Original Research Article

ASSESSING THE USE AND DIVERSITY OF THE COMMON ETHNOMEDICINAL FLORA OF PANGI-A COLD DESERT REGION OF NORTH-WEST HIMALAYAS

Abstract: Pangi -a dry temperate region of north-west Himalayas, is known ordnance of aromatic & medicinal plants and conventional knowledge coupled with these plants. Rich traditions and philosophy are deeply imbued in the cultural ethos of the natives while the modernity still eludes them, signalling a good scope for ethnobotanical studies. The inhabitants of the Pangi valley use various plant parts for curing different diseases like cough & cold, fever, burns, joint pains and stomach troubles besides using them for making household articles and in religious rites. The present study deals with twenty major medicinal plants used by the natives of the Pangi valley to cure a variety of ailments as the orthodox health care system practised by the local healers (Vaidyas). On extensive review of relevant research literature it was revealed that the use of these plants was never recorded before and hence the present investigation qualifies as a pioneering endeavour. The traditional herbal medicine is still the most prevalent system in the area while the modern health care systems are slowly creeping in.

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Key words: Medicinal Plants; Aromatic plants; Pangi valley; Himachal Pradesh.

Introduction

The present investigation was carried out in Pangi valley of Himachal Pradesh. The Pangi valley is a remote tribal, semi-arid region in North Western Himalayas. It lies between 32° 33' N to 33° 19' N latitudes and 76° 15' E to 77° 21' E longitudes and is bounded by

Ladakh area of Jammu & Kashmir in the north and north-east, Lahaul &Spiti district in the east and Chamba district in the south[1].The geographical area of Pangi valley is 1, 52,371.04 hectare and its administrative headquarters are at Killar. The Pangi valley is surrounded by high mountains, however, there are five passes by which this region is connected to the outside world. The Pangi valley is remarkable in its rugged grandeur and austere beauty. The Chandrabhaga or Chenab River which flows into the valley originating from Lahaul-Spiti, and running through entire length of the valley. The Pangwals, the Lahaula and the Bhot or Bodh are the inhabitants of this valley. A majority of the tribal population is that of Pangwals. The Pangwal literally means an inhabitant of Pangi. The least anthropogenic disturbances due to its unique location provide opportunity to conserve and maintain flora of the region [2]. Efforts are being made in recent years for social upliftment of the people in this region and thus many development plans have been initiated to bring this area into the mainstream.

Medicinal & aromatic plants play a significant role not only in upliftment of the financial system of the tribal communities but it is also the only resource for their health care material. This area is difficult to explore due to harsh geography coupled with poor road connectivity. As a result, the peoples of Pangi are dependent on the natural plant resource. Due to the remoteness and difficult topographic conditions of Pangi valley, very few floristic surveys have been made [3].So, very few researchers have visited the area for morphological studies [4]and for some cytotaxonomical studies of some angiospermic plants [5,6]. Keeping in view the importance of ethno-medicinal information about local flora, the present study give special stress on the ethnomedico-botany of Pangi with the specific objectives:

(i) To understand the ITK of the local tribal communities about the medicinal plants

(ii) To examine the sustainability of the eco-system

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Materials and Methods

Personal interviews and floristic survey were made to obtain the ethno-medicinal knowledge from inhabitant of the Pangi valley. The field surveys were carried out in the different regions as Dharwas, Karyas, Kothi, Killar, Sach and Shooni, ranging in altitude from 2,500 meter to 4,000 meter above mean sea level. The data pertains to the year 2012-2020 (Fig.1). Generally, elderly and knowledgably persons (locally called vaids) were interviewed. Frequently, vaids were going together with to the field for the collection, identification and authentication of plant species collected from their wild habitats. Along with this, the common people who themselves had used these plants for health issues and other house hold purposes were interviewed to establish reliability of such plant species.

In all, 250 persons were interviewed from these localities. Out of these, 80% inhabitants were used ethno- medicinal plants and majority of them were aged less than 55 yrs. In each locality, the number of peoples interviewed was 43 to 50. All collected information, such as plant part used, method of preparation, and way of use of each plant species was documented in detail. The collected plant specimens were identified with the help of available literature[7].

