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 rear plants that uses 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.

Keywords: Ethnomedicinal; traditional medicines; skin diseases; treatment

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 uses 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 extensive used in traditional medicines.

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 area 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 (Berberis 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>
<thead>
<tr>
<th>S. No.</th>
<th>Botanical name</th>
<th>Family</th>
<th>Local name</th>
<th>Habit/category</th>
<th>Part use</th>
<th>Uses</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Mangifera indica</em> L.</td>
<td>Anacardiaceae</td>
<td>Mango</td>
<td>Tree</td>
<td>Bark</td>
<td>Leukorrhea, bleeding hemorrhoids, lung hemorrhage, Diarrhea, Anemia, hypotension, cancer sore, gingivitis, diarrhea, dysentery, Infected wounds, skin diseases and dental caries</td>
<td>Wauthoz et al., 2007</td>
</tr>
<tr>
<td>2</td>
<td><em>Adhatoda zeylanica</em> Medic.</td>
<td>Acanthaceae</td>
<td>Adulsa</td>
<td>Shrub</td>
<td>All parts of the plant</td>
<td>Treatment of bleeding piles, in wound healing, and also use as antibacterial, anticholinesterase, hypoglycaemic, antiulcer, hepatoprotective, antitussive, cardioprotective, anti inflammatory and abortifacient/oxytocic</td>
<td>Ahmad et al., 2009</td>
</tr>
<tr>
<td>3</td>
<td><em>Apium graveolens</em> L.</td>
<td>Apiaceae</td>
<td>Ajmod</td>
<td>Herb</td>
<td>Seeds</td>
<td>Bronchitis, liver, asthma, and spleen disease, arthritic pain and rheumatism</td>
<td>Tyagi et al., 2013</td>
</tr>
<tr>
<td>4</td>
<td><em>Hyoscyamus niger</em> L.</td>
<td>Solanaceae</td>
<td>Henbane</td>
<td>Herb</td>
<td>All parts of the plant</td>
<td>Antispasmodic, anticholinergic and analgesic</td>
<td>Ghorbanpour et al., 2015</td>
</tr>
<tr>
<td>5</td>
<td><em>Juglans regia</em> L.</td>
<td>Juglandaceae</td>
<td>Walnut</td>
<td>Tree</td>
<td>Leaves</td>
<td>Antimicrobial, antihelminthic, astringent, keratolytic, anti diarrhoeal, hypoglycaemic and depurative</td>
<td>Taha, N. A., &amp; Al-wadaan 2011</td>
</tr>
<tr>
<td>6</td>
<td><em>Linum usitatissium</em> L.</td>
<td>Linaceae</td>
<td>flax and linseed</td>
<td>Herb</td>
<td>Seeds, Oil and flower</td>
<td>anti inflammatory, analgesic, vesicant, chest cleanser, aphrodisiac and phlegm expectorant</td>
<td>Jabeen et al., 2014</td>
</tr>
<tr>
<td>7</td>
<td><em>Oroxylum indicum</em> (L.) Vent</td>
<td>Bignoniaceae</td>
<td>Shyonaka</td>
<td>Tree</td>
<td>Root bark, leaves and seeds</td>
<td>biliousness, fevers, bronchitis, intestinal worms, vomiting, dysentery, leucodermia, asthma, inflammation, anal trouble, diarrhoea, dysentery, diaphoretic, and rheumatism, analgesic and antimicrobial activity</td>
<td>Deka et al., 2013</td>
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<td>8</td>
<td><em>Premna Latifolia</em> Roxb.</td>
<td>Verbenaceae</td>
<td>Agnimantha</td>
<td>Tree</td>
<td>Leaves and stem bark</td>
<td>Antiflammatory, Antifeedant activity, Immunomodulatory and cytotoxicity activity against cancer cell lines</td>
<td>Kumari &amp; Garg, 2014</td>
</tr>
<tr>
<td>9</td>
<td><em>Aconitum Heterophyllum</em> Wall. Ex Royle</td>
<td>Ranunculaceae</td>
<td>Atis</td>
<td>Herb</td>
<td>Dried tuberous roots</td>
<td>Antibacterial and enzyme inhibition activities</td>
<td>Srivastava et al., 2011</td>
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<tr>
<td>10</td>
<td><em>Melia azedarach</em> L.</td>
<td>Meliaceae</td>
<td>Ghoda Neem</td>
<td>Tree</td>
<td>Leaves, seeds, and bark</td>
<td>Insecticide, antibacterial activity, Rheumatism, anthelmintic, antileptic, anticancerous, antispasmodic and antiviral</td>
<td>Azam et al., 2013</td>
</tr>
<tr>
<td>No.</td>
<td>Scientific Name</td>
<td>Family</td>
<td>Common Name</td>
<td>Part Used</td>
<td>Medical Uses</td>
<td>Authors, Year</td>
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<td>11</td>
<td><em>Eclipta alba</em> (L.) Hassk.</td>
<td>Asteraceae</td>
<td>Bhringaraj</td>
<td>Leaves</td>
<td>liver cell generation, diuretic in hepatic and spleen enlargement, skin diseases and antiviral activity against Ranikhet disease virus</td>
<td>Pandey <em>et al.</em>, 2011</td>
<td></td>
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<td>12</td>
<td><em>Clerodendrum serratum</em> (L.) Moon</td>
<td>Verbenaceae</td>
<td>Bharangi</td>
<td>Leaves and roots</td>
<td>Respiratory disorders, fever, inflammation, liver disorders and antiasthmatic potential</td>
<td>Patel <em>et al.</em>, 2014</td>
<td></td>
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<tr>
<td>13</td>
<td><em>Centella asiatica</em> (L.) Urban</td>
<td>Apiaceae</td>
<td>Brahmi</td>
<td>Leaves</td>
<td>asthma, skin disorders, ulcers and body aches, nerve tonic, improving memory, Wound Healing, Cytotoxic and Antitumour, treatment of leprosy, urethritis and leucorrhoea</td>
<td>Singh <em>et al.</em>, 2010</td>
<td></td>
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<td>14</td>
<td><em>Oxalis corniculata</em> L.</td>
<td>Oxalidaceae</td>
<td>creeping wood sorrel</td>
<td>Leaves</td>
<td>fever and dysentery, remove warts and opacities of cornea</td>
<td>Sharma &amp; Kumari, 2014</td>
<td></td>
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<td>15</td>
<td><em>Cinnamomum zeylanicum</em> Blume</td>
<td>Lauraceae</td>
<td>Dalchini</td>
<td>Bark, leaves, flowers, fruits and roots</td>
<td>Antioxidant, anti inflammatory, antidiabetic, antibacterial and antifungal</td>
<td>Manosi <em>et al.</em>, 2013</td>
<td></td>
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<td>16</td>
<td><em>Woodfordia fruticosa</em> (L.) Kurz.</td>
<td>Lythraceae</td>
<td>Dhawa</td>
<td>Leaves, fruits, flowers, and gum</td>
<td>Antitumor activity, astringent, haemostatic, anthelmintic, enhance wound healing, antibacterial, and antidiysenteric</td>
<td>Rani &amp; Rahman, 2015</td>
<td></td>
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<tr>
<td>17</td>
<td><em>Euphorbia thymifolia</em> L.</td>
<td>Euphorbiaceae, Choti-dudhi</td>
<td>Herb</td>
<td>Roots, aerial parts, stem and leaves</td>
<td>Blood purification, antiviral, antihelmintic, anti-inflammatory, anti-spasmodic, anti-fungal, anti-bacterial, anti-microbial and diuretic properties</td>
<td>Muthumani <em>et al.</em>, 2016</td>
<td></td>
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<td>18</td>
<td><em>Gmelina arborea</em> Roxb.</td>
<td>Verbenaceae</td>
<td>Gambharia</td>
<td>Stem bark and leaves</td>
<td>Antioxidant, anthelmintic, antimicrobial, anti diabetic, antipyretic and analgesic</td>
<td>Pathala <em>et al.</em>, 2015</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td><em>Terminalia Chebula</em> (Gaertn.) Retz.</td>
<td>Combretaceae</td>
<td>Hara</td>
<td>Leaves and seeds</td>
<td>Antioxidant, wound healing, antidiabetic, renoprotective, antibacterial, antifungal, and anti plasmodial</td>
<td>Bag <em>et al.</em>, 2013</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td><em>Solanum surattense</em> Burm. f</td>
<td>Solanaceae</td>
<td>Kantakari</td>
<td>Whole plant</td>
<td>Cough, constipation, Diuretic, bronchospasm, Asthma, effective expectorant and sore throat</td>
<td>Samy <em>et al.</em>, 2008.</td>
<td></td>
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<tr>
<td>22</td>
<td><em>Butea monosperma</em> (Lam.) Taub.</td>
<td>Fabaceae</td>
<td>Dhak or palas</td>
<td>Leaves, stem bark, seed oil, flowers and seeds</td>
<td>Anti-inflammatory, antifungal activity, bactericidal and fungicidal, liver disorders, antiestrogenic and anthelmintic</td>
<td>Yadav <em>et al.</em>, 2015</td>
<td></td>
</tr>
</tbody>
</table>
Sapindus mukorossi 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

