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Review Article

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Review on Important Ethno- Medicinal Plants in Uttarakhand

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ABSTRACT

Ethno- botany has emerged as an important branch of study which focuses on the utility of different plant species and their values as food, medicine, etc. Uttarakhand state is considered as a repository of biodiversity with particular reference to medicinal plants that can be an important option for sustainable livelihood of the hilly people in coming future. About 300 medicinal plant species have been documented from this state, indicating ethno-medicinal richness as an herbal state and for strengthening herbal-based industry in this region. The potential drug value lies in plant roots, leaves, fruits, seeds and sometimes entire plant is used to cure the various ailments. These are administered in the form of infusion or decoction or applied locally as paste or powder to the affected body part to cure. The present paper focuses about the different medicinal plants used in the Uttarakhand Himalayan region.

Key words: *Medicinal Plants, Local Name, Part Used, Mode of Treatment, Demand and Market Value and Conservation*

INTRODUCTION

Medicinal plants have been the subjects of man's curiosity since time immemorial[8], almost every civilization has a history of medicinal plant use[10]. About 400 plants are used in regular production of *ayurvedic*, *unani*, *siddha* and tribal medicine[2] about 75% are from tropical and 25% from temperate forests in India[37]. India is also rich in medicinal plant diversity with all the three levels of biodiversity such as species, genetic and habitat diversity[20]. Due to its unique geographical location and different climatic condition, Uttarakhand Himalaya has rich biodiversity and variety of plant species[26] and also hastremendous potential for domestication of medicinal plants that can be an important option for sustainable livelihood of the hilly people in coming future[11].The Indian Himalayan Region (IHR) is the habitat of major tribal communities such as *Bhotias*, *Boaxas*, *Tharus*, *Jaunsaries*, *Shaukas*, *Kharvar* and *Mahigiri*, which use medicinal plants for curing the diseases and ailments through the use of natural medicine[34]. Published literature was collected through secondary sources mainly from the website of government of Uttarakhand (uk.gov.in), State Medicine Plant Board of Uttarakhand, SMPB (www.smpbuk.org) and Forest department of Uttarakhand (forest.uk.gov.in).

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Literature Review Strategy

The references from research papers, books, articles and newspapers were taken for interpretation of data.

Traditional medicinal knowledge

The indigenous knowledge is an important tool for study of natural resources that has enormous potential to facilitate development process in cost-effective and sustainable ways[29]. Knowledge of flora and vegetation of any area is essential for the study of biodiversity, environment and conservation of natural resources[6].The medicinal plants and their existing ethno-botanical knowledge as a tool will be beneficial in future understanding, research and sustainable management of medicinal plants occurring particularly in the region as well as those poor people who cannot afford expensive medicine from market and can get immediate relief from such medicinal plants traditionally used by villagers[15].

Uses

The 30% of preparations are derived from roots, 16% whole plants,14% bark, 10% fruits,7% seeds, 6% both stems &leaves, 5% flowers, 4% rhizomes,3% wood and only less than 20% of the species used are cultivated[2].Medicinal plants are chiefly used for curing stomach pain, fever, cold & cough, bleeding & wounds, fungal infection, burns, rheumatic pain, insect bite, influenza, diarrhoea, jaundice and cirrhosis[7,18,24]. The plants such as: *Adiantum venusthum*, *Capsicum annum*, *Hyoscyamus niger*, *Primula denticulate*, *Salix elegans*, *Salvia lanata*, *Tagetes arecta*, *Viola biflora*etc. appear vary high in demand in drug industry as they are being used in largest number of the preparations[28].The Medicinal plants available in Uttarakhand and their uses are tabulated in Table-1.

