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Traditional Use of Medicinal Plants among Tribal Communities of Bangus Valley, Kashmir Himalaya, India

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ABSTRACT This paper deals with the exploration of traditional knowledge pertaining to medicinal plants among tribal communities of Bangus valley of Kashmir Himalaya, India. The study reveals that 75 species of plants belonging to 44 families were used as traditional medicine by Gujjar communities for curing several diseases in the area. The information was collected from local dwellers of several different professions, practicing herbalists, reliable *hakims* (local traditional healers) and elderly people through group discussion and personal interactions. Botanical name, vernacular name, habit, family, altitudinal range, part used, ailments and prescription of these plant species were collected and enlisted.

INTRODUCTION

The traditional knowledge of plants and plant based medicine for human sustenance is based on the thousand years of experience and is an age old practice in Indian Himalayan region including Kashmir, where people by trial and error method have learnt how to recognize, prepare, formulate and utilize these plants for their day-to-day ailments. The traditional knowledge and protocols about the plant wealth is being passed-on from one generation to next as folklore among the tribal people through word of mouth; but this knowledge is on the verge of extinction in certain areas as it is not documented (Rajadurai et al. 2009).

Medicinal plants have regained a wide recognition due to an escalating faith in herbal medicine in view of its lesser side effects compared to allopathic medicine and to meet the requirements of medicine for an increasing human population (Kala 2006). Plant based remedies are believed to be much safer to treat various ailments (Mitalaya et al. 2003). Herbal medicines support about eighty-five percent of traditional ailments for primary health care system around the world (Kala 2005; Ignacimuthu et al. 2006). According to the estimates of World Health Organisation, almost sixty-five percent population of India depends on traditional medicines to meet their health needs (UNDP 2015). A well-documented and corroborated information on ethnomedicinal practices play a significant role in scientific research (Awadh et al. 2004). The valuable traditional knowledge validated by the scientific insights, may offer an innovative model for sustainable development. However, traditional knowledge and community protocols are threatened by unsustainable development with human induced climate change (O'Neill et al. 2017).

Large number of high value medicinal plants grow luxuriantly in the nearby forests of the area and the potential of ex-situ cultivation of these species is also high. That is why despite significant development of rural health services, the Gujjar communities of the study area still use herbal folk medicines to a good extent for treatment of various common ailments like cough, cold, fever, headache and body-ache, constipation and dysentery, burns, cuts and scalds, boils, ulcers, skin diseases, menstrual troubles and other sexual problems. During the last few decades some information on traditional knowledge of temperate plants has been documented (Peerzada et al. 2010; Malik et al. 2011; Mir et al. 2017). However, there is no report on the tradi-

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tional uses of the medicinal plants of the study area. Keeping in view these facts this study was conducted to ascertain the diversity of plant resources that are being used by the Gujjar communities inhabited in the far-flung areas of Bangus valley for curing various ailments.

METHODOLOGY

This study was carried out in and around the Bangus Valley of District Kupwara, Jammu and Kashmir (J&K) India, which is situated at 34° 222 2" N latitude and 74° 032 27" E longitude between an elevations of 1590 to 4308 m amsl. The study area faces severe cold during winter and pleasant weather during summer. The temperature ranges between -5° C minimum in winter and up to 22° C maximum during summer; and the mean annual rainfall is 1270 mm.

Several field visits were organized during 2013 to October 2015 for collection of data pertaining to traditional knowledge of plants among the Gujjar communities. Information on traditional uses of plants for treating various ailments was recorded through interviews, personal interactions and group discussions with local inhabitants between the age groups of 25 to 85 years of several different professions, tribal heads, elderly people, practicing herbalists and reliable hakims (local healers). Most of the interactions were conducted in local language, so that respondents can share the information contentedly. The traditional practices and protocols of using local plants as medicine was observed and recorded at various localities in the study area. At the end of interactions specimen of the plants mentioned for their traditional uses were collected, dried, documented, identified with the help of a taxonomist and rechecked by consulting important works such as *Wealth of India, Raw Materials* (Anon 2003), Kritikar and Basu (2001), Polunin and Stainton (1984), Working Plan of Langate Forest Division (2014) and other relevant literature. The plant species used by the people are listed alphabetically by genus, species, vernacular name, habit, family, altitudinal range, part used, ailments and prescription (Table 1).