Moringa oleifera Lam. | Moringaceae | Kelor tree Or Sohanjna | Tree | Root, leave, Stem, bark, gum and flowers | Anti-lithic, anti-inflammatory, treating rheumatism, inflammations, articular, kidney pains, headaches, piles, fevers, eye diseases, intestinal complaints, dysentery, muscle diseases and hysteria, tumors | Anwar et al., 2007

Argemone Mexicana L. | Papaveraceae | Satyanashi | Herb | Roots, leaves and seeds | Lepsory, skin-diseases, inflammations, and bilious fevers | Mehul & Unnati, 2014

Euphorbia nertifolia 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 et al., 2015

Ocimum sanctum L. | Lamiaceae | Tulsi | Herb | Leaves and Steam | Anticancer, chemopreventive, radioprotective, immunomodulatory, hepatoprotective anti-fertility and antacataract | Pandey & Madhuri, 2010

Abroma augusta Linn f. | Sterculiaceae | Ulatkambal | Shurb | Roots, leaves, barks and seeds | Antidiabetic, anti-inflammatory, antifungal, antibacterial and insecticidal | Gupta et al., 2011

Acorus calamus L. | Acoraceae | Vacha | Herb | Leaves and rhizome | Antispasmodic, antibacterial, antifungal, antioxidant, antihypotensive, immunosuppressive, insecticidal, antiulcer and antispasmodic | Divya et al., 2011

Aconitum ferox 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 et al., 2014

Pueraria tuberosa (Roxb. ex Wild.) | Fabaceae | Chemical Goldmines | Shrub | Tuber | Antioxidant and adaptogenic activity, | Theng & Korpenwar 2012; Pramanik et al., 2010

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**Authors’ contributions:**
All authors have contributed regularly in the manuscript. Author Vinay Mohan Pathak has carried out the data study. Author Navneet has guided throughout the study. All authors have examine and permitted the final manuscript.

**Competing interests:**
The authors declare that they have no competing interest.
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