

# Diversity of ethnomedicinal plants in Churdhar Wildlife Sanctuary of district Sirmour of Himachal Pradesh, India

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## ABSTRACT

Himachal Pradesh has a great altitudinal range (300–7,000 masl), with varied species, habitats, communities, populations, and ecosystems. There are more than 3,400 different species of plants are reported to be found in Himachal Pradesh. In the state, excess of thousand plant species identified as aromatic and medicinal appear in temperate forests, Shiwalik hills, alpine and sub-alpine pastures. Majority of the inhabitants in Himachal Pradesh belong to different communities and cultures, with specific traditional knowledge. In the remote areas, especially high-altitude regions are contemporary medical amenities, and therefore tribal and rural society mainly depends on native medicinal plants. Herein, we compiled 41 medicinal plant species belonging to same or different families used by migratory shepherds in Churdhar Wildlife Sanctuary of district Sirmour in Himachal Pradesh. This survey will help the medicos, pharmaceutical industry for refining the public healthiness amenities, and maintenance of wild medicinal plant prosperity of the studied zone.

## INTRODUCTION

The western Himalaya is a rich collection house of innumerable natural assets, of which vegetation aspect is preeminent. Indian Himalayan region extending from in the North-West (Jammu and Kashmir) to the east (Arunachal Pradesh) cover around 4,19,873 km<sup>2</sup> area. Indian ethno-medicinal information is a cache, shows a substantial part in rural inhabitants life. Traditional ethnomedicines used by our descendants for their health care and pass orally from one generation to other generation. According to the World Health Organization report, tribal and rural people use

ethnomedicines in the treatment of several illnesses. In the year of 2008, worldwide market of ethnomedicines was assessed 83 billion \$ and 25% of new medicines are obtained from the plant species (Jayati *et al.*, 2016; Rana *et al.*, 2015; Rawat and Kharwal, 2011).

Himachal Pradesh has different atmospheric conditions due to changing altitude ranging from 500 to 7,000 m from north to south and from east to west. Wide differences in altitude, topography, and climate conditions make Himachal Pradesh a suitable habitat for different variety of flora and fauna (Chauhan, 1999; Sood *et al.*, 2001). In general, 200 aromatic plants and 600 medicinal plants are existing here (Sheldon, 1998). The ethnomedicinal plants are significant in natural wares to accomplish all the human needs, such as food, shelter, fiber, and medicine etc. The partnership of plants and human beings is ancient and the antiquity of usage of plants can be assessed through ethnobotanical studies (Samant *et al.*, 2007). There are several methods of ethnobotanical research and those relevant to medicinal plants are archeological search in literature, herbaria, and the field studies. Therefore, the present study was designed to gather information on medicinal use of plants from

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tribal migratory shepherds in Churdhar Wildlife Sanctuary before it was vanished. The present study concentrated on the migratory shepherds as their travelling routine means that they are diligently linked with nature and reliant on natural means for their living, including the treatment of various diseases.

## MATERIALS AND METHODS

### Study area

The Churdhar Wildlife Sanctuary is the important dwindling area of the Himalayan region is situated in the Trans-Giri hill ranges of Sirmour district, Himachal Pradesh (Fig. 1). The Churdhar Wildlife Sanctuary contains an estimated region of 66.70 km<sup>2</sup> with wide altitudinal arrays from 1,900 to 3,647m and lies in 77°23'32"–77°29'49"E and 30°48'37"–30°54'39" N (Anonymous, 2005–2006; Subramani, 2014).

### Survey and data collection

Based on the climatic conditions and altitude aspect, the Churdhar Wildlife Sanctuary harbor's a wide array of

enumerated with Botanical name, family, Hindi name, flowering and fruiting, parts used, habit, ailments/diseases treated, and ethnobotanical uses.