RESULTS

The present investigation revealed that 75 plant species belonging to 44 families are used as traditional medicine to treat various ailments. Among which seventy-nine percent are herbs, twelve percent trees, seven percent shrubs, and two percent climbers (Table 2). The leaf and root (20% each) are the highest exploited parts of these plants, whereas, rhizome/bulb/tuber (14%), seed/fruit (13%) and (13%) of whole plant parts are being used in the study area (Table 3). The highest number of plant (9 species) having traditional importance belong to the family *Asteraceae* followed by *Ranunculaceae* with 6 species and *Lamiaceae* with 4 species. Whereas, families *Pinaceae, Polygonaceae, Scrophulariaceae* and *Solanaceae* are represented by 3 species each (Table 4).

Table 2: Percent of life forms of medicinal plants used by Gujjar communities of the study area

Life form	*Percent*
Tree	12
Shrub	7
Herb	79
Climber	2

Table 3: Percent parts of medicinal plants used by Gujjar communities of the study area

Parts	*Percent*
Leaf	20
Flower	7
Seed/Fruit	13
Root	20
Rhizome/Bulb/Tuber	14
Bark/Wood	7
Aerial portion	6
Whole plant	13

Table 4: Number of plant species in each family used by Gujjar communities of the study area

Family	*No of species*
Asteraceae	9
Berberidaceae	2
Boraginaceae	2
Caprifoliaceae	2
Gentianaceae	2
Lamiaceae	4
Liliaceae	2
Malvaceae	2
Papaveraceae	2
Pinaceae	3
Polygonaceae	3
Ranunculaceae	6
Scrophulariaceae	3
Solanaceae	3
Other families	One each

Table 1: Traditional use of medicinal plants among gujjar communities of Bangus valley of Kashmir

S. No.	*Species name*	*Vernacular name*	*Habit*	*Family*	*Altitudinal range*	*Part used*	*Ailment*	*Prescription*
1.	*Abies pindrow* Royle	Budul	Tree	Pinaceae	2100–3600	Bark	Tea for relieving sickness	Bark of the tree is removed to peel off its inner most red part. This red part is chipped into pieces, boiled in water and added with milk / sugar for making tea.
2.	*Achillea millefolium* L.	Berguer	Herb	Asteraceae	1800 – 3600	Leaf	Stomach pain, cold and tonic	Leaf infusion is used against stomach pain, cold and as a stimulant.Paste of leaf extract mixed with corn flour is applied to snakebite bruises for quick healing.
3.	*Aconitum chasmanthum* Stapfex ex. Holmes	Mohund	Herb	Ranunculaceae	3000 – 4500	Whole plant	Poisonous, odenticide	The crown and upper ground part of the plant is said to be poisonous and used as rodenticide after grinding/mixing with walnut kernels and mustard oil.
4.	*Aconitum heterophyllum* Wall.	Patrees	Herb	Ranunculaceae	2400 – 4000	Root	Abdomen pain, throat infection and anthelmin-thic, Febrifuge, tonic, malarial fever, chronic enteritis	Dried roots are finely powdered and taken orally with water or honey against cough, high fever and vomiting. It is a valuable febrifuge, a bitter tonic, mainly given to patients of malarial fever. Also used against general weakness, impo-tency, dysentery, diarrhea and chronic enteritis.A thin lotion of powdered roots mixed with few drops of mustard oil is massaged externally on forehead and chest to treat headache/cough. Pills of root powder coated with local butter is used as a body tonic and as aphrodisiac.
5.	*Acorus calamus* L.	Vai-gunder	Herb	Araceae	2000 - 3000	Rhizome	Antispasmodic and nerve sedative. Asthma, snake bite	Paste of rhizome is used as antispasmodic and nerve sedative. Also used as carminative, stimulant and tonic. Small pieces of rhizome is tied around the neck of children for teeth and throat problems. Effective against asthma, bronchitis and snake bite.

Table 1: Contd...

