

Traditional Knowledge and Utilization of Medicinal Plants of Himalayan Region

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Abstract: Primitive human societies have been depending on plants and plant products for various remedies. In certain areas these folk medical prescriptions are endemic and have survived through ages from one generation to next generation verbally. They do not exist as written knowledge. Generally these systems of medicines depend on old people's experiences. The person, prescribing these medicines has no so-called scientific knowledge about the disease. Indigenous systems of medicine are specially conditioned by heritage and myths.

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1. Introduction

In the past decade, there has been renewed attention and interest in the use of traditional medicine globally (Sheldon et al., 2000). The World Health Organization (WHO) has pointed out that traditional medicine is an important contributor to its health goals. Today, according to the WHO, as many as 80% of the world's people depend on traditional medicine and in India 65% of the population in the rural area use Ayurveda and medicinal plants to help care needs (Anonymous, 1992). Thus, traditional medicine practices, conserved over decades from old civilization, can serve as an effective basis for the discovery and development of modern therapeutic drugs. There are considerable economic benefits in the development of indigenous medicines and in the use of medicinal plants for the treatment of various diseases. In a report published by the World Bank, Lambert et al. (1997), pointed out that preserving and enhancing the plant knowledge and use was equivalent to rescuing a global heritage. Herbal medicines are comparatively safer than synthetic drugs. Plant-based traditional knowledge has become a recognized tool in search for new sources of drugs (Sharma and Majumdar, 2003).

The ethnobotanical survey can bring out many different clues for the development of drugs to treat human disease. Plants have been an integral part of life in many local communities for food and medicine both. India has more than 3000 years of medicinal heritage based on medicinal plants are widely used by all sections of the population either directly as folk remedies or indirectly in the preparation of modern pharmaceuticals. There has been a revival of interest in medicinal and wild plants during the last few decades among the ethnobotanists (Bhatt et al., 2000; Rajasab and Isaq2004) which is associated with an increasing desire for natural rather than synthetic medicine.

Central Himalaya is one of the biodiversity-rich zones of India in terms of vegetation and flora. Varied altitude, topography, status of soil and climatic conditions favour high species richness and support different types of forests. Deciduous and evergreen forest, semievergreen forests are the major types in the Central Himalayan region. Wide geographical and climatic diversity provides a repository of valuable medicinal and aromatic plants of the region. These plants have a valuable place in indigenous system of medicine as well as tribal dietary requirements. A review of literature revealed that ethnobotanical study in Himalayan region is limited especially the traditional knowledge. Therefore, a need was felt to document the information on medicinal drugs prepared by old people and traditional Vaidyas (one who have knowledge of herbal medicine) of the state. The Vaidyas of Uttaranchal have thus developed the medical system of therapy accordingly on the available bio-resources including wild and cultivated plant species growing in the state.

Therefore, the present investigation is an attempt to document the various herbal drugs prepared by various traditional herbal healers of Himalayan region.

2. Study Area

The present study was conducted in Uttarakhand state of central Himalaya. Uttarakhand is located in the northern region of India and span over an area of 53, 485km. The human population of the state is 8479562 of which 78% falls under rural category. The climate of the study area is referred to as monsoon warm temperate. Annual rainfall of the area is 2136 mm and mean monthly temperature varies from 7 to 27°C during summer and 2.1 to 3.8°C during winter. The winter is characterized by occasional snowfall. Of the

total precipitation, nearly 75% occurs during the three months of monsoon, mid-June to mid-September.

3. Methodology

Field study was carried out during the period between April 2007 and May 2008 across the various districts of Uttarakhand. The standard methods as suggested by Martin (1995) and Cotton (1999) were adopted for herbarium preparation. Plant identification was done with the help of regional and local floras. (Osmoston, 1927; Babu, 1917; Naithani, 1984; Purohit and Samant, 1995). Detailed information on wild medicinal plants were gathered through oral interviews of the local people and Vaidyas. Village people information were consulted to locate and collect these plants. Throughout the interviews the useful information on wild and medicinal plants were recorded. Semi structured questionnaire survey was conducted among knowledgeable traditional Vaidyas with a view to document the knowledge on the use of medicinal plants. The data were crosschecked by interviewing more than three Vaidyas on the use of specific plant species. Also comparison was made between the information provided by Vaidyas and available literature (Jain, 1991; Gaur, 1999; Kala, 2002). Some workshops were also organized and various groups of indigenous people including Vaidyas were invited to generate and help in documenting the indigenous knowledge of such parameters. Qualitative information so gathered was verified by cross-examination with different traditional Vaidyas.

