

Ethnomedicinal Plants of Kumaun and Garhwal Himalayan Region of Uttarakhand

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Abstract: Uttarakhand is well-known places for their natural wealth. Two major region of Uttarakhand i.e. Kumaun and Garhwal that comes under cross line area of Himalaya. These areas have great biodiversity that are serving as vital source of ethno-medically importance plants. There are many rare plants that use as medicine or in pharmaceutical formation of drugs found in these regions. In India the use of traditional medicine are much popular and acceptable by several tribal communities of India. Several peoples facing the side effects problems with allopathic drugs and due to this reason the market natural product based medicines increases. It influence the market demands raw material and lowering the availability medicinal plants in the absence of proper management strategies. There are need to some especial programme for conservation and sustainability of medicinal plants of Himalayan cross line areas.

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1. Introduction

The World Health Organization (WHO) has estimated that 80% of the world population is dependent on traditional medicine for their primary health needs. Traditional medicines are frequently used in the developing [Shadangi *et al.*, 2012; Singh J S. 2002]. In India medicinal plants exploited in several works (ceremonies) not only as medicines for disease treatment profession. Nowadays, the demands or availability of medicines is big problem and various concerns are also associated with synthetic drugs like side effects on body that opens new approach of interest on traditional medicine based on natural products [Korpenwar, A. N., 2012]. Herbal plants are hugely exploited as traditional medicines due to their well known medicinal properties against skin associated microbial originated diseases.

In India such types of practices are also in use from ancient time [Prashantkumar *et al.*, 2008]. Skin associated illnesses appear as major health problem in most of the countries. It is estimated that 34% of all occupational diseases is covered by the skin diseases throughout the world [Abbasi *et al.*, 2010]. And affect the huge range of population newborn infant to range of aged persons. In United States 126000 persons were reported for skin related disease that caused by MRSA (methicillin-resistant *Staphylococcus aureus*) [Njoronge and Bussmann, 2007]. In this study we discuss some of the valuable plants which are found in Himalayan cross line region and were extensively used in traditional medicines.



Figure 1. Location of the study sites

2. Significances of ethnomedicinal plants

WHO mentioned the burns also one of the known widespread concern in a current scenario that influenced skin infections via altering climatic conditions. All of these circumstances ultimately contribute to increase the death rate also affects the life in a continual manner that complicated to treat [De *et al.*, 2013].

Skin in our body working as first line of defense against foreign particle that are responsible for skin

infections, it serve as barrier for surrounding pollutant. Human showing curiosity and caring nature to maintain healthy skin and beauty for which they employed several synthetic or natural products, sometime it may help to improve skin quality [Baharvand-Ahmadi *et al.*, 2015]. As we seem that the use of natural products in traditional medicines from ancient time for disease treatment. Similarly, nowadays the reliability on natural products is also increases as therapeutic medicine to disease control and for curing the infections [Baharvand-Ahmadi *et al.*, 2015].

3. Status of ethnomedicinal plants in Himalayan region

Himalayan cross line area having great medicinal wealth due to the presences of natural resources that are found in this area, nearly 1748 medicinal plant species were reported form the Himalayan cross line area [Kapkoti *et al.*, 2014; Joshi, R. K. 2016]. In case of India the description of medicinal plants and their valuable properties were found in Charka Sanhita, Rig-Veda and Athurveda [Kapkoti *et al.*, 2014].

Himalayan cross line area of India are incredibly rich with biodiversity aspects and the plants found in this region are ethnomedicinal important and in some remote area these plants are ultimate source of medicine for diseases treatment and such type of practices seem in rural of Uttarakhand [Singh *et al.*, 2011; Singh *et al.*, 2014; Bibi *et al.*, 2015]. Kumaun and Garhwal well-known region of Uttarakhand and also an important part of Himalayan cross line shown in Figure 1 [Kapkoti *et al.*, 2014]. Such places are also important in biodiversity point of view and valley of flowers is one of suitable example biodiversity as well as ethnomedicinal plants [Prakash, R., 2014]. The occurrence of valuable herbal plants in this area was known from historical time and their extensive uses were also seemed in traditional medicines as therapeutic drug shown in table1 [Kapkoti *et al.*, 2014].

