

SURVEY ON TRADITIONAL USES OF MEDICINAL PLANTS OF BAGESHWAR VALLEY (KUMAUN HIMALAYA) OF UTTARAKHAND, INDIA

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Abstract

This paper communicates the traditional uses of medicinal plants of Bageshwar valley of Uttarakhand. Aims of the study were to document the medicinal plant and their indigenous traditional use patterns by local population. A total of 158 taxa belonging to 83 families were reported as locally used for various medicinal purposes. These medicinal plants used against various diseases e.g. asthma, cough, malaria, tuberculosis, cancer, abdominal pain, cholera, piles, tumor, headache, snakebites, jaundice, diarrhea, dysentery etc. Observation of the site showed that vegetation of the area was generally threatened due to deforestation, over grazing, habitat fragmentation, un-scientific extraction, and habitat loss. Measures for the conservation of plant resources especially medicinal plants of Bageshwar valley (Kumaun Himalaya) are urgently needed.

Keywords: Kumaun Himalaya; Medicinal Plants; Vegetation; Conservation; Bageshwar Valley

Introduction

India is one of the great resources of biodiversity in the world. In India the Central Himalaya is a great reservoir of various flora and fauna. The Himalayan region possesses millions of vegetations which is important from aesthetic, medicinal and nutritional aspects. According to an estimate between 35,000 and 70,000 plant species are used in medicine worldwide [1-3]. It is believed that out of over 1,600 species of medicinal plants traditionally used in India [4]. Himalayas is recognized as one of the hotspots of biodiversity that harbors nearly 8,000 species of flowering plants including 25.3% endemic [5, 6]. About 1748 plants reported used as medicinal purposes in Indian Himalaya [7, 8]. A large number of wild plants growing in this zone are used for such as food, medicine, edible fruits, fodder, fuel, timber and many other purposes by local communities [9-12]. Thus, a very close relationship and dependence have been established between forest and inhabitants of the hill.

The Himalayan vegetation ranges from sub-tropical deciduous to evergreen forests across the foothills to alpine meadows above the timberline [13-15]. The unique diversity of medicinal plants in the region is manifested by the presence of a number of native (31%),

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Endemic (15.5%) and threatened elements (14%) of total Red Data Book plant species of Indian Himalaya Region [14, 15]. Today more than 90% of plant species used in the herbal industries are extracted from the wild, majority of which comes from the different regions of the Himalaya [16]. The pharmaceutical sector is using 280 medicinal plant species, out of which 175 are from the Indian Himalayan region [17, 18]. Over exploitation, degradation of habitat and illicit felling of the medicinal plants have led to the extinction of more than 150 plant species in the wild B. Several studies have described the vegetation of Kumaun Himalaya [19-24].

The main purpose of the study is to know the traditional medicinal uses of plants by the local people of Bageshwar district of Uttarakhand and also provide scientific basis for further research.

Objectives of the study are:

- a. To explore and document the medicinal plants of the area.
- b. To collect information regarding uses of plants and availability of medicinal plants.
- c. To recommend ways for sustainable utilization of the local resources and to provide basis for further research

Materials and Methods

Geographical description of study area

The present study was carried out in Bageshwar district of Uttarakhand (India), which is situated in the eastern Kumaun Himalaya of Uttarakhand. Bageshwar is bounded on the west by Chamoli district, on the east by Pithoragarh district, and on the south by Almora district. Bageshwar district is geographically situated between 29.85° North latitude and 79.77° East latitude, covering an area of 2,302km² and has an average elevation of 520 meters from above sea level. According to the census of 2011, total population of Bageshwar is 259840 having males 124147 and females 135693. Literacy percent of the district is 80.69% with density of 116 people/km². Bageshwar is situated on the confluence of Gomti river with Sarju river which is a tributary of Kali river. The world famous glaciers Pindari, Sunderdhunga and Kaphni are situated in Bageshwar at the altitude of 3000-3500m between Nanda Devi and Nanda Kot mountains.

Climatic description of the study area

The climate of the study area is wet sub tropical to temperate. It is divided in summer, rainy and winter seasons. Summer begins from April to June and rainy season starts from last week of July to September. Winter season begins from mid November and lasts up to mid February. Winter experiences of light to heavy snowfall at higher altitudes. Average annual rainfall is 1383mm with temperature of 29.4°C (maximum) to -3.2°C (minimum) having relative humidity 60-85%. Subtropical, tropical, temperate and subalpine forests occurred with various dominant species like Pine, Oak, Sal, Khair, Mango, Rhododendron, Silver fir, Taxus, Shisham and Deodar. Major crops of the district are Rice, Wheat, Barley, Maize, Soyabean, Gahat, Mandua, Madira, Pigeon pea, French bean and other vegetables. The soil of the district is mostly sandy loam and it varies from place to place by local factors having soil pH from 4.5-6.5.

Methodology

The present study was focused on Bageshwar district which is based on field survey, collection, identification, documentation and finding medicinal values of plants. Field work carried out to explore medicinal plant diversity in study site. The survey conducted among with local people, villagers, farmers and local homeopathic person to know about the plants which they are using for medicinal purposes. After visiting several times at study sites interacted with people and collected the data about the plants. Plant specimens were collected along with

extensive field's notes including habit, habitat, life form and abundance. For collecting the information, an interview schedule was organized randomly from selected people of study sites. Scientific name, vernacular name, family and other information were recorded in proper way [25-29]. The data and sample collected from randomly selected 60 sites of Bageshwar district i.e. 20 sites of each Tehsil (Garur, Bageshwar, Kanda). The plant species were identified in Department of Forestry and Environmental Sciences and Department of Botany of Kumaun University, Nainital, Uttarakhand.

