



Diversity and ethnomedicinal uses of flowering plants of District Reasi, of J&K-North West Himalayas (India)

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Abstract

Conventional medicines are very important part of Indian culture. In the study, the outcome of 2 years survey of ethnomedicinal uses of flowering plants in District Reasi and nearby area is reported. Information related to different plants which are used by the local tribes i.e. Gujjar, Bakerwal, Paharis and Gaddis etc. in the treatment of many common diseases and well being in the area was collected. Data on the uses of medicinal plants were collected by negotiations and conversations with the local communities. Approximately 80 species of flowering plants belonging to 47 families and 77 genera used by the local healers were reported. Further, 80 plant species collected from the study area belongs to different 4 different life forms viz. trees, shrubs, herbs and climbers. Herbs dominated the floral composition with 32 species (40%) followed by shrubs represented by 23 species (28.75%), trees 22 species (27.5%) and climbers are represented by only 3 species (3.75%). Out of 80 families, Asteraceae dominate the floral composition comprised of 6 genera and 6 species (7.5%) followed by Euphorbiaceae represented by 3 genera and 5 species (6.25%) and Rosaceae and Lamiaceae represented by 4 genera and 4 species each (5%) were the dominant families. Fabaceae, Rutaceae and Acanthaceae represented by 3 genera and 3 species and Moraceae contributed 2 genera and 3 species while rest all represented by single genera and two species each. The utilization pattern of the species indicated that different parts of the plants viz. leaves are used most widely (46 species) followed by roots (17 species), fruits (14 species), whole plant (13 species), bark (12 species), seeds (07 species), flower (06 species), resin and latex are known to use against various ailments. The medicines are prepared in the form of powder, decoction, infusion, paste, juice, extract and pill etc.

Key words: Ethno-botanical, floral composition, north west Himalayas, Reasi, tribes and life forms, utilization pattern

Introduction

The familiarity with plant species producing medicines dates back to the beginning of civilization. In India, the use of plants for medicinal purposes and human sustenance has been practiced since the Vedic age. The earliest mention of the medicinal use of the plants is found in Rig-Veda (1500-1400 BC), Athervaveda (1500BC) and Upanishad (1000-600 BC). The epic Ramayana has a reference to the Sanjivinibooti, Sandhankarni and Vishalayakarni. Work of Papyrus Ebres (1550 BC), Hypocrites (460-370), Disocoroides (78BC), Galen (131-200AD) and that of Chinese, Summerian, Babylonian, Greek and other civilizations of the world have earliest records of use of plants as medicines (Sarver, 2007). Over centuries, cultures around the world have learned how to use plants to fight illness and maintain health. Worldwide, between 50,000 and 80,000 flowering plants are used medicinally to cure different kind of

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ailments(IUCN Species survival commission, 2007;Sharma, 2013). It is documented that about 80% of the world population has faith in traditional medicines, particularly plant drugs for their primary health care (Kala *et al.*, 2006). Indian Subcontinent is renowned for its cultural and plant biodiversity where large numbers of people are still living in tribes. These tribal people possess a pool of undisclosed, ethno medicinal and ethno pharmacological information regarding the flora of their surroundings, which may prove to be very helpful in rural community with its advantage (Kumar *et.al.* 2015). There are about 45,000 plant species which are concentrated hotspots in the regions of Eastern Himalayas, Western Ghats and Andaman & Nicobar Islands. There are currently about 2, 50,000 registered medical practioners of the Ayurvedic system (Total for all traditional system: 2,91,000) as compared to about 7,00,000 of the modern medicine system. India is sitting on a gold mine of well recorded and traditionally well practiced knowledge of herbal medicines. In rural India, 70 percent of the population is dependent on

