

ETHNOMEDICINAL POTENTIAL OF PLANTS OF CHANGA VALLEY DISTRICT SHANGLA, PAKISTAN

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Abstract

Comprehensive field studies were conducted to elaborate the ethnomedicinal plant potential of Changa valley district Shangla, Pakistan. The study revealed that a total of 50 taxa, belonging to 32 families are used for medicinal purposes. Out of which 2 species are Pteridophyte i.e. *Adiantum venustum* D. Don, *A. capillus-veneris* L. and one Fungi i.e. *Morchella esculenta* (L.) Pers ex Fr. Furthermore, the number of perennial herbs, annual herbs, shrubs, trees and biennial herbs were 28, 9, 7, 5 and 1 respectively. As majority of the locals still rely on these plant resources, especially for curing various ailments through indigenous medicine system, therefore loss of these plant resources will, to a certain extent, hamper the existing healthcare system in the area. Therefore measures for conservation of these plant resources are urgently needed.

Introduction

Changa valley is located between 34° 11' 22.1" N and 72° 15' 10.3" E on the globe. The valley is bound in west by Ghwarband, in north-east by parts of Swat i.e., Behrain and Kalam, in south by Kotke and Yakhtange (Fig. 1). The valley has an area of 11528 acres. Topographically the valley is narrower in the beginning at Lelonai with altitude of 1499m, becomes wider towards north and altitude rises up to 3590m in Chaper Sar. The only watershed is in the form of a stream, originated in Miandam on one side and Ganshal on the other and runs to Alpuri. Phytogeographically the valley is categorized as a typical representative of Sino-Japanes region (Ali & Qaiser, 1986). The valley has altitudinal variation ranging from 1400m in the south to more than 3500m in the north while the highest peaks are Bera Charai and Chapere Sar, having an altitude of 2850m and 3590m respectively.

Precipitation is in the form of rainfall and heavy snow fall starts by the end of November on high peaks and descend downwards as temperature falls till March. Temperature rises up to 30°C in the month of June and July while generally remains below freezing point in the months of January and February. Summers are pleasant while winter season is very harsh due to heavy rainfall. Annual rainfall is in the range of 300-1400 mm. (Anon., 1998). Four major tribes reside in the valley i.e., Yousufzai, Mia, Mullah and Gujors. They depend on natural resources for their subsistence. Agriculture is the main source in this context. Maize is cultivated as Kharif crop while wheat is the major Rabbi crop of the area. Due to the unavailability of modern healthcare facilities and poor economic condition, the locals are compelled to use medicinal plants as primary source of their healthcare. About 70-80% of the populations in Himalayan region depend upon traditional medicine for their healthcare (Pie & Manandhar, 1987). While in Hindukush-Himalaya about 10% of the total plants can be used for medicinal purposes (Pie, 1992). Hocking (1958) estimated that in early 1950 up to 84% of the Pakistani populations were dependent upon traditional medicine for all or most of their medicinal needs. Furthermore, about 50% of the drugs presently used in modern medicine are prepared synthetically from petrochemical based raw material in the country.

