

Ethnomedicinal Documentation of Anti-Jaundice Plants Used by Tribal Populations in Sohelwa Wildlife Sanctuary, Uttar Pradesh

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Abstract:

This study documents the ethnomedicinal use of 71 plant species belonging to 41 families that are traditionally employed by tribal groups and local residents of the Sohelwa Wildlife Sanctuary for the treatment of jaundice. For each species, detailed information on botanical identity, family name, local name, growth habit, and ethnomedicinal applications has been compiled. Jaundice is not a disease but a clinical manifestation of underlying hepatic dysfunction, characterized by elevated bilirubin levels in the bloodstream due to abnormalities in metabolism or excretion. This review provides a systematic account of the medicinal plants used in the region and underscores their significance in traditional healthcare practices and their potential relevance in the management of liver-related disorders.

Keywords: Ethnomedicinal, Jaundice, Sohelwa Wildlife Sanctuary.

Introduction:

Plants have been used as medicinal resources since ancient times, and herbal remedies continue to play a major role in primary healthcare due to their accessibility, affordability, and minimal side effects. Approximately 64% of the global population still depends on traditional medicines (Sindiga, 1994), and nearly 8,000 plant species have been documented for their ethnobotanical importance (Anonymous, 1994). Jaundice is a common health problem among local and tribal communities. It is not a disease in itself but a clinical manifestation of elevated bilirubin levels in the blood, resulting in yellow discoloration of the skin, sclera, and urine. Jaundice may occur due to excessive breakdown of red blood cells (prehepatic), impaired liver function (hepatic), or obstruction of the bile duct (post-hepatic). Factors such as viral infections, poor sanitation, and consumption of contaminated water or food contribute significantly to its prevalence. Ethnomedicinal plants form an important part of jaundice treatment in regions with limited access to modern healthcare. Several species such as *Asparagus racemosus*, *Boerhavia diffusa*, *Carica papaya*, *Eclipta prostrata*, *Fumaria indica*, *Leucas aspera*, *Phyllanthus emblica*, *Phyllanthus fraternus*, *Phyllanthus urinaria*, and *Terminalia arjuna*, are traditionally used for their hepatoprotective properties. These plants contain diverse secondary metabolites, including glycosides, tannins, alkaloids, steroids, and essential oils,

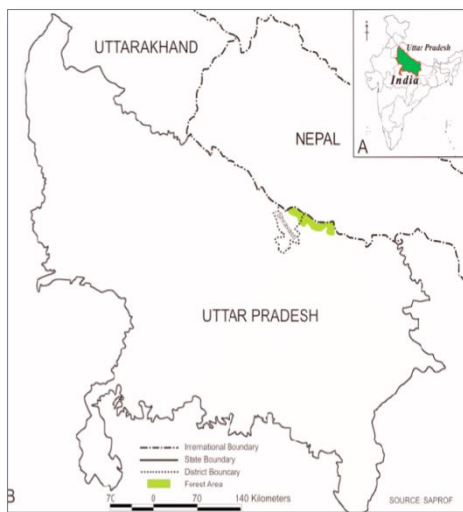
which exhibit antioxidant, anti-inflammatory, antimicrobial, and other therapeutic activities. Because of their proven benefits and cultural acceptance, tribal communities rely extensively on herbal remedies to manage jaundice and maintain overall health.

Study Area

Sohelwa Wildlife Sanctuary, situated across the Shravasti, Balrampur, and Gonda districts of Uttar Pradesh, India, is an ecologically important protected area known for its rich biodiversity. The sanctuary spans approximately 452.47 km² and lies between 27°30'1" to 27°55'42" N latitude and 81°55'36" to 82°48'33" E longitude, at an elevation of 120–200 m above mean sea level. Its geographical and climatic conditions support a mosaic of habitats, including moist deciduous forests, mixed sal forests, grasslands, and wetland ecosystems, creating favourable conditions for diverse flora and fauna.

The sanctuary is administratively divided into the Tulsipur, Barhawa, Bankatwa, Eastern Sohelwa, and Western Sohelwa ranges. The surrounding buffer zone, comprising the Bhaabar and Rampur ranges, functions as an ecologically sensitive transition belt that facilitates wildlife movement and provides regulated access to forest resources for local communities.