the traditional system of medicine, the Ayurveda (Bent, 2004). It is generally established that over 6000 plants in India are used for traditional folk and herbal medicines, representing about 75% of the medicinal needs of the third world countries (Dubey *et al.* 2004). As Indian Himalayan Region (IHR) is concerned large number of inhabitants of hilly areas depends on plants as they have been playing a vital role in the socio-economic development of such regions. They are the source of various components for them, e.g. food, fodder, fiber, medicine and a number of other commodities of human requirement (Tiwari *et al.*, 2010a & 2010b). State Jammu and Kashmir is a Northern most part of North West Himalayan Region and considered as one of the rich Hot spot of biodiversity because of its typical topography which supports the diverse habitats, species, population, communities and ecosystem. Vegetation ranges from tropical to alpine types (Sarver *et al.* 2009). As far as the study area is concerned, no work has been done except one or two scanty reports (Khan and Dubey, 2015, Rupali, 2013 and Sarver, 2009). Although, the area has rich repository of ethnobotanically important plants which are used widely by the tribal communities *i.e.*, Gujjar Bakerwal, Gaddis and Pahirs etc. for fulfill their daily need of life. Natural wealth as well as the undisclosed ethno pharmacological information and the tribal culture have been decreased remarkably at a disturbing rate due to change in life style, unintentional developmental programs, and mounting recent civilization. Negligence by the youth also influences the traditional knowledge. Therefore, it is necessary to discover and document this exceptional, original, and conventional information of the ethnic population, before it disappears with the knowledgeable persons. Inventory of biodiversity of any area is prerequisite for conservation and management planning (Samant and Joshi, 2003). A great need is being felt that relevant and upto date information on the inherent traditional knowledge on medicinal plants of District Reasi be made available, since the area has never been explored earlier in detail.

Aims and objectives

The primary aim of this research work was to assess the richness of ethnomedicinal plant species

used by the local tribes in forest areas and to provide an initial picture of the ethnomedicinal plants in the Distt. Reasi, which was not studied before from this viewpoint, so the present study was planned keeping in view the following goals:

- 1) Assessing the diversity, distribution, and utilization pattern of medicinal plants.
- 2) Identification and documentation of plant species used for the treatment and prevention of various diseases and ailments in the study area.

STUDY AREA:

Materials and Method

The survey was spread across the season during 2012-2014 to get maximum information following the typical protocols for the collection of ethnobotanical facts. The study was undertaken by carrying out ethnobotanical survey with the people living in the area under study (Fig. 1). The aims and objectives of the research were explained to the local tribal of the area and consulted for the recognition of knowledgeable persons (informants). These informants frequently recommended other potential informants. Few traditional healers and some religious leaders such as temple priests who are involved in the practice and prescription of medicinal plants were also interviewed. The selection criterion for the informants was the reliability and depth of knowledge each of them had. We attempted to interview people from all age groups, sex, and socio-economic and ethnic community so that informants include legislature of the entire community. In general the best informants were the older men and women who were alive at times when their culture was subjected inputs from contemporary society. Total 150 informants in the age group of 20-80 years were identified from Distt. Reasi and its surrounding areas. Out of the various informants there were 8 traditional healers and 7 temple priests. The collected data from these informants represent the whole community, because they are recognized healers, villagers, elder people, teachers, social workers, and so forth. The data was gathered involving a planned survey utilizing questionnaire with literate people and interview with the rest in local language by using interpreters. Local name of plants, taxonomic diversity, parts of the plant