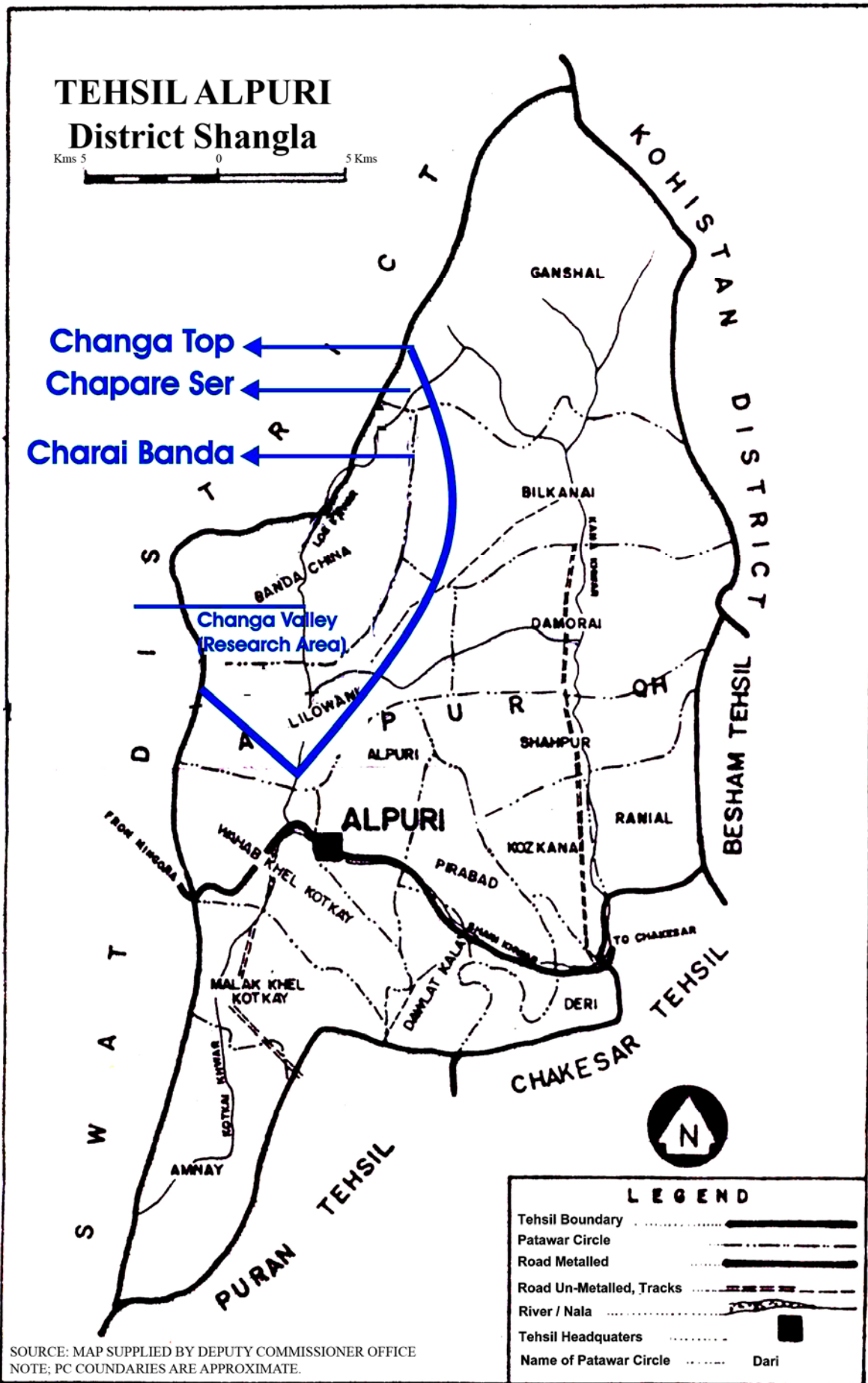


Fig. 1. Location map of the study area (Changa valley, district Shangla).

According to Ali (2008) a total of 5521 taxa are identified, majority of which are confined to the mountainous areas of the country (Ali & Qaiser, 1986). Exploration and documentation of indigenous knowledge of these mountainous and remote valleys of the country is urgently needed (Ali & Qaiser, 2009). No attempts have been made to document the indigenous knowledge of the study area; this might be due to the remote nature and various sociopolitical constraints. Basic objective of the present study is to document the indigenous knowledge of wild plants of entire Changa valley and provide scientific basis for further research.

Materials and Methods

Comprehensive field studies were conducted from April to the end of August 2005. Plant specimens were collected along with their habit, habitat, vernacular name, part used and local uses. Efforts were made to collect the ethnomedicinal information from people of different ages and different ethnic groups in order to collect the most authentic information. Importance was given to educated and elderly people as their knowledge and experience are considered as comparatively more authentic, and the complete recipe was recorded through audio recording device for further confirmation and future reference. Plant specimens collected were properly pressed, dried, preserved, mounted on standard herbarium sheets and identified with the help of flora of Pakistan (Nasir & Ali, 1970-1979: Nasir & Ali, 1980-1989: Ali & Nasir, 1989-1992: Ali & Qaiser, 1993-2009) and as far as possible on more recent available data on other taxonomic work. We have followed Boulos (1983) for western medical terminology. The plant specimens are deposited into the herbarium Department of Botany, University of Peshawar.

