilvan	Capparaceae	Whole plant	Antifungal	19	10	16	0.79	0.67	0.94	62.50
PTH0843	*Coccinia grandis* (L.) Voigt	Tondli	Cucurbitaceae	Fruits	Leprosy	18	11	14	0.75	0.58	0.94	78.57
PTH0359	*Cocculus hirsutus* (L.) Theob.	Vasan vel	Menispermaceae	Roots	Eczema	30	19	21	1.25	0.88	0.94	90.48
PTH0485	*Colocasia esculenta* (L.) Schott	Dhopa	Araceae	Corm	Alopecia	32	21	22	1.33	0.92	0.96	95.45
PTH0618	*Combretum indicum* (L.) DeFilipps	Rangunvel	Combretaceae	Seeds	Ringworm	17	10	14	0.71	0.58	0.94	71.43
PTH0663	*Commelina africana* L.	Kena	Commelinaceae	Whole plant	Leprosy	22	18	19	0.92	0.79	0.94	94.74
PTH0165	*Commelina diffusa* Burm. f.	Gandologi	Commelinaceae	Whole plant	Boils / Burns / Rashes	15	9	13	0.63	0.54	0.94	69.23
PTH0468	*Cordia dichotoma* G. Forst.	Bhokar	Cordiaceae	Bark/Fruit	Leprosy	28	17	19	1.17	0.79	0.94	89.47
PTH0816	*Crateva adansonii* DC.	Wairoda	Capparaceae	Bark/Leaves	Pruritus	29	20	20	1.21	0.83	0.94	100.00
PTH0700	*Crinum asiaticum* L.	Nagdaun	Amaryllidaceae	Leaves	Wounds	34	21	22	1.42	0.92	0.94	95.45
PTH0260	*Crinum viviparum* (Lam.) R. Ansari & V. J. Nair	Karkari	Amaryllidaceae	Bulbs	Burns	34	21	22	1.42	0.92	0.94	95.45
PTH0601	*Crotalaria juncea* L.	Sontag	Fabaceae	Seeds	Psoriasis	18	12	16	0.75	0.67	0.96	75.00

PTH1079	*Crotalaria retusa* L.	Dingala	Fabaceae	Leaves	Scabies	15	10	14	0.63	0.58	0.94	71.43
PTH0111	*Crotalaria spectabilis* Roth	Jangli-sontag	Fabaceae	Whole plant	Scabies	16	8	12	0.67	0.50	0.94	66.67
PTH0371	*Crotalaria verrucosa* L.	Bhat ghagri	Fabaceae	Leaves	Scabies	23	17	19	0.96	0.79	0.94	89.47
PTH0225	*Cucumis melo* L.	Galgala	Cucurbitaceae	Fruits	Leprosy	26	15	18	1.08	0.75	0.94	83.33
PTH0430	*Cucumis melo* L. var. *momordica* Duthie & Fuller	Dangru	Cucurbitaceae	Fruits	Eczema / Leprosy	18	13	14	0.75	0.58	0.94	92.86
PTH0846	*Cucurbita maxima* Duch.	Tambda bhopla	Cucurbitaceae	Fruits	Boils / Burns	18	15	16	0.75	0.67	0.94	93.75
PTH0220	*Cullen corylifolium* (L.) Medik.	Bavchi	Fabaceae	Seeds	Psoriasis / Leprosy	35	23	24	1.46	1.00	0.96	95.83
PTH0637	*Curculigo orchioides* Gaertn.	Kajuri	Hypoxidaceae	Roots	Wounds	29	17	19	1.21	0.79	0.94	89.47
PTH0528	*Curcuma longa* L.	Halad	Zingiberaceae	Rhizome	Boils	48	24	24	2.00	1.00	0.94	100.00
PTH0931	*Cymbopogon martinii* (Roxb.) Wats.	Tikhadi	Poaceae	Leaves	Leprosy	33	23	23	1.38	0.96	0.94	100.00
PTH0804	*Cynodon dactylon* (L.) Pers.	Harari	Poaceae	Whole plant	Leprosy / Wounds	34	16	18	1.42	0.75	0.94	88.89
PTH0174	*Cyperus mindorensis* (Steud.) Huygh	Gandal	Cyperaceae	Rhizome	Dermatitis	18	11	14	0.75	0.58	0.95	78.57
PTH0009	*Cyperus rotundus* L.	Nagarmotha	Cyperaceae	Roots	Wounds	14	7	12	0.58	0.50	0.94	58.33
PTH1276	*Cyperus tenuifolius* (Steud.) Dandy	Lavhale	Cyperaceae	Roots	Pruritus	16	9	15	0.67	0.63	0.94	60.00
PTH0533	*Dalbergia latifolia* Roxb.	Shisam	Fabaceae	Leaves	Leprosy	20	12	17	0.83	0.71	0.94	70.59
PTH0906	*Dendrophthoe falcata* (L. f.) Etting	Vanda	Loranthaceae	Leaves	Wounds	27	16	19	1.13	0.79	0.94	84.21
PTH0376	*Dentella repens* (L.) J. R. & G. Forst.	Jata	Rubiaceae	Whole plant	Pimples	23	15	20	0.96	0.83	0.95	75.00
PTH1043	*Dillenia pentagyna* Roxb.	Karmal	Dilleniaceae	Whole plant	Wounds	17	8	14	0.71	0.58	0.94	57.14
PTH0911	*Dioscorea alata* L.	Kordu	Dioscoreaceae	Tubers	Leprosy	32	19	21	1.33	0.88	0.94	90.48
PTH0828	*Diospyros melanoxylon* Roxb.	Tembhrun	Ebenaceae	Flowers	Boils	39	23	23	1.63	0.96	0.94	100.00
PTH0829	*Diospyros montana* Roxb.	Kudal	Ebenaceae	Fruits	Boils	39	23	23	1.63	0.96	0.94	100.00
PTH0113	*Diplocyclos palmatus* (L.) C. Jeffrey	Shivlingi	Cucurbitaceae	Whole plant	Carcinoma	37	18	21	1.54	0.88	0.95	85.71
PTH0813	*Distimake quinquefolius* (L.) A.R.Simões & Staples	Akadvel	Convolvulaceae	Leaves	Burns	29	18	22	1.21	0.92	0.94	81.82
PTH0209	*Dodonaea viscosa* (L.) Jacq.	Jakhmi	Sapindaceae	Leaves	Burns / Wounds	32	20	21	1.33	0.88	0.94	95.24
PTH0409	*Dolichandrone falcata* (Wall. ex DC.) Seem.	Irjan	Bignoniaceae	Fruits	Wounds	27	19	20	1.13	0.83	0.94	95.00
PTH0152	*Eclipta prostrata* (L.) L.	Maka	Asteraceae	Roots	Wounds	41	23	23	1.71	0.96	0.94	100.00
PTH0181	*Elephantopus mollis* Kunth	Kukuldawna	Asteraceae	Roots	Wounds	43	12	23	1.79	0.96	0.94	52.17
PTH0039	*Emilia sonchifolia* (L.) DC.	Dhamapan	Asteraceae	Whole plant	Wounds	37	18	21	1.54	0.88	0.94	85.71
PTH0052	*Enicostema axillare* (Poir. ex Lam.) A.Raynal	Chhota-karait	Gentianaceae	Whole plant	Leprosy / Pruritus	35	19	22	1.46	0.92	0.94	86.36
PTH1061	*Erythrina variegata* L.	Pangra	Fabaceae	Leaves	Wounds	31	19	20	1.29	0.83	0.94	95.00
PTH0736	*Eucalyptus alba* Reinw. ex Blume	Nilgiri	Myrtaceae	Leaves	Burns	34	22	23	1.42	0.96	0.94	95.65
PTH0607	*Euphorbia neriifolia* L.	Sabar	Euphorbiaceae	Whole plant	Leprosy	27	17	19	1.13	0.79	0.94	89.47