Sohelwa is noted for its substantial floral diversity, particularly its wealth of ethnomedicinal plants traditionally utilised by tribal and rural populations. Many of these species play a significant role in the treatment of jaundice and other ailments. The region therefore serves as an important reservoir of traditional knowledge and offers valuable potential for ethnobotanical and pharmacological research.



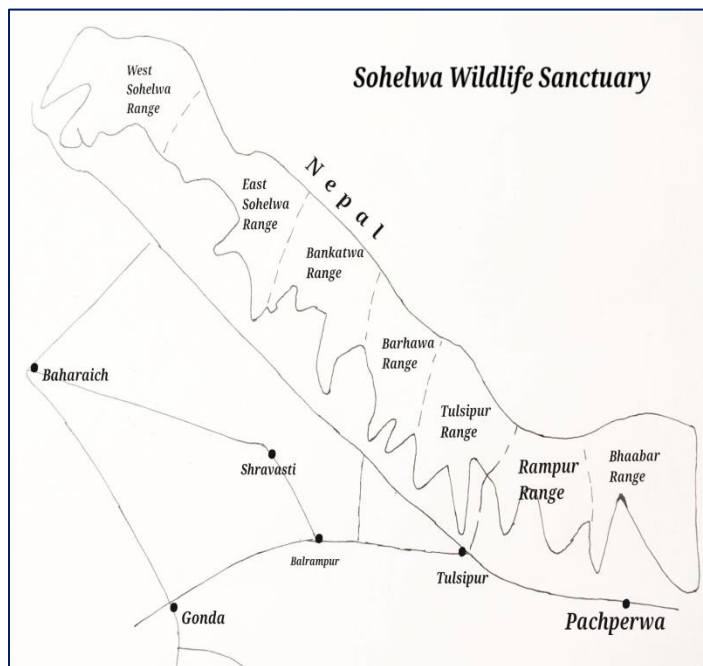


Figure: Geographic map depicting the location of Sohelwa Wildlife Sanctuary, Uttar Pradesh, India

Review of literature:

In India, currently, the work on ethnobotany has been done by many workers such as Chopra *et al.* (1956), Jain and Rao (1976), Jain (1991), Dastur (1996), Kirtikar and Basu (1999), Dubey *et al.* (2004), Kumar and Paul (2009), Elhag *et al.* (2011), Bajapai *et al.* (2016) Janghel *et al.* (2019) and Raghvanshi *et al.* (2021). Ethnobotany in Uttar Pradesh has been studied by many researchers, such as Dixit and Pandey (1984), Singh and Maheshwari (1989), Narain and Narain (1999), Pandey and Verma (2002), Singh *et al.* (2002), Khanna (2002), Singh *et al.* (2003), Singh *et al.* (2007), Singh *et al.* (2010a), Singh *et al.* (2010b), Kumar and Chayal (2012), Dubey (2012), Kumar *et al.* (2013), Narayan and Singh (2017) and Srivastav and Shukla (2018) etc. in different study areas. In the present study, an attempt has been made to document the traditional medical system of ethnic groups of the area so that the knowledge of thousands of years of evolution could be saved for future generations.

Materials and methods:

Regular field trips were conducted to comprehensively survey the Shrivasti, Balrampur, and Gonda districts within the Sohelwa Wildlife Sanctuary. Plant specimens were collected from various locations across different seasons. During collection, detailed field notes were recorded in a notebook, including the collection number, accepted botanical name, family, vegetation type, and photographs of each specimen. Labels were later prepared and affixed to herbarium mounting sheets, documenting essential information such as the botanical name, habitat, locality, plant height, morphological characteristics, collector’s name, collection number, and any additional details relevant for accurate plant identification (Jain and Rao, 1977). Specimen identification was carried out using standard floras and authoritative taxonomic literature,

including *Flora of British India* (Hooker, 1872–1897), *Flora of the Upper Gangetic Plain* (Duthie, 1960), and other relevant works (Rahul and Narain, 2025).