4. Results and Discussion

The study reveals that village people in the area depend on plants for medicinal purpose. During present investigation 90 species were identified as being used for treatment of approximately 45 ailments were gathered. In most of the case leaves (46%), were used for curing ailments followed by root parts (18%), fruit and seeds (14%), stem bark (12%), whole plants (8%), latex and resin (6%), flowers and other parts (4%). The drugs are prepared mainly in the form of juice, powder, decoction, paste, jam and pills.

Maximum numbers of plants were used for curing wounded parts, stomach problems, cold cough, fever, skin diseases, respiratory problems etc. It was also found that a single plant may be used for curing many ailments such as *Berberis asiatica* is used in healing ulcer, urethral discharge and jaundice. Similarly *Hedychium spicatum* is used for the treatment of many diseases (Table 1).

The results of the study indicate that most of the common species which grow in the garden and adjacent to the village areas in cultivated or forest lands are used by Vaidyas in majority of the cases for preparation of herbal drugs. Vaidyas use *Ocimum*,

Piper nigrum, *Curcuma domestica*, *Brassica campastris*, and *Rapnhanus sativus* frequently for making various herbal drugs (Kala et al., 2005).

The Vaidyas system of medicine pursues the holistic approach and does not aim to cure only the affected organs alone but aims to find out the origin and the casual factor of the disease in order to eradicate the disease from its root (Dash, 1999).

For gathering medicinal plants from nature, the Vaidyas follow some specific guidelines. They mainly avoid collection of plants for medicinal purpose if insects, pests and or any disease have infected the plant species. The collector of plants for any medicinal use were advised not to collect plants if the plants were affected by any toxicity, sunstroke, high velocity of winds, hailstorm, fire and flood. There was restriction of collection of medicinal plants among traditional Vaidyas from cemeteries, cremation grounds, sacred places, slaughter houses, areas affected by sewer discharges or polluted water, and termite infected areas, road sides, landslide prone areas and area furrowed by rodents (Kala et al., 2005).

The plants were collected for medicinal purpose when they attain maturity and it was judged by height of plants, branching pattern, and colour and other morphological characters including right fragrance and potency. All these judgments were based on the experiences and knowledge of the collectors. There are also some guidelines for collection of different parts of the medicinal plant species. The branches are collected mainly between flowering and ripening of fruits. If the roots of trees are required for medicinal purpose, then only the bark of hard and woody roots are collected. Roots and rhizomes of annuals are collected in summer and winter after the leaf fall or when the new leaves just emerge. Milk, sap, gum, resin, latex and other liquid exudes from plants are collected in autumn yet these products are collected depending on their availability. Similarly, as per the seasonality and availability the flowers and fruits are collected (Kala et al., 2005).

The use of plants for treatment in India dates back to prehistoric times. This indigenous knowledge about medicinal plants and therapies was compose verbally and passed orally from generation to generation. Much later, some of this information was composed in treatise form like Rigveda, Yajurveda, Charak Samhita, Sushrut Samhita, etc. These systematized system of knowledge about medicinal plants and therapies are included under Ayurveda- the Indian Traditional Medicine System.

Despite significant development of rural health services, village people still use herbal folk medicine to a good extent for the treatment of common ailments like cough, cold, fever, headache and bodyache, constipation, dysentery, burns boils, ulcer, skin diseases,

respiratory trouble and others. The Himalayas have a wide range of herbal products as this region supports approximately 18,440 species of plants. Just like the ancient people, the Himalayan people have close relationship with nature for their basic needs like food, fuel, fodder, medicine, etc. in health care, they use their own medicine system, which is based on the ancient cultural traditions.

The cultivation and use of medicinal plants has a great potential for employment generation, particularly in rural sectors. The recent emphasis on tribal and rural development indicates that cultivation of medicinal plants can play a prominent role in this direction, if undertaken properly. Unfortunately the traditional system of herbal use in Uttarakhand is not much popular in the younger generation because they

thought less opportunity in this tradition for getting immediate benefits (Kala et al., 2005).