PTH0157	*Euphorbia scordiifolia* Jacq.	Lahan-dudhi	Euphorbiaceae	Whole plant	Boils / Dermatitis / Wounds	21	14	17	0.88	0.71	0.94	82.35
PTH0867	*Euphorbia tirucalli* L.	Sher	Euphorbiaceae	Whole plant / (Latex)	Leprosy / (Warts)	26	20	21	1.08	0.88	0.94	95.24
PTH0908	*Euphorbia tithymaloides* L.	Chitavar	Euphorbiaceae	Latex / (Leaves)	Warts / (Wounds)	18	11	14	0.75	0.58	0.94	78.57
PTH0580	*Ficus benghalensis* L.	Wad	Moraceae	Bark	Wounds	26	19	19	1.08	0.79	0.94	100.00
PTH0910	*Ficus carica* L.	Anjir	Moraceae	Bark / (Latex)	Eczema / (Warts)	14	11	13	0.58	0.54	0.94	84.62
PTH0045	*Ficus hispida* L. f.	Kat-umbar	Moraceae	Fruits	Psoriasis	21	18	19	0.88	0.79	0.96	94.74
PTH0384	*Ficus racemosa* L.	Umbar	Moraceae	Leaves	Wounds	38	22	22	1.58	0.92	0.94	100.00
PTH0839	*Ficus religiosa* L.	Pimpal	Moraceae	Bark / (Leaves)	Leprosy / (Wounds)	40	22	23	1.67	0.96	0.94	95.65
PTH1028	*Flacourtia indica* (Burm. f.) Merr.	Girgot	Salicaceae	Roots	Pruritus	37	20	23	1.54	0.96	0.94	86.96
PTH0460	*Gardenia gummifera* L. f.	Dikeamali	Rubiaceae	Leaves	Leprosy / Wounds / Antifungal	27	17	20	1.13	0.83	0.94	85.00
PTH0333	*Gardenia latifolia* Aiton	Ghogri	Rubiaceae	Bark	Wounds	24	18	19	1.00	0.79	0.94	94.74
PTH0328	*Gardenia resinifera* Roth	Dikamali	Rubiaceae	Gum	Wounds	24	21	22	1.00	0.92	0.94	95.45
PTH0274	*Glinus oppositifolius* Aug. DC.	Jharsi	Molluginaceae	Whole plant	Pruritus	19	11	16	0.79	0.67	0.94	68.75
PTH0478	*Gloriosa superba* L.	Bachnag	Colchicaceae	Roots	Leprosy / Pruritus	44	24	24	1.83	1.00	0.94	100.00
PTH0641	*Gossypium arboretum* L.	Devkapus	Malvaceae	Leaves	Wounds / Pruritus / Leprosy	17	11	15	0.71	0.63	0.94	73.33
PTH0856	*Gossypium barbadense* L.	Kapas	Malvaceae	Seeds	Spots & Freckles	17	11	15	0.71	0.63	1.00	73.33
PTH0639	*Grewia hirsuta* Vahl	Kirmid	Malvaceae	Roots	Wounds	22	15	18	0.92	0.75	0.94	83.33
PTH0402	*Grewia tiliifolia* Vahl	Tadsal	Malvaceae	Bark	Wounds / Pruritus	20	16	17	0.83	0.71	0.94	94.12
PTH0081	*Grona triflora* (L.) H.Ohashi & K.Ohashi	Ran methi	Fabaceae	Whole plant	Pruritus / Wounds	21	17	18	0.88	0.75	0.94	94.44
PTH0179	*Gymnosporia senegalensis* (Lam.) Loes.	Bharati	Celastraceae	Whole plant	Carcinoma	37	23	23	1.54	0.96	0.95	100.00
PTH0301	*Gypsophila hispanica* (Mill.) Rauschert	Sabani	Caryophyllaceae	Leaves	Wounds	21	15	20	0.88	0.83	0.94	75.00
PTH0380	*Helianthus annuus* L.	Suryaphul	Asteraceae	Leaves / (Flowers)	Wounds / (Leprosy / Pruritus)	29	14	18	1.21	0.75	0.94	77.78

PTH0465	*Helicteres isora* L.	Muradsheng	Malvaceae	Roots/ Bark / (Fruits)	Scabies / (Wounds)	39	22	22	1.63	0.92	0.94	100.00
PTH0186	*Heliotropium indicum* L.	Bhurundi	Heliotropiaceae	Whole plant	Wounds / Ringworm	19	11	14	0.79	0.58	0.94	78.57
PTH0476	*Hemidesmus indicus* (L.) R.Br. ex Schult.	Khobarvel	Apocynaceae	Roots / (Leaves)	Leprosy / Pruritus / (Wounds)	39	23	23	1.63	0.96	0.94	100.00
PTH0041	*Hibiscus rosa-sinensis* L.	Jaswand	Malvaceae	Leaves / (Flowers)	Pruritus / (Leprosy / Pruritus)	41	20	21	1.71	0.88	0.94	95.24
PTH0322	*Holarrhena pubescens* Wall. ex G.Don	Kuda	Apocynaceae	Leaves	Scabies	42	24	24	1.75	1.00	0.94	100.00
PTH0814	*Holoptelea integrifolia* (Roxb.) Planch.	Chilar	Ulmaceae	Bark	Leprosy	38	20	22	1.58	0.92	0.94	90.91
PTH0023	*Ichnocarpus frutescens* (L.) W.T.Aiton	Bokadvel	Apocynaceae	Roots	Pruritus / Leprosy	37	20	20	1.54	0.83	0.94	100.00
PTH0227	*Indigofera sphaerocarpa* A. Gray	Premi	Fabaceae	Whole plant	Antifungal	23	14	18	0.96	0.75	0.94	77.78
PTH0183	*Ipomoea eriocarpa* R. Br.	Ranbhori	Convolvulaceae	Whole plant	Leprosy	20	11	16	0.83	0.67	0.94	68.75
PTH0119	*Ipomoea nil* (L.) Roth	Neelpushpi	Convolvulaceae	Seeds	Scabies	19	10	14	0.79	0.58	0.94	71.43
PTH0054	*Ipomoea pes-tigridis* L.	Jangal jyot	Convolvulaceae	Leaves	Boils / Pimples	21	12	17	0.88	0.71	0.94	70.59
PTH0507	*Ixora coccinea* L.	Bakara	Rubiaceae	Roots	Wounds	13	7	12	0.54	0.50	0.94	58.33
PTH0895	*Jasminum officinale* L.	Chameli	Oleaceae	Leaves	Pruritus	16	11	14	0.67	0.58	0.94	78.57
PTH0889	*Jasminum sambac* (L.) Ait.	Mogra	Oleaceae	Flowers	Leprosy	17	8	13	0.71	0.54	0.94	61.54
PTH0530	*Jatropha curcas* L.	Chandar-jyoti	Euphorbiaceae	Whole plant	Eczema / Ringworm / Scabies	26	16	17	1.08	0.71	0.94	94.12
PTH0146	*Jatropha gossypiifolia* L.	Mogli erand	Euphorbiaceae	Roots	Leprosy	29	16	19	1.21	0.79	0.94	84.21
PTH0805	*Justicia adhatoda* L.	Adulsa	Acanthaceae	Leaves	Wounds	41	20	21	1.71	0.88	0.94	95.24
PTH0842	*Kalanchoe pinnata* (Lam.) Pres.	Panfuti	Crassulaceae	Leaves	Eczema / Boils / Burns / Wounds	24	14	18	1.00	0.75	0.94	77.78
PTH0849	*Lagenaria siceraria* (Mol.) Standl.	Dudhi-bhopla	Cucurbitaceae	Leaves	Leprosy	20	13	16	0.83	0.67	0.94	81.25
PTH0330	*Lannea coromandelica* (Houtt.) Merr.	Moya	Anacardiaceae	Bark	Wounds	24	17	21	1.00	0.88	0.94	80.95
PTH0069	*Lantana camara* subsp. *aculeata* (L.) R.W.Sanders	Kamuni	Verbenaceae	Leaves	Eczema / Wounds	28	21	22	1.17	0.92	0.94	95.45
PTH0318	*Lawsonia inermis* L.	Mehandi	Lythraceae	Leaves / (Roots)	Wounds / Boils / Leprosy / Scabies / Irritations / (Leprosy)	30	18	22	1.25	0.92	0.94	81.82