Data collection:

An extensive ethnomedicinal survey was conducted in the Shravasti, Balrampur, and Gonda districts within the Sohelwa Wildlife Sanctuary between December 2024 and July 2025 to document plant species traditionally employed in the treatment of Jaundice. Data were gathered using a pre-tested, semi-structured questionnaire (Supplementary Information), supplemented with systematic field observations. Information regarding plant identification, parts utilized, preparation methods, modes of administration, dosage, and shelf-life of herbal formulations was recorded in detail.

Traditional knowledge was obtained primarily from experienced traditional healers, particularly elderly practitioners recognized for their long-standing ethnomedicinal expertise. Additional insights were collected from local *Vaidyas*, knowledgeable community members, and tribal informants. Interviews, informal discussions, and triangulation of responses across multiple informants were employed to validate the reliability and accuracy of the documented information.

Results:

An extensive ethnomedicinal survey was conducted within the Sohelwa Wildlife Sanctuary, encompassing the districts of Shravasti, Balrampur, and Gonda in the Terai region of Uttar Pradesh (Table 1). A total of 60 participants were interviewed, of whom 50 (83.3%) were male and 10 (16.6%) were female. The predominance of male respondents was attributable to their greater willingness to engage in discussions with the research team, whereas female participants exhibited comparatively lower levels of interaction during interviews.

The participant group comprised traditional herbal practitioners, medicinal plant collectors, farmers, and herdsmen. Traditional healers demonstrated substantial knowledge of local medicinal plants and their therapeutic applications. The informants represented diverse age groups and educational backgrounds, categorized into three age classes (Table 1). The majority of respondents were between 60–70 years of age (58.33%), while the smallest proportion belonged to the >70-year age group (16.66%).

With respect to educational status, illiterate individuals constituted the majority of participants (75%), followed by those with primary-level education (25%). Notably, illiterate informants contributed comparatively more detailed knowledge on the ethnomedicinal uses of local plant species. This pattern may be associated with generational differences, shifts in lifestyle, increased reliance on modern healthcare systems, and ongoing urbanization processes.

Table- 1: Demographic characteristics of informants in the Sohelwa Wildlife Sanctuary of the Terai region of Uttar Pradesh.

Demographic feature	Categories	No. of person	Percentage (%)
Informants	Local inhabitant's (Male)	50	83.3
	Local inhabitant's (Female)	10	16.6
Age	50-59	15	25

	60-70	35	58.33
	More than 70	10	16.66
Education	Illiterate	45	75
	Primary	15	25
Total		60	

The ethnobotanical survey conducted across the communities of Shravasti, Balrampur, and Gonda districts within the Sohelwa Wildlife Sanctuary documented **71 medicinal plant species** traditionally used for the treatment of jaundice. These species were categorised based on growth habits, with herbs constituting the largest proportion (**25 species; 35%**), followed by trees (**18 species; 25%**), shrubs (**14 species; 20%**), climbers (**10 species; 14%**), creepers (**3 species; 4%**), and a single twiner (**1 species; 1%**). Herbs emerged as the dominant group used in jaundice management.