Besides, there were several other reasons, which made to decline the tradition including less promotion of Ayurvedic medicine compared to the western medicine in the Indian education system in spite of the common belief that the pure vegetable drugs are more powerful in their efficacy than those which have under several laboratory processes (Nadkarni, 1954).

However, to meet the objective of developing the effective Ayurvedic drugs based on traditionally claimed efficacies; clinical trials coupled with extensive phytochemical investigations are required to decipher the chemical nature of biologically active compounds for more scientific utility.

Table 1: Medicinal plants used by indigenous communities of Uttarakhand

Sl	Species	Family	Part used	Diseases
1	<i>Aloe vera</i>	Liliaceae	Pulp	Fresh juice is used as cathartic and cooling. It is also used in treating fever, eye disease and joint pain
2	<i>Asparagus racemosus</i>	Liliaceae	Root	Dried root powder crushed with turmeric and the filtrate taken orally, 2 spoonful twice a day for 3 days to cure gastro intestinal disorder
3	<i>Asparagus odscendens</i>	Liliaceae	Root	Strength, vitality
4	<i>Asparagus curillus</i>	Liliaceae	Root	Gonorrhoea, piles, diabetes, rejuvenating tonic
5	<i>Asparagus filicinus</i>	Liliaceae	Root	Sexual debility, urogenital disorders
6	<i>Astragalus aegacanthoides</i>	Fabaceae	Root	Burns, boils, skin diseases
7	<i>Albizia lebbek</i>	Mimosaceae		Flowers are used to cure skin eruptions, swelling and antidote to poison
8	<i>Argemone mexicana</i>	Papaveraceae	Whole plant	Leucorrhoea, wounds
9	<i>Annona squamosa.</i>	Annonaceae	Fruit and seeds	Fruit juice is used to control dysentery. Seed paste is applied on the forehead for relief from headache.
10	<i>Achyranthes aspera</i>	Amaranthaceae	Stem, fruit, leaf, seed and whole plant	Muscular cramps, mouth blisters, snake bite, check bleeding, anti-fertility in women and gastro intestinal disorder
11	<i>Achyranthes bidentata</i>	Amaranthaceae	Whole plant	Diuretic, astringent, fever, jaundice, cough
12	<i>Aconitum atrox</i>	Ranunculaceae	Root	Rheumatism, neuralgia, paralysis, dyspepsia, phthisis, rheumatic fever, puerperal fever, asthma, snake bite
13	<i>Aconitum balfourii</i>	Ranunculaceae	Root, tuber	Septic, boils, tonsil, gastritis, leprosy
14	<i>Aconitum falconeri</i>	Ranunculaceae	Root	Paralysis, sciatica, gout, fever, rheumatism, diarrhoea
15	<i>Aconitum heterophyllum</i>	Ranunculaceae	Root, tuber	Vomiting, fever, cough, stomach ache, gastrointestinal disorders, digestive disorders, fever, piles, dysentery
16	<i>Aconitum voilaceum</i>	Ranunculaceae	Root, tuber	Stomach-ache, fever, abdominal pain, bronchitis, cough, epilepsy, headache, inflammation, neck pain, renal pain
17	<i>Acorus calamus</i>	Araceae	root	Inflammation, neck pain, asthma, gout, rheumatism, improve lost voice.
18	<i>Ajuga parviflora</i>	Lamiaceae	Leaf, seed	Leaves and seeds used to cure jaundice, ascariasis, fever, stomach-ache