PTH0576	*Leea asiatica* (L.) Ridsd.	Dinda	Vitaceae	Leaves	Wounds	27	16	21	1.13	0.88	0.94	76.19
PTH0158	*Leonotis nepetifolia* (L.) R. Br.	Dimpal	Lamiaceae	Whole plant / (Flowers)	Wounds / (Burns)	31	17	23	1.29	0.96	0.94	73.91
PTH0247	*Lepidagathis cristata* Willd.	Bhuigend	Acanthaceae	Whole plant	Pruritus	33	19	22	1.38	0.92	0.94	86.36
PTH0920	*Leucas aspera* (Willd.) Link	Tumbi	Lamiaceae	Whole plant	Eczema	36	15	23	1.50	0.96	0.94	65.22
PTH0715	*Leucas zeylanica* (L.) W.T.Aiton	Kuva	Lamiaceae	Whole plant	Ringworm	34	17	21	1.42	0.88	0.94	80.95
PTH0568	*Limonia acidissima* Houtt.	Kavath	Rutaceae	Fruits	Wounds	42	19	20	1.75	0.83	0.94	95.00
PTH0257	*Ludwigia adscendens* (L.) Hara	Jal kumudini	Onagraceae	Whole plant	Burns	17	11	15	0.71	0.63	0.94	73.33
PTH0848	*Luffa acutangula* Roxb.	Dodka	Cucurbitaceae	Leaves	Leprosy / Ringworm	19	8	14	0.79	0.58	0.94	57.14
PTH0776	*Lysimachia arvensis* (L.) U.Manns & Anderb.	Indraneel	Primulaceae	Roots	Leprosy	16	7	14	0.67	0.58	0.94	50.00
PTH0307	*Madhuca longifolia* (L.) J.F.Macbr.	Mahua	Sapotaceae	Bark	Pruritus	27	18	21	1.13	0.88	0.94	85.71
PTH0917	*Mallotus philippensis* (Lam.) Muell.-Arg.	Kamala	Euphorbiaceae	Fruits	Ringworm / Wounds / Herpes / Scabies	29	16	21	1.21	0.88	0.94	76.19
PTH0591	*Malvaviscus penduliflorus* DC.	Mirchi jaswand	Malvaceae	Leaves	Pruritus	19	10	14	0.79	0.58	0.94	71.43
PTH0299	*Mangifera indica* L.	Aamba	Anacardiaceae	Roots/ Leaves / Flowers	Wounds	27	11	17	1.13	0.71	0.94	64.71
PTH0888	*Manilkara hexandra* Dubard	Khirni	Sapotaceae	Fruits	Leprosy	33	22	23	1.38	0.96	0.94	95.65
PTH0551	*Mimosa pudica* L.	Lajalu	Fabaceae	Leaves	Wounds	19	8	14	0.79	0.58	0.94	57.14
PTH0893	*Mimusops elengi* L.	Bakul	Sapotaceae	Flowers	Wounds	23	14	19	0.96	0.79	0.94	73.68
PTH0100	*Mirabilis jalapa* L.	Gulbksh	Nyctaginaceae	Leaves	Boils / Wounds / Itching	17	7	14	0.71	0.58	0.94	50.00
PTH0407	*Mitragyna parvifolia* (Roxb.) Korth.	Karamb	Rubiaceae	Roots /Bark	Leprosy / Wounds	18	15	16	0.75	0.67	0.94	93.75
PTH0417	*Mollugo nudicaulis* Lam.	Nirangi	Molluginaceae	Leaves	Boils	19	9	17	0.79	0.71	0.94	52.94
PTH0847	*Momordica charantia* L.	Karla	Cucurbitaceae	Leaves / (Fruits)	Wounds / (Leprosy)	27	12	19	1.13	0.79	0.94	63.16
PTH0853	*Monoon longifolium* (Sonn.) B.Xue & R.M.K.Saunders	Ashok	Annonaceae	Bark	Antifungal	29	13	15	1.21	0.63	0.94	86.67
PTH0398	*Morinda coreia* Buch.-Ham.	Aal	Rubiaceae	Roots / (Leaves)	Boils / (Wounds)	32	19	21	1.33	0.88	0.94	90.48
PTH0567	*Moringa oleifera* Lam.	Shevga	Moringaceae	Roots	Ringworm	42	20	20	1.75	0.83	0.94	100.00
PTH0564	*Musa x paradisiaca* L.	Kela	Musaceae	Rhizome / Fruits / Leaves	Scabies / (Leprosy / Pruritus / Burns)	21	12	15	0.88	0.63	0.94	80.00
PTH0313	*Neltuma juliflora* (Sw.) Raf.	Vilayati bhabhul	Fabaceae	Leaves	Antifungal	21	14	17	0.88	0.71	0.94	82.35

PTH0890	*Nerium oleander* L.	Kanher	Apocynaceae	Roots / (Leaves)	Leprosy / Ringworm / (Scabies)	23	16	20	0.96	0.83	0.94	80.00
PTH0107	*Nyctanthes arbor-tristis* L.	Parijat	Oleaceae	Leaves	Pruritus	29	18	23	1.21	0.96	0.94	78.26
PTH0136	*Ocimum americanum* L.	Ran tulas	Lamiaceae	Leaves	Pruritus / Leprosy	24	14	18	1.00	0.75	0.94	77.78
PTH0524	*Ocimum basilicum* L.	Sabja	Lamiaceae	Leaves	Ringworm	29	21	23	1.21	0.96	0.94	91.30
PTH0140	*Ocimum tenuiflorum* L.	Tulsi	Lamiaceae	Whole plant	Acne	42	24	24	1.75	1.00	0.98	100.00
PTH0206	*Oldenlandia corymbosa* L.	Pittapapda	Rubiaceae	Whole plant	Eczema / Leprosy	27	18	23	1.13	0.96	0.94	78.26
PTH0523	*Operculina turpethum* (L.) S. Manso	Nishottar	Convolvulaceae	Roots	Pruritus	25	17	19	1.04	0.79	0.94	89.47
PTH0873	*Ougeinia oojeinensis* (Roxb.) Hochr.	Kala palas	Fabaceae	Bark	Leprosy	34	21	22	1.42	0.92	0.94	95.45
PTH0304	*Oxalis corniculata* L.	Ambushi	Oxalidaceae	Leaves	Burns / Wounds	29	18	20	1.21	0.83	0.94	90.00
PTH0097	*Pentapetes phoenicea* L.	Duparshendri	Malvaceae	Whole plant	Ringworm	17	10	14	0.71	0.58	0.94	71.43
PTH0234	*Pergularia daemia* (Forssk.) Choiv.	Utran	Apocynaceae	Leaves	Leprosy	32	21	22	1.33	0.92	0.94	95.45
PTH0305	*Phyllanthus emblica* L.	Awla	Phyllanthaceae	Fruits / (Leaves)	Leprosy / (Irritations)	43	23	23	1.79	0.96	0.94	100.00
PTH0016	*Phyllanthus reticulatus* Poir.	Pisaundi	Phyllanthaceae	Leaves	Eczema	38	18	18	1.58	0.75	0.94	100.00
PTH0040	*Physalis minima* L.	Phopandra	Solanaceae	Whole plant	Pruritus	31	15	16	1.29	0.67	0.94	93.75
PTH0531	*Pistia stratiotes* L.	Haravel	Araceae	Leaves	Ringworm	20	9	14	0.83	0.58	0.94	64.29
PTH0080	*Pleurolobus gangeticus* (L.) J.St.-Hil. ex H.Ohashi & K.Ohashi	Salparni	Fabaceae	Roots	Burns	20	13	18	0.83	0.75	0.94	72.22
PTH0141	*Plumbago zeylanica* L.	Chitrak	Plumbaginaceae	Roots	Acne	37	21	22	1.54	0.92	0.98	95.45
PTH0508	*Plumeria alba* L.	Devchafa	Apocynaceae	Latex	Herpes / Scabies	15	8	13	0.63	0.54	0.96	61.54
PTH0281	*Polycarpaea corymbosa* (L.) Lam.	Koyap	Caryophyllaceae	Leaves	Boils	19	15	18	0.79	0.75	0.94	83.33
PTH0790	*Polycarpon prostratum* (Forssk.) Aschers. & Schweinf.	Gimha	Caryophyllaceae	Leaves	Measles	19	17	19	0.79	0.79	0.95	89.47
PTH0390	*Pongamia pinnata* (L.) Pierre	Karanj	Fabaceae	Leaves / (Seeds)	Leprosy / (Leprosy / Scabies)	38	19	22	1.58	0.92	0.94	86.36
PTH0924	*Pontederia vaginalis* Burm.f.	Nilotpala	Pontederiaceae	Leaves	Boils	21	11	18	0.88	0.75	0.94	61.11
PTH0284	*Portulaca oleracea* L.	Mothi ghol	Portulacaceae	Leaves	Leprosy	20	9	16	0.83	0.67	0.94	56.25
PTH0521	*Pterocarpus marsupium* Roxb.	Bija	Fabaceae	Heartwood / (Leaves / Gum)	Leprosy / (Boils / Wounds & Psoriasis)	27	16	18	1.13	0.75	0.94	88.89
PTH0264	*Pupalia lappacea* (L.) A. L. Juss.	Chikta	Amaranthaceae	Fruits /(Whole plant)	Boils / (Leprosy)	26	19	21	1.08	0.88	0.94	90.48
PTH0265	*Ricinus communis* L.	Erand	Euphorbiaceae	Roots	Leprosy / Boils	37	22	23	1.54	0.96	0.94	95.65