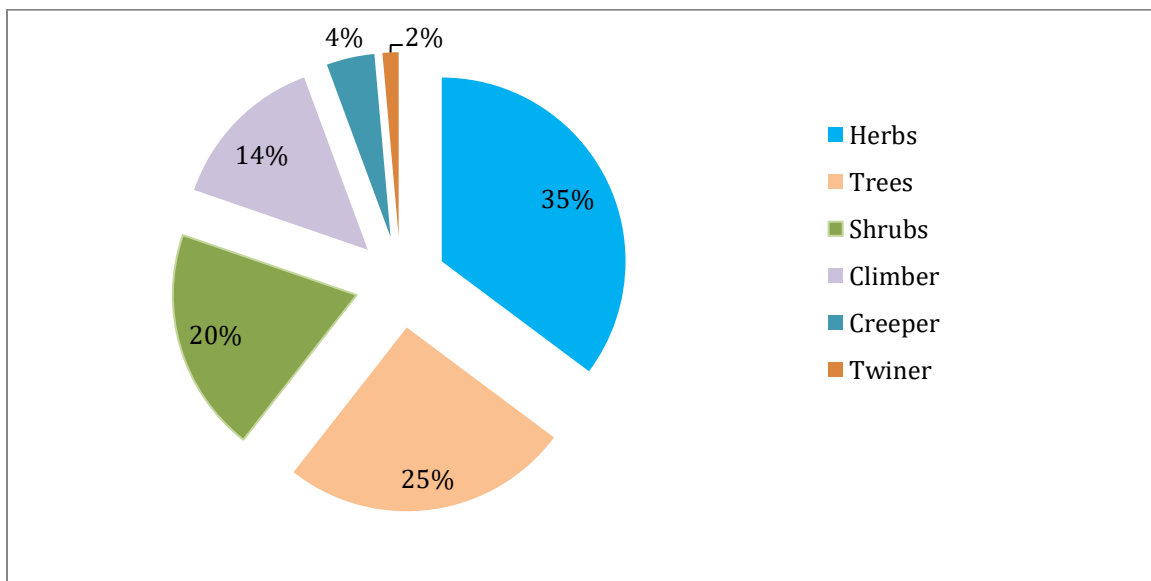


Fig:1- Habits of the plants in the Sohelwa Wildlife Sanctuary of the Tarai region of Uttar Pradesh.

Analysis of plant parts revealed that **leaves** were the most frequently utilised (**26 species; 32%**). This was followed by roots (**15 species; 19%**), fruits (**15 species; 19%**), whole plants (**14 species; 17%**), bark (**6 species; 7%**), flowers (**3 species; 4%**), rhizomes (**1 species; 1%**), and aerial parts of one species. The extensive use of these plant resources highlights the importance of ethnomedicinal knowledge among tribal and rural communities and its role in supporting primary healthcare needs.

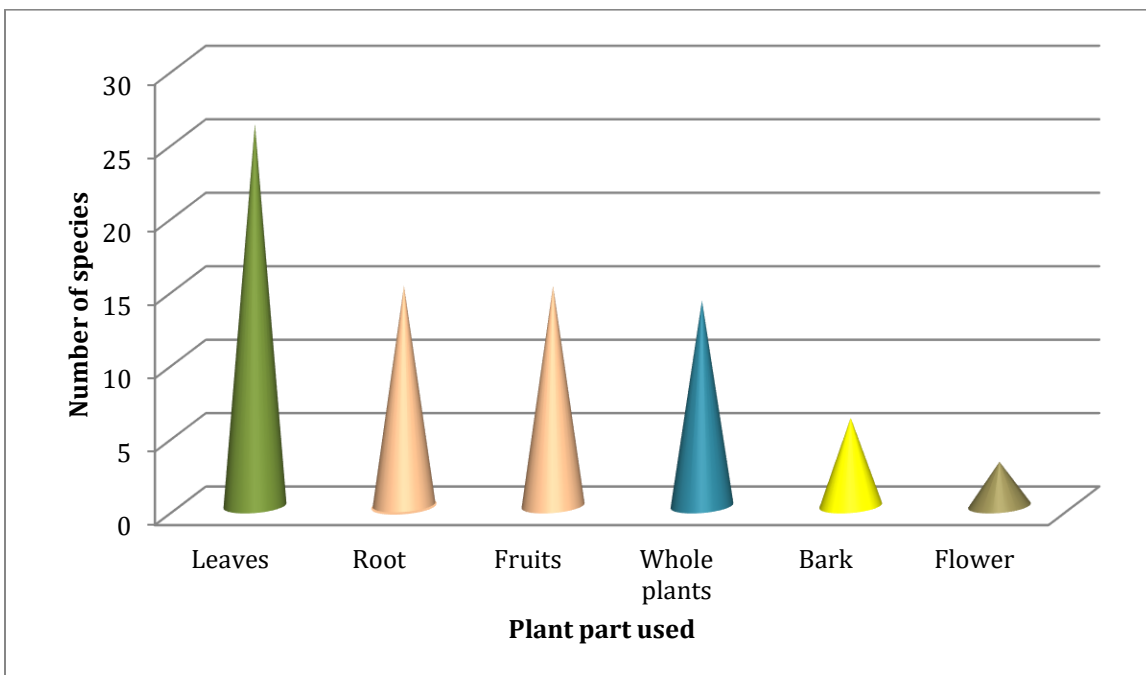


Fig:2- Most commonly used plant parts by local inhabitants in the Sohelwa Wildlife Sanctuary of the Tarai region.