S. No.	*Species name*	*Vernacular name*	*Habit*	*Family*	*Altitudinal range*	*Part used*	*Ailment*	*Prescription*
6.	*Actaea spicata* L.	Lalzar	Herb	Ranunculaceae	2900 – 3500	Root, Berry	Sedative, joint pains	Extract of the berries and roots applied externally to treat joint pain. Berries are also used as sedative.
7.	*Adonis aestivalis* L.	Taink-Batin	Herb	Ranunculaceae	1200 – 3000	Whole plant	Cardiac stimulant	It is considered as a cardiac stimulant.
8.	*Aesculus indica* (Wall. Ex Jacquem) Hook f.	Han-doon	Tree	Hippocastanaceae	1800 – 3000	Seed	Rheumatism, dandruff	Used as anti-dandruff Seed oil is is applied towounds for quick healing. Also used in rheumatism.
9.	*Allium humile* Kunth	Jangli-piaz	Herb	Alliaceae	3000 – 4000	Whole plant	Gastrointestinal disorders	Salad made of fresh plants is used to treat gastrointestinal disorders and urinary tract infections.
10.	*Anemone obtusiloba* D. Don.	Kakrya, Rattanjog	Herb	Ranun-culaceae	2100 – 4300	Rhizome, Leaf	Acidity, joint pains and ear problems	Dried rhizome is chipped into fine pieces and boiled in milk. This extract is taken orally or applied externally.Ear pus treated with the sap of crushed leaves.
11.	*Angelica gluca* Edgew.	Chohore	Herb	Apiaceae	2500 – 3000	Root	Gastrointe-stinal disorders	The roots are powdered and taken with milk to treat gastrointestinal disorders.
12.	*Arnebia benthamii* (Wall. ex D.Don) I. M.Johnston.	Gao-Zaban or Kah-Zaban	Herb	Boraginaceae	3000 – 4300	Whole plant	Cardiac problems, anti-inflam-matory, fever, urinary infec-tions and liver problems	The cardiac drug *"Gul-e-Kahzaban"* is made of its flowers.Roots are crushed and boiled in water. The decoction is taken orally for high body fever, cold and urinary tract infections. It is also believed to be a good blood purifier.The decoction of flowers and leaves is used to treat liver problems. Flowers are believed to have soothing effects on heart patients.
13.	*Artemisia absinthium* L.	Tethwan	Herb	Asteraceae	1500 – 2700	Leaf, Flower	Anthelmintic and diabetes. Respiratory and cardiac stimulant	Powdered dried leaves and inflores-cence mixed with lukewarm water or milk is used to treat stomach pain and to expel intestinal worms. Respiratory and cardiac stimulant. Decoction of leaves and flowers is used as an anthelmintic and also for controlling diabetes.

Table 1: Contd...

S. No.	Species name	Vernacular name	Habit	Family	Altitudinal range	Part used	Ailment	Prescription
14.	*Atropa accuminata* Royle ex. Lindl.	Jal-kafal	Herb	Solanaceae	1500 – 3000	Root, Leaf	Antiasthmatic, antispasmodic, diuretic, febrifuge and nerviness	It is used as anti-asthmatic, antispasmodic, diuretic, febrifuge and nerviness, sedative and also used in rheumatism neuralgia and inflammations.
15.	*Berberis lycium* Royle	Kawdach	Shrub	Berberidaceae	1500 – 3000	Fruit, Root.	Tonic, stomach problems, eye soars, bleeding piles, joint pains	Fruit extract is used against stomach ache, diarrhea, jaundice and liver diseases. Paste of fresh fruits is used for healing of wounds. Extract of roots is used as a cooling agent and eye lotion. This extract is also used as a tonic and to treat joint pains. Soft root peeling boiled in water and after adding sugar is taken to treat indigestion, irregular bowl movements, constipation and bleeding piles.
16.	*Bergenia ciliata* (Haw.) Sternb.	Zakhmi-hayat, Pathr-phad	Herb	Saxifragaceae	1800 – 2400	Whole plant	Gastroin-testinal infec-tions and control of diarrhea	Extract of leaves used in dysentery, stomach ache, throat infection, backbone pain and high fever Dried leaves and stem are grained into powdered form and applied to heal wound and burns.Rhizome is cleaned with a scalp and grounded into coarse powder. This powder is mixed with boiling milk to cure gastrointestinal infections and control of diarrhea. Rhizome decoction is used for removal of kidney stones. The sap is externally applied to treat gum diseases.
17.	*Betula utilis* D Don.	Burza	Tree	Betulaceae	2700 – 4300	Leaf, Bark	Diuretic, Joints pain, Gall bladder stone	A tea made from young leaves is used as a diuretic and to treat joint pain. Very rarely used to treat gall bladder stone. The papery bark of the tree is used by priests for writing amulets.
18.	*Bistorta vivipara* L. Delarbe	Masloon	Herb	Polygonaceae	3300 - 5000	Rhizome	Fever, body pain and muscle contraction	Rhizome is crushed to powder and mixed with milk to treat fever, body pain and muscle contraction.