Results and Discussion

The current study covers 50 plant species belonging to 32 families; representing Pteridophytes, Fungi, Dicots and Monocots. Depending upon plant habit, they are broadly divided into herbs, shrubs, trees and climbers. Plants are valuable natural resources and play a key role in human development as it provides all the primary necessities such as food, shelter, clothing and medicines. About 80% of the world population still depends on the traditional medicines. Pakistan has about 40,000 registered practitioners of traditional medicine and majority of the population, especially in villages, is getting health care by 'Tabibs' (local healers). It is estimated that 60% of the population use the herbal prescriptions of traditional practitioners (Haq, 1983).

The ancient system of herbal medicine is practiced in Pakistan while traditional Tabibs use various plant species for treatment of various diseases. In Indo Pak Sub-continent, traditional and indigenous system of health care has always remained the most popular system of health care practice. With the passage of time, the Greeko-Arabic system of medicine made its headway in the India during Mughal Empire. It was compiled in the form of Rig Veda from 4500-1600 B.C and Ayurveda from 2500- 600 BC (Zaman & Khan, 1972). The latter is still practiced under the name of Verdic medicine. Greeks modified Verdic's into Unani system which was modified into Hikmat or Tibb by Muslim scholars (Khan, 1951)

Medicinal plants are continuously used as a major source of drugs for the treatment of many health disorders all over the world. About 400-600 medicinal plant species out of 5700 are estimated to exist in Pakistan. It is estimated that in the early 1970, 84% of Pakistani population was dependent on traditional medicines while an estimated 80% of the rural population of Pakistan still depends on traditional medicines for their primary healthcare needs while 90% of the country medicinal herbs are imported (Atta-ur-Rahman & Choudhary, 2003).

The Changa valley has a rich flora and is a hot spot of biodiversity. Most plant species of the valley are of wild type. The local people depend on the wild plants in the form of foods, shelters medicines, wood, fodder etc. The use of these medicinal plants for primary health care is a common practice in the valley and the main reason for using traditional medicine is their socio economic condition, high price of medicine and lack of modern health care facilities is also one of the reasons for adapting the traditional system for various curative diseases.

A total of 1711 plant specimens were collected from different parts of the valley. Some important medicinal plants of the valley are *Berberis lycium* (Kware), *Viola pilosa* (Banafshah), *Valeriana jatamansii* (Mushke bala), *Podopyllum emodi* (Kakora), *Paeonia emodi* (Mamekh), *Adiantum venustum* (Sumbal), *Geranium wallichianum* (Sra zela) *Polygonatum verticillatum* (Nor-e-Alam), *Ajuga bracteosa* (Booti), which are frequently used for traditional health care in the valley, but over collection and over grazing have threatened these species. Utilization of plants as medicine, fodder, timber and fuel wood purposes are the main resources of subsistence for the locals. Local inhabitants, medicinal plant dealers and practitioners (Hakeems) collect medicinal plants through traditional way. Collection at proper time and preservation is very crucial for getting good results, but most of the collectors are ignorant and have insufficient knowledge about these valuable plants. Availability of medicinal plants decreased day by day due to urbanization, construction of roads and increased demand of crops cultivation in the valley. There is need of awareness among the locals to protect and make sure the sustainable use of medicinal plants in the valley and identify the factors affecting the availability of medicinal plants in the area.

