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Assessment of ethnomedicinal plant diversity of Una and Hamirpur district of Himachal Pradesh, India: An ethno-ecological approach

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Abstract: The present study was conducted to explore ethnobotanical diversity and importance of local plants harnessing for medicinal purposes by the local people of Una and Hamirpur district, Himachal Pradesh, India. We recorded in total 159 plant species of 138 genera belonging to 68 families to cure more than 33 different types of ailments. Across family-wise distribution, most important useful plants were recorded from ten families: Asteraceae, Euphorbiaceae, Fabaceae, Acanthaceae, Ceaselpiniaceae, Moraceae, Solanaceae followed by Annonaceae, Convolvulaceae and Liliaceae. These families accounted 43.7% of the total plants and exhibited most acclimatized within local environmental conditions. However, of the total recorded plants revealed as herbs contributed the major proportion (50 %) followed by trees (29%), shrubs (11%), climber (9%), creeper and khumb (<1% each). It was observed that most utilized plant parts were leaves recorded from 55 plant species to cure different ailments followed by other components viz: whole plant (43), bark and seed (34 species each), root and fruits (32 each), flower (18) and other remaining were stem shoot, bulb, rhizome and tubers, respectively. In general, people living to the adjoining areas of the forests have direct influence to utilize those local plants for different ailments; therefore, they have good practices and vast knowledge of traditional uses. Hence, aim of the present study was to collect information about ethno-medicinal plants which were not clearly documented earlier in the literature as well as to investigate the plant-human interactions to understand the socio-ecological relationships.

Key words: Ethno-botany; Ethno-ecological importance; local peoples; Medicinal uses; medicinal plants

Introduction

Since the beginning of civilization, people have used plants as food, medicine, fiber, cosmetics, fuel, poison and construction materials etc. (Pal *et al.,* 2014). Out of the total flowering plants reported from the world, more than 50,000 plants are used to treat the different diseases (Teklehaymanot and Giday, 2007). Major population reside in the remote area or villages where modern facilities are poorly developed, therefore, local people from adjoining araes of forests or mountains are mainly depend upon plants to combat their day to day needs (Manandhar 1995), and most of the indigenous people include tribal communities depend on medicinal flora for curing their various diseases (Patel, 2016).

According to World Health Organization more than 80% of world's population or 4.3 billion people of developing countries mainly rely upon the plant based medicines for curing different diseases (Gopal *et al.,* 2014). From the medicinal point of view, the ancient Indian plants occupied a place of pre-eminence because the full 9th Mandala of the Rig Veda—earliest literature of Hindus culture praised the medicinal value of plants and gave the references of 99 medicinal plants (Aushadhi Sutra). The Atharva Veda, Yajur Veda has reference of 288 and 82 plants respectively. The Brahmins and kalpa Sutra deal with about 129 and 519 plants respectively (Kamal, 1998). Almost all of them have medicinal ingredients which cure incurable diseases. So, Vedic Indians were more civilized, who evolved working knowledge of the things that formed their environment and how plants had established relationships with local environmental conditions; therefore, in order to utilize them to the best of their advantages for several means particularly food and medicines, many important plant species have been described in the famous compilations (Charak and Sushrut Samhita).

Since, Himachal Pradesh is a mountaneous region and characterized by rich wealth of plants including ethno-medicinal flora as well as rich heritage of wild edible plants. The traditions, myths, legends and folklore of ancient are carefully preserved in lore and more, temple and historical places in existence at various region of the state. Moreover, for the sake of gods/goddesses, most of the areas occupied with precious forests were preserved and today is known as sacred forests. Due to these practices in the Himachal Pradesh, forest cover is substantially better than other states of India.

Literature survey indicates that massive information is available pertaining to exploration of ethno-medicinal plant diversity from various parts of India; however, it is conspicously lacking from the parts where most of tribal and indigenous communities are living in the Himachal Pradesh like Una and Hamirpur districts. Generally, people living in this region mainly rely on getting remedies for their health-care and also for some set of food materials from wild plants. Few similar studies have been reported from the other parts of the same state, for examples, Bohtapa and Sharma (2010) have listed 33 medicinal plant species from Manali district, 43 species from north Western part of Himalaya (Samant *et al.,* 2007), 21 ethno-medicinal plants by Rawat and Kharwal (2013) from Kangra, Himachal Pradesh. Similarly, some more study from other areas of the same states like Sharma *et al.,* (2009) who documented 24 ethnomedicial plants of 14 families from Shimla and Rani *et al.,* (2013) 50 plant species from Chamba district. Today, ethno-ecological investigation and exploration of ethno-medicinal plants from other parts of India is receving good attention as ethnobotany includes in thrust areas of research in plant sciences. Therefore, literature available from other parts of the country, for example, Gitika and Kumar (2016) reported 66 plant species used to cure various different diseases by the local people of Haryana, Gupta *et al.,* (2010) recorded traditional medicinal uses of 53 plant species used by Gond tribes of Bhandara district of Maharastra; Sharma and Sharma 2010, collected medicinal information of 40 plants from Sonapur area of Kamrup district, Assam and Barbhuiya *et al.,* (2009) explored 150 plant species of Barak Valley in Northeast India out of which 24 plants of medicinal purpose were found.

Ethnic people who are living towards hilly and mountainous region have rich and vast knowledge of medicinal plants but

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this verbal information is seems to be risk of lost shortly due to lack of proper scientific documentation. Ethno-botanical study has been conducted by various workers from different regions of Himachal Pradesh from last two decades but no detailed study of the same has been undertaken from this study area. However, ethno-botanical study is over growing but traditional knowledge of many plants has not been recorded properly (Mekbib and Deressa, 2016). Hence, there is need to document the ethno-botanical and socio-ecological linkages before the traditional knowledge going to completely lost. There are several reasons why local and tribal peoples do not like to keep and protect own traditional knowledge today. Perhaps, one noticeable reason is the adoptation of modern life style and leaving traditional life style by most of them.

Therefore, in this study, main objective was to explore diversity and distribution of ethno-medicinal plants applied for traditional medicines which were used to cure the different ailments by the local and tribal people and find out linkages of local people with the plants for maintaining socio-ecological relationships. In this paper, we however discussed plant information, vernacualr names, uses, mode of applications, parts used, lifeform, taxon distribution and which plants are used for which ailments were synthesized.

Materials and Methods

Study Sites: The study area lies at Shivalik hills or outer Himalays in the Una and Hamirpur districts of Himachal Pradesh which lie to lower Himalayas; the elevation varies from 400 to 1100 meters. District Una is bounded by Kangra, Hamirpur and Bilaspur districts of Himachal Pradesh. The north, east and south part is bounded by Hoshairpur district of Punjab in the west. It lies within North Latitude 31^{0}17'52" - 31^{0}52'0" N and 75^{0}58'2" - 76^{0}28'25" E and study area Hamirpur district lies between 76^0-17'50" to 760-43'-42" eastern longitudes and 31^0-24'-48" to 31^0-53'-35" northern latitudes. It is bounded in the north by river Beas separates from Kangra district and in the east, Bakar and Seer Khads separate from Mandi district, whereas in the south, it is bounded by Bilaspur district and in the west by Una district. The climate is mainly sub-tropical and is not much hilly being closer to the plains. Annual average rainfall is about, 1520 mm where maximum rain fall occurs in the month of July to September and minimum in the months of April to June. In this region, demographic structures are mixed tribal communities along with other different castes such as Brahmins, Rajputs, Kolis, Khatti, and Dumanas etc. However, tribal population in this region is mainly Gujjar and Gaddis at the interior parts migrated from Chamba and Lahul Spiti.

Methodology: Field study was conducted at selected sites of Una and Hamirpur district (sub-divisional area of the district known as tehsil), Himachal Pradesh during the period of 2013 to 2015. In this study, we selected one Tehsil from each district named as: Nadaun from Hamirpur and Bangana from Una; in the selected tehsils, 15 villages from each tehsil were selected for intensive study. Ten households were taken from each village as informants for enquiring and collecting information. Selection of informants at each village was made by following criteria: 1) each household should have knowledge about plants, 2) household must have awareness about use and application of local plants for medicinal purposes, 3) household must have used to local climate and environment 4) household must be resident of the selected area. Therefore, in total, 300 informants (150 informants per tehsil) were interviewed across sites. Field survey and sampling was carried out to collect information regarding status, utilization of plants for the medicinal purposes with involvement of local informants from each selected number of villages. Therefore, collected information was monitored at each selected village to take proper interaction and interview in respect to proper utilization of plants for ethno-medicinal purposes.

In order to get satisfactory survey, a questionnaire was prepared pertaining to several required aspects and it was circulated among the informants. The information was collected in the native dialect (Pahari- close to Hindi), and recorded on the native names of the plants and their various uses for which plants are employed or used by the local people. The plant and its utility were assessed on the basis of consensus and confirmation by agreement of number of informants when data were pooled and subjected for further calculation. Data were subjected to statistical analyses in SPSS 14.0 version for data computation and analyses.

Each collected plant species was serially indexed, identified and herbarium was prepared. Each plant specimen was also visually documented with digital camera (Nikon P-500 model) for future prospect and proper records. Collected plant specimens were commonly available and known by the local people were identified in the field; while unidentified plants were identified at the herbarium center of Department of Botany, Panjab University Chandigarh (one of key herbarium Centre in country), India for proper identification. In addition, relevent litrature pertaining to ethnobotanical plants were consulted from authentic literature (Rani *et al.,* 2013a & 2013b, Kumar and Choyal, 2012 and Mukesh *et al.,* 2016). To identify correct name(s) and find out its exact authority name(s) we consulted Flora of Himachal Pradesh Vols.1, 2 & 3, Botanical Survey of India (BSI) Kolkata, India compiled by Chowdhary and Wadhawa (1984).