Table 1: Contd...

S. No.	*Species name*	*Vernacular name*	*Habit*	*Family*	*Altitudinal range*	*Part used*	*Ailment*	*Prescription*
19.	*Caltha alba* Jacquem ex Cambess	Baringu	Herb	Ranunculaceae	2400 – 4000	Aerial portion, Root	Mouth wash and digestive problems	The infusion of roots is used as mouth wash. A vegetable of its young leaves and shoots is used to treat digestive problems.
20.	*Cannabis sativa* L.	Bhang, Charas	Herb	Cannabaceae	1800 – 2800	Whole plant	Narcotic and Hallucinating	Green leaves, twigs, flowers and young fruits are rubbed between hands to extract black dirt like substance called as "*Charas*". It is a narcotic and hallucinating. People mix it with tobacco and smoke a cigarette.
21.	*Capsella bursa-pastoris* (L.) Medik.	Chambraka	Herb	Brassicaceae	1800 – 2200	Aerial portion, Seed	Blood pressure, Stomach problems	A vegetable of its aerial parts is used to treat diarrhea. Powder of seeds mixed with water is taken orally to cure high blood pressure.
22.	*Cedrus deodara* (Roxb. ex D. Don) G. Don.	Deodar	Tree	Pinaceae	1800 – 3000	Wood	Deodar oil used for massages	Wood is chipped into pieces and heated in earthen pot with a hole. The dark oily content is extracted in another pot attached to the main pot. This oil is preserved in bottles for its use during manual plantation and weeding of paddy fields. This oil is applied to legs and hands before venturing into the paddy fields for work. It protects them from a water borne irresistible itching and allergy locally called as *"Kheaez"*. This oil is also used for massages.
23.	*Chenopodium album* L.	Sarmay	Herb	Chenopodiaceae	1500 – 3600	Leaf, Shoot	Expel intestinal worms and urine infections	Tender shoots and leaves are used to expel intestinal worms and to stimulate bowel/ urine movement.
24.	*Cichorium intybus* L.	Kasni	Herb	Asteraceae	1500 – 2400	Whole plant	Fever and diarrhea	Dried plant material is grounded, then boiled in milk or water. Decoction is used for fever and diarrhea.
25.	*Colchicum luteum* Baker	Whirikium-posh	Herb	Colchicaceae	1800 - 3500	Bulb	Liver and spleen disorders	Bulbs are grounded and mixed with hot milk or water to cure liver and spleen disorders, rheumatism and gout. It is also used as anti-dandruff and anti-lice.

Table 1: Contd...

S. No.	Species name	Vernacular name	Habit	Family	Altitudinal range	Part used	Ailment	Prescription
26.	*Corydalis govaniana* Wall.	Sangi-harb	Herb	Papaveraceae	2400 – 4800	Aerial portion	Respiratory complaints, chest infections and asthma	Decoction of aerial parts is used to treat cough, chest infections, respiratory disorders and asthma.Flowers are used to treat eye diseases.
27.	*Cuscuta reflexa* Roxb.	Kukli-pot	Climber	Convolvulaceae	1800 – 3300	Whole plant	Hair tonic	It is used as a hair tonic and against dandruff.
28.	*Dactylorhiza hatagirea* (D Don) Soo	Salampanja	Herb	Orchidaceae	2800 – 4000	Root	Expectorant, astringent	It is used as expectorant, astringent, nervine tonic and aphrodisiac. Also effective for round worms of stomach and pus in boils.
29.	*Digitalis purpurea* L.	Degitelis	Herb	Scrophulariaceae	2000 – 2500	Leaf	Cardiac stimulant, stimulant	It is used as cardiac stimulant, diuretic,useful in renal obstruction and dropsy diuretic.
30.	*Dioscorea deltoidea* Wall.	Krish	Climber	Dioscoreaceae	1800 - 2600	Tuber	Anthelminthic, ophthalmic infections	Decoction of leaves is used as eye drops to sharpen eyesight and to treat ophthalmic infections. It is an effective anthelminthic. Dried tubers are grounded to powder and mixed with water or milk for applying externally on body and head. Tribal women apply the decoction on head to kill lice. Powder is also used as a fish poison by fishermen to catch fishes.
31.	*Equisetum arvense* L.	Bandakey	Herb	Equisetaceae	2200 – 3000	Aerial portion	Bones, hair, nails, weakness	Powder prepared from aerial parts is used for strengthening of bones, growth of hair and nails. It is also used to overcome the weakness caused by TB.
32.	*Fritillaria roylei* Hook.	Shethkhar	Herb	Liliaceae	2800 – 4000	Bulb	Urinary tract infections and softening of skin	Powder of bulbs mixed with butter is used to treat urinary tract infections. It is also used to soothe and soften the skin
33.	*Gentiana kurroo* Royle	Nilkanth	Herb	Gentianaceae	1500 - 3000	Root	Tonic, kidney and urinary tract infections	Dried roots are grounded into coarse powder and boiled in water and sieved. The decoction is taken orally as a tonic and to treat kidney and urinary tract infections, blood purification and as liver ailment.