Plants like *Adiantum venustum*, *Ajuga bracteosa*, *Berberis lycium*, *Bergenia ciliata*, *Bistorta amplexicaulis*, *Dioscorea deltoidea*, *Diospyros lotus*, *Geranium wallichianum*, *Hedera nepalensis*, *Hypericum perforatum* and *Thymus linearis* have market values and strong linkages should be developed among the locals to improve the economy of the locals. In order to reduce pressure on the utilization of plant resources, aquaculture and silviculture should be introduced in the valley. Deforestation is common in the area. There is no effective legislation and monitoring on the locals to control deforestation in the area. Ignorance, poverty and lack of scientific knowledge also create pressure on the vegetation and result is degradation of environment. The Plant Biodiversity of the area is under heavy biotic pressure of grazing, fuel wood collection, illegal logging of wood, medicinal plants collection and ecotourism. Biotic pressure can be reduced by providing alternate source of energy like gas and electricity in the valley. The main aim of the study is to document and explore the indigenous knowledge of local people about plants.

Important medicinal plants along with their pertinent information like botanical name, vernacular name, local uses etc., are discussed as follows:

Table 1. Ethnobotanical information of all the taxa collected from the study area.

Voucher specimen #.	Botanical name	Vernacular name	Habit	Part used	Local and medicinal use
2	<i>Achyranthes aspera</i> L.	Geshkay	Perennial herb	Root and shoot	Plant is diuretic and laxative; an infusion prepared from the root of plant is utilized to remove stones from kidney
48	<i>Aconitum heterophyllum</i> Wall. ex Royle.	Sarba zela	Perennial herb	Rhizome	It is bitter in taste and is used in various preparations as expectorant, stomachic and tonic. It is also used in dysentery, diarrhea fever and vomiting.
170	<i>Aconitum violaceum</i> Jacquem. ex Staf. (Fig. 2-A)	Ghra zaher	Perennial herb	Rhizome	The plant is highly poisonous and may cause death when taken as such. Rhizome is tied in the sheep or goat intestine and then it is boiled thoroughly in milk. The milk is then removed and the rhizome is dried and then powdered. This powder is used against rheumatism and arthritis.
19	<i>Adiantum capillus-veneris</i> L.	Sumbul	Perennial herb	Fronds	Plant is used for lowering body temperature and also used for cleaning and sparkling of teeth and effective against toothaches. Fronds are also diuretic, expectorant and tonic.
136	<i>Adiantum venustum</i> D. Don	Parsushah/Sumbul	Perennial herb	Fronds	The fronds are boiled in water, cooled, and the filtered water is used for eye trouble. It is also taken for headache and cough. It is also used for curing the infection of urinary bladder. Decoction is considered as coolant diuretic and expectorant.
94A	<i>Ailanthus altissima</i> (Mill.) Swingle	Shandai	Tree	Gum	Plant is anthelmintic and gum resin is mixed with milk to treat dysentery.
108	<i>Ajuga bracteosa</i> Wall. ex Benth.	Buti	Perennial herb	Leaves	Decoction is used in kidney pain. Fresh plant is powdered and its extract is used for ulcer and jaundice. Leaves of the plant are boiled in water; it is then cooled and is used for abdominal pain, itching and also used to purify blood. The leaves are also used as cooling agent. The leaves of the plant are kept in water for 24 hrs, the leaves are then removed and juice of plant is used for stomach problem.

Table 1. (Cont'd.).

