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Research Article

AN ETHNOBOTANICAL STUDY OF UNDOCUMENTED MEDICINAL PLANTS OF UTTARAKHAND REGION

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ABSTRACT

Nature always stands as a golden mark to exemplify the outstanding phenomena of symbiosis. In the western world, as the people are becoming aware of the potency and side effect of synthetic drugs, there is an increasing interest in the natural product remedies with a basic approach towards the nature. Throughout the history of mankind, many infectious diseases have been treated with medicinal plants. Ethnobotany is defined the study of the relationship between people and plants and most commonly refers to the study of indigenous uses of plants. According to World Health organization (WHO) nearly 80 per cent of the world population depends on traditional medicines. Recent surveys have revealed that almost 50 per cent of the prescription drugs are based on natural products and raw materials. India and China are the largest users of herbal medicines. India is the largest producer of medicinal plants and is rightly called the "Botanical garden of the World". The medicinal plants, besides having natural therapeutic values against various diseases, also provide high quality of food and raw materials for livelihood. These plant resources, therefore, have become important domains of intervention and are increasingly attracting the attentions of public and private sector policy researchers, policy makers and development program implementers. 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 present paper focuses about the indigenous knowledge of different medicinal plants of Uttarakhand region which are used frequently now a days but very little description found in Ayurvedic samhitas.

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INTRODUCTION

The Himalayas have a great wealth of medicinal plants and traditional medicinal knowledge. Medicinal plants have played an important role of primary healthcare system among the local people of Himalayan region. As the local people are settled far from urban area, they cannot take modern health care facilities so they are totally dependent on traditional medicinal practices for their primary health care. Out of 15,000 species of flowering plants found in India, about 17% have their medicinal value several species are from the Indian Himalayan region, and many of these are found in Uttarakhand. Local people of this region are partially or completely dependent on forest resources for medicine, food, and fuel and medicinal species are steadily diminishing due to anthropogenic activities. The Central Himalayan Region covers the Uttrakhand state of India, provides admirable opportunities for studying the Traditional Knowledge Systems. Uttrakhand has a rich variety of herbs, medicinal and aromatic plant species.

Acharya Carak also said that "Himalyas as the best habitat for medicinal plants."

Geography of Uttarakhand

Uttarakhand is 27th state of the republic of India. It was formed on November 9, 2000, which was carved out of Uttar Pradesh. It is a hilly state, having international borders with china (Tibet) in the north and Nepal in the east. On its north-west lies Himanchal Pradesh and while on the south is Uttar Pradesh. It occupies an area of 53,483sq km. This state lies between 28 ^{0}53' 24"-31^{o} 27' 50" N latitude and 77 ^{o} 34' 27"-81^{o}02' 22" E longitudes. Of its total geographical area, about 47, 325 sqkm is covered by mountains. There are Four major river systems viz. Ganga, Yamuna, Ramganga& Sharda originating from the

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state along with their tributaries which are major source of water for drinking, irrigation and hydropower. The state is divisible into four major geologic formations 1. Sivalikhimalayas, 2. Lesser Himalayas 3. Greater himalayas 4. Trans himalayas. Major wealth of the state is its forests with very rich biodiversity. The state ranks sixth among the other states in terms of percentage of recorded forest area.

Ethnomedicinal Plants of Uttarakhand

Out of 15,000 species of flowering plants found in India, about 17% have their medicinal value. Several species (1,745) are from the Indian Himalayan region, and Uttarakhand has a rich variety of herbs, medicinal and aromatic plant species. The Garhwal Himalaya is one of the richest floristic zones of India and contains more than 300 species of medicinal plants.

Many of them has been described in Ayurvedic Samhitas. Here I am discussing undocumented medicinal plants which have wonderful effects but not much described in Ayurveda.

Saussurea obvallata **(Prapaundrik)** family **Asteraceae**

It is a state flower of Uttarakhand.

Local Name- Brahmkamal**,** phenkamal,

Habit- A Large Herb with dark purple heads enclosed in membranous bract.