Results and discussion

The present study recorded 158 medicinal plants belonging to 83 families used by local population for their various medicinal purposes (Table 1). Out of 158 plants 3 climbers, 85 herbs, 24 shrubs and 46 trees were recorded on the study sites (Fig. 1). Most of the plants recorded in subtropical to temperate zone. Among these recorded medicinal plants, 94 were common, 35 rare, 21 threatened and 14 recorded as endangered (Fig. 2). Root extract of 22% plants, seed 9%, bark 15%, leaf 30%, flower 6%, fruit 10% and whole plant 8% used by local people in treatment of various diseases (Fig. 3). Most of the plants used to cure important diseases e.g. malaria, cancer, pneumonia, cough, cold, cholera, asthma and other diseases (Fig. 4).

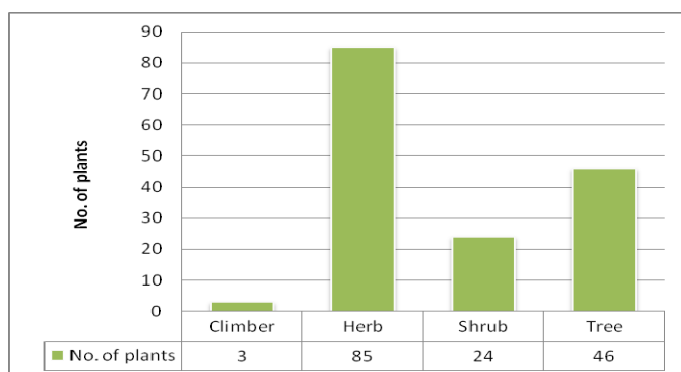


Fig. 1. Number of plants recorded on study site

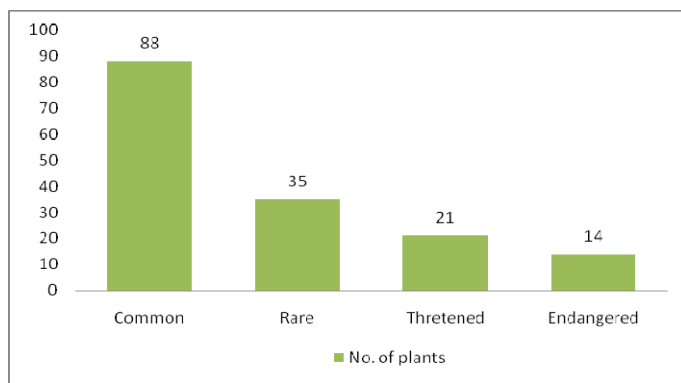


Fig. 2. Status of the plants at study site

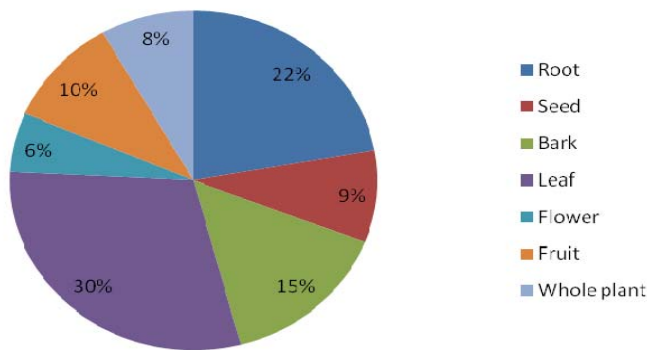


Fig. 3. Statistics of plant parts used in different diseases

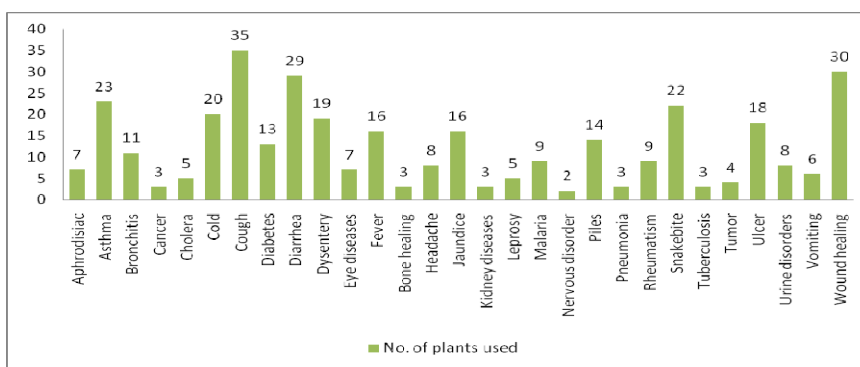


Fig. 4. Plants used in different diseases

Table 1. Medicinal plants of Bageshwar valley of Kumaun Himalaya

Family	Botanical Name	Local Name	Ht.	Alt. (m)	Parts used	Traditional medicinal uses
Acanthaceae	<i>Dioscorea deltoidea</i> , Wall.	Gethi	C	1000-1500	R	The extract of the root tuber used in treatment of urino-genital disorder.
Acoraceae	<i>Acorus calamus</i> , Linn.	Bach	H	1200-1800	R, L	Powder is used against dysentery, diuretic and carminative purposes. Decoction of leaves used in treatment of influenza and headache.
Alliaceae	<i>Allium cepa</i> , Linn.	Pyaj	H	Up to 2500	Bb	Used in treatment of bronchitis, piles, ringworm, epilepsy and abdominal pain.
Alliaceae	<i>Allium sativum</i> , Linn.	Lehsun	H	1000-2500	Bb	Juice of bulb along with goat milk used as eye drop, high blood pressure and body pain.
Amaranthaceae	<i>Achyranthes bidentata</i> , Bl.	Kuru	H	1400-2500	R	Juice of root used in treatment of eye diseases, cough, asthma, nasal infection, malaria, impotence, bronchitis, headache, pneumonia, rheumatism, fever, piles, abdominal pains and snake bite.
Anacardiaceae	<i>Rhus parviflora</i> , Roxb. ex. DC.	Tang/ Murthi	S	1500-2100	WP	Juice of root and flower used in cure sunburn. Leaf decoction used in treatment of cholera.
Anacardiaceae	<i>Lansea coromandelica</i> , Houtt. Merr.	Jhinghan	T	Up to 1500	Br	Extract of bark used in treatment of gout and aphthae of the mouth.
Anacardiaceae	<i>Mangifera indica</i> , Linn.	Aam	T	Up to 1400	L, S	Leaf extract used against luck worm. Decoction of seed used in treatment of vomiting, dysentery and diarrhea.