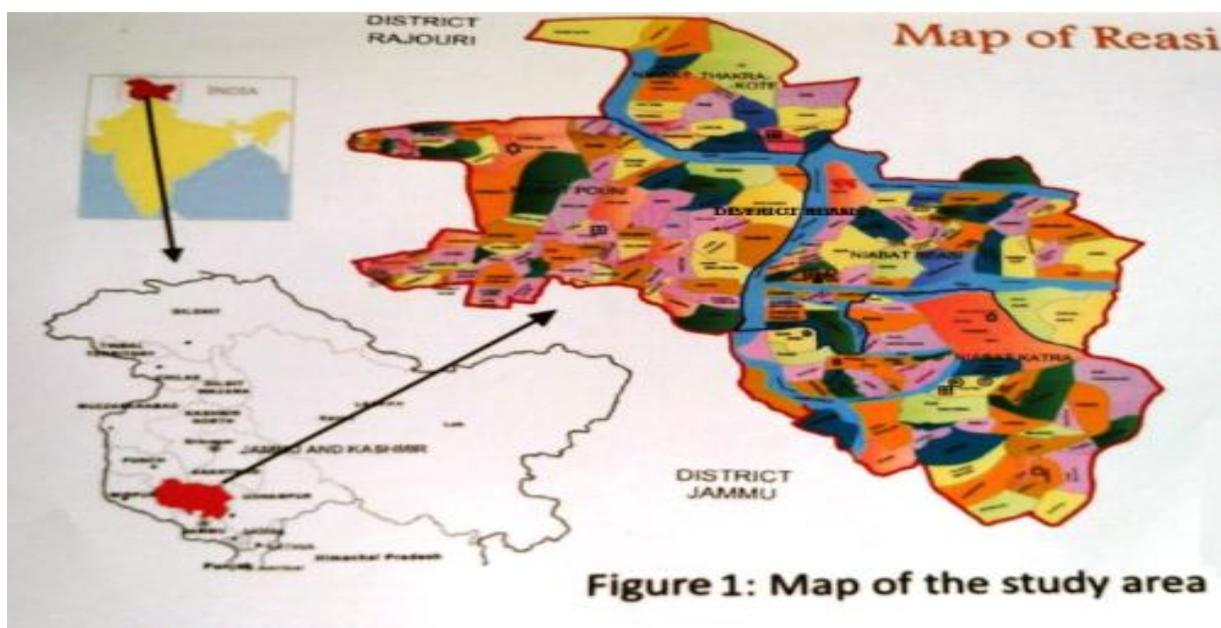


Figure 1: Map of the study area

used, indications, method and forms of preparation, and route of administration were recorded and documented by successive visit to different location and villages. The photographs of the plants were taken at their locality. Plant specimen were collected and preserved for herbarium preparation following standard procedures by Jain and Rao (1977). Identification was carried out by using Flora of Jammu and its neighbourhood by Sharma and Kachroo (1981), Flora of Udhampur by Swami and Gupta (1998), Flora of Lahul-Spiti (A cold desert in North West Himalayas) by Aswal and Mehrotra (1999), Forest Flora of Srinagar and plants of neighborhood by Singh and Kachroo (1994) and Flora of District Garhwal-North West Himalayas by R.D. Gaur (1999).

Results and Discussion

List of plant species along with their correct Botanical name, local name, family, life form, flowering period, parts used and indigenous uses etc are mentioned below in Table:1. A discussion of man being existence on this planet would not be complete without a look at the role of plants, because plants have been an integral part of human culture since the start of civilization. Ethno-botany is the learning of different methods by which communities of a particular province utilize native plants for their daily routine works, diet, outfit, medication and other activities (Aiyeloja and Bello, 2006).

For the protection and consumption of natural wealth its documentation is required (Muthu *et al.*, 2006). Several ethno-botanical studies were carried out to take record of the species used by the residents contiguous in the different area for health care. It is believed that there are still undisclosed species of plants in the rainforests and these species must be identified and explored for their undiscovered potentials and biological activities. Traditional medicine is practical application of the local therapeutically important plants as well as minerals. With every specialist that dies without an apprentice, the great medical knowledge base of their culture dies with them. Documentation of this undisclosed and traditional information is very much helpful in understanding the biodiversity (Ramakrishnappa, 2002), making of policies for the conservation of medicinal plants (Singh, 1999), and also the development of researches. The documented medicinal plants and all relevant data of present study are summarized in Table 1. Altogether 80 medicinal flowering plants belonging to 47 families and 77 genera were documented from the study area (Table.1). Asteraceae represented by 6 species (7.5%), Euphorbiaceae represented by 5 species (6.25%), Lamiaceae and Rosaceae have 4 species (5%), were the dominant families. Fabaceae, Acanthaceae, Moraceae and Rutaceae are represented by 3 species each followed by Amaranthaceae, Mimosaceae, Caesalpinaceae, Apocynaceae, Miliaceae, Malvaceae,