Table 1: Contd...

S. No.	*Species name*	*Vernacular name*	*Habit*	*Family*	*Altitudinal range*	*Part used*	*Ailment*	*Prescription*
34.	*Geranium pratense* L.	Laljhad, Ratanjoth	Herb	Geraniaceae	3000 – 4500	Rhizome	Blood pressure, stomach disorders, tonic	Powdered rhizome is used to control high blood pressure, stomach problems and urine infection. Also used as a tonic.
35.	*Hippolytia dolichphylla* (Kitam.) K.Bremer and Humphries	Lidd guggli	Herb	Asteraceae	3600 – 4200	Leaf, Flower, Root	Intestinal worms	Leaves and flowers are used for intestinal worms and roots as incense
36.	*Hyoscyamus niger* L.	Bazarbang	Herb	Solanaceae	2100 – 3300	Seed, Leaf, Flower	Nervousness, asthma, cough and toothache.	Powdered seeds used to cure gum and tooth ache.Leaves and flowers used to treat nervousness, asthma and whooping cough.
37.	*Hypericum perforatum* L.	Shin chae	Herb	Clusiaceae	1800 – 2500	Whole plant	Irregular menstruation, Respirator and Urinary disorders	Tea made of young shoots is used to treat respiratory, gastric and urinary disorders.Powder of roots is used to treat irregular menstruation.
38.	*Inula racemosa* Hook. f.	Poshkarmool	Herb	Asteraceae	2000 – 3200	Root	Anti-inflam-matory anti-asthmatic	Anti-inflammatory, anti-pyretic, anti-asthmatic and anti-septic.
39.	*Iris hookeriana* Foster	Mazaer-mund	Herb	Iridaceae	1500 – 4000	Rhizome	Urine infections, diseases. Gall bladder	Powder of dried rhizome in minute quantity is used to accelerate passing of urine and stool. Also used to treat gallbladder ailments.
40.	*Juglans regia* L.	Doon	Tree	Juglandaceae	1500 – 3000	Bark, Fruit	Brain tonic, Toothache	Nuts are used as brain tonic.Bark locally called as *"Dandasa"* is used by women folk for toothache and cleansing of teeth. Small piece is *"Dandasa"* is first chewed on one end to make it soft, then brushed on teeth and gums.
41.	*Jurinea dolomiaea* Boiss.	Guggal	Herb	Asteraceae	3000 – 4300	Root	Skin eruptions. aromatic oil, gout, rheumatism	Crushed roots are applied to skin eruptions. Oil extracted from roots is used to treat rheumatism gout. It is also used to make *Dhoop* for good omen in houses.
42.	*Lavatera kashmiriana* Mast.	Sazposh	Herb	Malvaceae	1800 – 3600	Flower, Root	Children's disease	Dried flowers are mixed with milk. This paste is used to treat mumps in children.Roots are used in respiratory complaints.

Table 1: Contd...