Apiaceae	<i>Coriandrum sativum</i> , Linn.	Dhania	H	1000-2200	L, S	Juice of leaves used to improve weak eyesight. Seed powder used in treatment of stomachic and diuretic.
Apiaceae	<i>Centella asiatica</i> , Linn.	Brahmi	H	Up to 1800	WP	Juice of plant used in treatment of blood diseases, mental disorder, gastric problems, diarrhea, tumor, skin diseases, leprosy and cholera.
Apiaceae	<i>Daucus carota</i> , Linn.	Gajar	H	900-2300	Rz	Used for improvement of weak eye sight.

SURVEY ON TRADITIONAL USES OF MEDICINAL PLANTS OF BAGESHWAR VALLEY, INDIA

Apiaceae	<i>Foeniculum vulgare</i> , Mill.	Saunf	H	Up to 2000	S	Seed powder used in worm infection, stomach disorder, fever and improvement of eye sight.
Apiaceae	<i>Angelica glauca</i> , Edgew.	Choru	H	2000-2500	L, R	Leaf used as snake and insect repellent and root powder used in treatment of stomach pain, bilious complaints and bronchitis.
Apocynaceae	<i>Carissa opaca</i> , Stapf. ex. Haines.	Karonda	S	Up to 2000	R	Root extract used in treatment of jaundice, hepatitis and also showing antioxidant activities. Used as cardiotoxic.
Apocynaceae	<i>Nerium indicum</i> , Mill.	Kaner	S	500-2000	L, Br, Fl	Extract of flower used as insecticide. Leaves and bark used for cure of snake bite.
Asclepiadaceae	<i>Crptolepis buchmanii</i> , Roem & Schult.	Dudil	S	Up to 1500	Br, L	Extract of bark and leaves used in cough, cold and fever.
Asclepiadaceae	<i>Calotropis procera</i> , Br.	Madar/Aak	T	Up to 1400	Br, R	Bark powder is used in treatment of leprosy and skin diseases. Extract of root is used against snake bite.
Asparagaceae	<i>Asparagus adscendens</i> , Roxb.	Kairu	H	Up to 1600	Sh, R	Shoot is used as diuretic. Root extract used against allergy.
Asparagaceae	<i>Asparagus racemosus</i> , Willd.	Keruwa	H	1500-2500	R	Powder of root is used as aphrodisiac. It is used in treatment of nose bleeding, cough, ulcer and urino-genital diseases.
Asteraceae	<i>Anaphalis trinervis</i> , Sims. C. B. Clark	Bugla	H	1500-3000	L	Leaf used in healing of wound.
Asteraceae	<i>Helianthus annuus</i> , Linn.	Surajmukhi	H	1000-2200	Fl, R, L	Powder of flower used in hypertension and also used as analgesic. Leaves used against malaria. Root decoction used in cough and cold.
Asteraceae	<i>Ixeris sagittarioides</i> , (C. B. Clarke) Stebb.	Garurbooti	H	Up to 1000	R	Decoction of root used in treatment of snake bite.
Asteraceae	<i>Tagetes erecta</i> , Linn	Hazari	H	Up to 2500	L	Paste of leaves used in treatment of piles, ulcer, muscular pain and wound healing.
Asteraceae	<i>Ichnocarpus frutescens</i> , Br.	Kalidudhi	S	Up to 1500	WP	Juice of whole plant used for given to nursing mother for lactation.