Table 1 List of Flora

S. No	Name of Plant Species	Local Name	Family	Life Forms	Flowering period	Parts Used	Indigenous Uses
1	<i>Abrus precatorius</i> L.	Ratti	Fabaceae	C	Aug.-Sep	Lf,Rt,Sd	Juice extracted from the leaves mixed with oil and applied on painful swellings and to promote hair growth. Decoction of roots is taken against fever, jaundice, rheumatism and dysentery.
2	<i>Acyranthus aspera</i> L.	Puthkanda	Amaranthaceae	H	Jul.-Sep	Wp	Plant powder is boiled with water and used against pneumonia. Ash of the plant is applied externally to cure ulcers and warts.
3	<i>Acacia catechu</i> (L.) Willd.Oliv.	Khair	Mimosaceae	T	Apr.-Aug.	Lf.St,Wd	Paste of fresh leaves is applied on the joints once a day for seven days to treat rheumatism. Bark used against diarrhea and dysentery
4	<i>Acacia nilotica</i> (L.) Wild.ex.Delile	Kikar	Mimosaceae	T	Mar.-April	Bk	Decoction of Bark is used for gargle against aching gums and throat disorders.
4	<i>Aegle marmelos</i> (L.) Corr.Serr.	Bill	Rutaceae	T	Feb.-Mar.	Lf, Fr	Decoction is taken against diabetes and jaundice. Green fruits are roasted in fire and seed coats removed to prepare a drink which is taken in empty stomach in the early morning to get relief from dysentery.
5	<i>Aerva sanguinolenta</i> (L.) Blume	Ser minjer	Amaranthaceae	Under shrub	Sep.-May	Lf,	The leaves and small twigs are used in tea against colds and chest discomfort. The juice of macerated leaves is applied on cuts and wounds to stop bleeding.
6	<i>Ageratum conyzoides</i> L.	NeeliJadi	Asteraceae	H	Throughout year	Wp	An infusion prepared from the leaves is employed to treat colic pain, cold, fever and diarrhea. Juice taken by crushing leaves is dropped in nose to stop nose bleeding.
7	<i>Ajuga bracteosa</i> Wall.exBenth	Neelkanthi	Lamiaceae	H	Mar.-Jul.	Wp	Plant infusion is applied on hair to kill the lice and make the hair dandruff free. Decoction of fresh leaves also used against jaundice
8	<i>Anagallis arvensis</i> L.	Changara	Primulaceae	H	Mar.-April	Wp	Leaves juice is mixed with honey and dropped into the eyes to cure dim eye sight.
9	<i>Artemisia absinthium</i> L.	Peejan	Asteraceae	H	Jul.-Sep	Wp	Plant infusion is useful to promote digestion and act as appetizer. Powder of dried flowers is most effective as vermifuge and against malarial fever.
10	<i>Asparagus adscendens</i> Roxb.	Satawari	Liliaceae	Sh	Aug.-Sep	Tuberous Rt, Ft	Roots are used to treat diarrhea and diabetes. Tuberous roots with honey are used against dysentery. Fruits are known to cause abortion.



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11	<i>Bauhinia variegata</i> L.	Kartyard	Caeselpiniaceae	T	Feb.-Apr	Lf, Fl, Bk	Bark is boiled in water to make decoction used to wash wounds in foot and mouth disease and also to cure injuries occur during plough in animals. Flowers are laxative given against constipation and flower buds are consumed against diarrhea. Ash of dry leaves is taken against cough.
12	<i>Berberis asiatica</i> Roxb.ex.DC.	Kamblu	Berberidaceae	S	Feb.-Apr.	Ft, Rt	A Locally known product 'Rasount' is prepared from the roots by boiling them in water, then strained and evaporated till a semi-solid mass is obtained and supposed to be very effective when taken in empty stomach in early in the morning against jaundice, diabetes and diarrhea. It is also used against eyesores. Bark paste is also applied to cure ring worm.
13	<i>Biden alba</i> (L.) DC.	Kumbru	Asteraceae	H	Mar.-Aug.	Lf	The leaves are chewed to cure sore throat and to expel the worm.
14	<i>Boerrhaavia diffusa</i> L.	Itt-sitt	Nyctaginaceae	H	Aug.-Dec.	Lf, Rt	2-4 tea spoons full of leaf extract is given empty stomach for the treatment of kalaazar. Roots are used as toothbrush to prevent pains in gums.
15	<i>Bombax ceiba</i> L.	Simbal	Bombacaceae	T	Jan.- Mar.	Sd,Bk, Rt	Seed paste prepared in water is applied on small pox boils. Bark paste is also applied externally against skin problems. Two spoons of water extract of roots is given to the patients for the treatment of dysentery.
16	<i>Calotropis procera</i> R. Br.	Desiakk	Asclepiadaceae	H	Dec.- May	Lt	Latex is commonly used against ringworms, skin diseases and as an antidote to scorpion bite.
17	<i>Cannabis sativa</i> L.	Pang	Cannabinaceae	H	Feb.- Mar.	Lf	The crushed leaves are rubbed on insect bites or stings to get relief from pain and to reduce swellings. The leaves are heated and tied on the aching joints.
18	<i>Capsella-bursapastoris</i> (L.) Medikus		Brassicaceae	H	Feb.-Mar.	Lf, Rt	Decoction of roots and leaves is taken against urinary trouble. Plant paste is applied externally on cuts and wounds
19	<i>Carissa opaca</i> Stapf ex. Haines	Garna	Apocynaceae	S	Apr.-Jun.	Fr,Lf,	Fruits are taken as a blood purifier. Tea made from leaves is also used against cold and cough.
20	<i>Caryopteris odorata</i> (Ham) B.L.Robinson	Neelkanthi	Lamiaceae	S	Feb.-Apr.	Lf, Bk	The powder of dry leaves and bark is sprinkled 2-3 times a day on the wounds to fasten their healing.
21	<i>Cassia tora</i> L.	Haedma	Caeselpiniaceae	H	Apr.-Sep	Lf,	Leave infusion is used against skin rashes. Leaves are cooked as vegetables and taken to control level of uric acid in the blood.
22	<i>Cedrela toona</i> Rxb.ex. RottlerWilld.	Toonu	Meliaceae	T	Mar.-April	Bk	Bark infusion is given to get relief from fever, rheumatism and applied to heel wounds.