Results

Respondents

A total of 200 persons consisting of 130 males and 70 females from 10 different villages were involved in the present study. One hundred forty five respondents (72.50%) use medicinal plants and prepare the formulations only when required for own use, 15 respondents (7.50%) not only use these medicinal preparations for themselves but also prepare for others on demand as and when needed, 4 folks (2.00%) are regular practitioners and treated patients as

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full time professionals, while the remaining 36 respondents (18.00%) reported no knowledge about any medicinal uses of the plants.

Plant Parts used

Different plant parts both underground and above ground such as leaves, bark, flowers, fruits, seeds, roots and whole plant are used to treat different ailments. Use of underground plant parts has been noted for 4 (21.06%) species, above ground plant parts for 12 (63.15%) species, and whole plant for 3 (15.79%) species. Of the above ground parts, leaves are used in the majority of cases with 7 (31.85%) species followed by whole plants and fruits 2 each (10.52%) species) (Fig. 2).

Taxonomic diversity

During the survey, a total of 20 different species of medicinal plants belong to eleven families were reported and has been used for treating fourteen different diseases or ailments of both human and animal (Table 1; Fig. 3). Of these medicinal plants, the family Rosaceae with 9 species was ranked first in use followed by Ranuculaceae with 2 species, while one species each of Cannabaceae,Convolvulaceae, Clusiaceae, Fabaceae, Pinaceae, Podophyllaceae,Polygonaceae, Vitaceae and Violaceae are being utilized in the area.

Importance of ailments indicated

Fourteen different ailments have been recorded in the present investigation. Out of these, the only 10 most common and important ailments in the area were evaluated based on the number of citations made by the respondents during survey to different villages. Figure 3 shows the relative importance of the specific ailment recorded as fever, cold and cough (21.42%); acne, cuts, burns and joint pain (14.28%); headache, abdominal pain, animal's cough and fever, bone fracture, diabetes, animal foot disease, menstruation cycle irregularities and stomach pain (7.14%).

Mode of preparation

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The usage of these medicinal plants is varying from nature of ailments or disease. Local people employ a variety of formulations such as crushing, decoction and extraction methods to prepare remedies for treating different ailments. In many cases, a decoction of plants parts has been used for treating single disease or many diseases concurrently. Commonly, decoctions have been made by boiling the plant parts in water and decanting of the liquid then drinking after cooling. The ground plant parts are usually applied as paste on affected areas. The dose given to the patient depends on age, physical status and health conditions of the patient.

Discussion

The present study revealed the valuable information on the entho-medicinal uses and local preparations of the plants used by the peoples of the Pangi valley. The ethno-medicinal knowledge could be useful for the botanists, industries, pharmacologists, and alike interested in the development of alternative therapies [8,9]. According to, World Health Organization (WHO), over three forth of the World population cannot afford the products of the modern medicine and have to rely on one or the other traditional medicine of plant origin [10].Traditional medicine has a long history and wide acceptability in most of the tribal communities' worldwide and the inhabitants of this region are no exception.

The present analysis also reveals that leaves as the most collected plant parts for medicinal purposes and herbs as the most frequently utilized growth form followed by tree and shrub species. Collection of leaves for medicinal preparations could be regarded as sustainable harnessing of the medicinal plants as some leaves is left over on the parent plant.

Conclusions

In the study, it has also been observed that in most of the cases the remedies were prepared from a single plant species. Moreover, there has not been any report of cultivation of medicinal plants by the local people hence all the preparations are made by collecting the

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plants from wilderness. This is a serious concern from the point of conservation and sustainability of the resources because such collection from the wild may lead to depletion of the population or even extinction of the resources particularly the roots of rare and endangered species. Many of the important medicinal species are facing the danger of extinction in the area e.g., *Actaea acuminate, berbarisarsista*, *valerianajatamansi*and *Podophyllum hexandrum* are extremely endangered species because of its high medicinal value [11,12]. Similarly the number of individuals of *Vicia bakeri* is decreasing at an alarming rate. Thus, there is need to protect plants and indigenous knowledge for conservation and to ensure sustainable management. There is also an urgent need for more documentation, identification and prioritization of important medicinal plants, development of database and proper harvesting techniques, evolving cultivation techniques for potential species.