PTH0472	*Rotheca serrata* (L.) Steane & Mabb.	Bharangi	Lamiaceae	Roots	Leprosy	17	7	12	0.71	0.50	0.94	58.33
PTH0837	*Rumex nepalensis* Spreng.	Chakvat	Polygonaceae	Leaves	Irritations	20	14	18	0.83	0.75	0.96	77.78
PTH0130	*Rungia repens* (L.) Nees	Ghatipittapapda	Acanthaceae	Leaves	Antifungal	18	9	13	0.75	0.54	0.94	69.23
PTH0689	*Saccharum officinarum* L.	Ganna	Poaceae	Stem	Leprosy	23	15	18	0.96	0.75	0.94	83.33
PTH0573	*Sagittaria guayanensis* subsp. *lappula* (D.Don) Bogin	Rumi	Alismataceae	Leaves	Pruritus	19	11	16	0.79	0.67	0.94	68.75
PTH0614	*Santalum album* L.	Chandan	Santalaceae	Heartwood	Leprosy	27	14	17	1.13	0.71	0.94	82.35
PTH0275	*Scoparia dulcis* L.	Mithi patti	Plantaginaceae	Whole plant	Boils / Erythema / Measles	19	12	15	0.79	0.63	0.94	80.00
PTH0518	*Semecarpus anacardium* L. f.	Bibba	Anacardiaceae	Fruits	Leprosy / Carcinoma / Eczema	43	22	24	1.79	1.00	0.94	91.67
PTH0400	*Senegalia catechu* (L.f.) P.J.H.Hurter & Mabb.	Khair	Fabaceae	Heartwood / (Bark)	Eczema / Boils / (Leprosy)	41	20	23	1.71	0.96	0.94	86.96
PTH0467	*Senegalia torta* (Roxb.) Maslin, Seigler & Ebinger	Chilar	Fabaceae	Bark	Measles	22	14	18	0.92	0.75	0.95	77.78
PTH0662	*Senna alata (*L.) Roxb.	Shimai-agashe	Fabaceae	Leaves	Ringworm	19	12	16	0.79	0.67	0.94	75.00
PTH0685	*Senna occidentalis* (L.) Link	Tarvad	Fabaceae	Leaves	Pruritus / Leprosy / Wounds	23	16	18	0.96	0.75	0.94	88.89
PTH0590	*Senna sophera* (L.) Roxb.	Takla	Fabaceae	Leaves	Ringworm	20	11	16	0.83	0.67	0.94	68.75
PTH0029	*Senna tora* (L.) Roxb.	Tarota	Fabaceae	Leaves	Eczema / Ringworm / Dermatitis / Scabies / Itching	23	18	19	0.96	0.79	0.94	94.74
PTH0457	*Sesamum indicum* L.	Til	Pedaliaceae	Seeds	Alopecia	31	17	19	1.29	0.79	0.96	89.47
PTH0219	*Sesbania bispinosa* (Jacq.) W. F. Wight	Ran shevari	Fabaceae	Seeds	Small pox / Eczema / Small pox / Ringworm	19	9	14	0.79	0.58	0.96	64.29
PTH0870	*Sesbania grandiflora* (L.) Poir.	Heti	Fabaceae	Root bark	Scabies	27	18	21	1.13	0.88	0.94	85.71
PTH0859	*Sida cordifolia* L.	Balag	Malvaceae	Roots	Wounds	29	14	17	1.21	0.71	0.94	82.35
PTH0703	*Smilax zeylanica* L.	Ghotvel	Smilacaceae	Roots	Eczema	39	21	24	1.63	1.00	0.94	87.50
PTH0354	*Solanum nigrum* L.	Kangni	Solanaceae	Whole plant	Leprosy / Wounds	31	18	19	1.29	0.79	0.94	94.74
PTH0237	*Solanum virginianum* L.	Dorli	Solanaceae	Whole plant	Leprosy	30	19	21	1.25	0.88	0.94	90.48
PTH0364	*Sonchus asper* (L.) Hill.	Mhatari	Asteraceae	Whole plant	Boils / Wounds	33	22	23	1.38	0.96	0.94	95.65
PTH0352	*Soymida febrifuga* (Roxb.) A. Juss.	Rohan	Meliaceae	Bark	Leprosy	35	22	22	1.46	0.92	0.94	100.00
PTH0907	*Spathodea campanulata* P. Beauv.	Patri	Bignoniaceae	Bark	Rashes	23	16	19	0.96	0.79	0.94	84.21
PTH0298	*Sphaeranthus indicus* L.	Godari	Asteraceae	Roots	Leprosy	24	17	18	1.00	0.75	0.94	94.44

PTH0631	*Stereospermum colais* (Buch.-Ham. ex Dillw.) Mabb.	Paral	Bignoniaceae	Leaves	Wounds	21	15	17	0.88	0.71	0.94	88.24
PTH0314	*Syzygium cumini* (L.) Skeels	Jambhul	Myrtaceae	Fruits	Ringworm	34	21	22	1.42	0.92	0.94	95.45
PTH0559	*Tabernaemontana citrifolia* L.	Swastik	Apocynaceae	Latex	Wounds	31	17	18	1.29	0.75	0.94	94.44
PTH0543	*Tagetes erecta* L.	Zendu	Asteraceae	Whole plant	Wounds	18	11	15	0.75	0.63	0.94	73.33
PTH0406	*Tamarindus indica* L.	Chinch	Fabaceae	Leaves	Boils / Ringworm / Scabies / Wounds	39	20	22	1.63	0.92	0.94	90.91
PTH0224	*Tectona grandis* L. f.	Sagvan	Lamiaceae	Bark / (Leaves)	Leprosy / (Leprosy / Pruritus)	23	11	17	0.96	0.71	0.94	64.71
PTH0073	*Tephrosia purpurea* (L.) Pers.	Diwali	Fabaceae	Roots / (Seeds)	Boils / Pimples / (Rashes)	17	8	12	0.71	0.50	0.94	66.67
PTH0483	*Terminalia anogeissiana* Gere & Boatwr. (Roxb. ex DC.) Wall. ex Guill. & Perr.	Dhawda	Combretaceae	Bark	Leprosy / Wounds	43	24	24	1.79	1.00	0.94	100.00
PTH0331	*Terminalia bellirica* (Gaertn.) Roxb.	Behda	Combretaceae	Fruits / (Seeds)	Leprosy / (Wounds)	46	23	23	1.92	0.96	0.94	100.00
PTH0509	*Terminalia catappa* L.	Jangli-badam	Combretaceae	Bark / (Leaves)	Pimples / Antifungal / (Wounds / Burns)	28	14	18	1.17	0.75	0.95	77.78
PTH0337	*Terminalia chebula* Retz.	Hirda	Combretaceae	Fruits	Leprosy / Wounds	44	23	24	1.83	1.00	0.94	95.83
PTH0142	*Thespesia populnea* Soland. ex Corr.	Paras pimpal	Malvaceae	Stem	Carcinoma	27	17	19	1.13	0.79	0.95	89.47
PTH0684	*Torenia crustacea* (L.) Cham. & Schltdl.	Kavdyachi vel	Linderniaceae	Whole plant	Boils / Ringworm	24	16	18	1.00	0.75	0.94	88.89
PTH0147	*Tragia plukenetii* Radcl.-Sm.	Aagya	Euphorbiaceae	Roots	Eczema	27	17	21	1.13	0.88	0.94	80.95
PTH0255	*Trapa natans* L. var. *bispinosa* (Roxb.) Makino	Shingada	Lythraceae	Fruits	Leprosy	17	10	14	0.71	0.58	0.94	71.43
PTH1044	*Tribulus terrestris* L.	Gokhru	Zygophyllaceae	Leaves / (Flowers)	Leprosy / (Scabies)	26	17	20	1.08	0.83	0.94	85.00
PTH0386	*Trichodesma indicum* (L.) Lehm.	Chhota-kalpa	Boraginaceae	Whole plant	Leprosy	21	15	17	0.88	0.71	0.94	88.24
PTH0433	*Trichodesma zeylanicum* (Burm. f.) R. Br.	Jal Shirsi	Boraginaceae	Roots	Wounds	20	15	17	0.83	0.71	0.94	88.24
PTH0013	*Trichosanthes cucumerina* L.	Kavlyachi shidori	Cucurbitaceae	Leaves	Alopecia	24	17	21	1.00	0.88	0.96	80.95
PTH0072	*Tridax procumbens* L.	Kambarmodi	Asteraceae	Leaves	Wounds	38	23	24	1.58	1.00	0.94	95.83
PTH0344	*Triticum aestivum* L.	Gahu	Poaceae	Seeds	Boils / Pruritus	18	12	14	0.75	0.58	0.94	85.71