Balsaminaceae	<i>Impatiens balsamina</i> , Linn.	Gulmendi	H	Up to 2000	S, Fl.	Seed powder used in skin disorder. Flower paste used in burns and scalds.
Berberidaceae	<i>Berberis aristata</i> , DC.	Kilmora	S	1000-2200	Br, R	Extract of bark used in treatment of ulcer, urethral discharges, malaria and skin diseases. Root powder used in treatment of eye diseases.
Betuleae	<i>Betula utilis</i> , D. Don.	Bhojpatra	T	2500-3500	Br	Bark paste used in treatment of broken bone.
Bignoniaceae	<i>Oroxylum indicum</i> , Vent.	Pharkat	T	Up to 1600	R	Root powder used in treatment of arthritis, cough, fever, diarrhea and back pain.
Bombacaceae	<i>Bombax ceiba</i> , Linn.	Semal	T	500-1500	L	Paste of leaves used in wound healing.
Boraginaceae	<i>Cuscuta reflexa</i> , Roxb.	Amarbel	C	900-2000	L	Paste of leaves used in joints pain.
Boraginaceae	<i>Cordia obliqua</i> , Willd.	Lassora	T	Up to 1500	Fr	Fruit is used in cough, gonorrhoea, diseases of lungs and chest.
Brassicaceae	<i>Brassica campestris</i> , Linn.	Rai/Sarso	H	1000-3000	S	Seed powder used against worm infection.
Brassicaceae	<i>Raphanus sativus</i> , Linn.	Muli/Mool	H	Up to 3000	L	Leaves are used in treatment of jaundice.
Burseraceae	<i>Garguga pinnata</i> , Roxb.	Titmer/Kharpat	T	1500-2200	L	Leaf juice used in treatment of asthma, diarrhea, stomach pain and conjunctivitis.
Caesalpinaceae	<i>Cassia absus</i> , Linn.	Banar/Ban-Kulathi	H	Up to 2000	S, Br	Juice of seed used in eye diseases. Bark extract used as a health tonic in anaemia.
Caesalpinaceae	<i>Cassia occidentalis</i> , Linn.	Kasodi	H	Up to 1400	L, Br	Extract of leaves used in treatment of piles, jaundice, snake bite and skin diseases.
Caesalpinaceae	<i>Bauhinia variegata</i> , Linn.	Qairal	T	1200-2000	Fl, Br	Extract of flower and bark used in treatment of ulcer, fatness, indigestion, malaria, leprosy, skin diseases, snake bite and tuberculosis
Caesalpinaceae	<i>Cassia fistula</i> , Linn.	Amaltas/Kirala	T	Up to 1500	R, L	Root powder used in treatment of rabies. Leaves are used against insect bite, swelling, rheumatism and facial paralysis.
Canabinaceae	<i>Cannabis sativa</i> , Linn.	Bhang	H	1200-2600	L, S	Decoction of flowering tops used as sedative, anodyne and narcotic. Extract of seed used in treatment of cough, cold and skin diseases.
Capparidaceae	<i>Cleome viscosa</i> , Linn.	Jakhya/Tilparni	H	1000-1700	L	Leaves are used against earache.
Chenopodiaceae	<i>Chenopodium album</i> , Linn.	Bathuwa	H	1000-2400	L	Leaves are used in treatment of heart diseases, cough, abdominal pain and nervous disorders.
Combretaceae	<i>Terminalia chebula</i> , Retz.	Harad	T	1500-2000	Fr	Fruit powder used in treatment of cough, cold, diabetes, bronchitis, diarrhea, dysentery, indigestion, menstrual disorder