Voucher specimen #.	Botanical name	Vernacular name	Habit	Part used	Local and medicinal use
41	<i>Allium humile</i> Kunth	Ghra pyaz	Biennial herb	Leaves	Leaves are stimulant, diuretic, expectorant, carminative, anti-hypertensive and also used for stomach disorders.
129	<i>Artemisia absinthium</i> L	Tarkha	Perennial herb	Leaves, shoots	Plant is effective against malarial fever and cough.
55	<i>Asparagus officinalis</i> L. (Fig. 2-B)	Shal gutte or Punja	Perennial herb	Rhizome	The root is tonic and demulcent. <i>Asparagus</i> are well known as a diuretic and laxative also used for uterine tumors and leucorrhoea. Rhizome is taken with boiled milk and sugar for dysentery and diarrhea.
80	<i>Berberis lycium</i> Royle	Kware, Ziyar largay	Shrub	Leaves, fruits, bark	Fruits are edible. Root and stem bark is tonic and also used as refrigerant. Decoction of root is used as aphrodisiac. Root is considered as antiseptic. It is tied upon the fractured bones and utilized for healing of internal and external wounds and arthritis. Bark of the root is powdered and utilized for ulcer and also carminative. Also used in child birth/delivery cases.
131	<i>Bergenia ciliata</i> (Haw) Sternb. f. <i>ciliata</i> Yeo	Ghat pana (Zakhm-e-Hayat)	Perennial herb	Root	Root is powdered and used as anti-diabetic and expectorant. Root is considered as tonic and used for curing muscular pain. Also utilized as general body tonic. The root is also used for sunburn, stomachache and eye tearing in various preparations.
157	<i>Bistorta amplexicaulis</i> (D. Don) Green var. <i>amplexicaulis</i>	Tarwa pana, Anjabar	Perennial herb	Leaves, root	Rhizome is powdered and is taken with water for treatment of gout and rheumatism. Special tea is prepared from the rhizome, which is then used for fever and flue. The rhizome is also effective to cure ulcers.

Table 1. (Cont'd.).

Voucher specimen #.	Botanical name	Vernacular name	Habit	Part used	Local and medicinal use
117	<i>Celtis caucasica</i> Willd.	Tagha	Tree	Fruits	Fruits are used in colic and also utilized for curing allergy in various preparations.
4	<i>Chenopodium album</i> L.	Sarmay	Perennial herb	Whole plant	The oil is aromatic. Powder of the plant is useful for abdominal pain. The juice of plant is effective against gas trouble.
28	<i>Coriandrum sativum</i> L.	Dhanya	Annual herb	Fruits and seeds	The fruits are diuretic, stimulant, carminative, tonic and stomachic. Decoction of the fruits is used for jaundice and considered as coolant. The fruits are considered as highly effective in flatulent and colic.
46	<i>Datura stramonium</i> L.	Harhanda	Perennial herb	Young leaves, seeds	The plant is also used for curing fever, diarrhea and skin disease. It is also used for jaundice and stomach problems. The juice of flower is useful in earache. Seeds are used against urinary disorders.
115	<i>Dioscorea deltoidea</i> Wall. ex Kunth	Qanis	Perennial herb	Root	Roots are used as vermifuge especially for children. The root is effective as a uterine sedative. They are effective in expelling tap worms from the body. The tubers are diuretic and expectorant. Also used for fishing.
49	<i>Eleusine indica</i> (L). Gaertn.	Methana	Perennial herb	Whole plant	It is considered as diuretic, stomachic and used against hypertension and retention of urine.
38	<i>Ficus carica</i> L. subsp. <i>carica</i>	Anzer	Tree	Fruit, latex	Fruits are laxative and used as nutritive, antispasmodic, and also used in constipation and urinary bladder problems.
7	<i>Fumaria indica</i> (Hausskn.) Pugsley	Papra	Annual herb	Fruits and shoots	Juice of the plant is used in stomach problem, fever and itching. Decoction of the plant is used for blood purification. The extract of plant is useful for jaundice and has cooling effect, also used for eye trouble.

Table 1. (Cont'd.).