Divers categories of plants were reported from Kumaun region that includes herbs, shrubs and trees also. Some of the examples of herbs (*Centella asiatica* Linn., *Cissampelos pariera* Linn., *Oxalis corniculata* Linn., *Dioscorea bulbifera* L., *Eupatorium adenophorum* Spreng., *Flemingia strobilifera* R. Br.), shrubs (*Berberies asiatica* Roxb., *Rubus ellipticus*, *Murraya koenigii* Linn., *Urtica dioica* Roxb.) and tree (*Shorea robusta* Roxb.) [Kumari, P., 2011; Rawat &

Vashistha, 2011; Singh, H., 2008; Kharkwal, G., 2009; Jalal & Nautiyal, 2015; Semwal *et al.*, 1999; Hussain *et al.*, 2008; Shah *et al.*, 2014; Shahid, & Joshi, 2016]. Such medicinal plants are much popular in tribal societies of India; they extensively exploited these plants as food, traditional therapeutics and for wealth also [Gangwar *et al.*, 2010; Prakash, R. 2015]. The reliability on these natural resources is higher due to their chances of adverse affects is very less or no as compare to allopathic products use for disease treatment [Kapkoti *et al.*, 2014]. The disturbance of natural habitat and excessive exploitation of natural resources decreases the availability of medicinal plants, which are the basic constituent of traditional drugs [Kumari *et al.*, 2012]. Sustainable availability of medicinal plants is important herbal based medicine and conservation, awareness, implementation of protection acts, applying for patenting etc., some of the important ways that significantly increases the population of medicinal plants in a particular area [Bisht & Badoni, 2009]. There are several reasons (biotic as well as abiotic factors) in addition to human interference to natural habitat. All of these activities hindered the growth of medicinally used plants and also much the population were affected that depends on these resources for their wealth. Some valuable plants species are lost day by as a result of their large scale consumption and improper management practices [Kapkoti *et al.*, 2014].

4. Conclusion

Present study discusses the importance of medicinal plants and their unique occurrence in Himalayan associated regions of Uttarakhand. Kumaun Himalayan range and Garhwal Himalayan range are the two most popular biodiversity rich land of Uttarakhand. In this series valley of flower (National parks) one of biggest biodiversity hot spot and also largest and vital source of medicinal plant in nearby area of Uttarakhand. In current scenario the commotional level of medicinal plants increase day by day but in the absence of well manages practices affects the growth and availability of such plants. There are needs to conducts some awareness, conservation and human involvement programme that lead the constructive way to protect the traditional used medicinal plants. The social responsibilities play the signature role to protect the natural wealth of Himalaya.