23	<i>Cinnamomum tamala</i> (Buch.-Ham.) Nees&Eberm	Tejpatta	Lauraceae	T	Feb.-Apr.	Lf, Bk	Decoction of cinnamon and black pepper powder along with honey is said to be good in treating sore throat and malarial symptoms. Its decoction is also gargled as mouth freshener and taken internally for nausea and vomiting
24	<i>Cissampelos pareira</i> L.	BattalBael	Menispermaceae	C	Apr.-Jun.	Lf, Rt	Leaves are made into paste, mixed with flour and chapatti is taken to get relief from loose motions. The aqueous extract of the root is given three times a day against fever.
25	<i>Colebrookia oppositifolia</i> J.E.Smith	Chittisuhali	Lamiaceae	S	Jan.-Apr.	Lf	Leaves are heated and tied on fractured bone to help in the joining of bones. Leaf paste is applied to heal wounds and cure ringworms.
26	<i>Cuscuta reflexa</i> Roxb.	Aandal	Convolvulaceae	C	Jun.-Sep.	WP	Plant juice is taken along with monakka to kill the intestinal worms and applied externally to treat itchy skin and also on hair to enhance their growth.
27	<i>Dalbergia sissoo</i> Roxb.ex.DC	Tali	Fabaceae	T	Mar.-Jun.		Leaves are made into paste in a clay pot and add small quantity of water and drink it after filtration, it is supposed to be good against fever. Oil obtained from the seeds is used externally as a cooling agent.
28	<i>Dicliptera bupleuroides</i> Nees.	KaluKaa	Acanthaceae	H	Thruoghout year	Lf	Leaf paste is applied on wounds to check bleeding and juice is used against cough and gastroenteritis.
29	<i>Dodonea viscosa</i> (L.)	Santha	Sapindaceae	S	Aug.-Apr.	Lf,	Leaves are heated and tied on aching joints for relief and also used to heal wounds.
30	<i>Emblica officinalis</i> Gaertn.	Amla	Euphorbiaceae	T	Feb.-Apr.	Fr.	Fruits are laxative used to relieve constipation and piles. Amla powder mixed with kumkum, neelkamal and rosewater cure headache and also to cure urinary problems.
31	<i>Eranthemum pulchellum</i> Andrews.	Kali Branker	Acanthaceae	S	Jan.-Apr.	Lf	Leaves are boiled with mustard oil applied externally on skin cracks and blisters.
32	<i>Euphorbia heliscopia</i> L.	Dudhli	Euphorbiaceae	H	Feb.-May	Lt, Sd	Milky latex is applied on skin eruption. Seed mixed with roasted pepper is used against cholera.
33	<i>E.hirta</i> L.	Doodhi	Euphorbiaceae	H	Jan.- Dec.	Wp	Decoction of dry herb and latex is applied on pimples, leaves pounded with turmeric and coconut oil are warmed and rubbed on itchy soles.
34	<i>E.royleana</i> Boiss.	Sulyan	Euphorbiaceae	S	Mar.-Apr.	Lt.	Latex is filled in the hollow cavities of decayed teeth to cure pain and stop further decaying of teeth.
35	<i>Ficus carica</i> L.	Cheermafagori	Moraceae	T	Jun.-Sep	Lt,Fr.	Fruit decoction is used against constipation, cold and cough.