Distribution- Found in alpine zone at Chamoli, Uttarkashi area, Kedarnath, Chora Barital, Gangotri,, Herkeedun.at4200 -5000 m altitude Flowering Sept .Oct.

Chemical constituent Protein, crude fibre, ash, phosphorus, calcium, magnecium, potassium, iron, reducing sugar and amino acid. In inflorescence highest (26.25 %) of protein present, iron (0.042%) in leaves and crude fibre (20%) and amino acid in stem.

Useful parts- Whole plants

Action and Uses **-** Whole plants, specially roots are applied on cuts and wounds and act as antiseptic styptic. It is used in urinary trouble, cough, cold, hydrocele, reproductive disorder. Flower CNS active, antiviral. The flowers, after frying, are used in rheumatism.[1]

Rhododendron arboreum **(Kurubak)** family **Ericaceae**

English name -Tree-Rhododendron

It is state tree of Uttarakhand. It is evergreen tree. Flowering March-July

Local name Burans, Burany, kafu, kaffu,

Distribution - Almora ,Chamoli, Tehri, Uttarkashi, Pithoagarh, at1600-2600m altitude. Chemical constituents Three biologically active phenolic compounds i.e. quercetin, rutin and coumaric acid have been reported in flowers of R. arboreum. The green leaves contain a glucoside, ericolin.

Useful parts-Leaves, flower petals, bark

Action and Uses Juices of petals is good drink for summer and heart tonic. It has Anti-inflammatory, Anti-nociceptive activity, Hepatoprotective activity and Anti-diarrhoeal activity.[2]

The young leaves are astringent and poultice. They are made into a paste and then applied to the forehead in the treatment of headaches. The juice of the bark is used in the treatment of coughs, diarrhoea and dysentery. A decoction of the flowers is used to check a tendency to vomit, especially if there is also a loss of appetite. The juice of the flowers is used in the treatment of menstrual disorders. The petals are eaten to assist the removal of any animal bones that have become stuck in the throat.[3]

The petroleum ether extract decreases the rate of heartbeat and contraction in isolated heart of frog. An alcoholic (50%) extract of the flowers lowered blood pressure in dogs and albino rats.[3]

Lyonia ovalifolia family **Ericaceae**

It is a tree which found along with Rhododendron arboreum.

Local name: Aiyar, Padme

Habit-Deciduous tree, flowers white in terminal and axillary raceme.

Distribution Tehri, Uttarkashi, Almora, Chamoli, Nainital, Pitthoragarh, At an altitude 2400- 3000 m.

Useful parts - Leaves

Chemical constituents - Leaves contain a toxic, insecticidal substance andromedotoxin.

Action and Uses - Young leaves and buds used externally for cutaneous affections. Leaves are insecticidal. Honey from flowers is poisonous[4].

Hippophae rhamnoides **(Neichak)** family **Elaeagnaceae, English name** Sea-buckthorn

Local name - Amesh, Dhooplakkar, Dhurchuk.

Habit - It is a thorny shrub.flowersred, fruit yellow when ripe.

Distribution - Uttarkashi, Bhagirathi valley, Hanumanchattie, Rambara. At an altitude 2500-3000 m .Flowering and fruiting-May to October.

Useful parts Fruits.

Chemical constituents The berries contain polyphenols,3-4dihydroxy benzoic acid and *p* coumarinacid. They are an important source of vitamins for people living in cold, long winter regions; contain high concentration of vitamin A,B1, B2, B6, C and E. berries have highest amount of vit.C.

Action and USES Various pharmacological activities such as cytoprotective, anti-stress, immunomodulatory, hepatoprotective, radioprotective, anti-atherogenic, anti-tumor, anti-microbial , antioxidant and anti cancerous effect are found and tissue regeneration have been reported. It can be used for skin problem like eczema[5].

Rheum moorcroftianum family **Polygonaceae**

English name- HimalyanRhuh, Indian rhubarb

Local name - Dolu, Archa

Habit- Perrinial tall glabrous herb flowers dark purple inleafy erect panicles, fruit purple.