Results and Discussion

The collected ethno-medicinal plants are listed with their scientific names, local names, family names, part used and their specific life-form in table 1. The families and the species within a family are arranged in alphabetical order. Therefore, in total 159 plant species of 138 genera are used to cure more than 33 types of ailments were documented in this study. The newly reported uses (not found in earlier literature on medicinal plants) are however marked with an asterisk.

Table 1. Ethno-botanical information, life form, parts used and species-wise, family-wise of collected medicinal plants at selected sites of Una and Hamirpur districts, Himachal Pradesh.

Sr. No.	Scientific/Vernacular name/ Family	Medicinal Uses	Parts used	Life Form
1.1.1	*Achyranthes aspera* Linn. Puthkanda Acanthaceae	• Used to cure cough, piles, itch, and stomachache. • Antidote to the venom of scorpion • Seeds in hydrophobia • Roots are used in pneumonia. • Prescribed internally in parasitic infections and for purifying blood • Used in respiratory and heart problems.	WP	H

1.2.2	*Andrographis paniculata* (Burm.f). Wall. Ex Nees Kalmegh	• Fresh Juice is used as anti-typhoid, anti-malarial and in general fever. • Used in stomachic and skin diseases.	WP	H
1.3.3	*Barleria prionitis* Linn Peelabansa/ piyaabaasa	• Leaves and roots are used in abdominal or stomach disorders, urinary infection, fevers and in muscle swellings. • Leaf juices mixed with coconut oil is applied for pimples; mixed with honey and is given to children in fever. • Root paste is applied over boils and glandular swellings. • Dried bark or ash obtained from whole plant, mixed with honey is given in bronchial asthma and cough also.	Lf, Bk & Rt	H
1.4.4	*Barleria cristata* Linn Kalabansa/ Raktajhinti	• Roots and leaves are used to treat asthma, cough, and swelling of glands, skin diseases and boils.	Rt & Lf	SH
1.5.5	*Justicia adhatoda* Linn. Vasaka	• Juice of roots is used in heart problems. • Bark powder and flowers are used in cough and asthma. • Leaves are applied directly on muscle swellings. • Flowers, roots and leaves are antiseptic in nature.	WP	SH
1.6.6	*Strobilanthes auriculata*/Nees Kapoor Minjar	• Plants are kept in dew from dusk to till dawn and then applied to eye lids for healthy eye sight.	Lf	SH
2.7.1	*Adiantum capillus-veneris* Linn. Hansraj Adiantaceae	• Fronds with black pepper are given as febrifuge • It regulates menstrual flow. • It is reported to be used in baldness as a hair tonic. • Whole plant powder is used for blood purification, inflammatory diseases, cough, asthma and antiseptic.	WP or Fd	H
3.8.1	*Agaricus campestris* Linn. Khumb Agaricaceae	• The plant boiled with milk is a good source to reducing debility. • Powder is used as aphrodisiac.	WP	KH
4.9.1	*Aerva Sanguinolenta L.* Blume Buei Amaranthaceae	• Leaves with cold water are used to cure high blood pressure • Leaves with lukewarm water are used to normalize the low blood pressure.	Lf	H
4.10.2	*Amaranthus spinosus*. Linn. Chaulai Amaranthaceae	• Fresh juice of leaves acts as antidote in toxic conditions, internal hemorrhages. • Leaves and young shoots are cooked as vegetable by local people. • Roots and leaves are used as expectorant.	Lf&Rt	H
5.11.1	*Allium cepa* Linn./Cultivated Piyaz Amaryllidaceae	• Juices of Onion are useful in diarrhoea and used against loose motions • *Juice is also used as ear drops in pain. • Fresh Onion juice is used against flatulence, dysentery and cholera. • Good appetizer and helps in digestion where mixture of Onion and pudina (*Mentha viridis*) is used.	WP	H
5.12.2	*Allium sativum* Linn. / Cultivated Lahsun	• Bulb juice is also used as ear drops in deafness. • It is prescribed in cardiac diseases and blockage of arteries. • Used in chronic fevers, tumors, throat infections, cough and asthma. • Used in joint pain and swelling.	Bl	H
6.13.1	*Mangifera indica* Linn. Aam/ Amb Anacardiaceae	• Ripe fruit is very nourishing and useful in nervous, atonic dyspepsia and constipation. • *Seed kernels are used against loose motions and dried kernel powder is taken with honey in cough. • It also cures vomiting, chronic dysentery, bleeding piles, roundworm, leucorrhoea, diabetes, parasitic skin diseases and bruises and cracks in feet. • Un-ripe fruits are also given in obesity & protect from sun-stroke • Bark is also useful in ulcers and rheumatism. • The bark's gum is used as an astringent in scabies. • Powder mixed with oil is given to cure cough & asthma and other respiratory ailments.	Fr, Sd & Bk	T
6.14.2	*Pistacia integerrima* Stewart ex Brandis Kakarsingi/ Kakar	• Powder mixed with oil is given to cure cough & asthma and in other diseases of the respiratory tract, ulcer, fever, leprosy and skin diseases. • Oil obtained from gall is antibacterial and anthelmintic. • Gall (outer growth in the plant) is used in powder form.	Bk, Go Lf	T
6.15.3	*Spondias pinnata*(L.f.) Kurz Ambara/jangli Aam/	• *Useful in controlling menstrual irregularities. • Bark paste is applied externally to articular and muscular rheumatism. • Fruit, leaves, bark- astringent, antidysentric and antiseptic.	Fr, Bk& Lf	T
7.16.1	*Polyalthia longifolia* (Sonn.) Thaw. Fake Ashoka/ False Ashoka Annonaceae	• The decoction of the bark is used for febrifuge; it lowers blood pressure, cardiac depression and stimulates respiration.	Bk	T
8.17.1	*Carissa spinarum* Linn. Garuna Apocyanaceae	• *Fresh leaves stop stomach pain; useful in sores, skin disease, in constipation. • Root paste is taken orally in fever, cut injuries and inflammation. • Plant is administered as cardiac tonic. • Un-riped and riped fruits are eaten by local people.	Lf& Rt	SH
8.18.2	*Catharanthus roseus* (Linn.) G. Don. Sadabahar	• Having anti cancerous properties; more useful in the cure of Leukemia; used as cardiac tonic. • Flowers parts are used for treating diabetic patients. • Roots are stimulant for stomach, hypotensive; used gastric catarrh, also for headaches, dizziness and behavior disorder.	WP	H

8.19.3	*Holarrhena antidysenterica* (Linn.) Wall Kutaj	• Root and bark is used in amoebic dysentery and prescribed in piles. • Also used in anemia, diseases of skin and and asthma. • Seeds are used for promoting conception and toning up vaginal tissues after delivery.	Rt, Bk and Sd	T
8.20.4	*Thevetia neriifolia* Juss. Pila Kaner	• Bark and leaves is bitter tonic useful in different kinds of intermittent fevers. • Extract obtained from kernels, bark and flowers are useful for heart diseases. • Root-paste is applied to tumors.	Lf, Fl,Bk& Rt	SH
9.21.1	*Acorus calamus* Linn. Baryan Araceae	• Used as nervine tonic, indigestion, colic pain, chronic diarrhoea and dysentery. • Used in high blood pressure and throat disorder.	Rh	H
9.22.2	*Alocasia indica* (Schott.) G. Don.	• Tubers and leaves are used in anti-inflammatory, abdominal inflammation and internal tumors. • Extract of roots and leaves are anti-cancerous.	Tu& Lf	H
10.23.1	*Calotropis procera* (Aiton) W.T. Ation Bra Ak Asclepiadaceae	• Powder of flowers is used in cold, cough and indigestion. • The fresh leaves soaked on direct heat are used as a bandage for pain relief in case of rheumatic joints, swelling and sores. • Its white juice is used for treating eye diseases. • Its white juice is also taken for male issue.	Ltx, Lf,Fl & Rt	SH
10.24.2	*Gymnema* sylvestre B.Br. ex. Schult. Gurmar	• Leaves extract is stimulant of cardio-vascular, activates the uterus and useful in glycosuria. • Roots and leaves used in stomach pain and effective against diabetes.	Lf& Rt	CL
11.25.1	*Ageratum conyzoides* Linn. Neela Phool or gandhela Asteraceae	• Roots, leaves and flowers are applied to cuts and sores; anti-dysenteric, renal and vesicle calculi. • It is also used in reducing malignant growth of cells. • Leaf juice is used as eye lotion	Rt, Lf& Fl	H
11.26.2	*Bidens bipinnata* Linn. Hook.f. Phutiam	• Lukewarm Juice of fresh plant is used in ulcers, ear-ache and conjunctivitis as well as on wounds. • *Roots and seeds are used in cough and asthma.	WP	H
11.27.3	*Bidens biternata* (Lour) Merr, &Scherff. Chirchitta	• Whole plant is administered for treating pustules, tumors, cough, bites and skin diseases. • Dried flowers are used as toothache. • Leaf paste is applied on cuts and wounds as a haemostatic agent.	WP	H
11.28.4	*Blumea lacera* (Burm. f).DC Kakrondha Asteraceae	• It cures fever, bronchial affections, and anti-inflammatory agent internally and externally. • *Extract of leaves mixed with black pepper is given in bleeding piles and ulcers. • Fresh root prevents dryness of mouth.	Lf&Rt	H
11.29.5	*Calendula officinalis* Linn. Zergul	• Fresh juice of flower and leaf is used in ointment for treating cuts, wounds, ulcers and scars. • And tincture of leaves and flowers is used in *fever 'jaundice and inflamed eyes. • Flower possesses stimulant, antiseptic properties • Used in eye injury, abdomen inflammation.	Lf&Fl	H
11.30.6	*Chrysanthemum indicum* Linn. Guldaudi	• Leaves are rubbed over aching heads and migraine. • The flowers in the form of infusion are used by women during irregular menstrual cycle.	Fl& Lf	H
11.31.7	*Echinops echinatus* Roxb. Utakatera	• Plant possesses nutritive value that can be used as tonic, also used is hoarse cough. • *An infusion of the plant is given in seminal debility and impotence. • Roots are used as abortifacient.	WP	H
11.32.8	*Parthenium hysterophorus* Linn. Chatak Chandni/ Congress grass	• Whole plant is used as a tonic, febrifuge and ant-amoebic. • Decoction of root is given in dysentery.	WP	H
11.33.9	*Silybum marianum* (Linn.) Gaertn. Holy-Thistle	• Seeds are used as antispasmodic, liver protective, gall bladder protective; in fevers, uterine troubles, jaundice and biliary affections. • Young leaves and flowers are also consumed by diabetic patients.	Sd, Lf& Fl	H
11.34.10	*Sonchus arvensis* Linn. Sahadevi	• Plant is slightly bitter and useful in chronic fevers, nervous debility and in the treatment of the cough in bronchitis and asthma. • Leaves are applied to swelling and roots for respiratory tract.	Lf& Rt	H
11.35.11	*Spilanthes acmella* (Linn.) R.K. Jansen Akarkara	• Leaves, flowers and seeds are chewed to relieve toothache, throat infection and gums and neurological affection of tongue. • Plant soup is best medicine in dysentery. • Increases the flow of saliva • In fever, especially during summer	Lf, Fl& Sd	H
11.36.12	*Tagetes erecta* Linn. Genda	• Whole plant infusion is useful in cold, bronchitis and rheumatism. • *Fresh leaves extract in ear ache and swellings of women breast. • Leaves are applied to boils and muscles pains. • Flowers juice for treating bleeding piles.	WP	H
11.37.13	*Vernonia cinerea* (L.) Less. Sahdevi	• In fever, blood purifier and piles, asthma, skin diseases, hematological disorder and leucorrhoea • Fruits used as tonic, diuretic and in small pox.	WP	H
11.38.14	*Xanthium strumarium* Linn. Banokra	• Seeds are used for removing inflammatory swellings • Leaves extract is used in snake bite. • Roots have ant- cancerous properties	WP	H