Demand and Marketing

Medicinal plants provide the natural raw material for most oral and non-oral traditional medications[36]. Cultivation and sustainable harvesting of medicinal plants with scientific knowledge and proper marketing system might be a big source of additional income for improvement of livelihood of rural people[35]. In the global market, the trade of herbal medicines is about Rs. 27 billion per year whereas in India it is about Rs. 3.5 billion per year and it is increasing at the rate of 7% per year[14]. There is a great deal of potential for the development of these crops in the hill regions without much heavy investment[11]. Uttarakhand can take advantages of increasing demand and low availability of medicinal and aromatic plant resources in the other parts of country and start to grow highly valuable medicinal plants in high altitudes areas[11]. Medicinal principles are present in different parts of the plant like root, stem, bark, heartwood, leaf, flower, fruit or plant exudates[11].

Conservation Value

The conservation and cultivation of natural resources especially of medicinal plants is required[15].Due to various reasons, the medicinal plants that are naturally grown in abundance in this hilly area are now a day's depleting fast[15]. Lack of alternate income sources force people to over-exploit natural resources of this region[15]. The cultivation of medicinal plants is considered to be of great importance for the safeguarding of biodiversity and contribution to rural livelihoods in Uttarakhand[11]. Moreover conservation and cultivation of medicinal plants can help the villagers to earn their livelihood to some extent[15]. Apart from human use, many plant species were also used in animal husbandry as the primary source of healthcare[30,13].

These findings would support use of medicinal plants and their conservation in the region[15].It is necessary to initiate systematic cultivation of medicinal plants in order to conserve biodiversity and protect endangered species. In addition to the requirement for conservation of medicinal plants it has also become essential to protect and patent the traditional knowledge[27]. New approaches of biotechnology and conservation strategy can help preserve and utilize the indigenous knowledge of medicinal plants for humankind[12,21].

CONSERVATION INITIATIVES FOR SUSTAINABLE CULTIVATION OF MEDICINAL PLANTS

After declaration of Uttarakhand as an Herbal State, the government took initiatives for sustainable cultivation of MPs in a phased manner. The government appointed Agriculture and Processed Food Products Development Authority, as a nodal agency to promote setting up of Agri Export Zones in two phases. Under the first phase, six districts: Chamoli, Dehradun, Haridwar, Pithoragarh, Udhamsingh Nagar and Uttarkashi, are being covered. In this phase, emphasis on 10 high value species as mentioned above will be cultivated on about 500 ha land. In the second phase, the area under cultivation would be increased and additional districts brought under the aegis of Agri Export Zones and other medicinal plants will also be cultivated. This is being done with the support from Infrastructure Development Finance Company Ltd to boost exports and enhance India's share in the world market. The State has established the Herbal Research and Development Institute at Gopeshwar in district Chamoli as a nodal agency to monitor developmental issues and for inventorisation of MPs species in the state[31]. As elsewhere, in the Indian Himalayan Region, ethnic communities in the state of Uttaranchal rely, to a large extent, on native plant species for sustenance of their traditional health-care system, both logistically as well as economically. However, the present scenario shows a decline in these traditional, plant-based health- care practices. These age-old practices are conservation-oriented and have tremendous potential to uplift the state economy. The excessive extraction of medicinal plant resources for use in the pharmaceutical industry has resulted in ruthless destruction of natural populations of medicinal plants. This work attempts to assess the current status of knowledge of medicinal plant resources of the state. It also focuses on the importance of documenting traditional knowledge and practices related to conservation and sustainable utilization of medicinal plants in Uttaranchal. A collaborative work plan involving scientists, government institutions and nongovernmental organizations is suggested for preserving the traditional knowledge system and practices, conservation of medicinal plants and upliftment of the rural economy of this mountain state[9]. Conservation of high-value medicinal plant species require sincere and serious attempt by stakeholders. Developing measures for *ex situ* conservation to encompass activities in totality within a given time frame need identification and concentration. The role of interested farmers is very vital in developing demonstrative cultivation trials and an effective long-term conservation strategy. From the perspective of biodiversity conservation, domestication, and cultivation through appropriate technological intervention, MAP resources are a viable option for natural resource management and livelihood enhancement[19,22]. Cultivation of such species mostly in abandoned and marginal land will improve the economic condition of farmers and help conserve medicinal plants diversity in their natural habitat[25]. Therefore, cultivation of these plant species in barren and marginal lands, as desired by local farmers, will be a step toward obtaining their benefits. Khoshboo[16] summarizes different options available for conservation of biodiversity. Both in situ (on site) and ex situ (off site) means of conservation are equally important and to be considered complementary to each other. In situ conservation of crop genetic resources has sometimes not been given importance. As in situ conservation provides a natural reservoir of crop genetic resources and this method is dynamic over ex situ since plants can continue to evolve in the natural habitat. In Himalayan region a number of protected areas-biosphere reserves, national parks and wildlife sanctuaries are in existence and are proposed.