Consent for publication: Yes, approval of all authors

Ethics approval: Not applicable

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Table: 1 List of medicinal plants with their part used, type of ailment treated, Mode of Preparation and Previously reported Ethno-Medicinal uses in literature from Pangi valley of District Chamba.

Sr. No	Plant name / Family/local name	Part used	Type of ailments treated	Mode of Preparation	Previously reported Ethno-Medicinal uses in literature
1.	*Actaea acuminata* Royle/Ranunculaceae/	Flowers	Acne	Made paste with curd of flowers applies on face at night time to cure acne.	Reddish-green dye [13]; Cough [14]; Sciatica [15].
2.	*Agrimonia pilosa*Ledeb. / Rosaceae/ Bharkhro	Roots and Leaves	Headache and abdominal pain	Made paste of roots with mustard oil applies on Head once a day to relief headache. Decoction of leaves taken early in morning to cure abdominal .	Yellow dye [13]; Antiviral [1]; Haemostatic, Tonic for asthenia, Astringent in diarrhoea and diuretic agents [17].
3.	*Cannabis sativa* L./ Cannabaceae/ Bhang	Leaves	Fever	Prepare decoction of leaves taken once a day to treat fever and also used as in toxicant.	Control bleeding [18]; Leprosy, Cough, Bronchitis [19]; Indigestion, Rheumatic pain [20, 21].
4.	*Cotoneaster microphyll us*Lindl./ Rosaceae/ Bhedda	Fruits	Menstruation cycle	The fruits are used to regulate the menstruation cycle.	Astringent [22].
2	*Cuscutareflexa*Roxb./ Convolvulaceae/ Akash Bel	Whole Plant	Joint Pain	Whole of plant boil in water then wash out affected area at night. repeat this process at a week regularly.	Menstruation disorder [23]; Eye disease and Itching [24]; Skin diseases, Eye diseases, Bodyache, Cuts and Wounds Diphtheria, Headache, Itching oedema, Anthelmintic, Carminative, Cough, Fever, Indigestion, Liver complaint and Jaundice, Nervine weakness [25].
6.	*Duchesnea indica* (Andrews) Focke/ Rosaceae/ Ratenjot	Roots	Cuts	Powdered form of dried roots mixed with mustard oil and applies on cuts.	Cuts, Eye disease, Swelling, Ulcer on tongue [26]; Diarrhoea and Leucorrhoea, Swelling [25].
7.	*Filipendulavestita* (Wall. ex G.Don) Maxim./Rosaceae/ Jot	Leaves	Cold and cough	Powdered form dried leaves taken with warm water at once a day.	Wound healing [27]; worm infested wound, stomach disorder [28].

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8.	*Fragaria nubicola*Lindl./ Rosaceae/Safad Ratanjot	Roots	Burns	Paste of fresh roots relives the pain of burns.	External parasites[28]; Fever[29].
9.	*Hypericum oblongifolium*Hook./Clusiaceae/	Leaves	Animal's cough and fever	Decoction of leaves given once a day to cure cough and fever of Animals.	Wounds, Boils [26].
10.	*Parthenocissus semicordata* Planch./ Vitaceae/Jangli Angur	Leaves	Acne	Paste of fresh leaves of face once a day to cure acne.	Bone fracture[30]; Leucorrhoea and Piles[29].
11.	*Pinus roxburghii*Sarg./ Pinaceae/Chir	Bark	Bone fracture	Warm the bark with linseed oil then tightly bound on fracture bone at night time.	Boils, Bone fracture, Cracks in sole of feet, Leprosy, other skin disease, Snake bite, Sprain, Swelling, Ulcers, Urine complaints[26]; Bone fracture [29] .
12.	*Podophyllum hexandrum*Royle/ Podophyllaceae/ Bancakrdhi	Roots	Diabetes	Dried form of roots taken with water at night time daily for 2 months to cure diabetes.	Purgative, Laxative, Cholagogue, Polyps, Emetic[30]; Diabetes, joint pain, jaundice and heart problems[31].
13.	*Polygonum amplexicaule* D.Don/ Polygonaceae/	Leaves	Joint pain	Paste of fresh leaves cocked with mustard oil then applies on affected area over night.	Cough, Dysentery, Haemostat, Tonic [26]; Eye disease[27].
14.	*Potentilla nepalensis*Hook./Rosaceae/ Lal jot	Leaves	Fever	Powder form of levees taken with water to cure fever.	Burns [32].
15.	*Prinsepia utilis* Royle/ Rosaceae/ Bhankel	Seeds	Burns and cuts	Powered forms of seeds mixed with linseed oil and apply on burns and cuts	Burns, Cuts, Rheumatism, Wounds[26].
16.	*Prunus cerasoides*D. Don/ Rosaceae/Phalsa	Leaves	Cough and Cold	Prepared decoction of young leaves and taken once a day to treat cough and cold.	Joint pains[29].
17.	*Ranunculusdiffusus*DC. / Ranunculaceae/	Whole plant	Animal foot disease	Paste of young leaves mixed with mustard oil and applies on it.	Boils [26] .