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36	<i>Ficus palmata</i> Frosk.	Fagwara	Moraceae	T	May.- Jun	Lt, Fr	Latex is applied externally for curing rheumatism and also applied on the skin where thorn is pricked, a pinch of salt is sprinkled over it and help in the removal of thorns from the deep layers of the skin.
37	<i>Flacourtia indica</i> (Burm.F.) Merr.	Kakoa	Flacourtiaceae	S	Feb.-Mar	Lf, Fr.	Tea made from leaves is given against cough and fever. Fruit decoction is given against diarrhoea, jaundice and fever.
38	<i>Grewia optiva</i> J.R.Drumm .ex.Burret	Tamman	Tiliaceae	T	Apr.-Sep.	Bk, Fr	Fruits are taken against indigestion.
39	<i>Holarrhena antidysentrica</i> L.Wall	Kugad	Apocynaceae	S	Apr.-Jul.	Bk, Sd	Bark is mixed with cow's urine and applied against skin allergies.
40	<i>Ipomea carnea</i> Jacq.	Akk	Convolvulaceae	S	Throughout year	Lt, Rt	Roots are boiled with water to used as laxative and also to provoke mensuration.
41	<i>Justicia adhatoda</i> L.	Branker	Acanthaceae	S	Feb.-Apr.	Lf	Leave decoction is mixed with 4 tea spoonful mishri and given ½ glaas to children for 1-2 days against cough. Green leaves are tied to the stomach of babies to cure constipation and on the head to cure fever.
42	<i>Mallotus philippinensis</i> (Lamak.) Muell. Arg	Kamel	Euphorbiaceae	T	Sep.-Nov.	Lf, Sd	Powder of seeds is taken with milk against tapeworms.
43	<i>Malvane glecta</i> Wallr.	Souchal	Malvaceae	H	Jun.-Sept.	Lf, Rt	The leaves are cooked and taken against constipation, cough and stomach upset.
44	<i>Malvestrum coromandelianum</i> (L.) Grack.	BadiBaryaad	Malvaceae	H		Lf	Leaf paste is applied on wounds, cuts and sores.
45	<i>Maytenus royleana</i> (Wall.ex M.A. Lawson) Cufod.	Leeya	Celastraceae	S	Feb.-Mar.	Lf	The fruit is placed in the mouth to relieve toothache and also used to relieve muscles and joint pain.
46	<i>Melia azadirach</i> L.	Draink	Meliaceae	T	Mar.-Apr.	Lf,	Leaf extract is taken 5ml orally thrice a day against bleeding piles. Fresh leaf extract is applied externally in case of burns and gargled as mouth wash against bleeding gums.
47	<i>Micromeria biflora</i> (Buch.-Ham ex D.Don) Benth.	Tande	Lamiaceae	H	Throughout year	Lf,Rt	Leaf extract along with milk is taken against gastroenteritis .Root paste is pressed between the jaws to treat toothache.
48	<i>Morus alba</i> L.	Toot	Moraceae	T	Feb.-Jun	Fr, Bk, Lf	Fruits are taken against weakness, dizziness, fatigue, anemia, to promote digestion and appetite and eliminate constipation
49	<i>Murraya keonigii</i> L.	Curry Patta	Rutaceae	S	Mar.-Aug.	Lf, Bk, Rt	The bark and roots are used externally to cure skin eruption and bites of poisonous animals and also used as a tonic and stomachic.



50	<i>Oenothera rosea</i> L.Her.exAiton		Onagraceae	H	Apr.- May	Lf	Leaf infusion is used against hepatic pains and kidney problems.
51	<i>Oxalis corniculata</i> L.	Ammi	Oxalidaceae	H	Throughout year	Lf	Leaf juice mixed with butter is applied to cure muscular swelling and pimples. Paste of plant is applied on head to relieve headache.
52	<i>Periscaria chinensis</i> (L.)		Polygonaceae	H	Mar.-Nov.	Wp	Leaf paste is applied to treat skin ailments. Plant infusion is against skin ailments.
53	<i>Phoenix sylvestris</i> (L.)	Khajoor	Arecaceae	T	Mar.-May	Fr, Rt	The fruits are given in fever, constipation and vomiting. The roots are chewed to stop toothache.
54	<i>Acorus calamus</i> L.	Bariyan	Acoracea	H	Mar.-Apr.	Wp	Herb is effective against digestive disorder. Root are internally used to treat bronchitis and externally used to treat skin eruptions, rheumatic pain and neuralgia.
56	<i>Pistachia integerrima</i> Stewart	Kakri	Anacardiaceae	T	Mar.-Apr.	Galls, Lf	The galls are used to made 'kakarsinghi' an herbal medicine used traditionally to cure cough asthma, dysentery and diarrhea. A mixture of gall powder and honey is taken thrice a day to recover from asthma and pneumonia.
57	<i>Plantago lanceolata</i> L.	Bhummukaa	Plantaginaceae	H	Apr.- Sep.	Lf, Sd	Tea made from leaves is used as highly effective medicine for cough .Leaf powder is used as an antiseptic and leaf paste is used for all types of sores on the skin, cuts, bites and various inflammations.
58	<i>Plumbago zeylanica</i> L.		Plumbaginaceae	S	Mar.-May	Lf, Rt	Roots are used to improve digestion and increase appetite and root paste applied externally on ringworm and wounds.
59	<i>Portulaca oleracea</i> L.	Kulfa	Portulacaceae	H	Apr.-Sep	Wp	Crushed leaves are applied directly on the skin to treat burns, insect stings, sores and acne.
60	<i>Potentilla indica</i> (Andrews) Th. Wolf	Koku	Rosaceae	H	Mar.-Jun.	Wp	Leaf extract is used to cure diarrhoea
61	<i>Punica granatum</i> L.	Darooni	Lythraceae	S	Apr.- Jun	Fl, Fr	Fruit juice is used to treat jaundice. The rind of fruit is ground in water and taken every morning to cure diabetes. The 'chutney' made from seeds is given in diarrhoea.
62	<i>Pyrus pashia</i> (L.) Butch-Ham ex D.Don	Kainth	Rosaceae	T	Feb.-Mar	Rs, Fr	The resin is boiled in water, cool down and dropped into ears against earache and deafness. Leaf paste is applied on hairs for their better growth.
63	<i>Ranunculus muricatus</i> L.	Churmbra	Ranunculaceae	H	Mar.-Aug.	Lf	The plant is used to treat fever, gout and asthma
64	<i>Reinwardtia indica</i> Dumort	Bal Basant	Linaceae	S	Nov.-Feb	Lf	Crushed leaf are used to heal wounds, petals are chewed as tongue wash
65	<i>Rosa</i>	Rowari	Rosaceae	S	Mar.-Apr.	Leaf, Fl	Leaf and flower juice is applied