S. No.	*Species name*	*Vernacular name*	*Habit*	*Family*	*Altitudinal range*	*Part used*	*Ailment*	*Prescription*
43.	*Malva neglecta* Wallr.	Sochal	Herb	Malvaceae	1800 – 2800	Seed, Leaf	Cough and fever	Dried seeds are boiled in sugary (locally called as *Sharbat*) to cure cough and fever. Green leaves are crushed and made into small balls to feed young calves for treatment of diarrhea.
44.	*Meconopsis aculeata* Royle	Achatsarmum	Herb	Papaveraceae	3000 – 4000	Whole plant	Analgesic, tonic, narcotic	This plant is used as a tonic, analgesic, in chronic renal pain, narcotic and febrifuge.
45.	*Mentha arvensis* L.	Pudna	Herb	Lamiaceae	1800 – 2200	Aerial portion	Cough, Sore throat, Indigestion	Aerial parts are powdered and mixed with curd to treat indigestion, sore throat and cough.
46.	*Nepeta linearis* Royle ex Benth.	Gandh-soie	Herb	Lamiaceae	1500 – 4000	Whole plant	Chest, Stomach and Lung complaints	It is used in cough and lung complaints. Mixed in green tea.The leaves are considered as cooling agent, gas expeller and in vomiting.
47.	*Onosma hispidum* Wall. ex G. Don.	Ratmundi, Ratanjot	Herb	Boraginaceae	3000 – 4000	Root	Rheumatism	Rheumatism, heat disorders and hair treatments.
48.	*Picrorhiza kurrooa* Royle	Kutki, Kour	Herb	Scrophulariaceae	3300 – 4300	Rhizome	Tonic, laxative and stomach problems	Dried rhizomes are grounded and boiled in water. The material is sieved and resulting decoction is taken orally as a tonic, laxative, for stomach and liver problems.
49.	*Pinus wallichiana* A B. Jack.	Kayur	Tree	Pinaceae	1800 – 3000	Resin / latex	Crack healer	Stems of the plant produce latex locally called as *"Kangul"*. It is applied to cracks on heals.
50.	*Plantago major* L.	Badagul	Herb	Plantaginaceae	1800 – 2200	Root, Leaf	Breathing problems in humans Treatment of milk infections and odder in cows	Leaf decoction is taken for breathing problems and root decoction is taken as anti-dysentric.Roots are grounded into small pieces and added with salt. It is then fed to mulching cows for treatment of milk infections and odder.
51.	*Platanus orientalis* L.	Booen	Tree	Platanaceae	1200 – 2400	Bark	Diarrhea and dysentery	The bark is grounded and mixed with vinegar and lemon juice to treat diarrhea and dysentery.

Table 1: Contd...

S. No.	*Species name*	*Vernacular name*	*Habit*	*Family*	*Altitudinal range*	*Part used*	*Ailment*	*Prescription*
52.	*Podophyllum hexandrum* Royle	Wanwangun, Kakri	Herb	Berberidaceae	2400 – 4500	Fruit, Rhizome, Leaf	Poisonous, Effective vermifuge, purgative and tonic.	It is a poisonous plant, however, used by experts' along-with other herbs.Fruits are used to ease bowel movement. Rhizome is grounded and mixed with boiling water or milk and taken orally as an effective vermifuge. Also used as tonic and purgative. Leaves are applied on boils for quick recovery.
53.	*Polygonatum verticillatum* L.	Salam-mishri	Herb	Convallariaceae	1500 – 3700	Root	Appetizer, Menstrual troubles.	It is used as an appetizer, in backache and menstrual troubles.
54.	*Primula denticulata* Sm.	Mamera	Herb	Primulaceae	2400 – 3500	Rhizome	Eye disorders	Rhizome powder mixed with honey is used to cure eye disorders.
55.	*Prunella vulgaris* L.	Kalwauth	Herb	Lamiaceae	2200 – 3500	Fruit, Flower	Respiratory difficulties, Fever and cold	Mature and dried inflorescence bearing fruit is boiled in water. This hot extract is massaged on chest for relieve from respiratory difficulties and on legs for relieving muscular pain or during fever and cold.
56.	*Rheum webbianum* Royle.	Pamb-Tchalan, Pamb-Hakh	Herb	Polygonaceae	3000 – 4200	Rhizome, Leaf		Purgative, tonic, lung infection Dried and powdered rhizomes are used as purgative, tonic and for cleaning teeth. Rhizome powder is mixed with water to cure body wounds and also winter frosts in feet.Leaves are cooked as vegetable.
57.	*Robinia pseudoacacia* L.	Kikar	Tree	Leguminosae	1500 – 2500	Leaf	Stop bleeding, Healing of cuts and wounds	Fresh leaves are grounded into paste and applied on cuts / wounds to stop blood loss and speed up healing.
58.	*Rosa webbiana* Wallich ex Royle.	Jangli-gulab	Shrub	Rosaceae	1500 – 4100	Flower, Bark	Respiratory problems, healing of wounds, Flavour	Processed flowers are used to treat respiratory disorders. Bark is used for healing of wounds and for flavoring.
59.	*Rumex nepalensis* Spreng.	Ambavati	Herb	Polygonaceae	1800 - 3000	Root, Leaf	Bowel evacuation	Roots used to ease bowel evacuation.Leaves of the plant used as a substitute of *Rheum* austral.