Ex situ conservation

Maintenance of ex situ populations of plants is carried out by a number of institutions including botanical gardens, forestry research institutes, and agricultural research centers. This involves three methods:

- **Field gene banks:** It is an assemblage of diverse plant species and their range of genetic diversity in an area. The plant materials are conserved and are available for breeding, reintroduction, research and other purposes. This method is useful for long living perennials trees and shrubs.
- **Botanical gardens** often have collections which are effectively field gene banks. These gardens also accommodate some endangered plants.
- **Seed banks:** Seed banks are the most efficient and effective methods of ex situ conservation for sexually reproducing seeds under long term storage. It is an effective and compact method of storage but is dependent on secure power supply, careful monitoring and testing of seed viability and regeneration in cases where the viability falls below a certain level. In India, NBPGR, is one of the largest depositories of PGR. There are a number of seed banks in the world with specialization in the nature of the collections, geographical area, taxonomic groups, wild plants, forestry trees, etc.
- **In vitro storage:** It refers to the conservation of germplasm through meristem tissues in test tubes. These methods are suited for the long term storage of propagules of species which otherwise cannot be maintained in seed banks. However, this method has limitations in applicability.

Factors responsible for the depletion of medicinal plant bio-diversity

- Increasing Demand of herbal products, i.e., medicine as well as cosmetic has resulted very high demand of raw plant parts causing tremendous pressure on their natural habitat.
- Shrinking of natural habitat of medicinal plants due to population pressure and other developmental activities.
- Indiscriminate and over exploitation from natural sources.
- Lack of agro-technology of highly demanded medicinal plants.
- No serious efforts for commercial scale cultivation.
- Forest fire plays a very devastating role in the destruction of small medicinal plants.
- Illegal trading of banned high value medicinal plants.
- Excessive grazing by domestic as well as wild animals.
- Cutting of medicinal trees for fuel, timber, etc., and lopping of leaves for fodder and cattle bedding.
- Change in climate and weather pattern.
- Lack of awareness towards this valuable heritage. The flora of Western and Central Himalaya were also explored by

Strachey and Winterbotton from 1,846 to 1,849 and they have identified an overall flora of these regions under 137 orders, 983 genera and 2,672 species of flowering plants and 101 genera, 371 species of cryptogams. In Flora Nainitalensis, Dr. R.K. Gupta has reported 457 genera and 869 species of herbs of Nainital district. E.T. Atkinson has reported more than 200 species of medicinal plants in his book Economic Botany of Himalayas. In 1975 an international level organization 'Conservation on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was established, about 155 countries are its members. This organization checks the trade of endangered plants and animal species with the help of IUCN and SSC group. For the export of endangered flora and fauna a permit is needed from CITES. India became its 25th member after joining it in 18th October 1976.

Income Generating Activities

The State of Uttarakhand has high degree of agro-climatic diversity and economic backwardness**.** Medicinal plant products can become a parallel market which, if captured in a strategic manner, can lead to the rapid development of the hill districts of Uttarakhand. Continuous extraction of several medicinal plant species from the wild and substantial loss of their habitats during last two decades have resulted into decline of many highly valuable medicinal plant species in the region. Cultivation and sustainable harvesting of medicinal plants with scientific knowledge

and proper marketing system might be a big source of additional income for improvement of livelihood of rural people[35]. The economic deprivation in region is not only because of small land holdings but also because of unproductive land use due to rain fed and operational constraints faced due to harsh physical conditions. Demand of the high quality medicinal plants is increasing day-by-day in the national and global market resulting in the loss of biodiversity and environmental degradation.