PTH0862	*Triumfetta rhomboidea* Jacq.	Thinjhira	Malvaceae	Leaves / Flowers	Leprosy	29	15	19	1.21	0.79	0.94	78.95
PTH1730	*Turnera ulmifolia* L.	Pila elder	Passifloraceae	Roots	Boils	24	19	22	1.00	0.92	0.94	86.36
PTH0091	*Typha angustifolia* L.	Kongsi	Typhaceae	Inflorescence	Wounds	27	20	21	1.13	0.88	0.94	95.24
PTH0875	*Uraria lagopus* DC.	Mahadev jata	Fabaceae	Roots / Seeds	Ringworm	20	17	19	0.83	0.79	0.94	89.47
PTH0182	*Urena lobata* L.	Van-bhendi	Malvaceae	Roots	Wounds	20	14	18	0.83	0.75	0.94	77.78
PTH0459	*Vachellia leucophloea* (Roxb.) Maslin, Seigler & Ebinger	Hivar	Fabaceae	Bark	Wounds	37	19	24	1.54	1.00	0.94	79.17
PTH0356	*Vallaris solanacea* (Roth ex Roem. & Schult.) Kuntze	Vanjai	Apocynaceae	Latex	Wounds	33	21	23	1.38	0.96	0.94	91.30
PTH106	*Ventilago denticulata* Willd.	Raktapapdi	Rhamnaceae	Roots	Pruritus	42	18	22	1.75	0.92	0.94	81.82
PTH0744	*Vincetoxicum fasciculatum* (Buch.-Ham. ex Wight) Kuntze	Bhindodi	Apocynaceae	Leaves	Wounds	27	15	18	1.13	0.75	0.94	83.33
PTH0377	*Vitex negundo* L.	Nirgudi	Lamiaceae	Roots	Leprosy / Wounds	44	23	24	1.83	1.00	0.94	95.83
PTH0649	*Vitis vinifera* L.	Angoor	Vitaceae	Leaves	Scabies	17	9	13	0.71	0.54	0.94	69.23
PTH0319	*Wahlenbergia marginata* (Thunb.) A. DC.	Seemdevi	Campanulaceae	Whole plant	Eczema	20	14	18	0.83	0.75	0.94	77.78
PTH0505	*Wattakaka volubilis* (L.f.) Stapf.	Hirandodi	Apocynaceae	Leaves	Boils	26	18	21	1.08	0.88	0.94	85.71
PTH0326	*Woodfordia fruticosa* (L.) Kurz.	Jilbili	Lythraceae	Flowers	Leprosy	28	21	23	1.17	0.96	0.94	91.30
PTH0898	*Wrightia tinctoria* (Roxb.) R. Br.	Kala kuda	Apocynaceae	Bark	Leprosy / Psoriasis	33	23	24	1.38	1.00	0.94	95.83
PTH0194	*Xanthium strumarium* L.	Shankwshwar	Asteraceae	Roots / (Fruits)	Carcinoma / (Small pox)	38	24	24	1.58	1.00	0.95	100.00

Most species were collected from the wild (202), whereas 38 cultivated and 21 ornamental taxa were also employed, reflecting the adaptive use of both natural and domesticated flora. The dominant families were Fabaceae (34 spp.), Malvaceae (15 spp.), Apocynaceae (14 spp.), Asteraceae (12 spp.), and Euphorbiaceae (10 spp.), each known for bioactive secondary metabolites (tannins, flavonoids, terpenoids, alkaloids) that justify their frequent use in dermatological remedies (Fig. 4).

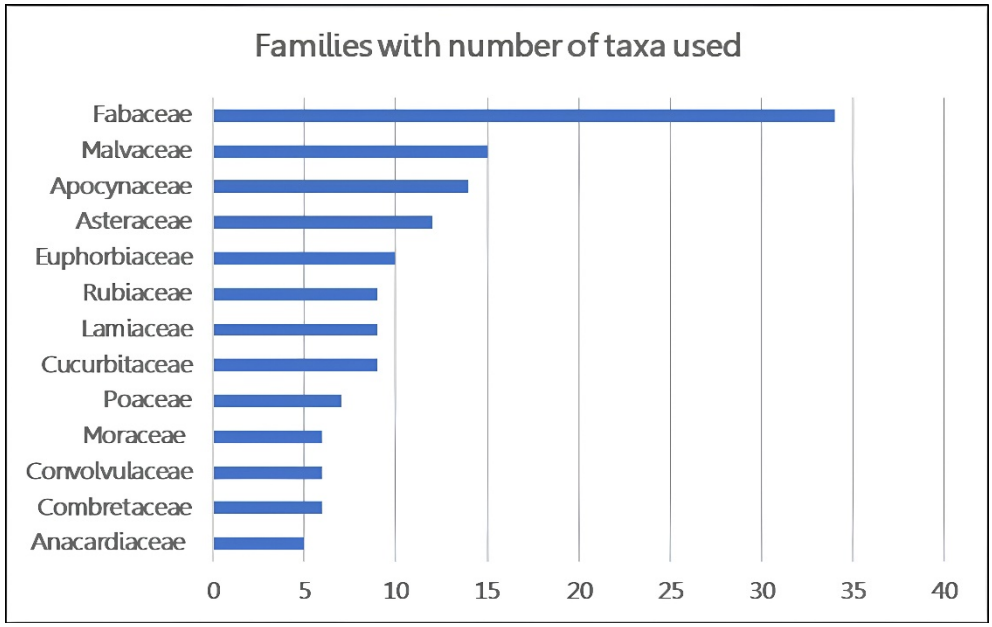

Figure 4. Families with several taxa used

The different parts of the plants were found useful in the treatment of skin diseases by the tribal and local people. In some cases, whole plants were found useful while in other particular part of the plant was found effective to cure the disease. Leaves were the most frequently used plant part (132 citations), followed by roots (60), bark (44), fruits (41), and whole plants (67). Their prevalence corresponds with nationwide patterns (Gupta *et al.* 2009; Shaheen *et al.* 2014) owing to ease of collection, renewability, and high phytochemical content. Bark and roots were reserved for chronic ailments such as leprosy and eczema, although their harvesting is ecologically destructive. Fruits, seeds, latex, and gums were used for specific conditions such as boils, ringworm, and warts, reflecting refined traditional selection based on observed efficacy (Fig. 5).