Discussion:

A total of 71 plant species were recorded from Sohelwa Wildlife Sanctuary that is traditionally used by tribal communities for treating jaundice.

Dominance of Herbs in Jaundice Treatment:

Despite advancements in allopathic medicine, herbs continue to play a critical role in the management of diseases, especially within indigenous and rural societies. In Sohelwa, herbaceous species such as *Acalypha indica*, *Aerva lanata*, *Asphodelus microcarpus*, *Amaranthus spinosus*, *Andrographis paniculata*, *Boerhavia diffusa*, *Eclipta prostrata*, *Fumaria indica*, *Leucas aspera*, *Phyllanthus* spp., and *Scoparia dulcis* are widely used for treating jaundice due to their easy availability and potent therapeutic properties. Leaves and whole plants of several herbs are commonly employed.

Shrubs also contribute significantly to traditional healthcare, serving as sources of food, fuel, and medicine. Species such as *Cajanus cajan*, *Datura stramonium*, *Lawsonia inermis*, *Mallotus philippensis*, *Solanum nigrum*, *Thespesia lampas*, and *Vitex negundo* are traditionally prescribed for jaundice. Trees including *Acacia nilotica*, *Azadirachta indica*, *Cassia fistula*, *Dillenia indica*, *Ficus religiosa*, *Glycosmis pentaphylla*, and *Tamarindus indica* further enhance the therapeutic diversity of the region. Additionally, several climbers (*Abrus precatorius*, *Asparagus racemosus*, *Cissampelos pareira*, *Tinospora cordifolia*), creepers (*Centella asiatica*, *Oxystelma esculentum*), and the twiner *Cuscuta reflexa* play important roles in jaundice treatment.

Predominance of Leaves as Medicinal Plant Parts:

Leaves (26 species) were identified as the most frequently used plant part, reflecting their high availability and concentration of bioactive compounds. Leaves of *Andrographis paniculata*, *Cajanus cajan*, *Centella asiatica*, *Cissampelos pareira*, *Eclipta prostrata*, *Oxalis corniculata*, *Vitex negundo*, and others are reported to be highly effective against jaundice. For example, the leaf juice of *Cajanus cajan* mixed with sugar is traditionally administered for one month to treat jaundice, whereas leaves and fruits of *Datura stramonium* are also used.

Roots of 15 plant species including *Aerva lanata*, *Asparagus racemosus*, *Cyperus rotundus*, *Desmostachya bipinnata*, and *Plumbago zeylanica*, and fruits of 15 species such as *Carica papaya*, *Cassia fistula*, *Phyllanthus emblica*, and *Tamarindus indica* are also noteworthy for their hepatoprotective activity.

Whole plants of 14 species such as *Boerhavia diffusa*, *Cuscuta reflexa*, *Elephantopus scaber*, *Phyllanthus urinaria*, *Portulaca oleracea*, play a crucial role in traditional medicine. *Phyllanthus urinaria* is known for clearing heat-toxin and dampness and is used to treat jaundice. Preparations of *Boerhavia diffusa* and *Phyllanthus fraternus* are widely administered for jaundice.

Bark of species like *Azadirachta indica*, *Haldina cordifolia*, and *Terminalia arjuna*, stems of *Ficus religiosa* and *Tinospora cordifolia*, flowers of *Hibiscus rosa-sinensis* and *Leucas aspera*, the rhizome of *Curculigo orchioides*, and aerial parts of *Fumaria indica* also contribute significantly to jaundice therapy.

Conclusion:

Jaundice is characterised by visible clinical manifestations resulting from elevated bilirubin levels in the bloodstream. The present study documents **71 ethnomedicinal plant species** traditionally used by tribal and rural communities of the Sohelwa Wildlife Sanctuary for the treatment of jaundice. The consistent use of species such as *Asparagus racemosus*, *Boerhavia diffusa*, *Leucas aspera*, *Phyllanthus emblica*, various *Phyllanthus* species, and *Terminalia arjuna* highlights their therapeutic significance and the community's extensive knowledge of plant-based remedies. These herbal treatments provide an accessible, cost-effective means of managing jaundice and reducing disease severity in populations with limited access to modern healthcare.