The elder migratory shepherds are far aware about the ethnomedicinal information on wild plant species practice than the younger generation. The voucher specimens thus composed, desiccated, and mounted on herbarium sheet, identified by using local Floras (Chowdhery and Wadhwa 1984; Kaur and Sharma, 2004). The species identified by comparing with the authentic specimens present in DD Herbarium of Forest Research Institute Dehradun (Uttarakhand) and Herbarium of Botanical Survey of India, Dehradun (Uttarakhand), vouchers samples for each species are also deposited in the Herbarium of Shoolini University, Solan.

## RESULTS AND DISCUSSION

In present study, total 41 medicinal plants reside to same or different families (Herb 24, Shrub 8, Trees 7, and Climbers 2) were reported in Churdhar Wildlife Sanctuary of district Sirmour in the Western Himalayas (Fig. 2, Table 1). These medicinal plants were commonly used by migratory shepherds in the Churdhar



Figure 1. Map of study are.

medicinal plants. Because of its rich medicinal prosperity, the area is remarkable and is relatively vital for thorough studies. The present study documents the use of ethnomedicinal plants by tribal migratory shepherds in Churdhar Wildlife Sanctuary. Regular exploration trips were made to Churdhar Wildlife Sanctuary to explore ethnomedicinal plant species used by shepherds for curing ailments. The shepherd's groups were randomly selected for the interview. The information on ethnomedicinal plants was poised by using a pretested questionnaire, participating remark, and through conversation method in 2017 to 2018. The ethnomedicinal uses of plant assets were well read with both the focused on learning how shepherds were gathering plant material. The plant species that are known are highly regarded in ethnomedicinal practices are

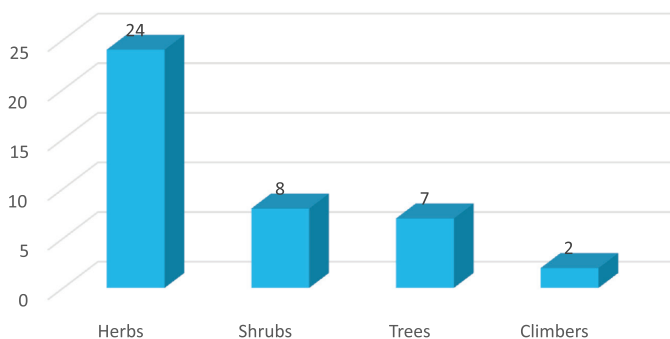


Figure 2. Ethnomedicinal plants used by shepherds in Churdhar Wildlife Sanctuary.

Table 1. Ethnomedicinal plants used by migratory shepherds in Churdhar Wildlife Sanctuary of district Sirmour, Himachal Pradesh.