Distribution - 2800-4000 m locality Chamoli

Useful parts Root

Chemical constituents: The phytochemical studies have shown the presence of many secondary metabolites belonging to anthraquinones, stilbenes, anthrones, oxantrone ethers and esters, chromones, flavonoids, carbohydrate, lignans, phenols and sterols. Two major glycosidic active principles, sennosideA and B, are present along with free anthraquinones.

Action and Uses - Purgative, astringent, aperient. Used for constipationand atonic dyspepsia. At low doses, the tannin exerts astringent effect and relieves diarrhoea; at higher doses anthraquinones stimulate laxative effect and relieve constipation. Not advised for patients suffering from gout, rheumatism, epilepsy. (When given internally, the root imparts a deeptinge to the urine.)

Crude extracts and isolated compounds show a wide spectrum of pharmacological activities, such as antidiabetic, anti-inflammatory, antifungal, antimicrobial, antioxidant, anticancer, hepatoprotective and immune-enhancing activities, as well as a usefulness for improving renal function.[6]

Rhus parviflora **(Tintadik)** family **Anacardiaceae**

English name **-**Sumach

Habit – a shrub with trifoliate leaves,flowers yellowish, fruit brown when ripe.

Local name **-**Tungla, Saunla, Tung

Distribution **-** common in tropical zone throughout the valley uptoupto 1500 m**.**

Useful parts leaf Root, Fruit. The ripe fruit are used medicinally as samakdana.

Chemical consituents **-** Nine phenolic compounds, phloracetophenone-4-O-β-D-glucopyranoside (1), p-hydroxybenzoic acid-4-O-β-D-glucopyranoside (2), leonuriside A (3), 3-methoxy-4-hydroxyphenol-1-O-β-D-glucopyranoside (4), cis-p-coumaric acid-4-O-β-D-glucopyranoside (5), trans-p-coumaric acid-4-O-β-D-glucopyranoside (6), trans-p-coumaric acid-9-O-β-D-glucopyranoside (7), (-)-shikimic acid (8) and (-)-methyl shikimate (9), were isolated for the first time from the fruits of Rhus parviflora.[7]

Action and Uses Hypnotic, can be used in neurodegenerative disorders (Alzheimer's disease), cholera, stomachache, carminative. Leaves decoction astringent, seeds eaten raw to treat stomachache. Rootbark paste used in sun stroke.

Taraxacum officinale family Asteraceae

English name- Common dandelion

Local name--Dudhli, Kanphool, Dugdhapheni

Habit-Perennialrhizomatous herbwith milky latex. flowers solitary on leafless scape, bright yellow.

Distribution - In temperate zone from 300 -5400m.

Useful parts - Leaf, root

Chemical constituents Dandelion contains flavonoids such as luteolin, apigenin and isoquercitrin (a quercetin-like compound), as well as caffeic and chlorogenic acid. Dandelion also contains terpenoids, triterpenes, and sesquiterpenes.

Action and Uses Root-diuretic, cholagogue, pancreatic and bile duct stimulant, stimulant to portal circulation, choleretic, urinary antiseptic, laxativedetoxicant, promotes elimination of plasma cholesterol. Used chiefly in kidney and liver disorders, for rheumatism and as a general tonic. A decoction is given for infective hepatitis. Most of the diuretics cause loss of Potassium, but dandelion leaves contain high levels of potassium.[8]

It has been used, and as a blood purifier. Young leaves and inflorescences are used as ingredients in salads and stir-fries.

Rubus ellepticus *family* ***Rosaceae***

English name- Yellow Himalayan Raspberry

Local name- Hinsalu, hinsar,hisalu

Habit - A thorny shrub with white flowers, fruits red.

Distribution- Common throughout the valley upto 1900 m.

Usefulparts Fruit, root, leaf

Chemical constituents **-**The plant gave a triterpenic acid, rubitic acid, characterizedas 7 alpha-hydroxyursolic acid.