Medicinal plant education:

The state is bestowed with abundant natural resources in the form of forests, water bodies and plants of rare kind. What it requires is focused application of skills and knowledge to make best use of it in a sustainable manner. There is a growing need for quality medicinal plants education in the state, which can create new employment in the areas such as plant science, food science, processing, agribusinesses, etc. It would be desired that special provisions be made to teach agriculture of medicinal plants to children in schools. The children's awareness and understanding of our ecosystem is essential, they must be exposed to the necessity of sustainable medicinal plant practices to ensure that the future of our biodiversity is secure. This can become the foundation of vibrant medicinal plants businesses in the newly formed state[11].

Legislation

There are no separate policies or regulations for conserving medicinal plants growing in forests in India. There conservation is covered under existing laws pertaining to forestry. Following are the laws formulated by government of India for conservation of forests which directly or indirectly protects the wild herbal flora: Forest Act- 1927, Wildlife (Protection) Act- 1972 and Wildlife (Protection) Amendment Act- 1991, Forest (Conservation) Act- 1980, Environment Protection Act-1986, National forest policy, 1988, National biodiversity Act- 2002, the scheduled tribes and other traditional forest dwellers Act- 2006[1].

Factors are needed to success on this sector

- To promote the cultivation of those medicinal plants with a large market potential.
- Select a suitable area with favorable agro-ecological conditions and relatively low levels of economic development.
- Research and development needs to be carried out to understand and find out favorable conditions for the cultivation of important medicinal plants. This can help to improve productivity and production of herbal and medicinal plants through increasing cooperation between researchers and farmers.
- Identifying a buyer in the market who can guarantee to purchase the whole production at a good price with higher return than other crops and increase their trade in the state.
- To increase the area of cultivation of aromatic and medicinal plants on hilly barren land.
- Strengthening the extension activities of Herbal Research and Development Institute (HRDI), Gopeshwar, Chamoli and Centre for Aromatic Plants (CAP), Dehradun and give more emphasis on - how to grow medicinal plants and conserve them.
- To increase the knowledge about the need of pharmaceutical and food industry.
- To increase awareness about herbal supplements and herbal remedies among the villagers.
- Find out the role of cultural factors in medicinal plant use and cultivation for maintain biodiversity.
- To fix support prices by the government are required for longterm plantation.
- To increase production and productivity it is important to establish the cluster approach and low-cost processing.
- To set up good road network at village level due to the difficult physical geography of the hill villages in the state.
- Need to revise state forest policies that support conservation and sustainable use of medicinal plants in Uttarakhand.

- Uttarakhand needs to build up technological and scientific capabilities to develop and improve the production of medicinal principles and to conduct R&D to develop green products.