12.39.1	*Oroxylum indicum (L.) Benth.ex. Kurz.* Tatpalanga/ Sonna paathaa Bignonaceae	• Root bark is used as astringent, useful in diarrhea and dysentery. • Tender fruits and seeds are used as stomachic and purgative. • Paste of leaves applied in the falling hair and baldness. • Bark is also used as uretic and ant-rheumatic	WP	T
13.40.1	*Cordia dichotoma* G. Forst. Lassoda Boraginaceae	• Fruits are prescribed in dry cough, in burning and sensation • Used in diseases of chest and urinary passage. • A decoction of the bark is useful in fever. • Leaf- decoction is used to cure cough and cold.	Frt, Lf&Bk	T
14.41.1	*Salmalia malabarica* (D.C.) Schott & Endl. Semul Bombaceae	• Fresh flowers and roots are given in dysentery, kidney calculus affection and rectal prolapse and snake bite. • Paste of flower and leaves applied in cutaneous troubles. • *Spike paste is also useful the remedy of chalazion. • Bark paste is applied to skin eruptions, boils, pimples and acne. • Seeds are taken for treating small pox, chicken pox, chronic cystitis and genitourinary diseases. • Gum is aphrodisiac and administered in bleeding piles, spermatorrhoea, diarrhea and dysentery	Fr, Sd, Lf ,Bk&Rt	T
15.42.1	*Opuntia stricta* (Haw.) Haw. Nagphany Cactaceae	• Fruits are refrigerants and useful in gonorrhea. • Leaves are applied as a poultice to relieve inflammation by few drops of milky juice mixed with sugar act as purgative. • *Plant is also used as antidote. • It is ecologically recommended species for SO2 absorbent in the highly-polluted area.	Fr& Lf	SH
16.43.1	*Bauhinia variegata* Linn. Kachnar/ Kwairal/ Karal Caesalpiniaceae	• The bark and roots are used to cure the skin diseases as anti-inflammatory, cough, leprosy, diarrhea, diabetes, ulcers, wounds, hemorrhoids, and hemoptysis. • Dried buds are used in dysentery where as roots are also used as a carminative in dyspepsia and flatulence. • Barks, roots, buds and gum are alternative tonic, astringent; carminative and laxative. • Decoction of roots prevents obesity.	Fl, Bd, Bk& Rt	T
16.44.2	*Cassia absus* Linn. Chaksu	• Young flowers and buds are cooked as vegetables by local people. • Leaves are used as purgative and as a remedy for cough asthma and bronchitis whereas leaves powder is used in ulcer dressing. • Seed used in ringworm, poisonous bites and wound, obesity, diarrhea. • *Mucilage from the leaves is an active ingredient of medicaments useful for soothing digestive system and mucous tissue	Lf& Sd	H
16.45.3	*Cassia fistula* Linn. Amaltas/ Alis/ Ali	• Fruit pulp is used as cough reliever of thoracic obstructions, indigestion, pustules and leprosy, constipation, fever and bacterial and fungal skin infection. • Flowers are useful for their astringent, purgative and ant bilious properties.	Fr& Fl	T
16.46.4	*Cassia occidentalis* Linn. Kasunda/ Bari Elwan	• Roots and leaves are used in skin diseases viz. scabies and ringworm. • Leaves and fruits are used in anthelmintic. • Seeds are used in diabetes and for blood purification.	WP	H
16.47.5	*Cassia tora* Linn. Chakunda/ Chhoti Elwan	• Leaves are milled and applied on cuts and act like as 'tincture Iodine'. • Juvenile leaves are taken internally to prevent skin diseases. • The filtrate obtained from boiled seed powder is considered as blood purifier and also useful in inflammation. • The whole plant is also used against snake bite, leprosy and bronchial problems.	WP	H
16.48.6	*Tamarindus indica* Linn. Imli	• Dried fruit pulp is given as cardiac tonic and to cure jaundice, scabies, conjunctivitis, mental fatigue. • *Leaf extract is used in ringworm as well as to overcome the throat diseases	Fr& Lf	T
17.49.1	*Cannabis sativa* Linn. Bhang Cannabinaceae	• Leaf extract is applied to remove head dandruff and useful in dressing for wounds or sores. • The drug acts like opium in first stimulating the nervous system and afterward depressing the vital infection. • It has also been used in uterine hemorrhage.	Fl& Lf	H
18.50.1	*Crataeva nurvala* Buch. - Ham. Barna Capparaceae	• Bark is used to treat urinary tract infections. • The decoction of the roots with honey is used in cervical adenitis. • * Leaf extract is applicable in sores and as blood purifier. • Unripe and green fruit might be used by women to stimulate secretion of milk	Bk, Rt& Lf	H
19.51.1	*Carica papaya* Linn. Papeeta Carcaceae	• Cooked as vegetable consider good for person suffering from renal or kidney diseases. • Flowers of Papaya have important role in controlling jaundice. • Seeds are also used as anti-poisonous; moreover, salted skinned unripe fruit banded over snakebite to remove poison. • Bark and fruit is used to dissolve the kidney stone.	Bk, Fr, Lf and Sd	T
20.52.1	*Bryophyllum pinnatum*(Lam.) Oken Pattharachat Crassulaceae	• The leaves are smoked in place of tobacco for relief in asthma. • Leaf is applied as a poultice to bruises in kidney stone. • Leaf extract is given with double quantity of butter in case of dysentery and diarrhea.	Lf	H