Table 1. An enumeration of plants and their use of medicinal purpose

S. No.	Botanical name	Family	Local name	Habit/category	Part use	Uses	References
1	<i>Mangifera indica</i> L.	Anacardiaceae	Mango	Tree	Bark	Leukorrhea, bleeding hemorrhoids, lung hemorrhage, Diarrhea, Anemia, hypotension, cancer sore, gingivitis, diarrhea, dysentery, Infected wounds, skin diseases and dental caries	Wauthoz <i>et al.</i> , 2007
2	<i>Adhatoda zeylanica</i> Medic.	Acanthaceae	Adulsa	Shrub	All parts of the plant	Treatment of bleeding piles, in wound healing, and also use as antibacterial, anticholinesterase, hypoglycaemic, antiulcer, hepatoprotective, antitussive, cardioprotective, anti inflammatory and abortifacient/oxytocic	Ahmad <i>et al.</i> , 2009
3	<i>Apium graveolens</i> L.	Apiaceae	Ajmod	Herb	Seeds	Bronchitis, liver, asthma, and spleen disease, arthritic pain and rheumatism	Tyagi <i>et al.</i> , 2013
4	<i>Hyoscyamus niger</i> L.	Solanaceae	Henbane	Herb	All parts of the plant	Antispasmodic, anticholinergic and analgesic	Ghorbanpour <i>et al.</i> , 2015
5	<i>Juglans regia</i> L.	Juglandaceae	Walnut	Tree	Leaves	Antimicrobial, antihelmintic, astringent, keratolytic, antidiarrhoeal, hypoglycaemic and depurative	Taha, N. A., & Al-wadaan 2011
6	<i>Linum usitatissimum</i> L.	Linaceae	flax and linseed	Herb	Seeds, Oil and flower	anti inflammatory, analgesic, vesicant, chest cleanser, aphrodisiac and phlegm expectorant	Jabeen <i>et al.</i> , 2014
7	<i>Oroxylum indicum</i> (L.) Vent	Bignoniaceae	Shyonaka	Tree	Root bark, leaves and seeds	biliousness, fevers, bronchitis, intestinal worms, vomiting, dysentery, leucoderma, asthma, inflammation, anal trouble, diarrhoea, dysentery, diaphoretic, and rheumatism, analgesic and antimicrobial activity	Deka <i>et al.</i> , 2013
8	<i>Premna Latifolia</i> Roxb.	Verbenaceae	Agnimantha	Tree	Leaves and stem bark	Antiinflammatory, Antifeedant activity, Immunomodulatory and cytotoxicity activity against cancer cell lines	Kumari & Garg, 2014
9	<i>Aconitum Heterophyllum</i> Wall. Ex Royle	Ranunculaceae	Atis	Herb	Dried tuberous roots	Antibacterial and enzyme inhibition activities	Srivastava <i>et al.</i> , 2011
10	<i>Melia azedaracbh</i> L.	Meliaceae	Ghoda Neem	Tree	Leaves, seeds, and bark	Insecticide, antibacterial activity, Rheumatism, anthelmintic, antileprotic, anticancerous, antispasmodic and antiviral	Azam <i>et al.</i> , 2013

11	<i>Eclipta alba</i> (L.) Hassk.	Asteraceae	Bhringaraj	Herb	Leaves	liver cell generation, diuretic in hepatic and spleen enlargement, skin diseases and antiviral activity against Ranikhet disease virus	Pandey <i>et al.</i> , 2011
12	<i>Clerodendrum serratum</i> (L.) Moon	Verbenaceae	Bharangi	Shrub	Leaves and roots	Respiratory disorders, fever, inflammation, liver disorders and antiasthmatic potentia	Patel <i>et al.</i> , 2014
13	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Brahmi	Herb	Leaves	asthma, skin disorders, ulcers and body aches, nervine tonic, improving memory, Wound Healing, Cytotoxic and Antitumour, treatment of leprosy, urethritis and leucorrhoea	Singh <i>et al.</i> , 2010
14	<i>Oxalis corniculata</i> L.	Oxalidaceae	creeping wood sorrel	Herb	Leaves	fever and dysentery, remove warts and opacities of cornea	Sharma & Kumari, 2014
15	<i>Cinnamomum zeylanicum</i> Blume	Lauraceae	Dalchini	Tree	Bark, leaves, flowers, fruits and roots	Antioxidant, anti inflammatory, antidiabetic, antibacterial and antifungal	Manosi <i>et al.</i> , 2013
16	<i>Woodfordia fruticosa</i> (L.) Kurz.	Lythraceae	Dhawa	Tree	Leaves, fruits flowers, and gum	Antitumor activity, astringent, haemostatic, anthelmintic, enhance wound healing, antibacterial, and antidysentric	Rani & Rahman, 2015
17	<i>Euphorbia thymifolia</i> L.	Euphorbiaceae,	Choti-dudhi	Herb	Roots, aerial parts, stem and leaves	Blood purification, anti-viral, antihelmintic, anti-inflammatory, anti-spasmodic, anti-fungal, anti-bacterial, anti-microbial and diuretic properties	Muthumani <i>et al.</i> , 2016
18	<i>Gmelina arborea</i> Roxb	Verbenaceae	Gambharia	Tree	Stem bark and leaves	Antioxidant, anthelmintc, antimicrobial, anti diabetic, antipyretic and analgesic	Pathala <i>et al.</i> , 2015
19	<i>Tinospora cordifolia</i> (Willd) Hook. f. & Thoms.	Menispermaceae	Giloy	Climber	Leaves	Hypotensive, anti-inflammatory, anti-allergic, immune-stimulatory and diuretic properties	Bhalerao <i>et al.</i> , 2013
20	<i>Terminalia Chebula</i> (Gaertn.) Retz.	Combretaceae	Hara	Tree	Leaves and seeds	Antioxidant, wound healing, antidiabetic, renoprotective, antibacterial, antifungal, and anti plasmodial	Bag <i>et al.</i> , 2013
21	<i>Solanum surattense</i> Burm. f	Solanaceae	Kantakari	Herb	Whole plant	Cough, constipation, Diuretic, bronchospasm, Asthma, effective expectorant and sore throat	Samy <i>et al.</i> , 2008.
22	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Dhak or palas	Tree	Leaves, stem bark, seed oil, flowers and seeds	Anti-inflammatory, antifungal activity, bactericidal and fungicidal, liver disorders, antiestrogenic and anthelmintic	Yadav <i>et al.</i> , 2015