19	<i>Ajuga bracteosa</i>	Lamiaceae	Leaf, root	Leaves and roots used to cure jaundice, leucorrhoea, blood purifier, fever, worm killer
20	<i>Abies pindrow</i>	Pinaceae	Leaf, resin, bark	Cough, cold, rheumatism, ulcer
21	<i>Abrus precatorius</i>	Fabaceae	Leaf, seed	Diabetes, menstruation, cough, fever, asthma
Sl	Species	Family	Part used	Diseases
22	<i>Aesculus indica</i>	Hippocastanaceae	Fruit, seed, leaf, root	Fistula, Rheumatic, leucorrhoea
23	<i>Ainsliaea aptera</i> DC.	Asteraceae	Root	Stomach-ache
24	<i>Bidens pilosa</i>	Asteraceae	Whole plant	The warm juice of the fresh plant is used to treat earache and conjunctivitis and as a styptic on wounds
25	<i>Boerhaavia diffusa</i>	Nyctaginaceae	Leaf	Leaf paste is applied on the cuts and wounds to stop bleeding
26	<i>Buchanania lanzan</i> Spreng.	Anacardiaceae	Root, leaf	The roots and leaves are pounded, mixed with buttermilk and given in diarrhoea
27	<i>Bergenia ciliata</i>	Saxifragaceae	Root	Decoction of root is used to remove kidney stone.
28	<i>Berberis asiatica</i>		Root	Roots are used in healing ulcer, urethral discharges, in leucor, ophthalmia, jaundice, fever etc.
29	<i>Basella alba</i>	Basellaceae	Leaf	Boils, blisters
30	<i>Bauhinia variegata</i>	Caesalpiniaceae	Flower, bud	Diarrhoea, dysentery, tumours, stomach disorder
31	<i>Butea minor</i>	Fabaceae	Leaf	Anthelmintic, boils, skin diseases
32	<i>Betula alnoides</i>	Betulaceae	Bark	Eye diseases
33	<i>Betula utilis</i>	Betulaceae	Bark	Cuts, burns, wounds, hysteria, jaundice, ear, pain asthma, cough, cold, internal injury, menstruation
34	<i>Capparis sepiaria</i>	Capparaceae	Leaf	Decoction of leaf is used in cough and skin diseases
35	<i>Carissa carandas</i>	Apocynaceae	Leaf	Decoction of the leaves is given for fever
36	<i>Cassia angustifolia</i> Vahl	Caesalpiniaceae	Leaf, fruit	Leaves and fruits are used as laxative and purgative
37	<i>Cassia auriculata</i>	Caesalpiniaceae	Seeds	Seeds are ground and paste is applied to cure skin disease
38	<i>Cassia occidentalis</i>	Caesalpiniaceae	Leaf, seed	Seeds and leaves are used in skin troubles. Leaves are also used in foot and mouth disease of cattle
39	<i>Commelina benghalensis</i>	Commelinaceae	Whole plant	Whole plant is used to treat leprosy
40	<i>Corchorus trilocularis</i>	Tiliaceae	Whole plant	Plant macerated with water yields, mucilage, prescribed as a demulcent. Seeds are used in fever and for cleaning bowls
41	<i>Crotalaria retusa</i>	Fabaceae	Whole plant	Plant is used in scabies and impetigo
42	<i>Crotalaria verrucosa.</i>	Fabaceae	Leaf	The leaf decoction is given orally to cure jaundice
43	<i>Centella asiatica</i>	Apiaceae	Leaf	Painful and slow urination, Eye trouble, fever, snake bite, brain tonic, malaria, cholera
45	<i>Cotoneaster microphyllus</i>	Rosaceae	Root	Scrofula
46	<i>Colebrooekea oppositifolia</i>	Lamiaceae	Leaf, root	Cataract, epilepsy, wounds, bruises
47	<i>Dioscorea bulbifera</i>	Dioscoreaceae	Tuber	Check conception, bronchial cough, cold
Sl	Species	Family	Part used	Diseases
48	<i>Dioscorea deltoidea</i>	Dioscoreaceae	Root	Spermatorrhoea, piles, dysentery
49	<i>Dioscorea belophylla</i>	Dioscoreaceae	Root	Blood purifier
50	<i>Dioscorea kemaonensis</i>	Dioscoreaceae	Tuber	Arthritis, rheumatism
51	<i>Diploknema butyracea</i>	Sapotaceae	Seed	Skin diseases
52	<i>Dalbergia sissoo</i>	Papilionaceae	Seed	Rheumatic pain, skin diseases, breast cancer
53	<i>Daphne papyraceae</i>	Thymeliaceae	Whole plant	Purgative, febrifuge
54	<i>Datura metel</i>	Solanaceae	Leaf, seed, root	Fistula, gum trouble, pyorrhoea, asthma
55	<i>Delphinium</i>	Ranunculaceae	Leaf	Cut and burn