Combretaceae	<i>Terminalia bellerica</i> , Roxb.	Bahera	T	Up to 1800	S, Fr	and pneumonia. Seed oil used in skin diseases and hair fall. Fruit is used in cough, cold and asthma. Powder of fruit used in wound healing and blood clotting.
Compositae	<i>Anaphalis contorta</i> , D. Don. Hook. F. Kuntze.	Bhglya/ Poth	H	1600-3000	Fl, L	Flower paste used in diarrhoea, bleeding arrest and wound healing. Leaves used as insect repellent.
Compositae	<i>Eupatorium cannabinum</i> , Linn.	Kharna	H	1000-2800	WP	Extract of plant used against spleen and liver disorders, diarrhoea, snake bite, ulcers, wound healing and fever.
Compositae	<i>Jurinea dolomiaea</i> , Boiss.	Dhoop	H	2500-3800	R	Extract of root is used in treatment of rheumatism, gout, fever and skin eruptions.
Crassulaceae	<i>Sedum quadrifidum</i> , Pall.	Suru	H	3000-4000	Sh	Juice of shoot used in treatment of piles and headache.
Cucurbitaceae	<i>Momordica charantia</i> , Linn.	Karela	H	500-1800	Fr	Extract of fruit is used in jaundice and diabetes.
Dipterocarpaceae	<i>Shorea robusta</i> , Gaertn.	Sal	T	Up to 2000	Br, G	Bark extract and gum are used in diarrhoea, dysentery and skin allergies.
Ericaceae	<i>Rhododendron arboretum</i> , Sm.	Burans	T	1200-2500	Br, L, Fl	Juice of bark used against diarrhoea, cough, cold, fever, piles, diabetes and jaundice. Leaf paste used in headache. Flower juice used as health tonic
Ericaceae	<i>Rhododendron campanulatum</i> , D. Don.	Simris/ Chimal	T	2700-4000	L	Leaves extract used in chronic rheumatism, syphilis and sciatica.
Ericaceae	<i>Lyonia ovalifolia</i> , Wallich.	Angyar	T	1100-2400	S, L	Paste of leaves used in pimples, skin eruption, worms and wound healing.
Euphorbiaceae	<i>Jatropha curcas</i> , Linn.	Pahari arand/ Jamaalgotaa	S	Up to 1500	Sh, S	Paste of wood used in blood clotting. Seed powder used against skin problems.
Euphorbiaceae	<i>Ricinus communis</i> , Linn.	Arandi	S	Up to 2300	L, S	Paste of leaves used against swelling. Leaf and seed are narcotic and purgative.
Euphorbiaceae	<i>Mallotus philippensis</i> , Linn. Muell.	Rolli/ Ruin	T	Up to 1700	Fr	Fruit extract used in wound healing, ulcers, cough, ringworm, hemorrhages and skin disorders.
Euphorbiaceae	<i>Emblina officinalis</i> , Gaertner	Amla/ Angau	T	1200-1600	Fr	Fruit juice used in treatment of asthma, diabetes, dysentery, fever, headache and stomach problems.
Fabaceae	<i>Abrus precatorius</i> , Linn.	Ratti/ Gunj	C	500-1450	L, S	Leaf powder used in leucoderma, aphrodisiac tonic, skin disorder and wound healing. Seed extract used externally in skin diseases, hair fall and ulcers.
Fabaceae	<i>Cicer arietinum</i> , Linn.	Chana	H	Up to 1500	Fr	Fruit is used in dysentery, indigestion, vomiting, dyspepsia and lower blood sugar.
Fabaceae	<i>Desmodium gangeticum</i> , Linn. DC.	Shalparni	H	1200-1900	R	Extract of root used in asthma, bronchitis, cough, dysentery, fever, vomiting, health tonic and snake bite.
Fabaceae	<i>Desmodium elegans</i> , DC.	Bhatul	H	1500-2300	WP	Extract of plant used in cough, cold, bronchitis, wound healing, dysentery and burning sensation.
Fabaceae	<i>Cajanus cajan</i> , Linn	Arhar	S	Up to 1700	L, S	Leaf paste used in jaundice, mouth diseases, asthma, ulcer and measles. Seed powder used in obesity.
Fabaceae	<i>Butea monosperma</i> , Roxb.	Dhak	S	Up to 1500	L, Br, S	Leaf extract used as aphrodisiac tonic and regulate menstrual cycle in women. Bark extract used against snake bite. Seed paste used in skin disorder.
Fabaceae	<i>Quercus leucotricophora</i> , Roxb.	Banj	T	1200-2500	Fr, Rs	Fruit extract used in asthma and diarrhoea. Resin is used against cough and cold.
Gentianaceae	<i>Swertia chirayata</i> , Roxb. ex Flem.	Chirayata	H	2000-2500	WP	Extract of plant used in cough, cold, asthma and headache. Root extract used in liver diseases. Juice of leaves used in blood diseases.
Geraniaceae	<i>Geranium wallichianum</i> , D. Don. Ex. Sw.	Kaphla	H	2000-2800	R	Paste of root used in joints pain. Root extract used in cholera, dysentery and cold.
Geraniaceae	<i>Geranium nepalense</i> , Sw.	Lajari/ Bhanda	H	1700-2500	R	Root extract used in jaundice, ulcer, wound healing and stomach disorders.
Hippocastanaceae	<i>Aesculus indica</i> , Colebr.	Pangar	T	1500-3000	Fr, L	Fruit extract used in treatment of ulcer, leucorrhoea and skin diseases. Juice of leaves used against fever, cough and cold.
Hypoxidaceae	<i>Curculigo orchoides</i> , Gaerth.	Kali- Musli	H	1800-2600	Rz, L	Powder of rhizome used in urinary disorder, diarrhea, jaundice, aphrodisiac tonic and piles. Paste of leaves used in wound healing.
Juglandaceae	<i>Juglans regia</i> , Linn.	Aakhor/ Akhrot	T	1500-2500	L, Br, Fr	Leaf extract used in skin disorders. Powder of bark used in toothache. Fruit is used in rheumatism.
Labiatae	<i>Thymus serpyllum</i> ,	Jangli-	H	1400-2000	WP	Juice of plant with honey used in treatment of cough, asthma and skin