The study further indicates that local people rely on a diverse range of plant species not only for jaundice but also for preventing and managing other ailments. Such practices underscore the cultural and economic value of medicinal plants and their potential contribution to rural livelihoods.

In Sohelwa Wildlife Sanctuary, tribal and rural communities demonstrate a deep understanding of the medicinal properties of local flora, emphasising the need for scientific documentation and sustainable utilisation of this natural heritage. On-going conservation efforts, including protection of forest areas and promotion of medicinal plant cultivation, are crucial to preserving biodiversity and supporting traditional healthcare systems in the region.

Table:2- Documentation of various Herbal and Local plants used by local inhabitants of Sohelwa Wildlife Sanctuary of Uttar Pradesh.

S. No.	Botanical Name	Family	Common name	Parts used	Habit
1	<i>Abrus precatorius</i> L.	Fabaceae	Ghumchi	Leaves, root, seed	Climber
2	<i>Acacia nilotica</i> (L.) Willd.	Fabaceae	Babool	Whole plant, flower	Tree
3	<i>Acalypha indica</i> L.	Euphorbiaceae	Khokli	Leaves	Herb
4	<i>Aerva lanata</i> (L.) Juss.ex Schult.	Amaranthaceae	Gorakh buti	Root,	Herb
5	<i>Asphodelus microcarpus</i> parl.	Liliaceae	-	Root	Herb
6	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Katili chaulai	Fruit	Herb
7	<i>Andrographis paniculata</i> (Burm.f.) Nees.	Acanthaceae	Kalpnaath	Leaves	Herb
8	<i>Argemone mexicana</i> L.	Papaveraceae	Bharbhanda	Whole plant	Herb
9	<i>Asparagus racemosus</i> Willd.	Liliaceae	Satawar	Root	Climber
10	<i>Azadirachta indica</i> A. Juss	Meliaceae	Neem	Bark	Tree
11	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Patharchatta	Whole plant	Herb
12	<i>Cajanus cajan</i> (L.) Millsp.	Fabaceae	Arhar	Leaves	Shrub
13	<i>Carica papaya</i> L.	Caricaceae	Papeeta	Unripe fruit	Tree
14	<i>Cassia fistula</i> L.	Fabaceae	Amaltas	Fruit	Tree
15	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Brahmi	Leaves	Creper herb
16	<i>Cissampelos pareira</i> L.	Menispermaceae	Kersane	Leaves	Climber herb
17	<i>Clitoria ternatea</i> L.	Fabaceae	Aprajita	Seed	Climber
18	<i>Curculigo orchioides</i> Haertn.	Amaryllidaceae	Siah musli	Tuberous root,	Herb

				Rhizome	
19	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Amarbel	Whole plant	Twiner herb
20	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Doob	Leaves	Herb
21	<i>Cyperus rotundus</i> L.	Cyperaceae	Motha	Root	Herb
22	<i>Datura stramonium</i> L.	Solanaceae	Datura	Leaves, Fruits	Shrub
23	<i>Dendrocalamus strictus</i> (Roxb.) Nees	Poaceae	Baans	Leaves	Tree
24	<i>Desmostachya bipinnata</i> L. Stapf.	Poaceae	Kusha	Root	Herb
25	<i>Dillenia indica</i> L.	Dilleniaceae	Elephant apple	Fruit	Tree
26	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Bhangraiya	Leaves	Herb
27	<i>Elephantopus scaber</i> L.	Asteraceae	Bishari	Whole plant	Herb
28	<i>Ficus religiosa</i> L.	Moraceae	Peepal	Bark, leaves	Tree
29	<i>Flacourtia indica</i> (Burm.f.) Merr.	Flacourtiaceae	Kantia	Root	Tree
30	<i>Fumaria indica</i> (Hauskn.) Pugsley	Papaveraceae	Bangajra	Aerial parts	Herb
31	<i>Gloriosa superba</i> L.	Liliaceae	Kaliyari	Tuberous root	Climber herb
32	<i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	Guturu	Leaves juice	Tree
33	<i>Haldina cordifolia</i> (Roxb.) Ridsdale.	Rubiaceae	Haldu	Bark	Tree
34	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Gurhal	Raw flower	Shrub
35	<i>Hygrophila auriculata</i> (Schumach.) Heine.	Acanthaceae	Talmakhana	Root, Leaves	Herb
36	<i>Lagenaria siceraria</i> (Molina.)	Cucurbitaceae	Lauki	Root, leaves	Climber