Table 1: Contd...

S. No.	Species name	Vernacular name	Habit	Family	Altitudinal range	Part used	Ailment	Prescription
60.	*Salix alba* L.	Veer	Shrub	Salicaceae	1800-2500	Branch, Leaf	Mouth freshener, analgesic	The tender branches are used for cleansing teeth and mouth, locally called as "Miswakh".The leaves are boiled in water with *Prunella vulgaris* inflorescence and applied to legs and feet. It works as an analgesic.
61.	*Sambucus wightiana* Wall.	Gandula	Shrub	Caprifoliaceae	1800-3000	Fruit	Stomach disorders	Fruits are used to treat stomach disorders, stimulating vomiting, stomach wash to expel poisonous substances.
62.	*Saussurea* Lipsch. *costus* (Falc.)	Kuth	Herb	Asteraceae	2800-3500	Rhizome	Rheumatism, joint pain, asthma and cough	Dried rhizome is grounded into fine powder and mixed with boiling milk or water. The filtered extract is taken as a tonic and for the treatment of joint pain, rheumatism, asthma, back pain, sole ulcers, fever and cough.
63.	*Solanum tuberosum* L.	Alua	Herb	Solanaceae	1800 – 2200	Tuber	Burns and bruises	Paste of ripened tuber is applied externally to the burns and tightly fastened with a woolen cloth.
64.	*Stellaria media* (L.) Vill.	Losdhi	Herb	Caryophylaceae	1600 – 2900	Seed, Leaf	Skin infection and allergy	Seeds are crushed to powder and mixed with milk to treat skin infection and allergy in children.Paste of leaves is applied to heal wounds caused by burning or frost.
65.	*Swertia petiolata* Royle	Chiryta	Herb	Gentianaceae	3000 – 4500	Whole Plant	Stomach problems	Powder of dried plant is used to treat irregular or infrequent passing of faces and stomach burning.
66.	*Taraxacum officinale* F.H. Wigg.	Handh	Herb	Asteraceae	1500 – 3800	Leaf, Root	Tonic, bone fractures, liver and kidney	Leaves are served as a vegetable to women after delivery. It is considered as best tonic for the post-delivery mothers. Paste made of boiled leaves, salt and turmeric is used to treat bone fractures. Roots are used in disorders of liver and kidney.

Table 1: Contd...