Action and Uses whole plant has astringent properties,and used to reduce fevers specially typhoid. Inner bark is used as antidiuretic. Fruit juices is also used for fevers, for a colic. Scientific studies have found that alcoholic extract of rubusellepticus have antioxidant, antiinflammatory property and antimicrobial activity[9]

Extract of the leaves showed anticonvulsant activity against electrical induced convulsions, potentiated hypnotic effect of phentobarbitone sodium and had positive inotropic and chronotropic effects.

Taxus baccata (sthaunyak) family **taxaceae**

English name- Himalayan yew

Local name- Thuner

Habit- an evergreen tree.. All parts of the tree are poisonous, with the exception of the bright red arils .Eating just a few leaves can make a small child severely ill and fatalities have occurred.

Distribution- common throughout the valleys from 2100m to 3000m altitude.

Useful parts- Leaf, Bark aril

Chemical constituents-Berry contains Taxolalkaloids that have been developed as anti cancer drugs, The needles contain diterpene esters of taxane-type (mixture is known as taxin). Taxine consists of 11 compounds of which only taxineA and B have been characterized. Taxol, the diterpene amide, is found active against ovarian cancer in humans. Dried needles contain biflavonoids, including sotetsuflavone, sequoiflavone, sciadopitysin, ginkgetin, kayaflavone, amentoflavone, beta-sitosterol, heptacosanol and surcose. The needles gave several phenolics. Betuloside (rhododendron) exhibited hepatoprotective activity against hepatotoxins in rats.

Action and Uses

All parts of the plant, except the fleshy fruit, are antispasmodic, cardiotonic, diaphoretic, emmenagogue, expectorant, narcotic

and purgativeantirheumatic, anticatarrhal, insecticidal and wound-healing properties to the dried needles of Himalayan Yew and indicated the use of the drug in powder form (1-3 g) in disorders due to vitiated blood, tumours, dermatosis and helminthiasis.[10]

Hpericum perforatum family hypericaceae

English name Common St. john s wort.

Local name Peoli, Chaya

Habit - Perrinial herbs

Habitat- Sporadic throught the valley upto 3000 m altitude.

Useful parts Whole plant

Chemical constituent The herb contains hypericin and pseudohypericin (0.0095% to 466% in the leaves and as much as 0.24% in the flowers), rutin, quercetin, hyperoside, methylhesperidin, caffeic, chlorogenic, *p*-coumaric, ferulic, *p*-hydroxybenzoic and vanillic acids.

Action and Uses – Hypericum perforatum may block the receptor that binds serotonin to maintain normal mood and emotional stability. It is used in treating a wide range of disorders, including pulmonary complaints, bladder problems, diarrhea and nervous depression. It is also very effectual in treating bed wetting in children. It has a sedative and pain reducing effect. It is especially regarded as an herb to use where there are menopausal changes triggering irritability and anxiety. In addition to neuralgic pain, it will ease fibrosistis, sciatica and rheumatic pain. The oil extract of the plant can be taken for stomach ache, colic, intestinal problems, and as an expectorant for the congestion in the lungs. Externally, a medicinal infusion of the flowers in olive oil is applied to wounds, sores, burns, ulcers, swellings, cramps, rheumatism, tumors, caked breasts, and other skin problems. It is also valued in the treatment of sunburn and as a cosmetic preparation to the skin.[11]

CONCLUSION

At the moment, scientific research on medicinal plants is being carried out most intensely in research institutes, universities and pharmaceutical laboratories as well as in the clinics of many developed and developing countries. This research is oriented mainly in two directions. Firstly, the active ingredients of plants that have long been known for their healing properties are investigated. The second sphere of basic research is directed towards the discovery of new kinds of medicinal plants and new drugs from the more remote regions of the world, which have not been explored so far. There are too many plants like *Rumex hastatus, Clematis montana, budlejia asiatica, Debregea siasalicifolia, Gingko biloba etc.* many plants of himalyan region which are not documented in Ayurvedsamhita but are beneficial for human beings. Acharya Carak also said that every dravya can be used as medicine but we should use these dravya with inference (yukti). In the era of herbal medicine now we should documented these drugs on Ayurvedic parameter also.

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