SURVEY ON TRADITIONAL USES OF MEDICINAL PLANTS OF BAGESHWAR VALLEY, INDIA

	Linn.		Pudina				diseases.
Lamiaceae	<i>Micromeria biflora</i> , Buch.-Ham. ex. D. Don. Benth.		Garurbooti	H	2000-3500	R	Root extract used in snake bite and wound healing.
Lamiaceae	<i>Origanum vulgare</i> , Linn.		Ban-Tulsi	H	1500-3000	L	Juice of leaves used in treatment of cold, fever, influenza, menstrual disorder, indigestion and diarrhea.
Lamiaceae	<i>Mentha piperata</i> , Linn.		Podin	H	Up to 2300	L	Leaf extract used in vomiting, cough, cold and nausea.
Lamiaceae	<i>Thymus linearis</i> , Benth.		Ban-Ajwain	H	2500-3700	L, Fl	Powder of leaves and flower used in treatment of cuts and wound healing.
Lauraceae	<i>Cinnamomum tamala</i> , Nees.		Dalchini	T	1000-2500	L, Br	Extract of leaves and bark used in vomiting, nausea, diarrhea and diabetes.
Lauraceae	<i>Persea duthiei</i> , King ex. Hook.		Kaul	T	1500-2000	L	Leaf powder used against cough, cold and stomach disorders.
Leguminosae	<i>Desmodium elegans</i> , DC.		Bhatul/ Chamlai	H	1200-2500	R	Root powder used in asthma, chronic fever, vomiting and snake bite. Root juice used in treatment of cholera.
Leguminosae	<i>Trifolium repens</i> , Linn.		Teenpatti	H	1500-2400	L	Juice of leaves used in hair dandruff.
Liliaceae	<i>Gloriosa superba</i> , Linn.		Kalihari/ Langhi	H	Up to 2000	R	Root powder used in piles, worm infection, snake bite, skin diseases and wound healing.
Liliaceae	<i>Paris polyphylla</i> , Smith.		Satwa	H	1700-2600	R	Root powder used in fever, diarrhea and nerve tonic.
Liliaceae	<i>Polygonatum verticillatum</i> , Linn.		Maha-Meda	H	2000-3500	R	Root extract used as aphrodisiac and nervine tonic and also used in gastric complaints and wound healing.
Liliaceae	<i>Nomocharis oxypetala</i> , Royale E.		Ban-Pyaj	H	3000-3600	Bb	Used as health tonic.
Loranthaceae	<i>Viscum articulatum</i> , Burm, F.		Budu/ Pand	S	1000-2500	WP	Powder of plant and seed used in treatment of menstrual disorder and hypertension. Bark is used in atrophy, rheumatism and snake bite.
Lythraceae	<i>Woodfordia fruticosa</i> , Linn. Kurz.		Dhaul	S	Up to 2000	L	Leaf extract used in treatment of cancer, cholera, cough, diarrhea, dysentery, fever, nausea, night blindness, pregnancy complications, muscle pain, ulcer and healing of wounds. Chewing of root used for curing impotency.
Malvaceae	<i>Hibiscus rosa-sinensis</i> , Linn.		Gurhal	S	1300-2000	St, Fl	Extract of stem and flower used in treatment of cough, anti fertility, menorrhagia, bronchitis, kidney diseases and urine disorders.
Meliaceae	<i>Toona ciliata</i> , Roem.		Tuni/ Toon	T	1200-2000	Br, Fr, L	Powder of bark and fruit used in asthma, dysentery, malaria and gastric problems. Leaves used as antiseptic, insect repellent and insecticide.
Meliaceae	<i>Melia azedarach</i> , Linn.		Bakain	T	800-1700	L, S	Decoction of leaves used in hysteria and skin diseases. Seed are used in treatment of rheumatism, malaria, diabetes, cough and hypertension.
Mimosaceae	<i>Acacia catechu</i> , Willd.		Khair	T	1000-1500	Br, St	Powder of bark with milk used in treatment of cough, cold and diarrhea. Katha is used in mouth ulcer, boils, piles, skin diseases and gum infection.
Mimosaceae	<i>Acacia nilotica</i> , Linn.		Babool	T	Up to 1500	S, R, Br	Seed powder used as tooth powder. Powder of root used in cancer, tumor and tuberculosis. Bark extract used in pneumonia, asthma and bronchitis. Juice of leaves used in diarrhea.
Moraceae	<i>Allium wallichii</i> , Kunth.		Ban-Lehasun	H	2800-3500	L	Leaves used in indigestion.
Moraceae	<i>Picrorhiza kurroa</i> , Royle ex. Benth.		Kutki/ Karui	H	2400-3700	R	Root extract used in stomach pain and fever.
Moraceae	<i>Ficus religiosa</i> , Linn.		Pipal	T	1000-1800	L, Fr, Br	Leaves used in asthma, diarrhea, gastric problems and eye diseases. Fruit used in asthma and respiratory diseases. Bark powder used in diarrhea, gonorrhea, blood clotting, paralysis, diabetes and healing of fractured bone.
Moraceae	<i>Ficus racemosa</i> , Linn. Var. typical Barrett.		Timul	T	Up to 1500	Br, Lt	The decoction of bark and latex used in diarrhea, dysentery and jaundice.
Moraceae	<i>Morus alba</i> , Linn.		Tutri	T	2000-3200	Br, L	Bark powder used in cough, fever, wheezing and headache. Leaf extract used in snake bite and hemorrhage.
Moraceae	<i>Ficus palmata</i> , Forsk.		Bedu	T	1000-2100	Fr	Fruit is used in treatment of diseases of lungs.
Moraginaceae	<i>Cordia obliqua</i> , Willd.		Lassura	T	Up to 1400	Fr	Fruits are used in cough, chest problems, gonorrhea and chronic fever.
Morinaceae	<i>Morina longifolia</i> , Wall. ex. DC.		Bishkandar	H	2500-3200	R	Paste of root used in burns and boils.