21.53.1	*Stellaria media* Linn.Vill Safed fulki/Kkakon Carryophylaceae	• The plant is employed in plaster of fracture bones and swellings as it is supposed to be binding and cooling herbs. • It is also used as astringent and demulcent; used to expel the excessive body heat and relieve irritation	WP	H
22.54.1	*Celastrus paniculatus* willd Malkangni Celastraceae	• Seeds oil is applied externally on scores, ulcers, wounds and scabies. • It is used as memory tonic which increase the intelligence. • Not only this, its oil is very useful in the remedy of rheumatic pains and paralysis	Sd&So	CL
23.55.1	*Chenopodium album* Linn. Bathu Chenopodiaceae	• Whole plant is used as blood purifier. • Fresh leaf powder is used as antiseptic for burns or wounded skin. • Oil obtained from its seeds is applied to kill stomach worms. • Application of seeds is in hepatic diseases also. • Leaves and young shoots are cooked as vegetable by local people.	WP	H
23.56.2	*Spinacia oleracea* Linn Palak /Spinach	• Seeds are demulcent and diuretic that useful in blood deficiency (anemia), because of rich source of iron. • * Fresh leaf paste is applied on face for charming and fair skin as well as to remove scares.	WP	H
24.57.1	*Cheilanthes albomarginata* C.B. Clarke Shapamar booty/ Silver Fern Cheilanthaceae	• Plant extract with honey is taken after meal which strongest the weaker persons. • It is used for treating tuberculosis and antifungal infection. • Young plants possess some chemical constituent that to be used as tonic for healthy.	WP	H
25.58.1	*Terminalia arjuna* (Roxb ex DC) W&A Arjuna Combretaceae	• Arjuna bark is popularly taken as cardiac tonic and is useful for the treatment of heart diseases, blood dysentery and blood pressure, fractures of bones, wounds, ear ache and contusion. • It is also useful in diarrhea, piles and chronic skin disease. • Leaves are used as fodder for sheep.	Bk& Lf	T
25.59.2	*Terminalia bellirica* (Gaertn.) Roxb. Bahera Combretaceae	• Fruits are astringent, acrid, sweet, thermo genic, ant inflammatory, narcotic, digestive, ophthalmic, anthelmintic, and rejuvenating. • They are useful in treating cough, irregular fever, piles, diarrhea, bronchitis, dyspepsia, vomiting, skin disease, leprosy, ulcer, general debility and *cardiac affections. • Bark is mildly diuretic and is useful in anemia.	Fr, Bk	T
25.60.3	*Terminalia Chebula* Retz. Harar Combretaceae	• Dried fruits are used in indigestion, dermatitis, urinary and, *vaginal disorders. • The fruits included in tonic for improving eye sight. • It is useful in treating asthma, bile troubles, bleeding, blood pressure, cough, dysentery, throat sores, ulcer and diseases of the heart and as cardio tonic. • Fruit is one among the Triphala of Ayurveda	Fr	T
26.61.1	*Convolvulus microphyllus* Sieb. Ex. Spreng Shankhpushpi Convolvulaceae	• It is used as specific tonic for promoting brain power or intelligence, in nervous debility and dysentery. • Flowers are used to remedy uterine bleeding and roots are used for curing several diseases like gastric and duodenal ulcers. • Shankpuspi is taken with milk for seven days after drinking water for purification. • Shankpuspi and pipali were also given to the new born baby with a golden spoon (Kaus Sutra).	WP	H
26.62.2	*Cuscuta reflexa* Roxb. Amarbel/Akas-bel	• Used for treating protracted fevers, jaundice, cough and paralysis. • Seeds used for the liver and stomachic problems. • *In case of headache, plants taken in small pouch is placed directly on forehead for several minutes. • The plant is also taken as tonic.	WP	CL
26.63.3	*Ipomoea digitata* Linn. Bilaikand	• Tuber of Bilaikand is used as aphrodisiac and respiratory troubles. • Juice or dry powder is prescribed as tonic in spermatorrhoea.	Tu	CL
26.64.4	*Ipomoea hederacea* Jacq. Kaladana	• Direct seeds are used as a purgative whereas it is more effective in liver and spleen diseases.	Sd	Cl
27.65.1	*Brassica campestris* Linn. Sarson Cruciferae	• Seed oil is used in various skin diseases. • *Oil and gram flour mixed is used in fairness of skin	Sd oil	H
27.66.2	*Raphanus sativus* Linn. Muli	• Fresh juice obtained from leaves is used as diuretic and laxative. • It also helps in regulation of irregular menstrual cycle. • Seed paste removes scars from face.	Lf&Rt	H
28.67.1	*Bryonopsis laciniosa* Linn. Shivlingi Cucurbitaceae	• Seeds are used extensively for treating vaginal disorders, painful menstruation and ovary dysfunction during menstrual period, inflammation of uterus, burning pain in the fundus of the uterus. • *It is also given to sterile women to overcome sterility	Sd	CL
29.68.1	*Cyperus rotundus* Linn. Nagarmotha/ Buracucha Cyperaceae	• Root tubers are anti-inflammatory, antipyretic and analgesic and also applied for healing wounds, act as appetizer useful in skin diseases, useful in appeasing of thirst, diarrhea and disorder of stomach. • It is also taken to reduce pain in scorpion sting.	Rt& Tu	H
30.69.1	*Croton tiglium* Linn. Jamaalgotta or Jamlota Euporbiaceae	• Seeds and seed oil are given for acute constipation, abdominal drops and purgative	Sd	

30.70.2	*Emblica officinalis* Gaertn Aamla	• Fruits are diuretic, laxative, cardiac astringent, useful in anemia, diarrhea, dysentery, hemorrhage, jaundice, leucorrhoria, inflammation of eye, inflammation of lungs, gastro- intestinal disorder, ulceration and discharges painful micturition. • The fruit is edible and regarded as astringent tonic. • The dried powder of fruit with water is used for washing hair and is also helpful in treatment of asthma, bronchitis, and nausea and vomiting. • It is taken in heart complaint and promotion of urination also. • *It also checks the release of semen or dhaat diseases in male.	Fr	T
30.71.3	*Euphorbia hirta* Linn. Chhoti Dudhli Euporbiaceae	• *Milk of the plant is applied at the edge of lower surface of eye for removing unclear visibility, it is also used to kill abdominal worm. • Roots are anti-rheumatic, bronchial affection, asthma and useful for lactation in nursing woman.	WP	H
30.72.4	*Euphorbia thymifolia* Linn. Badi Dhudhli	• It is purgative and used in antifungal infection such as ring worm, as well as in respiratory diseases such as cough.	WP	H
30.73.5	*Euphorbia tirucalli* (Linn.) Tohar	• Latex has purgative medicinal properties and is used for treating skin diseases, allergy, rheumatism and toothache • Seed and seed oil is purgative, promote hair growth.	Ltx	T
30.74.6	*Jatropha curcas* Linn. Safed Arand or Ratanjot	• Leaves are used for jaundice, diarrhea, stomachache, scabies and cough. • Bark helps in curing animal bites. • *Bark powder with coconut oil is used for treating burn wound. • Leaves are mixed with neem leaves are burnt to generate smoke to repel insects.	Lf&Sd	SH
30.75.7	*Mallotus philippensis* (Lam.) Muell. Arg. Kamala or Kabila	• Fruits are used as aphrodisiac, blood purifier and anti-helminthic. • It is also used in constipation, eye disease, diabetes, remedy for tapeworm and internal paralysis. • Oil is used for skin diseases.	Fr	T
30.76.8	*Phyllanthus urinaria* Linn Bhui-Aamala/tamravalli	• Poultice of the root and whole plant combined with rice water is used for ulcers, sores and swellings. • It is administered in the treatment of jaundice, chronic dysentery and Genito-urinary troubles	Rt	H
30.77.9	*Putranjiva roxburghii* wall. Putranjiva	• Leaves and stems are given in leucorrhoea, cold, fever and rheumatism. • Root part of male plant is used to cure the disease of breasts. • Used for Child male issue.	Lf, Sd& Rt	T
30.78.10	*Ricinus communis* Linn. Arand	• Decoction of root and root bark is used in asthma, rheumatic and gastrointestinal disorders like flatulence and constipation. • They are also locally used in skin diseases and ophthalmic. . • The oil extracted from the seeds is a mild and effective purgative.	Rt, Lf& Sd	SH
31.79.1	*Abrus precatorius* Linn. Ratti Fabaceae	• Seeds are used as suppository to bring abortion. • It is also used in baldness, dandruff, other hair disease. • Seed paste is applied locally in stiffness of shoulder joints.	Lf, Rt, Sd	CL
31.80.2	*Albizia lebbeck* Linn. Kala Siris	• Bark is used in ulcer, and snake bite, wounds, asthma, thoracic pain, night blindness, diarrhea, leprosy, sprains. • Flowers are given as sex drug for achieving retention and to retard premature ejaculation. • Seeds are given for promoting the quality of semen.	Bk, Sd, Lf&Fl	T
31.81.3	*Butea monosperma* Linn Palah/Palash/Tesu	• Leaves, flower's solution are used externally to disperse boils pimples. • It is used to cure colic, cough, skin diseases, epilepsy, arthritis, piles, and diabetes. • Seeds are anthelmintic and gum is aphrodisiac.	Bk, Sd, Lf, Fl & Gm	T
31.82.4	*Clitoria ternatea* Linn. Aparajita	• Used in internally in oedema, goiter. • Roots and seeds are prescribed internally in cough, diuretic, diseases of the liver and spleen and rheumatic infections. • Seeds are purgative. It is also useful in urinary diseases and eye infections.	WP	H
31.83.5	*Dalbergia sissoo* Roxb. Tahli/Shisham	• This plant is useful in Leprosy, eye diseases, whitish spot on skin act as blood purifier. • *It is administrated to person having very foul sweat. • The wood oil relieves burning sensation	Lf & Wo	T
31.84.6	*Delonix regia* Roxb. Gulmohar	• Leaves extract is used to cure Leuchhorea and over bleeding in female • Its flower are used as anthelmintic and active against the roundworm	Fl	T
31.85.7	*Mucuna pruriens* (Linn.)DC. Drougal bel	• Seeds powder is taken internally in respiratory troubles of wasting diseases and paralysis. • Used externally as an ointment for wounds. • It is a sex tonic in sexual weakness. • Roots are prescribed in diseases of nervous system.	Sd&Rt	CL
31.86.8	*Pongamia pinnata* (Linn.) Merr. Karanj	• Oil is antiseptic, used for skin diseases. • Bark is astringent, stimulative. • Flowers are carminative and useful in urinary diseases • Leaf juice is also used for said diseases.	Bk, Sd, Lf& Fl	T
31.87.9	*Pueraria tuberosa* (Willd.) DC. Siali or Salod or Bidari	• Tubers are used medicinally to cure fever, swelling of joints. • Used to regulate menstrual cycle. • It is used to stop bleeding from nose.	Tu	CL