23	<i>Sapindus mukorossi</i> Gaertn.	Sapindaceae	Reetha	Tree	Leaves, seeds and fruits	Anti-bacterial activity, gout, rheumatism, dental caries, arthritis, remove tan and freckles from the skin, salivation, pimples, epilepsy, chlorosis, migranes, eczema and psoriasis	Upadhyay & Singh, 2012
24	<i>Moringa oleifera</i> Lam.	Moringaceae	Kelor tree Or Sohanjna	Tree	Root, leave, Stem, bark, gum and flowers	Antilithic,, anti-inflammatory, treating rheumatism, inflammations, articular, kidney pains, headaches, piles, fevers, eye diseases, intestinal complaints, dysentery, muscle diseases and hysteria, tumors	Anwar <i>et al.</i> , 2007
25	<i>Argemone Mexicana</i> L.	Papaveracea	Satyanashi	Herb	Roots, leaves and seeds	Lepsory, skin-diseases, inflammations, and bilious fevers	Mehul & Unnati, 2014
26	<i>Euphorbia nerifolia</i> L.	Euphorbiaceae	Patashij	Shurb	Juice, root, stem and leaves	Asthma, syphilis, dropsy, general anasarca, leprosy, ulcers and scabies, antiseptic, bronchitis, piles, diuretic, cough and cold	Rahman <i>et al.</i> , 2015
27	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulsi	Herb	Leaves and Steam	Anticancer, chemopreventive, radioprotective, immunomodulatory, hepatoprotective antifertility and anticataract	Pandey & Madhuri, 2010
28	<i>Abroma augusta</i> Linn f.	Sterculiaceae	Ulatkambal	Shrurb	Roots, leaves, barks and seeds	Antidiabetic, anti-inflammatory, antifungal, antibacterial and insecticidal	Gupta <i>et al.</i> , 2011
29	<i>Acorus calamus</i> L.	Acoraceae	Vacha	Herb	Leaves and rhizome	Antispasmodic, antibacterial, antifungal, antioxidant, antihepatotoxic, immunosuppressive, insecticidal, antiulcer and antispasmodic	Divya <i>et al.</i> , 2011
30	<i>Aconitum ferox</i> Wall. ex Ser.	Ranunculaceae	Mithazaahar	Herb	Tubers	Fever, stomach ache, sore throat, in leprosy, Body pain, diabetes, debility, asthma, typhoid, rheumatism, and paralysis	Kapoor, L. D. 2000; Tamilselvan <i>et al.</i> , 2014
31	<i>Pueraria tuberosa</i> (Roxb. ex Willd.)	Fabaceae	Chemical Goldmines	Shrub	Tuber	Antioxidant and adaptogenic activity,	Theng & Korpenwar 2012; Pramanik <i>et al.</i> , 2010

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All authors have contributed regularly in the manuscript. Author Vinay Mohan Pathak has carried

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Competing interests:

The authors declare that they have no competing interest.

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