Table 1: Medicinal plants of Uttarakhand and their uses

Sl. No.	Botanical Name	Local Name	Parts Used	Uses	Mode of treatment
1.	*Achyranthes bidentata*, Blume.	Dansh	Root	As Laxative	One palmful root decoction in one litre water given two times for vigour
2.	*Artemisia nilagiric*a, Pampanini.	Patti & Kunj	Whole plant	For urinary tract infection	One palmful whole body decoction in one litre water given one cup with gur
3.	*Artemisia sacrorum*, Ladeb.	Kaparpatti & Jholpatti	Leaf &Bud	For hair fall	One palmful leaves & bud decoction in two litrewater given one cup twice a daily
4.	*Abies webbiana*, Lindl.	Talispatra	Bud	In cough	One palmful bud decoction in 3 litre water given thrice a day
5.	*Adina cordifolia*, Hook. F	Haldu	Bud& leaf	For wound & fever	Applying paste of new bud on the wound. Decoction of leaves in ½ litre water given thrice a day in fever
6.	*Acacia catechu*, Wild.	Khair	Stem	In urine problem &dysentery	One palmful stem decoction in ½ litre water given one cup four times a day
7.	*Achyranthes aspera*, Linn.	Chirchira	Whole plant	For teeth problem	One palmful whole plant in ½ litre water
8.	*Aconitum balfouria*, stapf.	Bishjahar	Root	In wound	One matured root burns in 1litre oil gives a ointment
9.	*Acorus calamus*, Linn.	Banj	Root	Fever & pain	Two matured root with fibrous food given daily
10.	*Adiantum venusthum*,G. Don.	Hanshraj	Seed	For chest problem and hair fall	One palmful seed given with fibrous food
11.	*Aesculus indica*, Colebr.	Pangar	Fruit	In stomach problem	One palmful fruit decoction in ½ litre water given with gur
12.	*Agrimonia pilosa*, Ledeb.	Kafliya	Whole plant	For purification of blood	½palmful whole plant decoction in three/ four litre water given ½part with gur in morning
13.	*Ajuga parviflora*, Benth.	Ratpatia	Whole plant	In arthritis	One palmful whole plant decoction in 3/4 litre water given one cup daily
14.	*Allium stracheyi*,Baker.	Jambu	Whole plant	For stomach problem	Two palmful whole plant given thrice a day
15.	*Allium wallichii*, Kunth.	Jangali Lasun	Root	In infection	Two node given daily
16.	*Aloe vera*, Linn.	Patquar	Leaf	Stomach problem	Juice of leaves given ½ cup a day
17.	*Althaea officinalis*, Linn.	Jangali hauli	Root	For termination of pregnancy	Three/ four matured root decoction in one litre water is given
18.	*Anagallis arvensis*, Linn.	Vish Khaparia	Fruit/Leaf	As pain killer	Two palmful fruit/ leaves given daily
19.	*Anemona obtusiloba*Don.	Kakaria	Leaf	In sinus	A cotton bud is made of paste of leaves with ghee for cleaning sinus
20.	*Artemisia parviflora*, Roxb.	Patti & Dhopani	Leaf/ Bud	For round worm	One palmful leaves/ bud decoction in a litre water given 1/8 litre in one hour interval
21.	*Asparagus racemosus*, willd.	Kairuwa	Bud	In liver problem & enhance lactation	One palmful bud given twice a day
22.	*Atropa belladonna*, Linn.	Dhatur Jahar	Leaf	In injury as pain killer	Paste of one palmful leaves burns in oil acts as ointment
23.	*Berberis aristata*, DC	Kilmori	Root & stem	In fever & weakness	One palmful root/ stem decoction in ½ litre water given one cup daily
24.	*Bergenia ciliata*, Moench.	Silfhora	Root	For hydrophobia	Two palmful root decoction in ½ litre water given its one cup thrice a day
25.	*Betula utilis*,Don.	Bhuj & Bhojpatra	Seed	To protect from worm	Two small pinch is useful
26.	*Boerhaavia diffusa*, Linn.	Parnata	Leaf	In blood dysentery &dropsy	Juice of leaves thrice a day
27.	*Brassica napus*, Linn.	Kali sarso	Seed	In poor appetite	Two palmful seed is given with fibrous food and gur twice a day
28.	*Butea frondosa*, Koen.	Dhank	Flower &Seed	As painkiller	Paste of flower and seed is given
29.	*Calendula officinalis*, Linn.	Ganda (Tokar)	Leaf	In bleeding	Juice of leaves is helping in bleeding
30.	*Calotropis procera*, R. Br.	Ank	Root	In indigestion	One palmful powder of root decoction in one litre water given one cup twice a day
31.	*Canna indica*, Linn.	Kewara	Root	In disinterest &afra	Powder of one bunch of root is given with gur
32.	*Capsella bursa-pastoris*, Moench.	Torighash	Whole plant	For Sikkarog	Two palmful whole plant decoction in water given two times for vigour
33.	*Capsicum annum*, Linn.	Khusane & Marac	Fruit	As oil massage	One palmful fruit decoction in three litre water gives one cup twice a day
34.	*Cassoa absus*, Linn.	Banar&Chakwar	Seed	In urine problem	One palmful seeds decoction in ½ litre water given one cup thrice a day
35.	*Centella asiatica*, (Linn.)Urban	Brahmi	Leaf	For brain fever	Apply paste of green leaves on forehead during fever
36.	*Chenopodium album*, Linn.	Bethuwa	Leaf/ seed	For worm	Two palmful seed is given before breakfast
37.	*Cinnamomum tamala*,Ness.	Kiriya, karkiriya & Dalchini	Leaf	In stomach problem & gastric problem	Powder of leaves and bark with half palmfulfibre food is useful
38.	*Clerodendruminfortunatum*,Gaertn.	Aranyo	Bark	In efra	Powdered bark decoction in 2 litre water given one cup thrice a day
39.	*Cuminum cyminum*, L.	Jeera	Seed	For indigestion	One palmful seed in ¼ litre water given daily
40.	*Cureuma angustifolia*, Roxb.	Banhaldi	Root	In gastric problem & anti-worm	Paste of root
41.	*Datura metal*, Linn.	Dhatura	Seed	As pain killer (for external use only)	25g roasted seed in one litre oil is used for massage
42.	*Datura stramonium*, Linn.	Dhatura	Leaf	In injury as pain killer	Paste of one palmful leaves acts as ointment