31.88.10	*Uraria picta* Desv. Dabra	• Entire plant is prescribed in diarrhea, dysentery, cough and respiratory diseases. • Leaves are considered to be antiseptic.	WP	CL
32.89.1	*Fumaria parviflora* Lamk. Pit Papra Fumariaceae	• Whole dried plant powder is used as blood purifier, fever and influenza. • Leaves are administered for treating urinary disorders and to improve digestive system. • Seeds are useful in flatulence	WP	H
33.90.1	*Swertia chirata* (Wall.) C.B. Clarke Chirata Gentianaceae	• The entire plant stems and roots either fresh or dried are used as medicine to cure the chronic skin diseases, stomach disorder, and fever and to kill the worms. • It is also used in the form of tea in atonic dyspepsia and functional inactivity of the liver	WP	H
34.91.1	*Mentha spicata* Linn. Pudina Labiatae	• Leaves are prescribed in flatulence, stomachs, nausea, vomiting, and cholera. • Leaves and flowers are tops exhibited stimulant, carminative, antispasmodic. • It is also used for chutney preparation by local people	WP	H
34.92.2	*Ocimum basilicum* Linn. Ban-Tulsi	• Generally, this plant is used as carminative, diuretic, dysentery, diarrhea, sprains, asthma, gonorrhea, nephritis, bronchitis and internal piles. • Roots are applied for the bowel complaint of children. • Leaves are useful in treatment of cough; juice of leaves is dropped into the ear for the cure of hearing.	WP	H
34.93.3	*Ocimum sanctum* Linn. Tulsi	• Flower having stimulant and diuretic properties. • . Leaves or extract of leaves is prescribed internally for fever, skin eruptions, cough, asthma, and dyspepsia. • It stimulates digestion; cures dysuria, ear ache, post partulation, pain and chest disease. • Seeds are given in disorders of the Gento-urinary system. • Decoction of Leaves is useful in common cold. • Fresh mature leaves are used to treat headache also.	WP	H
35.94.1	*Litsea chinensis* Lamk. Rihan Lauraceae	• Paste of bark is applied externally as an emollient; application for sprains, bruises and rheumatic and gouty joints. • Bark powder with honey is prescribed internally in fractures. • Bark infusion decoction is given in diarrhea and dysentery. • It is used as a ulcer healing agent in intrinsic hemorrhages	Bk	T
36.95.1	*Asparagus racemosus* Willd. Shatavari Liliaceae	• In disorders of female genital urinary diseases, gynecological disorder of nervous system, hyperacidity, and gastritis. • It is used as general tonic, as appetizer and also useful in dysentery. • It is also effective medicine to cure ailment caused by dog bites. • Tubers are taken medicinally in dried and fresh form.	Tu	SH
36.96.2	*Asparagus adscendens* Roxb. Safed Musli	• Used as tonic, galactagogue and used to arouse sex urge. • Tuber boiled in milk and sugar is prescribed in chronic leucorrhoea. • Powder of tuber is also prescribed in diarrhea, dysentery, dyspepsia, and hyperacidity	Tu	H
36.97.3	*Gloriosa superba* Linn. Agnishikha	• Used as abortifalcient; useful in chronic ulcers, thirst, leprosy inflammations and piles. • Root paste is antidote to snake bite.	Tu& Sd	CL
36.98.4	*Urginea indica* (Roxb.) Kunth Jangli Piaz	• It is used as cardiac tonic, digestive, diuretic, in inflammations, ulcers, asthma, cough and bronchitis. • Plant is employed in rheumatism and skin troubles • It is prescribed for promoting hair growth.	Blb	H
37.99.1	*Lawsonia inermis* Linn. Mehndi Lythraceae	• Paste of leaves is rubbed over soils of feet for allaying burning sensation. • It is used externally for ulcers, and scabies. • It is also used as blood purifier and also stops itching and various diseases of urinary tract	Lf& Sd	SH
37.100.2	*Woodfordia fruticosa* (Linn.) Kurtz Tauin/Dhain	• Dried flowers purify blood, ulcers, astringent and stimulant and useful in bowel complaints. • Diarrheas, a dysentery complaint, fever and leucorrhoea is also cured. • Bark is uterine sedative and acts as stimulant in pregnancy	Bk & Fl	SH
38.101.1	*Hibiscus rosa-sinensis* Linn. Gurhal Malvaceae	• Flowers are prescribed as refrigerant & vitalizes in palpitation, burning sensation in the body. • Paste of flowers with *Emblica offacinalis* flowers is prescribed extremely as a tonic for retarding for mature graying of hair. • Roots & flowers are also given for cough & fever. • Flowers are made up to a paste & applied to swelling & boils. • Stem bark is given internally as a blood purifier & antiperiodic.	Fl& Rt	SH
39.102.1	*Azadirachta indica* A. Juss. Neem Meliaceae	• Stem bark, root bark and young fruits are used as bitter tonic, ulcer, rheumatism, intestinal worms, and insecticides. • Leaf & seed oil is used as a strong antiseptic. • It is also used in cosmetic preparations, such as soaps, pastes & mixed with hair oil to prevent baldness. • Oil is a potentially antiulcer & anti-inflammatory. • *The bark extract is used to cure for the renal or kidney diseases also.	Bk, Rt, Sd& Lf	T

39.103.2	*Melia azedarach* Linn. Drek	• Inner bark is bitter exhibit antheilmantic and the outer bark is astringent. • Decoction of leaves is regarded as astringent & stomachic. • A poultice of flowers is applied to skin diseases. • Bark is also act as blood purifying and used in menstrual problems. • Seed powder is used to kill lice's by women.	Bk , Lf& Fl	T
39.104.3	*Toona ciliata* M. Roem. Tooni	• Bark is used as astringent. • Leaves are useful in skin disease, constipation and boils & sours. • The sort is regarded as antidote to poison.	**Bk& Lf**	T
40.105.1	*Cissampelos pareira* Linn. Batindu Menispermaceae	• Locally the root is used against snake-bite and toothache. • It is also used in internally in fever, urinary disorders, indigestion, dysentery, piles, urogenital affection and loss of appetite. • Used as a cleansing and antiseptic agent for wounds & ulcers slightly. • Heated leaf with oil is applied on boils and then it burst the boil. • It is also administered for preventing miscarriage and painful menstruation.	Lf& Rt	H
40.106.2	*Cocculus hirsutus* (Linn.) Diels. Chireta	• Roots used in rheumatic problem. • Roots & leaves are used in headache & neurologic pains. • It is also used for cough & to put to sore cycloids to often breasts. • Aqueous extract of root and stem is sedative, hypotensive, Brady cardiac and cardio tonic. • A decoction of leaves is taken to cure spermatorrhoea, leucorrhea, gonorrhea and urinary problem.	Lf& Rt	Broom CR
40.107.3	*Tinospora cordifolia* (Will.) Miers. Ex. Hook. f. &Thoms. Giloe/ Gulanj	• Use as antipyretic, ant acid, antidysenteic, and antidiarrheal, ant rheumatic, blood purifier. • Stem juice is also prescribed in high fever and diabetes. • WP is used to cure tumor.	Sd, Rt & Fl	CL
41.108.1	*Acacia catechu* (L.f.) Willd Khair Mimosaceae	• Heart wood powder is powerful astringent, antidiarrhoel, haemostatic; used for treating excessive mucous discharge, throat and mouth stomatitis, irritable bowel. • Heart wood dried pieces are taken to cure cough, cancer, piles, oral ulcers, traumatic injuries, skin diseases, urinary disorder, lipid disorders and as blood purifier.	Wd	T
41.109.2	*Acacia nilotica*. Benth. Babul	• Gum is used in sore throat along with latex of *Calotropis*; smoothing agent for inflammatory condition of respiratory, digestive and urinary tracts. • It is useful to cure asthma, diarrhea and dysentery and skin diseases. • Pods are used in urogenital disorder. • Seeds also stimulate insulin secretion.	Bk, Pd, Lf& Gm	T
41.110.3	*Mimosa pudica* Linn. Lajwanti	• Herb is applied over piles, ulcers and wounds. • And, it is also useful in various disorders of female genital tract, leucorrhoea, morbid condition of vagina and glandular swellings. • Root is used for treating the urinary complaints. • A decoction is taken to relieve asthma.	Rt	H
42.111.1	*Artocarpus lakoocha* Roxb. Badhal/ Tiuh Moraceae	• It is used only externally in combination with inter antiseptic herbs for treating arthritic swellings; obstinate skin diseases for cleaning wounds. • Bark in powder form is applied to sores, draw out purulent (Pus-filled) matter, heal boils, pimple and skin cracks.	Fr, & Bk	T
42.112.2	*Broussonetia papyrifera* Linn. Herit en vent jangleeTut	• Used in indigestion. • Seeds are administrated as tonic and diuretic.	Bk& Lf	T
42.113.3	*Ficus benghalensis Linn.* Bargad/ Bar/ Bat Vriksh	• Its bark is tonic astringent, cooling, dry and diuretic. • Bark is also prescribed as a blood purifier in skin diseases. • Its seeds and fruits are cooling and tonic. • Young buds and milky juice is astringent. So it contains lot of medicinal properties like to cure the burns, thirst, hemorrhage, diabetes, hemoptysis, gonorrhea, dysentery, diarrhoea, fracture and rheumatic pains. • Latex and fruits are useful for curing sores, ulcers, to soles of feet, when cracked or inflamed. • * Milky juice or latex is taken to increase the excitement in sexual inter-course and it also stops the sudden release of semen during night in men (Night fall)	Bk, Ltx, Lf, Fr	T
42.114.4	*Ficus carica* Linn. Anjir/ Dogla	• Fruit juice with honey is prescribed for checking hemorrhage. • Its fruits are reported to be useful in treatment of cancer and as blood purifier. • Milky expectorant is diuretic and used in constipation. • *Fruits are also used to cure piles.	Fr	T
42.115.5	*Ficus glomerata* Roxb. Gular	• This tree is also considered as energy giving and the enhancer of peace of domestic life. Bark, leaves and unripe fruits are astringent, carminative and vermicide. • Roots are used in diarrheas, dysentery and diabetes. • Bark is applied to the ulcer. • Fruits can be used as stomachic and latex is used in piles and diarrheas	Bk, Lf Rt, & Fr	T