Voucher specimen #.	Botanical name	Vernacular name	Habit	Part used	Local and medicinal use
107	<i>Geranium wallichianum</i> D. Don ex Sweet	Sra zela	Perennial herb	Root	It is considered as tonic and is used to lower the blood pressure and is also effective against jaundice while decoction of plant is used for fever and cough.
79	<i>Hedera nepalensis</i> K. Koch	Prewathe, Zelye	Perennial herb	Leaves, fruit	The leaves are stimulant and decoction of leaves is used for abdominal pain, also diuretic and is effective against urinary trouble. Leaf extract is used for curing diabetes. Fruits are purgative while the leaves are also utilized for curing blood pressure.
57	<i>Hypericum perforatum</i> L.	Shin Chae	Perennial herb	Leaves, flowers	Plants are used as astringent and diuretic. Flowers are used to treat piles and prolapsed uterus.
37	<i>Isodon rugosus</i> (Wall. ex Benth.) Codd	Spairkey	Shrub	Whole plant	Antiseptic and also used as remedy for toothache.
59	<i>Mentha longifolia</i> (L.) L.	Valene	Perennial herb	Whole plant	The fresh leaves are used in constipation. Dried leaves are crushed, powdered and is used for diarrhea and also effective against abdominal pain. The dried leaves are mixed with Qahwa (green tea), which is given in case of vomiting. Plant is also used as stimulant and antiseptic.
35A	<i>Morchella esculenta</i> (L.) Pers ex Fr.	Gujae	Annual herb	Fronds	The fronds are fried and eaten for its delicious taste. It is highly pertinacious and the current market rate is PK Rs.20,000/kg (dried form). It is considered as general body tonic, one of the important and precious fungal plants, which can play a leading role in economy of the area. It grows under shady plants and is mostly collected by local woman and children during March-May at 1500-2500m.
110	<i>Morus alba</i> L.	Spin Toot	Tree	Fruits, leaves and bark	The bark is used as purgative and vermifuge. The leaves are considered as diaphoretic and emollient. The fruit is refrigerant and also effective to enhance the digestion.

Table 1. (Cont'd.).

Voucher specimen #.	Botanical name	Vernacular name	Habit	Part used	Local and medicinal use
31	<i>Nasturtium officinale</i> R.Br.	Tarmeera	Annual herb	Whole plant	An infusion prepared from the herb is diuretic. The plant is antiseptic, stimulant and also used in chest trouble.
87	<i>Olea ferruginea</i> Royle	Khona	Tree	Wood, leaves, bark	Locally considered as holy tree of graveyard. Oil obtained from the fruits is used as rubefacient and is also effective in rheumatism. Branches and stem are used for constipation. Leaves and bark is antiseptic, diuretic and also used as tonic. Decoction of leaves is also used for toothache.
62	<i>Oxalis corniculata</i> L.	Zmake taroke	Annual herb	Leaves	The fresh leaves are utilized to stop bleeding from wounds. The juice of plant is effective in stomach problems. The leaves are also refrigerant and have cooling effect. Decoction of roots is used as vermifuge.
146	<i>Paeonia emodi</i> Wall. ex Royle var. <i>emodi</i> (Fig. 2-C)	Mamekh	Perennial herb	Rhizome	Rhizome is boiled in milk and the extract is used for backache, general body weakness and also effective as sexual tonic. Seeds are purgative. It is also considered as blood purifier.
122	<i>Plantago lanceolata</i> L.	Jabai	Perennial herb	Leaves and seeds	Leaves are considered as astringent. Extract of leaves is applied to wounds and inflamed surfaces. It is effective against dysentery and mouth diseases. Leaves are also considered as refrigerant.
40	<i>Plantago major</i> L.	Ghata jabai	Perennial herb	Leaves and seeds	Leaves are warmed and added with flour of maize and applied externally on ruptured skin. Leaves are refrigerant and astringent while the seeds are tonic and also used as coolant. The seeds are mixed with honey and then used in constipation. The inflorescence of plant is utilized for measles in children.

Table 1. (Cont'd.).