43.	*Delphinium denudatum*, Wall	Nirwishi & Munel	Seed	In tics	One palmful seed decoction in ½ litrewater is given
44.	*Digitalis purpurea*,Linn.	Prawasitpushpi	Leaf	In burning	One palmful leaves is roast with oil is used as ointment
45.	*Emblicaofficinalis*,Gaertn.	Aula & Awla	Fruit	In eye disease/ good health	Two palmful fruits powder with fibrous food
46.	*Ephedra gerardiana*, Wall.	Gidjing	Stem	In pain	One bunch of stem pieces decoction in twolitre water given one cup in early morning
47.	*Equisetum arvense*, Linn.	Horsetel	Whole plant	For urinary problem	Half palmful whole plant decoction in one litre water given
48.	*Euphorbia prolifera*, Buch. Ham.,ex.Don.	Duwila	Fruit	Used in dog bite	Powder of fruit is useful
49.	*Foeniculum vulgare*, Mill.	Saup	Seed	For hookworm	One palmful seed in 1/8 litre water given before morning meal
50.	*Fragaria vesca*, Linn.	Pudalia Kafal	Leaf	To protect abortion	Two palmful leaves given daily
51.	*Fumaria parviflora*,Lamk.	Pitpapara	Whole plant	In skin etching(disease)	One palmful whole plant decoction in onelitre is given
52.	*Gentiana tenella,(Roltb*) H. Smith.	Kutuki & Katuwi	Fruit	In hysteria and weakness	25g of bark of fruits decoction in one litre water given one cup with honey per day
53.	*Geranium ocellatum*, Camb.	Bhiljari	Whole plant	As insecticide	Four whole plant with fibrous food twice a day. Powder of whole plant is given as insecticide
54.	*Hedychium*spicatum,Ham.ex. Smith	Kapur Kachari	Root	For fever & cough	Root is given with gur
55.	*Holarrhenaantidysenterica*, Wall.	Quiar & Indraw	Seed & bark	In fever, gastric &dysentery	One palmful powder of bark/ seed decoction in one litre water given one cup with gur
56.	*Hyoscyamus niger*, Linn.	Bran juwan	Leaf & Seed	As pain killer	Paste of leaves and seed is used as ointment
57.	*Hypericum cernum*	Vaya & Culi	Whole plant	For hoskins and wound	Two palmful whole plant decoction in one litre water given two times for vigour
58.	*Juglans regia*, Linn.	Akhore	Leaf/ fruit	In stomach problem and As anti-worm	Two palmful leaves or two green fruits decoction in 1 litre water is given one cup with two spoon honey thrice a day
59.	*Juniperus communis*,Linn.	Jhora & khichiya	Fruit	In liver disease	Twelve fruits daily
60.	*Linum umbrosa*, Ness.	Circira	Leaf	In bone injury	Paste of leaves in water as ointment in bone injury
61.	*Linum usitatissinum*,Linn.	Alsi	Whole plant	For strength	Two palmful whole plant decoction in 1& 1/4 litre water given two times for strength
62.	*Litsaea polyantha*, Juss.	Cirira	Leaf	In injury	Powder of bark & leaves in cold water as ointment
63.	*Lobelia pyramidalis*, Wall.	Bran tambacoo	Whole plant	For liver disease	Two palmful whole body decoction in 3/4 litre water given one spoon with honey thrice a daily
64.	*Mallotus philippinensis*, Muell. & Arg.	Roli & Kasela	Fruit	To protect from worm	Fruit extract with one palmful fibrous food is given once a day
65.	*Melilotus alba*, Lamk.	Banmethi	Whole plant	For stomach problem and Indigestion	One palmful whole plant given three times in a day for vigour