Musaceae	<i>Musa paradisiaca</i> , Linn.	Kela	H	Up to 1600	St, Fr	Stem and fruit juice used against snake bite and dysentery.
Myricaceae	<i>Myrica esculenta</i> , Buch.-Ham.	Kaphal/ Kaphoo	T	1200-2500	Br	Bark powder used in fever, cough, asthma, urinary disorders, bronchitis, piles, anaemia, ulcers and tumors.
Myrsinaceae	<i>Myrsine africana</i> , Linn.	Ghani/ Banwan	H	1000-2800	Fr	Fruit extract used in cough.
Myrtaceae	<i>Syzygium cumini</i> , Linn.	Jamun	T	1000-1500	Br	Bark powder used in indigestion, diabetes, stomach pain and piles. Leaf extract used in treatment of skin problems.
Orchidaceae	<i>Coelogyne cristata</i> , Lindl.	Gondya	H	500-1500	Bb	Bulb used as aphrodisiac tonic.
Orchidaceae	<i>Habenaria edgeworthii</i> , Hook, F. ex. Collet	Ridhi	H	1200-2500	R	Root extract used as nervine and cardiac tonic.
Orchidaceae	<i>Habenaria intermedia</i> , D. Don.	Vridhi	H	1500-2700	R	Root extract used as health tonic.
Orchidaceae	<i>Malaxis acuminata</i> , D. Don.	Lasania	H	1200-2350	Bb	Bulb used in fever, weakness, tuberculosis and aphrodisiac tonic.
Oxalidaceae	<i>Oxalis corniculata</i> , Linn.	Tinpatiya	H	1400-2800	WP	Juice of plant used in cough, cold, stomach pain, piles, dysentery and diarrhea. Paste of leaves used in wound healing and skin problems.
Papaveraceae	<i>Argemone maxicana</i> , Linn.	Bhatbhamt	H	700-1500	WP	Latex is used in cure of eye diseases.
Papilionaceae	<i>Dalbergia sisoo</i> , Roxb.	Shisam	T	Up to 1500	St	Wood powder used in cure of leprosy.
Pedaliaceae	<i>Sesamum indicum</i> , Linn.	Til	H	Up to 1750	S	Seed oil used in treatment of Cholera, diarrhea, dysentery and bladder troubles.
Pinaceae	<i>Cedrus deodara</i> , Roxb. Loud.	Deodar/ Deyar	T	1200-3000	St	Wood powder used in cure of fever, diabetes, piles and kidney stones.
Pinaceae	<i>Pinus roxburghii</i> , Sargent.	Salla	T	900-1800	St	Wood resin used in skin diseases, snake bite and scorpion stings.
Plantaginaceae	<i>Plantago himalaica</i> , Pingler.	Isopgol	H	1500-2200	S	Seed extract used in dysentery, diarrhea, fever, cough and cold.
Plumbaginaceae	<i>Plumbago zeylanica</i> , Linn.	Cheel/ Chitrak	H	Up to 1800	R	Root powder of paste used in piles, skin disorders, leprosy and malaria.
Poaceae	<i>Cynodon dactylon</i> , Linn.	Doob	H	Up to 2700	L, St	Stem extract used in dysentery and urinary disorders. Paste of leaves used in cuts, wound healing, piles and diarrhea.
Podophyllaceae	<i>Podophyllum hexandrum</i> , Wall. ex. Royle	Ban- Kakdi	H	2600-3900	R	Paste of root used in wound healing.
Polygonaceae	<i>Polygonum amplexicaule</i> , D. Don.	Ban- Madua	H	500-2000	Rz	Paste of rhizome used to soften the mammary gland of livestock.
Polygonaceae	<i>Rumex hastatus</i> , D. Don.	Chaulmor a/ Khatti- Mitti	H	700-2400	R	Root extract used in jaundice and also used as antiseptic.
Polygonaceae	<i>Rumex nepalensis</i> , Spr.	Jangli- Palak	S	1500-3000	L	Paste of leaves used in itching.
Punicaceae	<i>Punica granatum</i> , Linn.	Darim	T	1400-2900	Fr, St	Fruit juice used against diarrhea, dysentery and jaundice. Stem and fruit bark used as astringent and anthelmintic purposes.
Ranunculaceae	<i>Delphinium denudatum</i> , Wall.	Nirbisi	H	1500-2200	R	Root decoction or powder used in abdominal pain, toothache, snake bite, ulcers and respiratory problems.
Ranunculaceae	<i>Anemone rivularis</i> , Buch.	Ratanjot/ Nevla-Jadi	H	1800-3000	L	Paste of leaves used in wound healing and cuts.
Ranunculaceae	<i>Clematis montana</i> , Buch.-Ham.	Kauniabali	H	1300-3500	Fl, L	Flower juice used in cough. Leaf extract used in diabetes and urinary complications.
Ranunculaceae	<i>Aconitum heterophyllum</i> , Wall.	Atees	T	2000-3700	R	Root extract used in snake bite.
Rhamnaceae	<i>Ziziphus mauritiana</i> , Lamk.	Ber	T	Up to 1800	R, Br	Root powder used in cough and headache. Bark extract used in fever and diarrhea. Leaf paste used in cough, healing of wound and diarrhea.
Rosaceae	<i>Fragaria indica</i> , Andr.	Aakhe	H	1200-3000	L	Leaf extract used in gastric, ulcer, diabetes and wound healing.
Rosaceae	<i>Rubus ellepticus</i> , Smith.	Hisalu	S	1200-2200	R, L	Powder of root used in diarrhea, dysentery, fever and gastric trouble. Leaf paste used in wound healing.
Rosaceae	<i>Cotoneaster microphylla</i> , Wall. ex. Lindl.	Bakri- Chara	S	1600-2000	Fr	Fruit is used in stomach pain.
Rosaceae	<i>Prunus cerasoides</i> , D. Don.	Padam/ Payya	T	1500-2300	Br	Paste of bark used in wound healing. Amulet of bark tied in arm or waste of child for their well being.
Rubiaceae	<i>Rubia manjith</i> , Roxb.	Manjistha	H	1200-2000	R, Fl	Powder of root and flower used in