	Standley				
37	<i>Lagerstroemia parviflora</i> (L.) Pers.	Lythraceae	Dhaura	Root	Tree
38	<i>Lawsonia inermis</i> L.	Lythraceae	Mehndi	Root, leaves	Shrub
39	<i>Leptadenia pyrotechnica</i> (Forsk) Decne	Apocynaceae	Khip	Plant	Shrub
40	<i>Leucas aspera</i> Spreng.	Lamiaceae	Guma	Flower, leaves	Herb
41	<i>Madhuca longifolia</i> (J.Kornig) MacBr.	Sapotaceae	Mahua	Fruit	Tree
42	<i>Mallotus philippensis</i> (Lam.) Mill. Arg.	Euphorbiaceae	Lali	Bark	Shrub
43	<i>Mangifera indica</i> L.	Anacardiaceae	Aam	Bark	Tree
44	<i>Momordica charantia</i> L.	Cucurbitaceae	Karela	Fruit, leaves	Climber
45	<i>Nelumbo nucifera</i> Gaertn.	Nymphaeaceae	Kamal	Stem	Herb
46	<i>Ocimum americanum</i> L.	Lamiaceae	Ban tulsi	Whole plant	Herb
47	<i>Oroxylum indicum</i> (L.) Kurz	Bignoniaceae	Arlu	Bark	Tree
48	<i>Oxalis corniculata</i> L.	Oxalidaceae	Amrul	Leaves	Herb
49	<i>Oxystelma esculentum</i> (L.f.) Sm.	Apocynaceae	Dudhi bel	Root	Creepers
50	<i>Persicaria glabra</i> (Willd.)	Polygonaceae	Knotweed	Root	Shrub
51	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Amla	Fruit	Tree
52	<i>Phyllanthus fraternus</i> G.L.Webster	Euphorbiaceae	Bhuiaonla	Whole plant	Herb
53	<i>Phyllanthus urinaria</i> L.	Euphorbiaceae	Hajarmani	Whole plant	Herb
54	<i>Piper betel</i> L.	Piperaceae	Pan	Leaves	Climber
55	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Chitrak	Root	Herb

56	<i>Portulaca oleracea</i> L.	Portulacaceae	Kulfa	Whole plant	Herb
57	<i>Saccharum officinarum</i> L.	Poaceae	Ganna	Plant juice	Herb
58	<i>Scoparia dulcis</i> L.	Scrophulariaceae	Meethi patti	Whole plant	Herb
59	<i>Solanum incanum</i> L.	Solanaceae	Banabhata	Fruit	Shrub
60	<i>Solanum nigrum</i> L.	Solanaceae	Makoi	Whole plant	Shrub
61	<i>Tamarindus indica</i> L.	Fabaceae	Imli	Fruit	Tree
62	<i>Tephrosia purpurea</i> L.	Fabaceae	Sarpokha	Whole plant	Shrub
63	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjun	Bark	Tree
64	<i>Terminalia chebula</i> Retz.	Combretaceae	Harra	Fruit	Tree
65	<i>Thespesia lampas</i> (Cav.) Dalzell & Gibson	Malvaceae	Ban kapas	Whole plant	Shrub
66	<i>Tinospora cordifolia</i> (Willd.) Miers Ex Hook F. and Thomas	Menispermaceae	Gurich	Stem	Climber shrub
67	<i>Trichosanthes cucumerina</i> L.	Cucurbitaceae	Jangali Chichinda	Fruit	Climber herb
68	<i>Triticum aestivum</i> L.	Poaceae	Gehu	Seed, Leaves	Herb
69	<i>Vitex negundo</i> L.	Verbenaceae	Sambhalu	Leaves	Shrub
70	<i>Woodfordia fruticosa</i> (L.) Kurz	Lythraceae	Dhawai	Fruit	Shrub
71	<i>Ziziphus jujuba</i> Miller	Rhamnaceae	Ber	Fruit	Shrub

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