42.116.6	*Ficus religiosa* Linn Peepal	• Leaves and paste for aerial young roots or bark is applied for curing wounds, burns and skin infection. • A decoction of the bark is administration on whooping cough and asthma, indigestion, leprosy, rheumatism and as cardio tonic. • Aerial roots are chewed by women to induce conception and to regulate menstrual cycle. • *Roots increases concentration of semen and helps in appetite. • Extract of peepal bark and neem bark is used to cure the kidney or renal diseases also. • It is worshiped by local people.	Bk& Rt	T
43.117.1	*Moringa oleifera* (Lam.) Sanjana Moringaceae	• Leaves, flowers, seeds, pods and bark have medicinal properties. • Oil obtained from seeds is useful remedy for acute rheumatism. • Fried pods are used by diabetic patients. • All parts of plant are reported to be used as cardiac tonic, nervous debility and circulatory stimulant. • Leaves bark and roots are considered spasmodic. Juice of roots with milk is taken as a diuretic, ant lithic and digestive.	Lf, Fl, Sd, Pd & Bk	T
43.118.2	*Trigonella foenum-graecum* Linn. Methi	• Cooked vegetable is taken as uterine pain reliever. • Seed power is used in loss of appetite, flatulence, dyspepsia, colic, diarrhea, dysentery, rheumatic disorders; chronic bronchitis; enlargement of liver and spleen; and as lactagogue and puerperal tonic; also possess digestive and laxative properties.	Sd	H
44.119.1	*Eucalyptus globulus* Labill Safeda Myrtaceae	• Oil extracted from leaves is used locally as an antiseptic especially in the treatment of infections of upper respiratory tract and in certain skin diseases, antibiotic, antiviral and anti-asthmatic. • Oil of the leaves is used in joint and rheumatic and muscular pain of the body. • Dried leaves are used in the form of to cure asthma, chronic, bronchitis, migraine, congestive headache and rheumatic problems.	Lf	T
44.120.2	*Syzygium cumini* Linn.Skeels. Jammun Myrtaceae	• *increases excitement and time of sexual inter course. • Given in leucorrhea and flow of white fluid. • *Juice of young leaves with sugar overcome indigestion • Decoction of seeds is given to person suffering from diabetes. • Useful for stomach troubles. • Leaves and fruits are also used to cure mouth ulcer.	Fr, Sd& Bk	T
44.121.3	*Psidium guajava* Linn. Amrood	• Decoction of bark is given in diarrheas. • Fruits are laxative and useful in colic. • Fresh mature fruits with one tea spoon sugar overcome constipation	Bk & Fr	T
45.122.1	*Musa paradisiaca* Linn Kela Musaceae	• Useful internally in piles, urinary diseases, dermatitis, leucoderma. • Used in chronic dysentery and diarrhea. • Unripe fruits and cooked flowers are found to be useful in diabetes and kidney troubles.	Fr, Fl, Lf, & Sd	H
46.123.1	*Boerhavia diffusa* Linn. Nom.cons. Rakt Punarva Nyctaginaceae	• Prescribed in asthma, jaundice, anemia, hemorrhage; diseases of the nervous system and heart problems. • The leaf juice is given internally as a blood purifier and to relief muscular pain. • Used in kidney and urinary problems.	WP	H
46.124.2	*Boerhavia punarnava* Linn. Itsit	• Roots are used as anti-inflammatory. • A paste of plant is applied to get rely resulting from poisonous insect bites. • Prescribed for bleeding piles and menorrhagia.	WP	H
47.125.1	*Nelumbo nucifera* Gaertn. Kamal Nymphaeceae	• Flowers- decoction is given cholera, fever, palpitation of heart or cardiac tonic. • Rhizome is given to children in diarrhea and dysentery. • Tendrils are administered internally for promoting adhesive of fractural bones. • Lotus seeds mixed with honey are prescribed in cough.	Fl, Sd, Td, Lf, Rt& Rh	H
48.126.1	*Oxalis corniculata* Linn. Amlika/ Khatti-Mithi Buti Oxalidaceae	• Fresh juice is given in dyspepsia, in fever with biliousness; also prescribed in inflammation of gums. • *To relieve in toothache, leaves ball is kept directly on the teeth for several minutes. • Leaf paste is applied over forehead to cure headache. • Plant boiled with butter milk is a home remedy for indigestion and diarrhea in children.	WP	H
49.127.1	*Argemone mexicana* Linn. Satyaanashi Papaveraceae	• Seed oil is used (externally) in skin diseases and ulcers. • The fresh latex is applied externally to treat warts, tumors and cancer. • It acts as antiseptic, anti-bacterial; also, used in parasitic infection. • Flowers in ointment are used over leucoderma.	Sd, Ltx & Fl	H
50.128.1	*Sesamum indicum* Linn. Til Pedaliaceae	• Seeds mixed with sugar are given in diarrhea. • Equal part of oil and lime water is applied as a dressing for burns and scabs. • Seed are also prescribed to lower blood sugar level. • *Oil is used in migraine.	Sd & So	H

51.129.1	*Hemidesmus indicus* (Linn) R.Br. Sariva Nyctaginaceae	• Plants have antifungal, antiviral, anti-inflammatory and blood purifying property. • It is also useful in leprosy, rheumatism and gout. • Root-powder is used against leucoderma, gonorrhea, bleeding piles, jaundice and dysentery	Rt	H
52.130.1	*Pinus roxburghii* Sarg. Chir Pinaceae	• Decoction of leaves & bark is prescribed internally for fever and loss of appetite. • Seeds are used in bronchitis, tuberculosis & bladder infection. • Oil obtained from needles is used for muscular pains.	Lf, Bk& Sd	T
53.131.1	*Plumbago zeylanica* Linn. Chitrak Plumbaginaceae	• Dried roots are used are as appetizer. • Used in treatment of piles, indigestion, fever, leprosy, anemia and diarrhea having divaricate properties • Useful in bleeding and cuts.	Rt	H
54.132.1	*Cynodon dactylon* (Linn.) Pers. Doob Poaceae	• Roots are taken with sugar cubes for memory power. • Paste is applied for external application in scabies and eczema. • Plant extract is medicinally applicable in heat stroke; for preventing bleeding from nose and urinal problems. • *It may be used as anticancer.	WP	H
54.133.2	*Desmostachya bipinnata* (Linn.)Stapf. Kusha	• Roots are diuretic, astringent used in urino-genital troubles and other diseases of bladder. • Clums are used in dysentery, diarrhea and in skin diseases or blood purifier. • It is also used for treating vaginal discharges	Rt& Clm	H
54.134.3	*Zea mays* Linn. Makki/Maize	• Corn silk cob for cystitis, burnt and powder cob is prescribed internally in bleeding piles; mixed with salt for treating cough. • *Powdered corn silk also removes pain from urinary tract. Corn silk is used in urine break by which urine flow come properly.	Csk	H
55.135.1	*Anagallis arvensis* (Linn.) Johkmari Primulaceae	• Used in gout cerebral afflictions, epilepsy & in snake bites. • Extract of the plant is antiviral & diuretic. • Whole plant or dried seeds of the plant are ground with black pepper are given two times daily in diphtheria internally	WP	H
56.136.1	*Nigella sativa* Linn. Kalongi Ranunculaceae	• Seeds are stimulant, carminative, diuretic and lactiferous. • Powdered seeds are applied to boils externally. • Oil is prescribed in common cold, cough and bronchospasm. • It is also given in dysmenorrhea also for expelling placenta & stimulating uterine contraction	Sd	H
57.137.1	*Zizyphus jujuba* (Lam.) Gaertn. Mill Ber Rhammaceae	• Fruit is prescribed internally in menstrual & other vaginal disorder; • Powder of bark is used in stop bleeding externally. • Leaves are applied for curing scabies and other skin diseases. • Smoke from dried leaves is inhaled for the treatment of colds & cough.	Fl, Lf, Rt & Bk	T
58.138.1	*Randia dumetorum* (Retz.) Poir. Madanphal Rubiaceae	• Fruits are nervine, and abortifacient; where pulp of fruits is nauseated, expectorant & diaphoretic. • Bark is astringent & given in diarrhea & dysentery; for aborting accumulated phlegm. • Paste of nut is applied externally in rheumatism.	Fl & Bk	Sh
59.139.1	*Aegle marmelos* Linn. Bil/ Bael Rutaceae	• Ripe fruit is internally used as an appetizer & laxative; leaves produce heat in the body & for toning up the digestive system. • Unripe fruits are used in reducing obesity. • It is also taken for treating constipation, worms, skin diseases, high blood pressure, jaundice, leprosy, leucoderma and piles.	Lf, Fl, Sd, Rt & Bk	T
59.140.2	*Citrus aurantium* Linn. Khatta	• Leaves are prescribed in the swollen legs and bronchitis. • Aqueous extract of flowers employed in fever and inflammation	Lf & Fl	T
59.141.3	*Murraya koenigii* (Linn.) Spreng. Kurry patta/Gandhela	• Plant is used as tonic, hair tonic; for treating vomiting, anti-diabetic, dysentery, flatulence and stomach ache and for bites of poisonous animals. • It is used in karri preparation for delicious and tasty by local people.	Lf, Fl& Bk	SH
60.142.1	*Dodonaea viscosa* Linn jacq. Maindru Sapindaceae	• Leaves are applied to cure wounds, rheumatism and snake bite and to remove pain. • Oil of seeds is also administrated in muscular pain and swelling. • The plant is also useful in healing burning skin.	Lf& Sd	SH
60.143.2	*Sapindus mukorossi* Gaertn. Reetha	• Fruits are expectorant, useful in excessive salvation, chlorosis & epilepsy. • It is used in shampoos for promoting healthy hairs growth.	Fr& Bk	T
61.144.1	*Populus ciliata* wall.ex. Royle Poplar Salicaceae	• Bark of the plant is considered stimulant and is used as tonic and to purify the blood. • Decoction of the bark is taken in diarrhea.	Bk	T
62.145.1	*Capsicum annuum* Linn. Lalmirch Solanaceae	• *It keeps nervous system healthy. • Paste of capsicum as a single raw drug is considered ant poisonous & is applied to the dog-bite as a first aid. • Useful in cholera and diarrhea	Fr	H
62.146.2	*Datura metel* Linn. Dhatura (kala	• Seeds are used after detoxification; drug obtained from it is used as narcotic and anodyne. Seed, root and leaf are febrifuge, antidiarrheal, ant catarrhal found in insanity, and cerebral compulsion. • Leaf possesses anti-tumor & ant rheumatic properties. • Seed, root & leaf are infusion of the flowers is given to relieve from mental disorder.	Lf,Sd& Rt	H