66.	*Mentha arvensis*, Linn.	Pudina & Eliachi	Whole plant	In post pregnancy problems	Two palmful whole plant decoction in a litre water given ¼ part thrice a day
67.	*Ocimum sanctum*, Linn.	Tulsi	Whole plant	In fever	Two palmful whole plant twice a day
68.	*Origanum vulgare*, Linn.	Jangali tulsi	Whole plant	Indigestion	Four palmful whole plant with fibrous food twice a day
69.	*Psyllium orata*, Forsk.	Esabgol	Seed	In dysentery	One palmful seed in ½ litre water makes a semisolid paste given thrice a day
70.	*Paeonia emodi*, Wall.	Bhoi Pawin	Root	In stomach problem	One matured root decoction in 3/4 litre water is given one cup with 100g gur thrice a day
71.	*Pimpinella diversifolia*, Dc	Dhanjari	Seed	For lactation	One palmful seed given daily
72.	*Piper longum*, L.	Pipal	fruit	In low appetite & oil massage	Powder of fruit is useful for low appetite. Oil with powder massage is useful
73.	*Plantago major*, Linn.	Vrantank	Leaf	In injury, teeth problem &fever	Paste of leaves in water useful for injury & teeth pain. Two bunch of leaves decoction in one litre water given 1/6 part thrice a day for fever
74.	*Potentillaargyrophylla*	Danti & Brajdanti	Leaf/Root	For stomach problem	One palmful leaves/two matured root decoction in 3/4 litre water given thrice in a day
75.	*Primula denticulate*,Smith.	Vish Khaparia	Fruit	In cough & useful for mammary glands	Two palmful flower given with gur
76.	*Punica granatum*, Linn.	Darim	Skull of fruit	As antimicrobials	One palmful skull of fruit decoction in ½ litre water given its one cup three times a day with gur
77.	*Quercus dilatata*, Lindl.	Banj	Bark	In dysentery	Two palmful powder of bark decoction in one litrewater given one cup twice a day
78.	*Reinwardtia lasiocarpus*, Sm.	Kala Hisalu	Leaf	In pregnancy	Leaf is useful for cow specially in pregnancy pain
79.	*Reinwardtia trigyna*, Planch.	Pyuli	Root	In wound	One bunch of root decoction in ½ litre water given one cup in a gap of two days
80.	*Rhamnus virgata*, Roxb.	Chaitula	Fruit	In leg swelling	Five matured fruit decoction in ¼ litre water given daily
81.	*Rheum emodi*, Wall.	Dolu & Archa	Root	For blood purification & energy	One matured root decoction in one litre water given three times for vigour
82.	*Ribes grossularia*,Linn.	Caktu	Whole plant	For preventing abortion	One palmful whole plant given daily
83.	*Ricinus communis*, Linn.	Erind	Leaf	For internal injury	Oil of this plant is useful. Use of leaves in heat therapy
84.	*Rosa moschata*, Herrm.	Kunjpani	Fruit	For leucorrhea, bleeding and pregnancy termination	Two palmful fruit with one spoon honey given daily
85.	*Rubus paniculatus*,Sm.	Kala Hisalu (Kadula)	Leaf	In pregnancy	Two palmful leaves decoction in ½ litre water given its one cup twice a day
86.	*Rumex hastatus*, D. Don	Bhilmora	Whole plant	For skin disease & In fever	One palmful whole plant decoction in 3/4 litrewater given one cup thrice a day
87.	*Salix elegans*, Wall.	Garbainsh	Fruit	In rickets	Three palmful fruits decoction in one litre water given one cup thrice a day