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18.	*Rubus niveus* Wall./ Rosaceae/ Kala akhae	Fruits	Stomach pain	2-4 fresh fruit taken once a day to cure stomach pain	Menstrual cycle[29]; Cough, Cold, Diarrhea [26] .
19.	*Vicia bakeri* Ali/ Fabaceae/ Muturu	Whole plant	Cold and Cough	Decoction of whole plant taken once a day to cure cold and sneezing. Also used as fodder.	----
20.	*Viola betonicifolia*Sm./ Violaceae/ Banaksha	Leaves	Fever	Decoction of young leaves and flowers taken at once a day to cure fever.	Fever, Cough, Diaphoretic, Skin diseases, Blood diseases [25] .

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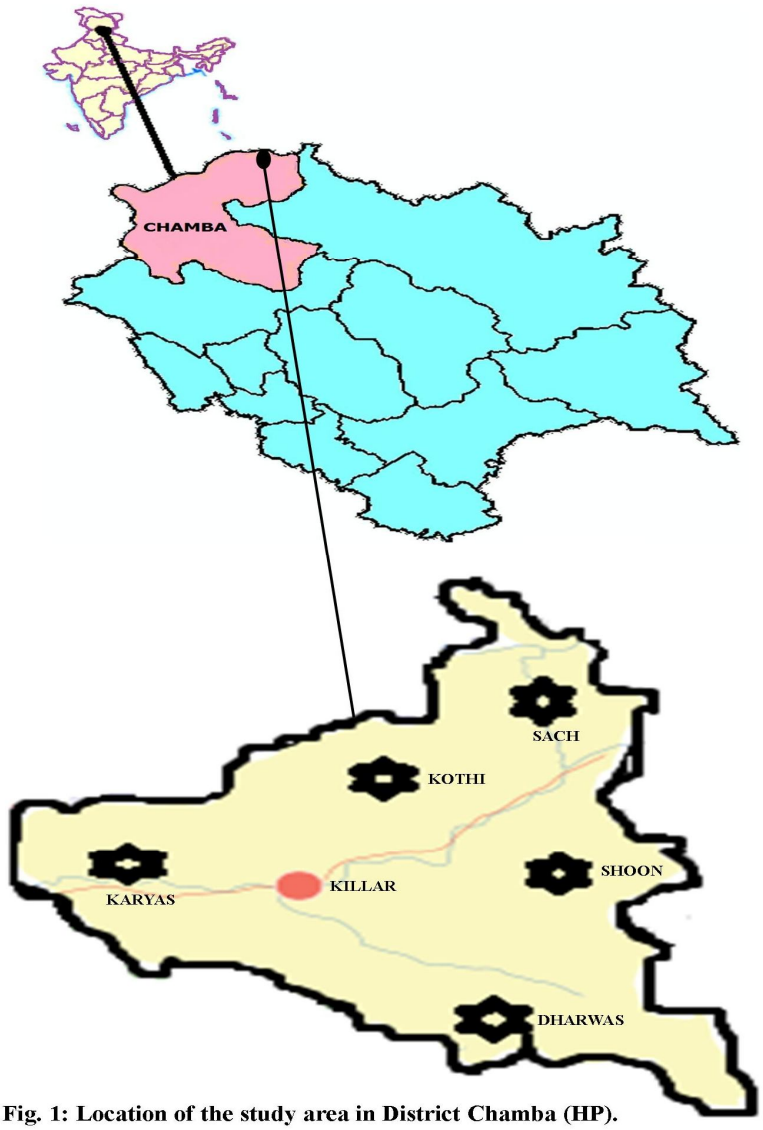

Fig. 1: Location of the study area in District Chamba (HP).