Sr. No.	Botanical Name	Family	Hindi name	Flowering and fruiting	Parts used	Habit	Ailments/diseases treated	Mode of preparation and uses
1	<i>A. viridis</i> L.	Amaranthaceae	Jungali chaulayi	July–October	Leaves, Roots	Herb	Skin infections	Juice of leaves and roots are mixed with cold milk and applied on skin infections.
2	<i>A. millefolium</i> L.	Asteraceae	Bhulkesi	June–December	Whole part	Herb	High blood pressure, Body pain, Respiratory infection	Juice of whole plant is used to treat high blood pressure, body pain and respiratory infection.
3	<i>A. precatorius</i> L.	Fabaceae	Ratti, Gunchi	October–May	Leaves	Climber	Wound healing	The fresh juice of leaves is used for wound healing.
4	<i>A. mexicana</i> L.	Papaveraceae	Satyanashi, Bharband	Throughout the year	Whole part	Herb	Malaria	<i>A. mexicana</i> tea is used for malaria.
5	<i>A. vasica</i> Nees.	Acanthaceae	Arusa, Vasaka	December–June	Leaves	Herb	Cough, Asthma, Cold	Juice of leaves is mixed with hot water and used to treat cough, asthma and cold.
6	<i>B. lycium</i> Royle.	Berberidaceae	Karmashal	March–July	Fruits, Roots	Shrub	Nutritious for health, Cough, Cold, Fever	Fruits are edible and highly nutritious for health. Roots decoction is given in cough, cold and fever.
7	<i>B. utilis</i> D. Don.	Betulaceae	Bhojpatra	May–October	Seeds	Tree	Bone fracture	Seeds mixed with fresh juice of <i>Cynodon dactylon</i> and paste prepared and used on fractured part then covered with the bark of <i>B. utilis</i> .
8	<i>Bathinia variegata</i> (L.) Benth.	Fabaceae	Kachmar	April–November	Leaves, Bark	Tree	Joint pain	Juice of dried leaves and Bark are mixed with milk and used for joint pain.
9	<i>Chenopodium album</i> L.	Chenopodiaceae	Bathua	June–September	Seed, Roots, Stem	Herb	Urinary infections, Dysentery, Sun burn	Juice of seeds, roots and stem are mixed with hot water and used to treat urinary infections, dysentery and sun burn.
10	<i>Commelina benghalensis</i> L.	Commelinaceae	Kana, Kankawa	Throughout the year.	Leaves, Roots, Flowers	Herb	Diarrhea, Stomach disorder, Eye problems	Juice of leaves, roots and flowers are drunk to treat diarrhea, stomach disorder and eye problems.
11	<i>Cannabis sativa</i> L.	Cannabaceae	Bhang	June–September	Leaves	Herb	Abdominal pain	Leaves of <i>Cannabis sativa</i> burn over flame and smoke is used to treat abdominal pain.
12	<i>Dioscorea deltaidea</i> Wall. ex Griseb.	Dioscoreaceae	Singli mingli	July–October	Tubers, Leaves	Climber	Skin allergy, Constipation, Wound healing, Burns	The juice of tubers and leaves are used to cure skin allergy, constipation, wound healing and burns.
13	<i>E. adenophora</i> (Spreng.) King & H. Rob.	Asteraceae	Pamakani	March–April	Leaves	Shrub	Skin cuts	The fresh juice of leaves is mixed with milk and applied on skin cuts.
14	<i>F. religiosa</i> L.	Moraceae	Peepal	November–February	Leaves, Bark	Tree	Wounds, Skin allergy	Powder of dried bark and leaves is mixed with water and applied on wounds and skin cuts.
15	<i>Hedychium spicatum</i> Sm.	Zingiberaceae	Kapurkachri	July–October	Rhizomes	Herb	Cough, Asthma, Headache, Skin infections, Purify Blood	The powder of rhizomes is mixed with hot water and used to treat cough, asthma, headache, skin infections and purify blood.
16	<i>Hypericum perforatum</i> L.	Hypericaceae	Basant, Balsana	May–September	Leaves, Roots	Herb	Skin allergy	The fresh juice of leaves and roots are mixed with milk and applied on skin allergy.
17	<i>Hypericum oblongifolium</i> Choisy.	Hypericaceae	Basant	May–September	Roots	Herb	Skin allergy	The fresh juice of roots mixed with cold water and applied on skin allergy.
18	<i>J. regia</i> L.	Juglandaceae	Akhrot	April–October	Bark, Leaves, Fruits	Tree	Toothache, Diarrhea	Bark, leaves and fruits are mixed with milk and used to treat toothache and diarrhoea.
19	<i>Lycycaena formosa</i> Wall.	Caprifoliaceae	Piralu	June–November	Roots	Shrub	Skin infections	The fresh juice of roots is used to treat skin infection.
20	<i>Lyonia ovalifolia</i> (Wall.) Drude.	Ericaceae	Ayar, Airan Alhan	April–September	Leaves, Buds	Herb	Throat infections, Insecticides	Tea of young leaves and buds are mixed with milk and used to treat throat infections and insecticides.
21	<i>P. cerasoides</i> D. Don	Rosaceae	Pajja	December–March	Fruits	Tree	Nutritious for health	Fruits are edible and highly nutritious for health.