88.	*Salvia lanata*, Roxb.	Sania & Sunip	Whole plant	For vomiting & painkiller	Two palmful whole plant with gur and fibrous food thrice a day
89.	*Scutellaria angulosa*, Benth.	Karuijhar	Whole plant	In acidity	One palmful whole plant decoction in ½ litre water given one spoon with honey thrice a day
90.	*Seneciochrys anthemoides*, DC.	Ratpatia	Whole plant	For skin disease	Two palmful whole plant decoction in 3/4 litrewater given one cup daily
91.	*Swertia purpurascens*, Wall.	Ciraita	Whole Plant	In fever & weak appetite	Two palmful whole plant decoction in one litre water given one cup thrice a day
92.	*Tagetes arecta*, Linn.	Hazari	Fruit	In vomiting & healing wound	One palmful fruit is given with fibrous food at the time of vomiting. Its external use is in filling wound
93.	*Thymus serpyllum*, Linn.	Van ajmain	Whole plant	In chest pain	One palmfulwhole plant decoction in ½ litre water given one cup twice a day
94.	*Trifolium repens*, Linn.	Garila	Whole plant	For Satrika	Four palmful whole plant given two times a day
95.	*Urtica dioica*, Linn.	Sisauna	Leaf	Skin disease & lactation	One palmful leaves is given with fibrous food in 1hourinterval
96.	*Valeriana hardwichii*, wall.	Samyo & Dhup	Root	For titaini	Four matured root decoction in two litre water given ¼ litre twice a day
97.	*Verbascum thapsus*, Linn.	Akalvir	Leaf	In bronchitis	One palmful leaves decoction in 3/4 litre water given one cup thrice a day
98.	*Viola biflora*, Linn.	Banpansa	Whole plant	In calf for heart & faint problem	Two palmful whole plants two times a day for attack. Three/four parts of two palmful whole plant & a spoon honey given two times for heart &skin problem
99.	*Viscum album*, Linn.	Bana	Fruit	In pregnancy problem	Six fruits with milk twice a day
100.	*Woodfordia floribunda*, Salisb.	Dhow	Flower	As energy syrup	One palmful dry flower decoction in water is useful for animals
101.	*Zingiber officinals*	Banhaldi	Root	Internal injury & antiworm	Paste of root

CONCLUSION

Medicinal plants are the principal health care resources among the most of people in India. Their primary cure of diseases is based upon deep observation of nature and their understanding of traditional knowledge of medical practices. Local people in this region, especially tribal people and women heavily use these traditionally available medicinal plants for health and believe that these are easily available, less expensive and have no side effects as compare to modern medicine. The plants used for medicinal purposes in the primary health traditions are slowly becoming extinct due to development activities, population explosion, impact of tourism, deforestation and many more. The state has tremendous potential for medicinal plants cultivation and it can become one of the important options for sustainable livelihood for the hilly area.

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