Voucher specimen #.	Botanical name	Vernacular name	Habit	Part used	Local and medicinal use
150	<i>Podophyllum emodi</i> Wall. ex Royle (Fig. 2-D)	Kakora	Perennial herb	Rhizome	Fruits are used as general body tonic. Seeds are powdered and taken with glass of water as general body tonic. The powdered rhizome is used against jaundice and other liver diseases. Also considered as hepatic stimulant, emetic and purgative. Rhizome is used for rheumatism, general body weakness and as aphrodisiac.
159	<i>Polygonatum verticillatum</i> (L.) All.	Norialam	Perennial herb	Rhizome	Rhizome is expectorant, and effective to clear the phlegm. Rhizome is also considered as antibacterial
162	<i>Primula denticulata</i> Smith	Asli	Perennial herb	Rhizome	Fresh juice is considered as refrigerant and used in urinary problems. The pulp of fruit is cardiac stimulant. Epicarp of the fruit is effective against gonorrhoea, urinary diseases and for bronchial asthma. Leaves and pericarp of fruits are used in dysentery and whooping cough. Bark of stem is used for curing fever.
66	<i>Punica granatum</i> L.	Mamera Anangoray, Narsaway, Khona	Shrub	Fruit, bark, leaves	Decoction prepared from the plant, is used for asthma and fever.
12	<i>Ranunculus muricatus</i> L.	Ziargulay	Perennial herb	Leaves	Oil is purgative while seeds are sedative. An infusion prepared from the plant is utilized for skin especially for inflammation.
36	<i>Rhicinus communis</i> L.	Harhanda	Shrub	Seeds, Oil	Leaves of the plant are stimulant and juice of the flowers are used as remedy for eye trouble.
58	<i>Rosa webbiana</i> Wall. (Fig. 2-E)	Ghra gulab	Shrub	Leaves	The leaves are diuretic and astringent. Its shoots are used for healing the irritation caused by touching <i>Urtica dioica</i> .
160	<i>Rumex dentatus</i> subsp. <i>klotzschianus</i> (Meisn.) Rech. f.	Shalkhey	Perennial herb	Leaves, shoot	The leaves and shoots are carminative, astringent and diuretic. It is also considered as stomachache.
13	<i>Rumex hastatus</i> D. Don.	Tarokay	Perennial herb	Leaves, shoot	Juice extracted from the plant is used for lowering blood pressure. It is also used as coolant, while the powdered roots are useful for abdominal pain.

Table 1. (Cont'd.).

Voucher specimen #.	Botanical name	Vernacular name	Habit	Part used	Local and medicinal use
130	<i>Skimmia lauroala</i> (DC.) Sieb. & Zucc. ex Walp.	Nazar panra	Shrub	Leaves	Leaves are used in curing smallpox. It is locally believed that smoke of burning leaves is effective to repel evils.
45	<i>Solanum nigrum</i> L. var. <i>nigrum</i>	Kach Mako	Annual herb	Fruits and shoots	The plant is diuretic and used for curing hepatitis and sore throat. Juice of the leaves is used for skin diseases, also used for cleaning and washing the wounds. Juice extracted from the plant is used in itching.
29	<i>Sonchus asper</i> (L.) Hill	<i>Shodapai</i>	Annual herb	Whole plant	It is utilized in cough and bronchitis. Plant is also useful in asthma and considered as cooling agent. It is also diuretic and antiseptic.
168	<i>Thymus linearis</i> Benth. subsp. <i>linearis</i> J alas	Ghra spirkay	Annual herb	Fruits and shoot	Plant is used for making green tea. The fruits are tonic and used for cold, cough and digestive problems.
137	<i>Valeriana jatamansi</i> Jones	Mushkebala	Perennial herb	Rhizome	This taxon is exploited on commercial scale. Rhizome is used for stomach problem and effective against fever. Rhizome is aromatic and antispasmodic. It is also used for curing involuntary urine discharge in children. Rhizome is also utilized as carminative.
155	<i>Viola pilosa</i> Blume	Banafsha	Annual herb	Whole plant	Flowers are collected at commercial scale and used as diaphoretic, antiseptic and febrifuge. Decoction of flowers is considered as blood purifier and cooling agent. Flowers are mixed with leaves and boiled in water; the mixture is then useful in cough and colds, and relieves liver congestion. Roots are also considered to be useful in jaundice. It is also a very good carminative.
11	<i>Zanthoxylum armatum</i> DC.	Dambara	Shrub	Bark, fruit, stem, seeds	Fruits are powdered and eaten with boiled egg for chest infection. Fruits are also used as stomachache, toothache and as a carminative. Seeds are tonic, aromatic and used for fever. Young shoots are useful in gum diseases. Leaves decoction is recommended in malarial fever.



Fig. 2. A, *Aconitum violaceum*; B, Rhizome of *Asparagus officinalis*; C, *Paeonia emodi*; D, *Podophyllum hexandrum*; E, *Rosa webbiana*.

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