(Continued)

Table 1. (Continued)

Sr. No.	Botanical Name	Family	Hindi name	Flowering and fruiting	Parts used	Habit	Ailments/diseases treated	Mode of preparation and uses
22	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulsi	June–September	Flowers, Seeds, Leaves	Herb	Fever, Cough, Cold	Juice of dried flowers, seeds and leaves are mixed with hot water and used in the treatment of fever, cough and cold.
23	<i>P. crenulata</i> (D. Don.) M. Roem.	Rosaceae	Bedu, Chhotia seb	March–June	Leaves, Fruits, Stem	Shrub	Tonic, Fever	Leaves, fruits and stem are used as a tonic and fever.
24	<i>Pinus roxburghii</i> Sarg.	Pinaceae	Chir	March–May	Leaves	Tree	Joint pains	Juice of leaves is used to treat joint pains.
25	<i>Phytolacca actinosa</i> Roxb.	Phytolaccaceae	Jharka, Jalga	June–September	Leaves, Twigs	Herb	Nutritious for health	Tender leaves and twigs are cooked as vegetable and nutritious for health.
26	<i>R. arborescens</i> Sm.	Ericaceae	Burans	March–September	Flowers	Tree	Cough, Cold, Fever	Juice of dried flowers is used to treat cough, cold and fever.
27	<i>Rubus ellipticus</i> Sm.	Rosaceae	Anehhu, Hinsalu, Aakhe	Feb–April	Fruits	Shrub	Fever, Cough	Fresh juice of fruits is used to treat fever and cough.
28	<i>R. hastatus</i> D. Don.	Polygonaceae	Churki, Churka	June–August	Roots, Shoots	Herb	Indigestion	Fresh juice of shoots and roots are used to treat indigestion.
29	<i>Rhus parviflora</i> Roxb.	Anacardiaceae	Samakdana, Samakdan	July–August	Bark	Shrub	Headache	The paste prepared from the dried bark is mixed with hot water and used to treat headache.
30	<i>Solanum surratense</i> Burm.f.	Solanaceae	Kantkari	April–August	Fruits	Herb	Stone in Bladder	Juice of fruits is used to treat stone in bladder.
31	<i>Solanum nigrum</i> L.	Solanaceae	Mokoi, Dhakh	April–July	Leaves, Roots	Herb	Foot infection	Decoction of fresh leaves and roots are applied on skin to treat foot infection.
32	<i>Solanum surratense</i> Burm.f.	Solanaceae	Kantkari	April–August	Fruits	Herb	Stone in Bladder	Juice of fruits is used to treat stone in bladder.
33	<i>Selinum vaginatum</i> C.B. Clarke.	Apiaceae	Bhutkeshi, Mathosia	July–September	Leaves	Herb	Skin allergy	Decoction of leaves is used to treat skin allergy.
34	<i>T. serpyllum</i> L.	Lamiaceae	Banjwain	April–September	Leaves, Seeds	Shrub	Stomach problems, Fever, Cough, Cold	Leaves and seeds are considered a popular remedy for stomach problems, fever, cough and cold.
35	<i>T. govaniatum</i> (D. Don.) Kunth.	Trilliaceae	Nagehatri	May–June	Leaves, Roots	Herb	Fever, Headache	Juice of leaves and roots are mixed with milk and used to treat fever and headache.
36	<i>U. dioica</i> L.	Urticaceae	Bichhu Booti	June–October	Leaves, Roots, Shoots	Herb	Wound, Nutritious for health	Juice of leaves and roots are applied on skin to treat wounds. The tender leaves and shoots are cooked as vegetable.
37	<i>Urtica parviflora</i> Roxb.	Urticaceae	Kandali	June–October	Leaves, Shoots	Herb	Sprain of foot	Juice of fresh leaves and shoots applied on sprain of foot.
38	<i>Vitex negundo</i> L.	Verbenaceae	Nirgandi	March–September	Leaves	Herb	Joint pains	Fresh juice of leaves is applied on joint pains.
39	<i>V. jatamansi</i> Jones	Caprifoliaceae	Muskhala	March–April	Leaves, Roots	Herb	Headache, Wounds	Juice of dried leaves and roots mashed in water is applied on forehead to relieve the pain. The juice of dried roots is applied on wounds for healing.
40	<i>Verbascum thapsus</i> L.	Scrophulariaceae	Tamaku	June–August	Roots	Herb	Vomiting	Fresh juice of roots is taken orally to treat vomiting.
41	<i>Zanthoxylum armatum</i> DC.	Rutaceae	Tirmir	April–June	Bark, Seeds, Fruits	Shrub	Fever, Tooth pain	Fresh juice of bark, fruits and seeds are mixed with hot water and used to treat Fever and Tooth pain.