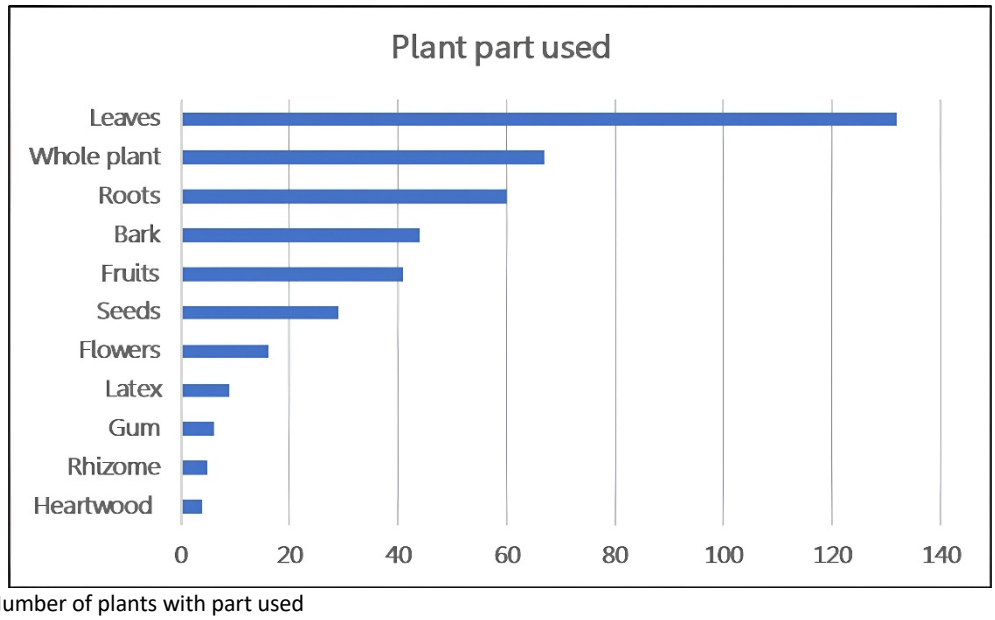

Figure 5. Number of plants with part used

Ailment categories and therapeutic patterns

A total of 24 distinct skin conditions were treated using local flora, with leprosy (98 species) and wounds (97 species) being the most frequently addressed. Other major categories included pruritus (40), boils (34), scabies (27), and ringworm (26). The predominance of infectious dermatoses underscores the ecological reality of tropical environments and the continued dependence on plant-based care (Fig. 6). Less common conditions include carcinoma, psoriasis and lupus, which were linked to specific rare plants used as poultices or decoctions. This reflects both the prevalence of infectious skin diseases in rural, tropical climates and the deep-rooted reliance on herbal treatments for dermatological conditions (Sardana *et al.* 2009; Singh *et al.* 2023).

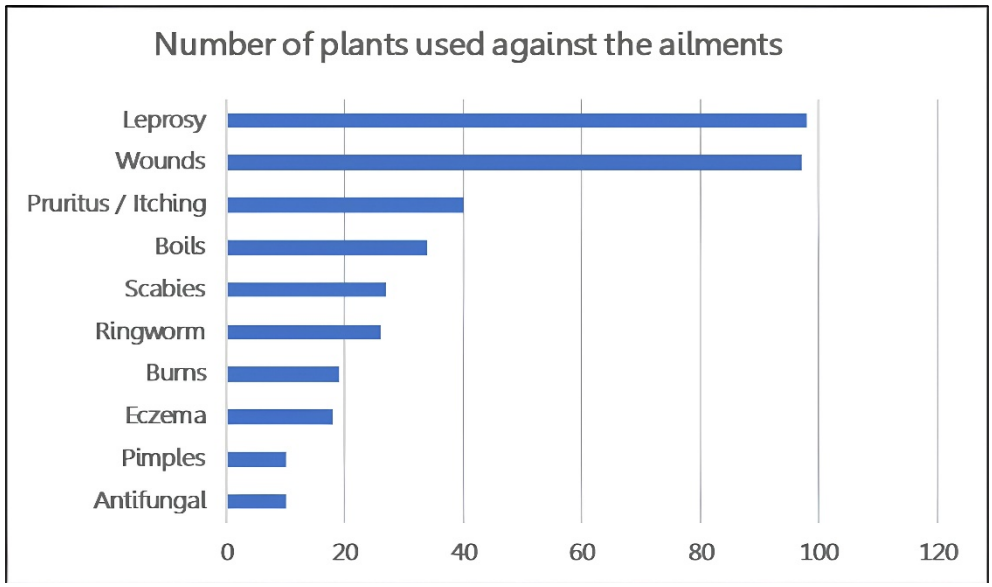

Figure 6. Number of plants and the ailments

Analysis of plant parts employed in the treatment of skin diseases in Bhandara district revealed that leaves were the most frequently utilized component, followed by roots, bark, fruits, and whole plants (Fig. 7). The predominance of leaves aligns with ethnobotanical findings across India (Gupta *et al.* 2009; Malik *et al.* 2015; Singh *et al.* 2023), as they are readily available throughout the year, renewable, and rich in bioactive secondary metabolites such as flavonoids, alkaloids, tannins, and saponins that exhibit antimicrobial and anti-inflammatory properties (Rupani & Chavez 2018). Bark and roots, though less frequently used, were specifically associated with chronic or severe skin ailments like leprosy, eczema, and pruritus. However, the removal of bark and roots is ecologically destructive, emphasizing the need for sustainable harvesting practices. Fruits and seeds were applied primarily for infections such as scabies, boils, and ringworm, often as poultices or powdered formulations, while latex and gums were used sparingly for warts and wounds due to their irritant nature.

Mode of use and dosage

The ethnomedicinal practices documented in Bhandara district reveal diverse preparation methods for treating skin diseases, most of which rely on topical application. Leaves were commonly pounded into pastes or crushed to extract fresh juice, which was directly applied to affected areas in cases of wounds, boils, scabies, and eczema. Rhizomes and roots, particularly those of *Curcuma longa* and *Asparagus racemosus*, were often ground into fine powders or decocted, with the resulting preparation applied externally or occasionally taken in small oral doses mixed with milk or water. Fruits such as *Phyllanthus emblica* and *Limonia acidissima* were used in the form of poultices, while gums and latex from *Butea monosperma* and *Jatropha curcas* were sparingly applied to lesions in very small quantities due to their known irritant potential. Dosages were generally measured in traditional household terms, for example, a “pinch” of powder, a “few drops” of juice, or a “small handful” of leaves, reflecting empirical rather than standardized measures. Applications were typically repeated once or twice daily until visible improvement was observed. Importantly, healers emphasized moderation, warning against excessive application of strong latexes or alkaloid-rich extracts (*Gloriosa superba*, *Semecarpus anacardium*), which could exacerbate irritation. These observations illustrate pragmatic dose control and traditional safety awareness, yet call for modern pharmacological standardization.

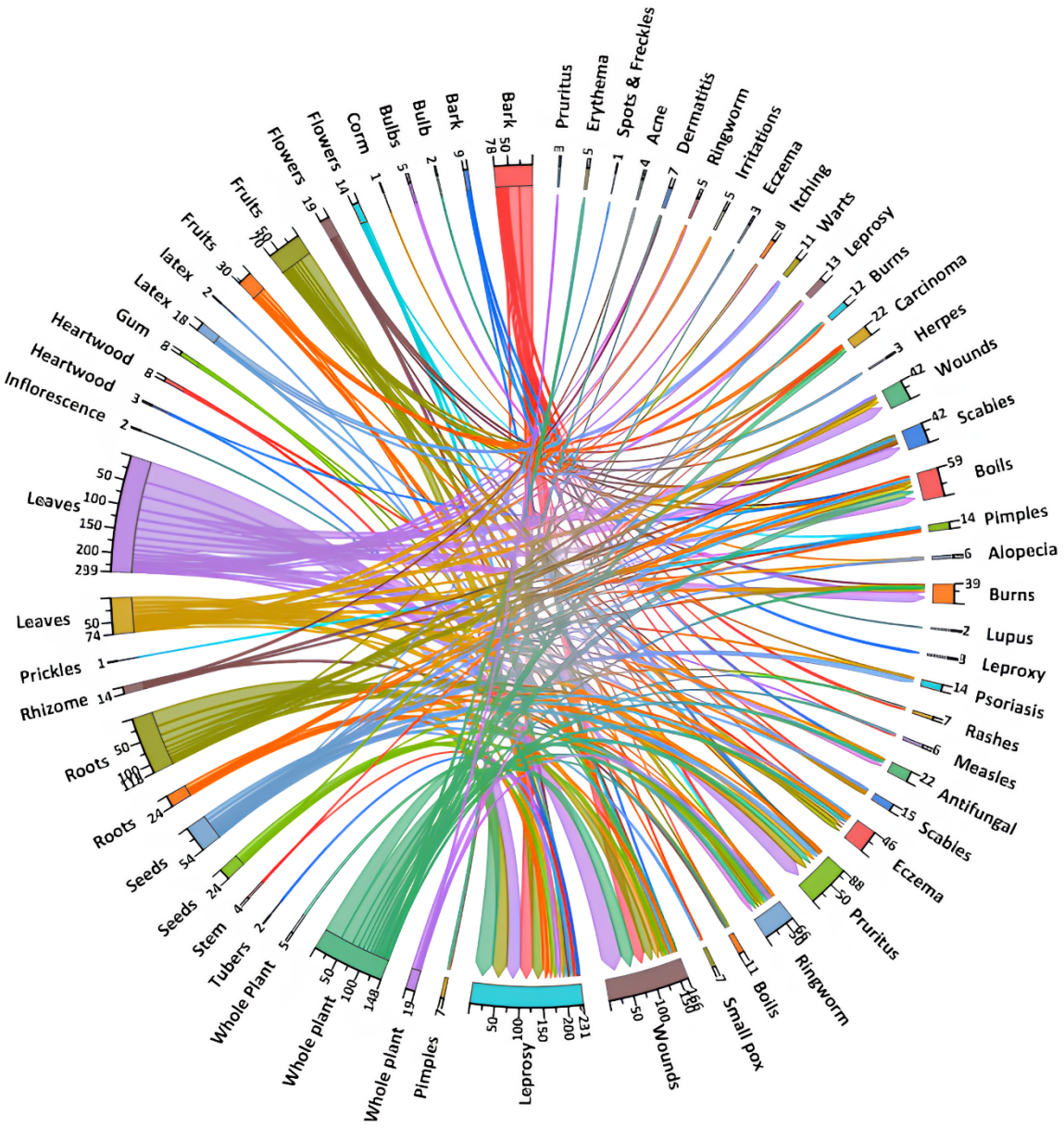

Figure 7**.** Plant parts used against diseases or ailments

Quantitative ethnobotanical indices

Application of quantitative indices enhanced the understanding of plant importance in cultural practices.