	<i>brunonianum</i>			
56	<i>Delphinium denudatum</i>	Ranunculaceae	Root	Contusion, ulcer, toothache, abdominal pain, respiratory disorder, ulcer
57	<i>Delphinium vestitum</i>	Ranunculaceae	Whole plant	Snake bite, cuts, wounds, fever, diarrhoea
58	<i>Desmodium oojainense</i>	Fabaceae	Bark	Low blood pressure
59	<i>Desmodium heterocarpon</i>	Fabaceae	Whole plant	Cough, fainting, convulsion
60	<i>Ficus palmate</i>	Moraceae	Latex, root	Boils, dysentery
61	<i>Ficus religiosa</i>	Moraceae	Leaf, latex, bark	Bronchial asthma, improve female fertility,, ear trouble, snake bite
62	<i>Flemingia strobilifera</i>	Fabaceae	Whole plant	Rheumatic pain
63	<i>Foeniculum vulgare</i>	Apiaceae	Whole plant	Vomiting
64	<i>Fragaria vesica</i>	Rosaceae	Root , leaf	Headache inflammation
65	<i>Fritillaria roylei</i>	Liliaceae	Bulb	Asthma, bronchitis, burns, stomach trouble
66	<i>Galinsoga parviflora</i>	Asteraceae	Leaf	Earache
67	<i>Galium acutum</i>	Rubiaceae	Whole plant	Antiscorb, diuretic, skin diseases
68	<i>Geranium nepalense</i>	Geraniaceae	Root	Renal diseases, cuts, jaundice, toothache, ulcer, wounds, stomach disorder
69	<i>Geranium ocellatum</i>	Geraniaceae	Whole plant	Diuretic
70	<i>Geranium wallichiana</i>	Geraniaceae	Root	Dysentery, diarrhoea, astringent, ear trouble, toothache
71	<i>Gerbera gossypina</i>	Asteraceae	Root	Menstrual disorder, blood pressure, gastric
72	<i>Hedera nepalensis</i>	Araliaceae	Leaf, flower	Rheumatism
73	<i>Hedychium spicatum</i>	Zingiberaceae	Root	Gastric trouble, asthma, vomiting, blood purifier, inflammation, liver complaints, etc.
74	<i>Hedychium accuminatum</i>	Zingiberaceae	Root	Dyspepsia, piles
75	<i>Heracleum candicans</i>	Apiaceae	Root, flower	Leucoderma, menstrual disorders
Sl	Species	Family	Part used	Diseases
76	<i>Hypericum cernuum</i>	Linaceae	Flower	Wounds, boils
77	<i>Impatiens gigantean</i>	Balsaminaceae	Aerial part, seed	Wounds, scarcity, burns
78	<i>Inula cappa</i>	Asteraceae	Root	Stomach-ache, dysentery, indigestion
79	<i>Ipomoea carnea</i>	Convolvulaceae	Leaf	Rheumatism, gout, cuts, boils
80	<i>Iris kumaonensis</i>	Iridaceae	Root, leaf	Urinary, kidney disorders, fever
81	<i>Litsea glutinosa</i>	Lauraceae	Bark	Bone fracture
82	<i>Litsea umbrosa</i>	Lauraceae	Seed	Skin diseases, wounds
83	<i>Malaxis muscifera</i>	Orchidaceae	Bulb	Wounds, bone fracture, burns
84	<i>Meconopsis aculeata</i>	Papaveraceae	Whole plant	Fever, renal pain, colic, backache
85	<i>Oxalis corniculata</i>	Oxalidaceae	Leaf, root, seed	Cuts, wounds, swelling, insect stings, snakes bite, scorpion sting, appetite, corns, dysentery, fever, jaundice, rickets, stomach-ache
86	<i>Rubia cordifolia</i>	Rubiaceae	Whole plant	Used to increase memory
87	<i>Swertia chirayita</i> Karst.	Gentianaceae	Whole plant	Used for blood purification
88	<i>Saussurea obvallata</i>	Asteraceae	Leaf	Paste of leaf applied to treat cut and wounds
89	<i>Valeriana jatamansi</i>	Valerianaceae	Root	Roots are used in hysteria, hypochondriasis, nervous unrest, and emotional troubles, carminative, sedative etc.
90	<i>Thalictrum foliolosum</i> DC	Ranunculaceae	Leaf, root	Diuretic, purgative, tonic dyspepsia ; valued for ophthalmia
91	<i>Rauwolfia serpentina.</i>	Apocynaceae	Whole plant	To control high blood pressure
92	<i>Ocimum sanctum</i>	Lamiaceae		A handful of leaves boiled in water and the infusion taken orally till pain relief

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