Sanctuary. The maximum plant species were used for urinary infections, dysentery, sunburn, cough, cold, skin disease, diarrhea, joint pain, stomach infection, for wound healing, etc. Some plants species in extension to their medicinal prominence have religious and cultural significance, such as *Betula utilis*, *Ficus religiosa*, and *Cannabis sativa*. Migratory shepherds passage in between the bends of Himalayan elevations ranges from high hills of more than 4,000 msl to low hills or plains of 350 msl. Some ethnomedicinal plants used by tribal peoples are earlier reported by many researchers from different parts of Himachal Pradesh named as *Amaranthus viridis*, *Achillea millefolium*, *Abrus precatorius*, *Argemone mexicana*, *Adhatoda vasica*, *Berberis lycium*, *B. utilis*, *Dioscorea deltoidea*, *Eupatorium adenophora*, *Juglans regia*, *Prunus cerasoides*, *Pyracantha crenulata*, *Rhododendron arboretum*, *Rumex hastatus*, *Thymus serpyllum*, *Trillium govanianum*, *Urtica dioica*, *Valeriana jatamansi*, etc. (Chauhan, 1999; Radha, 2018; Radha *et al.*, 2018). The seasonal movement of shepherds is precise significant for the existence of the livestock in the tough environmental circumstances, including high temperature in the summertime at low elevations and analyzed and cold temperature in winter season at high hills. The seasonal movement of shepherds makes propensity on the natural resources including the innate medicinal plant species for a healthcare structure. The migratory shepherds also hoard and gather some medicinal plant parts in their homes and offsite passage camp site for imminent uses.

In present study shepherds interestingly, informed that their preference for ethnomedicinal plants are *A. mexicana*, *A. vasica*, *B. utilis*, *D. deltoidea*, *R. hastatus*, *B. lycium*, *J. regia*, *V. jatamansi*, *T. serpyllum*, *T. govanianum*, and *U. dioica*. The plant species such as *T. govanianum*, *V. jatamansi*, and *T. serpyllum*. are become rare and very difficult to get from our surroundings that due to over exploitation of medicinal plants from studied areas.

Hence, there is an immediate requisite to preserve ethnomedicinal knowledge through documented literature and proper communication with younger generation. Because the medicinal plants of Himalayan region have been reducing due to absence of proper documentation and knowledge in present generation. Therefore, scientific attention on pharmacology and chemistry is required on traditional used wild medicinal plants before its extinction from human civilization.

## CONCLUSION

Himachal Pradesh is a source of medicinal plants and ethnomedicinal information associated with these plants. Application of plant assets has age-old practice of the shepherds residing hilly state of Himachal Pradesh. In present study, it is concluded that medicinal plants play significant role to treat several diseases of shepherds named as high blood pressure, body pain, respiratory infection, skin infections, malaria, cough, cold, asthma, cuts, wound healing, urinary infections, dysentery, sunburn, joint pain, etc. The present study advises to familiarize some management procedures to be taken jointly with the tribal shepherd's societies in order to preserve medicinal plant resources from becoming vanished. In addition to the above-mentioned

species, the migratory shepherds also use many other plants. These plant species form an integral form of their way of life, and hence always been valued.

Finally, the present study also endorses scientific rationality and toxicity tests of the described medicinal plants used for the treatment of various different human diseases. The information gathered from the study concerning the medicinal plant species used by the shepherds requires a through phytochemical analysis, including alkaloid separation and is promotion along with some clinical trials. This could help in making mass alertness concerning their preservation, promotion of ethno-medicinal-botany information with in the area also paying to the conservation and improvement of the gene bank of such economically important plant species before they are last permanently.

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## CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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