Use Value (UV): The highest UV was observed for *Azadirachta indica* (2.04), *Curcuma longa* (2.00), and *Asparagus racemosus* (1.96). High UV values suggest broad recognition and multiple dermatological applications, reaffirming their pivotal role in indigenous medicine.

Relative Frequency of Citation (RFC): Several species, including *Butea monosperma*, *Gloriosa superba*, *Ocimum tenuiflorum*, and *Terminalia bellirica*, achieved RFC values of 1.00, indicating unanimous recognition among informants. Such uniformity reflects their entrenched status in folk medicine.

Informant Consensus Factor (ICF): Values ranged from 0.94 to 0.98, with acne, leprosy, wounds, and pruritus showing the highest consensus. High ICF values (>0.9) point to a strong agreement among informants regarding plant selection, suggesting that treatments are not random but embedded within collective cultural wisdom (Singh & Rawat 2020).

Fidelity Level (FL): Several plants demonstrated exceptionally high FL, such as *Curcuma longa* (100%), *Gloriosa superba* (100%), and *Phyllanthus emblica* (100%). These values indicate a near-exclusive cultural association with dermatological use, making these species prime candidates for pharmacological validation.

These indices collectively validate the consistency and cultural reliability of reported knowledge, providing a basis for future phytochemical investigation.

Comparison with previous ethnodermatological studies

The prominence of *Azadirachta indica*, *Curcuma longa*, and *Lawsonia inermis* echoes findings from ethnobotanical research in other Indian regions, including Manipur (Panmei *et al.* 2019), Odisha (Acharya *et al.* 2025), and the Western Himalaya (Malik *et al.* 2015). Similarly, *Vitex negundo* and *Terminalia chebula* were consistently reported across multiple ethnobotanical studies, reinforcing their pan-Indian dermatological relevance. Globally, the use of *Aloe vera* and *Ocimum* species for skin disorders has been extensively validated in African and Southeast Asian traditions (Shaheen *et al.* 2014; Rupani & Chavez 2018). Such cross-convergence reinforces empirical efficacy and suggests evolutionary selection of bioactive species.

Side effects and safety considerations

Although many of the reported ethnomedicinal remedies are valued for their effectiveness, informants also acknowledged potential side effects, particularly when remedies were applied in excessive quantities or without proper preparation. Latex-bearing plants such as *Jatropha curcas*, *Euphorbia tirucalli*, and *Calotropis gigantea* were reported to cause burning sensations, blistering, or skin irritation when overapplied. Similarly, seeds of *Gloriosa superba* and fruits of *Semecarpus anacardium* are traditionally recognized as toxic, requiring precise handling and minimal dosages; accidental overuse may result in severe dermatitis, ulceration, or systemic toxicity. Astringent barks (*Terminalia chebula* or *Albizia lebbeck*) may induce dryness, whereas oily preparations (*Ricinus communis* or *Aloe vera*) occasionally trigger allergic responses. Importantly, none of the remedies documented were used as substitutes for emergency medical care, and traditional healers often cautioned patients to discontinue use if irritation worsened. These observations underscore the necessity for toxicological assessment and the development of safety guidelines before clinical integration.

Pharmacological relevance and research gap

Several high-use species have already been investigated for dermatological activity. For example, *Curcuma longa* is known for its potent anti-inflammatory and wound-healing properties (Prasad *et al.* 2024), while *Azadirachta indica* exhibits strong antifungal and antibacterial effects (Rupani & Chavez 2018). However, many species with high cultural importance, such as *Gloriosa superba* and *Butea monosperma*, remain underexplored in modern pharmacological studies. Species with high Fidelity Level but limited clinical data (*Ventilago denticulata, Limonia acidissima*) represent novel targets for future bioprospecting. Systematic phytochemical and pharmacological investigations into these taxa could yield new dermatotherapeutics.

Phytochemical rationale for dermatological applications

The observed cultural importance is substantiated by phytochemical evidence. *Azadirachta indica* contains limonoids (azadirachtin and nimbidin) with broad antimicrobial and anti-inflammatory activities relevant to leprosy, eczema, and pruritus (Rupani & Chavez 2018). *Curcuma longa* is rich in curcuminoids, particularly curcumin, which possesses well-documented antioxidant and wound-healing properties, making it a culturally and scientifically validated remedy for boils and inflammatory skin conditions (Sankar *et al.* 2024). Similarly, *Vitex negundo* produces flavonoids and iridoids with analgesic and antimicrobial effects that justify its use in treating wounds and leprosy, while *Terminalia chebula* and *T. bellirica* contain tannins and gallic acid derivatives known for their antimicrobial and astringent properties. Moreover, *Gloriosa superba* is characterized by colchicine alkaloids, long recognized for their anti-mitotic and anti-inflammatory roles, though requiring caution due to potential toxicity. These biochemical profiles corroborate the high UV and FL scores and provide scientific justification for traditional use.

Knowledge transmission and cultural erosion

Ethnobotanical expertise was found to be concentrated among elderly male healers, with younger generations demonstrating limited engagement. Modernization and the shift toward allopathic care accelerate this decline. Similar trends have been reported in ethnobotanical studies across India (Naqvi *et al.* 2022; Tabuti *et al.* 2023). Without proper documentation and intergenerational transfer, this invaluable cultural heritage risks being lost. Community-based documentation, education, and inclusion of traditional medicine in local curricula are recommended to safeguard cultural continuity.

Implications for conservation and healthcare integration

These results hold dual significance for biodiversity conservation and public health. Highly valued species (*Gloriosa superba*, *Terminalia* spp., *Vitex negundo*) face pressure from overharvesting and require sustainable management. From a healthcare perspective, validated traditional remedies can supplement primary care in resource-limited settings. Collaboration among traditional healers, botanists, and clinicians is essential to promote ethical integration of indigenous knowledge with modern medicine.

Conclusion

This study provides the first systematic and quantitative account of ethnomedicinal plants used for treating skin diseases in Bhandara district, documenting 261 species across 85 families. The high Use Value, Relative Frequency of Citation, and Fidelity Level indices observed for species such as *Azadirachta indica*, *Curcuma longa*, *Butea monosperma*, *Terminalia chebula*, and *Vitex negundo* underscore their central role in local ethnodermatological practice. Informant Consensus Factor values exceeding 0.9 across most ailment categories further confirm that plant use is not idiosyncratic, but reflects collective and culturally consistent decision-making within the community.

Importantly, the pharmacological plausibility of many high-ranking species is supported by their known bioactive compounds, *viz.*, curcuminoids in *Curcuma longa*, limonoids in *Azadirachta indica*, tannins in *Terminalia species*, and flavonoids in *Vitex negundo*, which exhibit antimicrobial, anti-inflammatory, and wound-healing activities relevant to dermatological disorders. At the same time, some culturally significant plants such as *Ventilago denticulata* and *Limonia acidissima* remain poorly studied, highlighting clear opportunities for future phytochemical and pharmacological investigations.

From a conservation perspective, several species (e.g., *Gloriosa superba*, *Terminalia bellirica*) are susceptible to overharvesting, highlighting the need for sustainable harvesting protocols, cultivation efforts, and community-based resource management. The demographic skew toward elderly informants also indicates that ethnomedicinal knowledge transmission is weakening, emphasizing the urgency of documentation and youth engagement.