62.147.3	*Solanum nigrum* Linn. Makoi	• Entire plant is useful in skin lesions, cough & muscular dystrophy; the herb is having antiseptics & antidysentic properties. • Berries are considered as a domestic remedy for fevers, diarrheas, ulcers & eye troubles. • Leaves are applied in wounds & sores. • The juice of the plant is given in chronic enlargement of liver and spleen; in treating hydrophobia, nephropathy, general debility, dysentery, painful swollen testicles and heart diseases	WP	H
62.148.4	*Solanum khasianum* C.B. Clarke Janglee Bhindi	• Whole plant decoction influence CNS, useful in making birth control pills, also useful in AIDS. • Leaves & roots are prescribed for toxi cosis pain & oedema of vagina.	WP	H
62.149.5	*Solanum surattense* Burm.f. Kantkari	• Entire plant & fruit extract is used as interval prescriptions for bronchial problems, dysuria and for rejuvenation. • It is useful in controlling stones in bladder. • Its drug is used in muscular pain, blood cancer, vomiting & fever. • Root ash is used medicinally and is taken in alternative aphrodisiac, tonic, diuretic,	WP	H
62.150.6	*Withania somnifera* (Linn.) Dunal Ashvagandha	• Narcotic, sedative, cold, nerviness, debility, externally skin diseases and ulcer. • It is used in rheumatism, cough and dropsy. • It is administered to promote vitality in men and fertility in women • Paste of the roots mixed with mother's milk is applied to sagging breasts. • It also delays aging.	Lf& Rt	H
63.151.1	*Helicteres isora* Linn. Marorphali Sterculiaceae	• Its bark is used in diarrhoea. • Fried pods are given to children to kill intestinal worms. • It is also given in scabies, ulcer, diabetes, wounds and bloody loses motions. • It is an important brain tonic and psychotropic agent memory enhancer.	Bk & Pd	T
64.152.1	*Centella asiatica* Linn. Brahmi Umbelliferae	• Decoction of leaf is prescribed internally for rejuvenation and intestinal infection. • Dried herb is produced significant intellectual improvement and behavior changes in mentally retarded children also. • Used to cure leucorrhea and bleeding in women. • Externally, powdered seeds are dusted over wounds and ulcers.	WP	H
64.153.2	*Daucus carota* Linn. Gazar/Carrot	• Carrot is prescribed for the elimination of uric acid; increase the quantity of urine; also lower blood sugar and in palpitation. • * Carrot is also given in madness and its seeds are taken internally to remove chest pain.	Rt	H
65.154.1	*Vitex negundo* Linn. Nirgundi/Bana Verbenanceae	• Leaves, seeds are used medicinally in dyspepsia, cough and asthma. • Paste of leaves is applied to temples during headache. • Its seeds exhibit significant anti-inflammatory effects. • Oil is found to be useful for sloughing wounds and ulcer; in treating rheumatic swelling, bronchitis, cardiac disorder and diarrhea	Lf&Sd	SH
66.155.1	*Viola serpens* Wall. Banphasha/ Banaksha Violaceae	• Syrup made from the flowers, is good medicine for cough, hoarseness voice. • The syrup, when mixed with almond oil, is a gentle laxative for children and helps to soothe irritative cough and to relieve sore throat. • It is antipyretic, cooling, demulcent, diaphoretic, and useful in asthma, bleeding piles, cancer of throat and in constipation.	WP	H
67.156.1	*Curcuma aromatica* Salisb. Jangli Haldi Zingiberaceae	• Rhizome is used as tonic and carminative. • Oil from rhizome is antimicrobial, antifungal and anthelmintic. • It is also used in skin eruption and infection. • They are applied externally to bruises and sprain. • A decoction is recommended to cure the biliary gastritis	Rh	H
67.157.2	*Curcuma longa* Linn. Haldi Zingiberaceae	• Powder of rhizome is stomatic, blood purifier, externally act in antiseptic. • Its powder mixed with milk give for expediting the healing of fractured bones. • Two gm. powder of curcuma and four gm. black peeper in one cup milk is used to overcome common cold. • Two gm. curcuma with forty gm. curd is taken two times to cure jaundice. • Powder of curcuma with til oil paste on mouth remove pimples. • It also increases eye sight.	Rh	H
67.158.3	*Zingiber officinale* Rosc. Adrak/ Ginger	• Fresh rhizome juice and dried rhizome powder is used as a stimulant, carminative. • Juice of fresh rhizome with honey is good remedy for cough and cold. • Paste of ginger is a local stimulant. • Paste of ginger, cinnamon and clove is applied to forehead for neurologic headache	Rh	H
68.159.1	*Tribulus terrestis* Linn. Gokharu Zygophylaceae	• Fruits powder is taken as a sex tonic for treating impotence; urinary discharge and calculus affection. • It is prescribed in urinary diseases in painful micturition, suppression of urine. • Powder mixed with milk is administered in cough and asthma.	WP	H

Abbreviation used for life form: - H = Herb, SH = Shrub, T = Tree, CL = Climber, CR = Creeper and KH = Khumb; Plant parts used: WP = Whole Plant, Lf = Leaf, Fr = Fruit, Fl = Flower, Bk= Bark, Rt = Root, Rh= Rhizome, Tu = Tuber, Sd =Seed, So = Seed oil, Pd = Pod, Csk = Corn Silk and Clm = Clum, Ltx = Latex, Gum = Gm and Go = Gall oil

These medicinal plants were distributed among 68 families. The most important ethno-medicinal plant families were Asteraceae (14 species), Euphorbaceae (10 species), Fabaceae (10 species), Acanthaceae, Ceaselpiniaceae, Moraceae, Solanaceae (6 species each), Anonaceae, Convolvulaceae, Liliaceae (4 species each), only these 10 families accounted about 43.7% plants, although, other families were represented by at most 1, 2, 3 species each which was not in substantial. (Fig. 1) Across collected ethno-medicinal plants, majority of species were herbaceous, therefore, it has contributed the largest proportion in the lifeform (50%) followed by trees (29%), shrubs (10%), Climber (7%), Creeper and Khumb (<1% each) (Fig.2). Most of the recorded species (137) were wild plants collected from the selcted site areas, except few were cultivaeted or domesticated (22 species from 14 families). Evidently, Acharya (2012) conducted ethnobotanical study for medicinal purposes and reported 161 plant species from Resunga Hill used by Magar community of Nepal, in which majority of the plant species belong to life-form 39% as herb and 26% tree, 24 % as shrub and 11 % as climber, respectively. Parveen *et al.,* (2007) recorded 68 plants from Churu district in the Thar Desert of Rajasthan, India for medicinal information having life form in sequence of herbs followed by shrubs, trees and climbers and twinners.

In our study, most frequently used plant part to cure different ailments were leaf constituting 55 plant species followed by whole plant (43 species), bark and seed (34 species each), root and fruit (32 species each), flower (18 species) and remaining were stem shoot, bulb, rhizome, tuber and others (Fig. 3) and component-wise use of total aerial plant parts was higher (69.81%) than the underground parts (30.18%). In conformity with this, Sreeramulu *et al.,* (2013) documented 243 medicinal plants from Nalgonda and Warangal district of Andhra Pradesh; they found maximum utilization of plant source for medicnes were leaf component followed by stem bark root and whole plants and major contribution were aerial parts for medicinal uses.

In order to get utilization of each species by local people for medicinal purposes, recorded information was cotagorised into disease-wise uses of each plant species found a very interesting information i.e. highest relative utilization (41.5 %) was to cure abdominal problems, 35.8 % for Diarrhoea and Dysentry, while slightly lesser (34.6%) for skin. Moreover, some plant species were used to treat Heart problems, Leucorrhea, Urinary disease, Menusterial problems, Blood pressure, diabetes, respiratory problems, seminal weakness, AIDS, ulcer, antidote, cancer and others, respectively by local and ethnic comunities in the areas.