SURVEY ON TRADITIONAL USES OF MEDICINAL PLANTS OF BAGESHWAR VALLEY, INDIA

	ex. Flem.					jaundice, dysentery, snake bite, liver problems, ulcer and stomach pain.
Rubiaceae	<i>Randia tetrasperma</i> , Benth. & Hook. F. ex. Brandis.	Ghanaalo	H	1300-2600	R	Root extract used in treatment of jaundice and stomach pain.
Rutaceae	<i>Agave americana</i> , Linn.	Rambas	S	1200-1800	L, R	Leaf and root extract used as diuretic and purgative.
Rutaceae	<i>Zanthoxylum armatum</i> , Roxb.	Timur	S	1000-2000	WP	Used as stomachic, anthelmintic and carminative purposes. Shoot used as tooth brush.
Rutaceae	<i>Murraya koenigii</i> , Linn. Spreng.	Gandhela/ Gani	S	1000-1700	L, Br, R	Extract of leaf, bark and tonic used as health tonic. Branches used as tooth brush.
Rutaceae	<i>Aegle marmelos</i> , Linn. Correa ex. Roxb.	Bael	T	Up to 1300	L, Fr, R	Leaf extract used in fever, asthma, skin diseases and intestinal infections. Fruit juice used in treatment of diarrhea, cough and high blood pressure. Root powder used in diabetes.
Sapindaceae	<i>Sapindus mukorossi</i> , Goertn.	Ritha	T	1000-1500	Fr	Fruit extract used in epilepsy and also used as expectorant.
Saxifragraceae	<i>Saxifraga ligulata</i> , Linn.	Pasanbhed	H	1200-2500	Rz	Powder of rhizome used in curing cough, fever, tumor and vaginal diseases.
Scrophulariaceae	<i>Bacopa monnieri</i> , Linn.	Ban-Brahmi	H	1500-2800	WP	Decoction of whole plant used in asthma, mental disorder, epilepsy and also used as nervine and cardiotonic.
Scrophulariaceae	<i>Picrorhiza kurrooa</i> , Royle ex. Benth.	Karui	H	2800-4000	R	Root extract used in fever, stomach pain, scorpion sting, asthma and liver problems.
Solanaceae	<i>Capsicum annum</i> , Linn.	Mirch	H	Up to 2600	Fr	Paste of fruit used in scorpion sting.
Solanaceae	<i>Datura stramonium</i> , Linn.	Kala-Dhatura	H	1000-2500	L	Extract of leaf used in snake and insect bite. Smoking of leaves is traditional cure of asthma.
Solanaceae	<i>Solanum nigrum</i> , Linn.	Giwai	H	1600-2200	WP	Decoction of plant used in treatment of cough, dysentery, jaundice, rheumatism, goiter, piles, urine complications and skin diseases.
Taxaceae	<i>Bergenia ciliata</i> , Royle	Silphor/ Pathar-Chatta	H	1400-2500	R	Root powder used in fever and diarrhea.
Taxaceae	<i>Lawsonia inermis</i> , Linn.	Mehndi	S	1000-1500	L	Leaf paste used in wound healing.
Taxaceae	<i>Taxus baccata</i> , Wall. ex. Steud.	Thuner	T	1400-2600	L, Br	Leaf powder used in treatment of cough, cold, fever, asthma, epilepsy, jaundice and malaria. Bark extract used in fractured bone and cancer.
Thymelaeaceae	<i>Daphne papyracea</i> , Wall. ex. Steud.	Satpura	S	1500-3200	WP	Juice of plant used in high blood pressure.
Tiliaceae	<i>Grewia oppositifolia</i> , Roxb.	Bhimal/ Bheku	T	Up to 1700	L, Br	Paste of leaves used in fever and skin eruption. Bark paste used in cure of fractured bone.
Urticaceae	<i>Urtica dioica</i> , Linn.	Bichughas / Sisun	S	1000-3500	R, L	Root and skin paste used in rheumatism and skin problems.
Valerianaceae	<i>Valeriana jatamansi</i> , Jones.	Samyo	H	1600-3500	WP	Extract of plant used in treatment of liver problems, hysteria and nervous disorders. Paste of root used in wound healing and blisters.
Verbanaceae	<i>Clerodendrum serratum</i> , Linn.	Ban-Kakri	H	1000-1800	R, L	Decoction of root used in cough, asthma and fever. Leaf paste used in headache and skin diseases.
Verbanaceae	<i>Callicarpa macrophylla</i> , Vahl.	Giwai	S	Up to 1500	S, R, Br	Seed and root powder used in stomach pain. Bark paste used in rheumatism, mouth and tongue sores.
Verbanaceae	<i>Vitex negundo</i> , Linn.	Sewae/ Sumalu	S	1000-1800	R, L	Paste of root and leaves used against chest and back pain.
Verbanaceae	<i>Premna barbata</i> , Wall.	Agneo	T	800-1700	L, Br	Leaf paste used in joints and back pain. Bark powder used in dropsy, ulcer and diarrhea.
Violaceae	<i>Viola canescens</i> , Wall. ex. Roxb.	Banafsa	H	1100-2700	Fl, L	Decoction of leaf and flower used in cough, cold, malaria and jaundice.
Zingiberaceae	<i>Costus speciosus</i> , Koenig ex. Retz. J. E. Smith	Kewati	H	750-1600	R	Root powder used in cure of boils, wound healing and diabetes.
Zingiberaceae	<i>Curcuma longa</i> , Linn.	Haldi	H	Up to 1800	Rz	Rhizome powder used in treatment of skin disorders and wound healing.
Zingiberaceae	<i>Hedychium spicatum</i> , Buch.-Ham. ex. Sm.	Ban-Haldi	H	1400-2600	Rz	Rhizome powder used in asthma, piles, bronchitis, snake bite and nausea.
Zingiberaceae	<i>Zingiber officinale</i> , Rosc.	Aad/ Adrak	H	1200-1700	Rz	Juice of rhizome used in cough, cold and asthma.
Zygophyllaceae	<i>Tribulus terrestris</i> , Linn.	Gokharu	H	Up to 1400	WP	Decoction of leaf and root used in treatment of kidney stone.

Ht - Habit, Alt - Altitude, T - Tree, S - Shrub, H - Herb, C - Climber, R - Root, S - Seed, Br - Bark, L - Leaf, WP - Whole plant, Rz - Rhizome, Bb - Bulb, St - Stem, Lt - Latex, Fl - Flower, Fr - Fruit, Re - Resin

According to survey of the sites, there are many medicinally important taxa viz: *Taxus baccata*, *Betula utilis*, *Aesculus inidca*, *Rhododendron arboretum*, *Rhododendron campanulatum*, *Persea duthiei*, *Polygonatum verticillatum*, *Bacopa monnieri*, *Premna barbata*, *Hedychium spicatum*, *Cedrus deodara*, *Dioscorea deltoidea*, and *Viola canescens*, which are being severely exploited by the local people for their various medicinal purposes. A drastic reduction in the total population of these valuable medicinal plants was recorded in this region.

Conclusion

The geographical and geological peculiarities make the Himalayas a very diverse system subtending a wide range of vegetation types. The Himalayan biodiversity is severely threatened by natural and anthropogenic disturbances. A large number of medicinal plants grow in these forests. Local population used these plants for curing of different diseases by traditional knowledge and also used as food and other purposes. But now a day due to changes of traditional culture and introduction of modern technologies this indigenous traditional knowledge is now become extinct. The present study revealed that the biodiversity of the study site need to be conserved against deforestation, habitat loss and unscientific collection of flora.

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