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	<i>brunonii</i> Lindley						on wounds. Dried flower powder is given against diarrhea. Decoction of leaves with cow's urine is applied on cuts and wounds
66	<i>Rubus ellipticus</i> Smith	Akhe	Rosaceae	S	Jan.-Mar.	Rt, Lf	Decoction of leaves with cow's urine is applied on cuts and wounds. Extract of roots is given half tea spoonful twice a day, in the treatment of stomachache for 7-21 days.
67	<i>Rumex nepalensis</i> Spreng.	Ammi	Polygonaceae	H	Apr.-Aug.	Lf	Leaf infusion is given to get relief from painful menstruation and stomachache. Leaf extract is used as a remedy for the sting of nettle and skin sores.
68	<i>Saussurea heteromella</i> (D. Don) Hand.-Mazz.	Kaliziri	Asteraceae	H	Mar.-Aug.	Lf, Rt	Leaf paste with mustard oil is rubbed on wounds. Root extract is given against fever.
69	<i>Silene dioica</i> (L.) Clairv	H	Caryophyllaceae	H	Feb.-Apr.	Sd	The seeds when crushed are used against snakebites.
70	<i>Solanum nigrum</i> L. Skeels	Kayan	Solanaceae	T	Mar.-May	Wp	The fruits are eaten to treat abdominal pain. Plant infusion is used to cure dysentery, fever and asthma.
71	<i>Syzygium cumini</i> (L.) Skeels	Tallan	Myrtaceae	T	Mar.-May	Bk, Lf.	Fresh bark juice is used to cure diarrhea. Bark and leaf extract is given against diabetes, bronchitis, asthma and ulcers
72	<i>Taraxacum officinale</i> Weber	Dudhal	Asteraceae	H	Feb.-Oct.	W	Dried rhizome decoction along with sugar is taken orally twice a day for 6-7 days during jaundice. Root paste is mixed with milk, applied on burnt parts of the body for immediate healing and to reduce pain. Dried roots and leaves powder is given twice a day for the treatment of jaundice and abdominal pains.
73	<i>Trifolium pretense</i> L.	Shattali	Fabaceae	H	Apr.-May	Wp	The dried pods are used in cough and bronchitis.
74	<i>Verbascum thapsus</i> L.	Ban Tamaku	Scrophulariaceae	H	Jan.-Jun.	Fl	Flowers are boiled and extract is used for the treatment of whooping cough and chronic bronchitis
75	<i>Viola cinerea</i> Boiss	Banaksha	Violaceae	H	Feb.-Mar	Wp	Infusion of herb is taken to treat cough, sore, and indigestion.
76	<i>Vitex negundo</i> L.	Bana	Verbenaceae	T	Mar.-Oct	Lf, St, Fl	Decoction of the roots is taken for 3 times a day for 3-4 days to cure cough, cold and fever. Twigs are used as toothbrush. Leaves mixed with cow dung are massaged during backache.
77	<i>Woodfordia fruticosa</i> (L.) Kurz	Dhain	Lythraceae	S	Jan.-Apr.	Fl.	The powder of dried flowers sprinkled over ulcers and wound has helped in their healing and also taken daily to purify the blood.
78	<i>Xanthium strumarium</i> L.	Jojda	Asteraceae	S	Jul.-Dec.	Lf	Leaf decoction is recommended in long standing malarial fever. Root decoction has been used in the treatment of high fever and also improve appetite and