S. No.	Species name	Vernacular name	Habit	Family	Altitudinal range	Part used	Ailment	Prescription
67.	*Taxus wallichiana* Zucc.	Pos-tul	Tree	Taxaceae	2500 – 3400	Bark	Winter sickness	Tea is made of its bark to cure sickness in winter.
68.	*Thymus linearis* Benth.	Van Jawend	Herb	Lamiaceae	2200 – 3200	Leaf, Seed	Itches, skin eruptions, baldness	Leaf infusion is used to treat skin eruptions and itches.Leaf extract is given to children against worm infections.
69.	*Trillidium govanianum* (D.Don.) Kunth.	Tripater, Satva	Herb	Liliaceae	2800 – 4000	Root	Body and sexual tonic	Powdered roots are used as a body and sexual tonic.
70.	*Tusilago farfara* L.	Funjiwam	Herb	Asteraceae	3800 – 4500	Aerial portion	Respiratory infections	Aerial parts are cooked to treat respiratory infections.
71.	*Urtica dioica* L.	Soie	Herb	Urticaceae	1800 – 2500	Leaf, Root	Cysts, joints pain	Leaves are used as hair stimulant and for cleaning hair wax and dandruff.Root paste boiled in mustard oil is used to treat cysts of feet and hand. It is rubbed on joints for pain relief.
72.	*Valeriana jatamansi* Jones	Mushkbala	Herb	Valerianaceae	1500 – 3600	Root	Tranquilizer, sedative and in perfumes	It is used as a tranquilizer, sedative and in perfumes.The dried roots are burnt in rooms on important occasions like festivals, marriage ceremonies etc. for fragrance
73.	*Verbascum thapsus* L.	Jangali	Herb	Scrophulariaceae	1800 – 3800	Whole plant	Aphrodisiac, sedation	Leaf paste is used to treat skin problems. Powder of roots is considered aphrodisiac.
74.	*Viburnum grandiflorum* Wall. ex DC	Kulmanch	Shrub	Caprifoliaceae	2500 – 3600	Seed	Cough, typhoid	Juice extracted from seeds is used to treat typhoid and whooping cough.
75.	*Viola odorata* L.	Bunafsha	Herb	Violaceae	2400 – 3600	Flower	Cough and cold	Dried flowers are mixed with sugar and fermented to form it into a jam locally called as *"Khambeer"*. Served with a drink, called "*Kehwa"* for treatment of cough, cold, hoarseness of voice, sore throat and fever.

DISCUSSION

The most common diseases that are being treated with the help of herbs by local people in the study area include cold, cough, fever, diarrhea, dysentery, worm infestation, wound healing and body ache etc. The formulations to treat the above ailments are mostly prescribed in decoction form, powder or paste form and sometimes may also be taken as tea. These findings are in conformity with the observations of other authors (Peerzada et al. 2010; Malik et al. 2011; Mir et al. 2017) and the Indian System of Traditional Medicine (Anon 2003; Kritikar and Basu 2001).

The elderly population of the study area has good knowledge about the medicinal plants and their traditional uses. However, the younger generation is not well informed about the traditional practices and methods of plant based medicine prevalent in this area. Traditional knowledge about the medicinal plants is confined to the elderly persons only, as the younger generation is reluctant to adopt it, consequently, elders are hesitant to share this heritage passed on to them by their ancestors. In the past, empirical knowledge of medicinal plants among the village communities continued to be communicated orally. Information on the folk medicinal uses of these plants is not well documented, there is an urgent need to collect the information and preserve it for future needs.

CONCLUSION

The Gujjar communities of study area depend on traditional systems of medicine and household remedies to a great extent, owing to their proximity to the sundry temperate forests of the region.

This area has a great floristic diversity and includes a large number of medicinal plants but there is very little information available about the cultivation, sustainable harvesting and uses of these species. The deterioration of the medicinal plants of the area needs immediate attention as most of the species have become rare due to deforestation, population growth, over-exploitation and unscientific use. Some of the important medicinal plants like *Aconitum heterophyllum, Arnebia benthami, Saussurea lappa, Trillium govanianum* were once harvested sustainably by Gujjars or *hakims* (local traditional doctors) for judicious use, but now these plants are heavily exploited and marketed illegally for revenue generation by smugglers. The unscrupulous exploitation of valuable plant species has not only degraded the forest ecosystem of the area, but has also put several species under certain categories of threat, thereby impacted the livelihood options of a huge population. During the field investigations and surveys, it was observed that the rampant cattle grazing throughout summer months is another threat to the survival of medicinal plants of the area. Medicinal plants are either grazed or trampled by the cattle even before the flowering and seed setting stage, which has drastically impacted the regeneration of several important species.

RECOMMENDATIONS

- Participatory conservation and management of medicinal plants for sustainable livelihoods
- Documentation of indigenous systems of local knowledge associated with bio-resources
- Awareness generation and acknowledgement of gender role in medicinal plants conservation and management
- Medicinal plant resource assessment with respect to distribution, genetic diversity and growing stock
- Setting up of extraction policy, harvesting rules and guidelines
- Streamlining of data management and reporting on extraction and trade of medicinal plants
- Capacity building of frontline forest officers and local communities on medicinal plant resource management, identification and utilization
- To facilitate conservation of medicinal plants in natural forests, local communities must be encouraged to form co-operatives at village level for non-destructive harvesting, processing and marketing of medicinal plants to augment their income and sustainable use

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