In our study, some new uses of plant species for medicinal purposes have been recorded are not reported in the literarture, for example, fruit or bark of *Sapondias pinnata* is used to cure menstrual irregularities, moreover, its seed kernel is also used to stop loose motion and seed-powder with combination of honey useful in cough relief; fresh leaves of Carissa spinarum is used to stop stomach pain, constipation and root paste in fever. White latex of *Calotropis procera* were used for birth of a male child, eye disease and cancer; *Ageratum conyzoides* is a weed and having negative role with agro-ecosystem but its leaf (extract) could be useful as eye lotion, whereas, *Blumea lacera* leaf extract in bleeding piles, Leaves and flowers of *Calendula officinalis* used in fever and Jaundice, Leaf extract of *Xanthium strumarium* in snake bite; Spike paste of *Salmalia malabarica* useful remedy of chalazion, and *Opuntia stricta* used as antidote. Mature fruits of *Bryonopsis laciniosa*—a herbaceous cucurbit climber are given to women to overcome sterility, treating vaginal disorders, painful menstruation and ovary dysfunction during menstrual period.

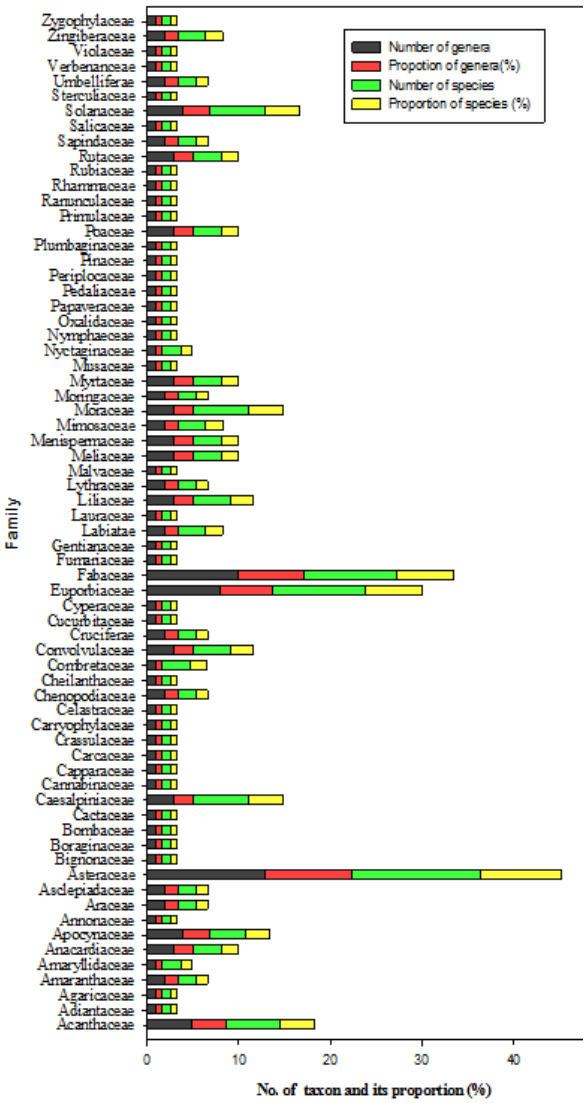


Figure 1: Family-wise species and genera distribution with its proportion of recorded ethno-medicinal plant species from selected study sites at Hamirpur and Una districts, Himachal Pradesh.

Milky extract of *Euphorbia hirta* is applied for unclear visibility and to kill abdominal worm, fruit of *Mallotus philippensis* for eye disease, leaf extract of *Dalbergia sissoo* is used to person having pungent sweating and for over bleeding for wemen during menstrual period whereas, tuber of *Pueraria tuberosa* was found to regulate menstrual cycle and bark extract of *Azadirachta indica* to cure renal and kidney diseases, *Acacia nilotica* bark powder for cancer and root powder of *Ficus religosa* increase concentration of semen, cure heart problems and in kidney failure. Syzygium cumini is a fruit bearing tropical woody and most important plant which has have many uses in diabetes, blood pressure etc. but juices of its leaf used to as aphrodiasic and leaves of *Oxalis corniculata* prepared as small ball to kept directly on teeth in teeth pain. *Cynodon dactylon* is applicable for preventing bleeding from nose and urinal problems Centella asiatica cure leucorrhoea and bleeding in women, Single plant species or in combination with other either in decoction or in powdered form generally applied to cure any ailments by a Local people as well as provided by herbal healer(s). Mostly single plant is used to cure multiple diseases (Ijinu *et al.,* 2011)

for example, *Achyranthes aspera* plant species is used cure fever, cold, cough, respiratory problems, heart problem, teeth pain (Gupta *et al.,* 2010) etc. similarly, *Tinospora cordifolia* is used to cure fever, blood pressure, diabetes, tumor or cancer. *Withania somanifera* is used to cure rheumatism, ulcer, piles, cold etc. (Zereen *et al.,* 2013). *Ficus bengalensis* is used to cure debility of seman, night fall, as stimulant. *Andrographis paniculata* is used to cure malarial, typhoid and general fever (Chandra *et al.,* 2007).

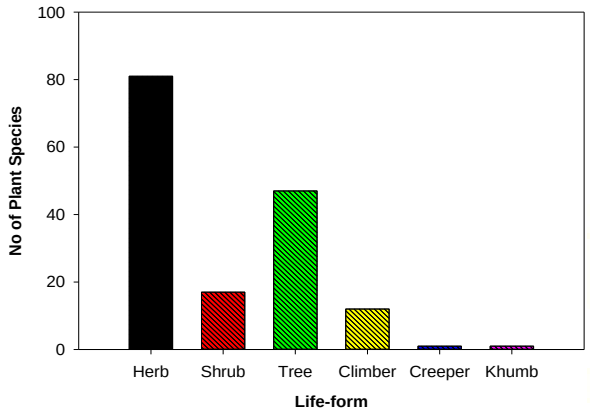


Figure 2: Total number of ethno-medicinal plant species recorded in various life-forms from selected sites at Hamirpur and Una districts, Himachal Pradesh.

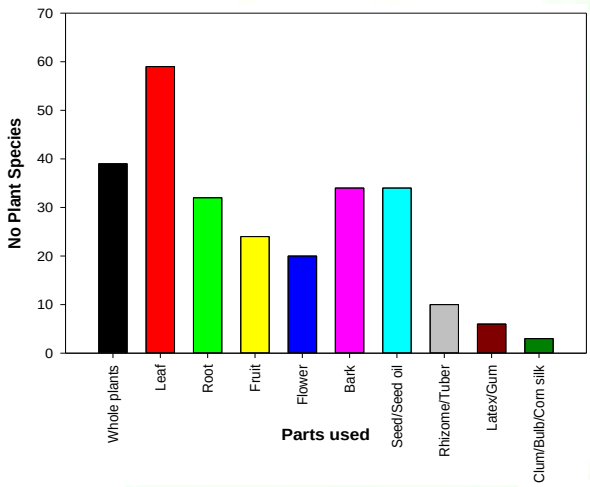


Figure 3: Component-wise uses of recorded ethno-medicinal plant species from selected sites at Hamirpur and Una districts, Himachal Pradesh.

In our study, we found that some local informants agreed that they use some particlar plants together with for a specific ailment if be required for teartment of a specific ailment. In general, there are many evidences given in the eralier literature as well as from scientific documents that combined form of a plant species can be a better and effective remedy for some non-curable ailments. In present study, leaf powder of one hundred one plants except those plants having milky extract and poisounus in nature are used to cure incurable diseases like cancer and HIV. Plants in combination of two or more plants to cure the specific disease and they might be used to cure different more diseases. On the other hand, many informants reported that two or more plants are used to cure same or specific disease, for example, Ficus *religiosa* and *Azadirachta indica* both plants are used to cure renal or kidney failure and leaves of *Vitex negundo*, *Adhatoda vasica* and *Acorus calamus* are used in combination to cure diseases like fever, stomach problems, artery blockage or heart troubles, also in chicken pox and joint pain (Jeeva *et al.,* 2007 and Ijinu *et al.,* 2011). These three plants are however highlighted with full support by the local people that nobody can die in the presence of these plants.

Conclusions

In this study, we found that selected sites at Una and Hamirpur district is rich in wild flora having with vast diversity of ethno-medicinal plants. The meeting with local rural peoples or villagers revealed that the uses of plants are in hands of limited peoples who keep the knowledge of the plants secrets to other people. Even they do not disclose this information to his/her whole family members, but they pass it to the selected members of the family and other also. They have myth that if they disclose the same to any one, the utilization quality of that plant species would be decreased. So, the information pertaining to the uses and applications for different ailments are in the hand of some Sianas or old peoples (= those people must be head of the family or group). The young generation is not well aware about the utilization of these plants and also not willing to accept or keep such information for future generation. Hence the information of their uses is not uniformly distributed among the peoples.

We collected total 159 plants belonging to 68 families, in which, most of them are wild in nature but useful for several purposes inculding medicinal. In addition, we also tried to encompass some specific cultivated or domestic plants which are in total 22 belonging to 14 families. For examples, *Aloe vera, Adhatoda vasica, Vitex negundo, Phyllanthus emblica, Terminalia arjuna, Ficus benghalensis, Vinca rosa* and *Tinospora cordifolia* used to cure heart troubles, cancer, diabetes, general disability, jaundice and lung troubles and some common plants like Basil (tulsi), Mint (Pudina), Turmeric (Haldi), Ginger (Adarak) and Red-chilli (Lal-mirch) also used to cure the day to day diseases.

Present study may provide an array and new hope to screen suitable medicinal plant species having with medicinal properties to synthesize new drugs for curring incurable diseases like cancer, HIV, diabetes and Heart troubles etc. Furthermore, conducting such study is urgently needed to document all those species existing in the remote areas those have not been explored and documented yet. In conclusion, present study could be act as backbone information to understand people-plants relationships with respect to its local climate under socio-ecological dimention.

Authors' contributions

ANS designed experimental design, RCB performed field study and drafted manuscript, CN helped in preparation and finalized manuscript, RK, AK and VK helped during field and lab study. All authors have equal role in preparation and finalizing the manuscript.

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