Based on these results, it is therefore recommended that (i) targeted phytochemical screening and clinical pre-validation be prioritised for the three most culturally significant taxa (*Azadirachta indica*, *Curcuma longa*, *Terminalia chebula*), particularly in relation to wounds and leprosy; (ii) evidence-supported plant-based therapies be considered for future integration into primary healthcare at local level where appropriate; and (iii) knowledge-conservation interventions be implemented to maintain both biological and cultural continuity. Finally, it must be emphasized that the uses recorded herein represent ethnomedicinal practice, not clinical prescription, and further pharmacological validation is essential before any therapeutic endorsement.

Declarations

List of abbreviations: MS- Maharashtra State

Ethics approval and consent to participate: All the participants interviewed for the collection of ethnomedicinal data from the district were well informed about the use of the data and oral consent was taken from them to publish this data for human welfare.

Consent for Publication: Not applicable

Availability of data and materials: Not applicable

Competing interests: Not applicable

Funding: Not applicable

Author contribution: The data was collected during floristic exploration of the district and the whole script of this research paper is prepared by the author and no one participated in the collection and preparation of any data writing and analysis. The image of the location map given in this paper is created by the author with the help of CorelDraw.

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Literature cited

Acharya B, Behera A, Mohanty P, Sahu S, Padhan T, Mishra DP, Behera A, Sahu PK. 2025. Ethnobotanical wisdom in phytocosmeceuticals: Investigating pharmacological applications in Western Odisha, India. Ethnobotany Research and Applications 31: 1-34.

Anand U, Tudu CK, Nandy S, Sunita K, Tripathi V, Loake GJ, *et al.* 2022. Ethnodermatological use of medicinal plants in India: From Ayurvedic formulations to clinical perspectives - A review. Journal of Ethnopharmacology 284: 114744.

APG IV: Angiosperm phylogeny group classification for the orders and families of flowering plants: https://www.gbif.org/dataset/fa8ab13c-52ed-4754-b838-aeff74c79718

Asiimwe S, Namutebi A, Borg-Karlsson A, Kamatenesi-Mugisha M, Oryem-Origa H. 2014. Documentation and consensus of indigenous knowledge on medicinal plants used by the local communities of western Uganda. Journal of Natural Products and Plant Resources. 4(1): 34 42.

Asiimwe S, Tabuti JRS, Namutebi A, et al. 2021. Ethnobotanical survey methods: Advances and applications. Ethnobotany Research and Applications 21: 1-18.

Channaveeraiah SK and Entoori K. 2022. Recent perspectives on the impact of ethnobotany in India: A review. Journal of Medicinal Plants Studies 10(4): 1-7.

Cooke T. 1958. The Flora of the Presidency of Bombay. Vol. I-III, (Botanical Survey of India reprint), Calcutta.

Cragg GM, Newman DJ. 2005. Biodiversity: A continuing source of novel drugs leads. Pure and Applied Chemistry 77 (1): 7-24.

Dhar ML, Dhar MM, Dhawan BN, Mehrotra BN, Ray C. 1968. Screening of Indian plants for biological activity: Part I. *Indian* Journal of Experimental Biology 6(4): 232-247.

Fabricant DS, Farnsworth NL. 2001. The value of plants used in traditional medicine for drug discovery. Environmental Health perspective, 109 (Suppl. 1) :69-75.

Gupta R, Singh R, Sharma A. 2009. Ethnopharmacological approaches to skin disorders in India. Journal of Ethnopharmacology 123(2): 213-229.

Gupta R, Vairale MG, Chaudhari PR, Wate SR, 2009. Ethnomedicinal Plants Used by Gond Tribe of Bhandara District, Maharashtra in the Treatment of Diarrhoea and Dysentery, Ethnobotanical Leaflets 13: 900-909.

Humane P, Patle C and Pimpalshende A 2025. Statistical analysis of dicot flora of Ambazari lake premises, Nagpur (M. S.), India. Advances in Botanical Research, Vyom Hans Publications, Punjab, India: 1-18.

Humane PT. 2020. Statistical analysis of Ethnobotanically important flora of Bhandara District (MS), India. International Journal of Life Sciences 8(3): 583-588.

International plant name index (IPNI). https://www.ipni.org/

Jain SK, Goel AK. 1995. Workshop Exercise-1. Proforma for Field Work, 142-147. In: Jain SK. (ed.). A Manual of Ethnobotany, Scientific Publishers Jodhpur, India

Khumbangmayum AD, Khan ML, Tripathi RS. 2005. Ethnomedicinal plants in the sacred groves of Manipur. Indian Journal of Traditional Knowledge. 4 (1): 21-32

Kshirsagar RD, Singh NP. 2000. Less-known ethnomedicinal uses of plants in Coorg District of Karnataka state, Southern India. Ethnobotany. 12: 12-16.

Lain-Entralgo 1982. Historia universal de la medicine. Vol.- 7, Salvat Edit, Madrid.

Malik ZA, Bhat JA, Ballabha R, Bussmann RW, Bhatt AB. 2015. Ethnomedicinal plants traditionally used in health care practices by inhabitants of Western Himalaya, India. Journal of Ethnopharmacology 172: 133-144.

Naik VN. 1998. Flora of Marathwada. Amrut Prakashan, Aurangabad (MS), India

Naqvi N, Gurao S, Humane P. 2022. Ethnobotanical Survey on Trees of Seminary Hills, Nagpur (M.S.): An Approach towards Plant Conservation. Current World Environment. 17(3): 678-689

Naqvi N, Mungole A, Humane P. 2023. Ethnobotanically Important Herbaceous Flora of Seminary Hills, Nagpur. Indian Forester. 149 (1): 90-94.

Panmei R., Gaurel PR, Singh B. 2019. 2025. Ethnopharmacological practices for common skin diseases: A study of medicinal plants used by the Zeliangrong ethnic group of Manipur, Northeast India. Journal of Pharmacology 10: 235:164-182.

Pardal N. 1937. Medicina aborigen Americana. Buenos Aires, J. Anesi.

Panmei, R., P.K. Singh, & K.H. Boiroju. 2019. Ethnomedicinal plants used for skin diseases by the Rongmei tribe of Manipur, Northeast India. Ethnobotany Research and Applications 18:1-14

Perumal SR, Ignacimuthu S. 2000. Antibacterial activity of some folklore medicinal plants used by tribal in Western Ghats of India. Journal of Ethnopharmacology 2000; 69:63-71.

Prasad, S., A. Tyagi, & B.B. Aggarwal. 2024. Curcumin and skin health: Molecular mechanisms and clinical evidence. *Phytotherapy Research* 38(2):347-360.

Rupani R, Chavez A, 2018. Medicinal plants with traditional use in dermatology: An update. Clinics in Dermatology 36(6): 306-309.

Sankar V, Anand Babu K, Deepak M, Poojitha Mallapu, Raghu S, Anandharaj G. 2024. In vitro pharmacological evaluations of ethanolic extract of *Jatropha maheshwari*: Wound-healing and anti-inflammatory potential. Preprint *arXiv*:2411.04232.

Sardana K, Mahajan S, Sarkar R, Mendiratta V, Bhushan P, Koranne RV, Garg VK. 2009. The spectrum of skin disease among Indian children. Pediatric Dermatology 26 (1): 6-13.

Shaheen H, Qureshi R, Akram A, Gulfraz M, Potter D. 2014. Cosmetic ethnobotany practiced by tribal women: Exploring plants used in facial care. Avicenna Journal of Phytomedicine 4(4): 239-250.

Singh B, Singh B, Kishor A, Singh S, Bhat MN, Surmal O, Musarell CM. 2020. Exploring plant-based ethnomedicine and quantitative ethnopharmacology: Medicinal plants utilized by the population of Jasrota Hill in Western Himalaya. Sustainability 12(18), 7526.

Singh H, Kumar S, Arya A. 2023. Ethno-dermatological relevance of medicinal plants from the Indian Himalayan region and its implications on cosmeceuticals. Journal of Drug Research in Ayurvedic Sciences 8(2): 97-112.

Tabuti JRS, Obakiro SB, Nabatanzi A, Anywar G, Nambejja C, Mutyaba MR, Omara T, Waako P. 2023. Medicinal plants used for treatment of malaria by indigenous communities of Tororo District, Eastern Uganda. Tropical Medicine and Health. 51: 34.

The world flora online (WFO). https://www.worldfloraonline.org/

Ugemuge NR. 1986. Flora of Nagpur District. Shree Prakashan, Nagpur (MS), India.

World Health Organization (WHO) 2022. https://www.who.int/teams/who-global-traditional-medicine-centre/overview