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							memory.
79	<i>Zanthoxylum armatum</i> DC., Prodr.	Timbru	Rutaceae	S	Mar.-May	Wp	Leaves and fruits are chewed for mouth wash and tooth care. Young shoots are used as toothbrush against pains in gums. Timbru soup is given to treat common stomach complaints
80	<i>Zizyphus mauritiana</i> Lam.	Ber	Rhamnaceae	T	Jun.-Aug.	Fr, Lf, Rt	The fruits mixed with salt and chilli pepper is given against indigestion. Crushed leaves mixed with gur and soap, applied as poultice on boils. 2 tea spoonful roots extract is given twice a day for 3 days to cure malarial fever.

Convolvulaceae, Polygonaceae and Lythraceae contain 2 species each and rest 30 Families contain single species and single genera. Among the Genera, Euphorbia (3sp.), Ficus and Cassia (2 sps. each) were the dominant genera and rest were monogeneric. There were mainly four types of growth forms including Herbs, Shrubs, Trees and Climbers. Herbs make up the highest proportion of the medicinal plants species followed trees, shrubs and climbers in descending order. Thirty two species belonging to 21 families and 31 genera (40%) were herbs, 23 species belonging to 16 family and 22 genera (28.75%) were shrubs, 22 species belonging to 14 families and 19 genera (27.5%) were trees and 3 species belonging to 3 families and 3 genera (3.75%) as represented in Fig 2.

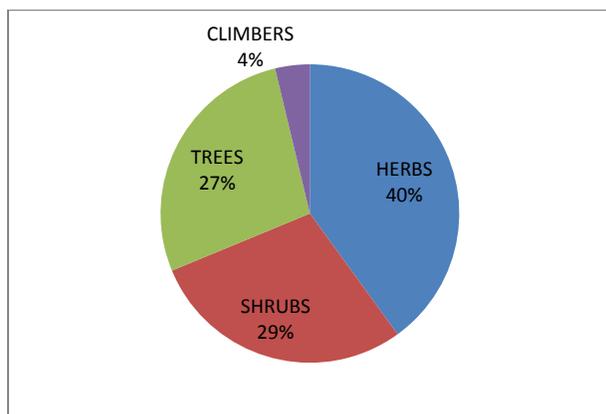


Fig: 2 Distribution of Life Forms

The common ailments among the people living in the study area were skin problems, indigestion, respiratory problems, fever, dysentery and diarrhoea, jaundice, toothache, Rheumatism, Antidote, diabetes and urinary problems etc. All the parts of the plants

i.e. leaf, flower, fruit, root, bark, seed and shoot were used as a source of drugs. The leaf (46 sps.) was widely used part followed by roots (17 sps.), fruits (14 sps.), whole plants (13 sps.), bark (12 sps.), seed (7 sps.), flower and latex (6 sps. each), resin (2sps.) and stem (1 sps.) as represented in Fig 3. The plant parts are consumed in the form of a decoction, paste, extract, powder, juice and infusion etc. Sometime, the same plant was used by the tribal for more than one diseases and single disease was treated by several plant species. In such cases it is difficult to assess which plant is actually effective in curing a particular disease or condition.

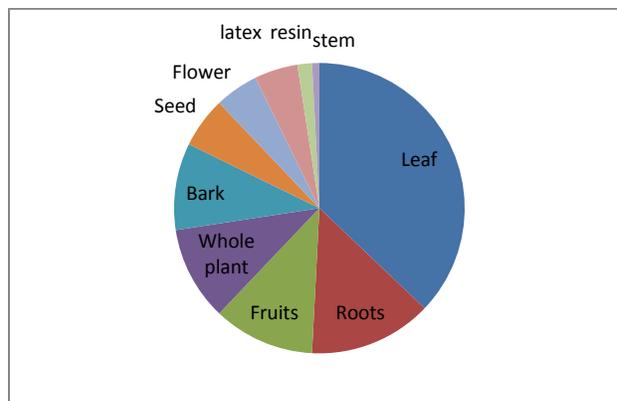


Fig: 3 Distribution of Plant Part used

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