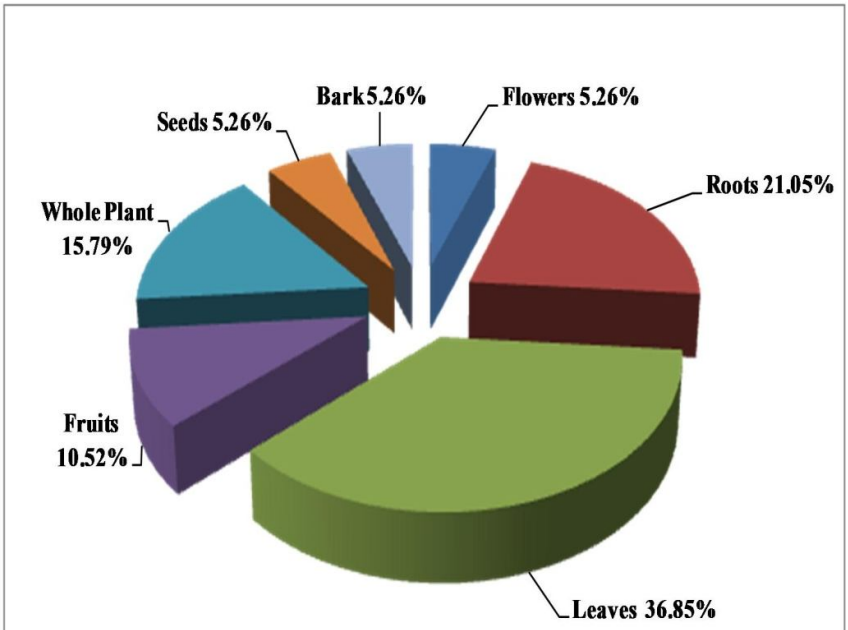

Fig. 2: Plant parts used for medicinal purposes across

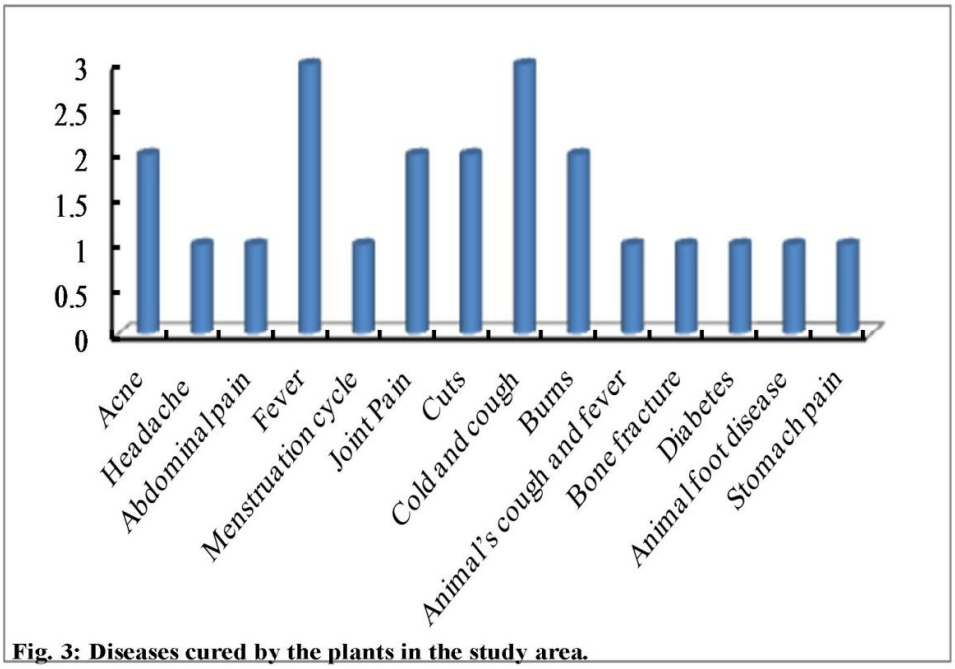

Fig. 3: Diseases cured by the plants in the study area.

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