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An ethnobotanical and phyto-chemical studies of some medicinal plants of Dachigam National Park, Srinagar, Jammu and Kashmir

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Abstract

The study of ethno botany was carried out along with the ethnic groups residing in the vicinity of the National Park. In the present study 21 plant species belonging to 17 families were included. In this assertion, the information collected from the traditional healers was used to compare with the already accessible literature on the ethnobotany of India. The conventional ethno medicinal plants were mostly used for fever, dysentery, skin diseases, poison bites, wounds, piles and rheumatism. The medicinal plants used by traditional users are arranged alphabetically followed by botanical name, family name, local name, major chemical constituents and medicinal uses.

Keywords: Ethnobotanical, phyto-chemical studies, medicinal plants

Introduction

India is one of diverse countries in the world, rich in medicinal herbs and plants. In Indian traditional system of medicine, herbal medicines have been used primordially. Over the last century, ethnobotany has evolved into a specific discipline that looks at the people-plant relationship in a multidisciplinary manner, such as ecology, economic botany, pharmacology and public health (Balick, 1996) [2]. Herbal medicines are assumed to be of great importance in the primary healthcare of individuals (Sheldon *et al.*, 1997) [13] and communities in many developing countries as the herbal medicines are comparatively safer than synthetic drugs. Plant-based traditional knowledge has become a recognized tool in search for new sources of drugs and nutraceuticals (Ghosh, 2003; Sharma and Mujundar, 2003) [3, 12]. In this present research article, we report on the information collected from traditional practitioners residing in the vicinity of national Park to cure various ailments.

Study area

Dachigam National Park located amidst the Western Himalayas is rich in biodiversity. It covers an area of 141 Sq/kms., is located 22 kms from the city Srinagar (J&K) varying in altitude 1700 to 4300 meters above sea level. Due to this variation Dachigam National Park is clearly demarcated into an upper and lower region. The Park has been protected area since 1910 first under the care of Maharaja of Jammu and Kashmir and later under the observation of the concerned Govt. Authorities. It was initially created to ensure clean drinking water supply to the city Srinagar. It was finally upgraded and declared as National Park in the year 1981. Dachigam National Park is flourished with diverse species of medicinal flora which are very important for their medicinal value. Ethno botanically, the area remains unexplored and very less comprehensive account of local tradition is available. In view of this fact, the work was carried out in Dachigam National Park to provide a comprehensive account of folklore medicinal plants with their phytochemical constituents. The studies on phytochemical constituents of the medicinal plants in the National Park will be quite useful since the same will generate a database for further research.

Methodology

Methodologies adopted for carrying out investigations on the status assessment, resource use pattern and indigenous uses of the medicinally important forest resources of the area and the analysis of the information are given below:

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Assessment of Resource Utilization Pattern

Theed, Mulnar, Shaltang, Dara, Dardekhwar, Taanch Mohalla and Gandtal the representative villages located on the boundaries of Dachigam National Park and having complete dependence on it, were selected to generate information on Resource Utilization Pattern of the inhabitants and other relevant parameters. Information pertaining to the traditional knowledge, local uses of the plants and curative properties were recorded through intensive interviews and discussions with the elderly people, herbal healers, local *hakim* and rural women of the area and the same have been documented and are depicted in the results. Local *hakim* and knowledgeable persons from each village were also hired while surveying and collecting the useful plant species from the natural habitats.

Fresh samples of the useful species were collected and identified with the help of local and regional floras.

Information on the mode of utilization of medicinal plants was also collected.

The indigenous uses mostly based on the surveys, had also been updated with the help of available information (Jain, 1991; Samant & Palni 2000; Samant *et al.*, 2001b, 2007a & b) [7, 10, 11]. Some of the species of medicinal plants those are not used by the inhabitants but their uses as medicine known from other parts of the State and Indian Himalayan Region have also been included under medicinal plants. The information was compiled and analysed for the utilization pattern following Samant *et al.*, (2002a, 2006a).

Results

Total 21 medicinally important plant species belonging to 17 families and 19 genera were recorded and their phytochemical constituents and medicinal properties have been mentioned in the Table-1.

Table 1: Chemical Constituents and local uses of some important medicinal plants found in Dachigam National Park

S. No.	Taxa	Local/ Common name	Family	Chemical constituents	Local Uses
1.	<i>Acorus calamus</i> Linn.	Nagruss/Vai	Acoraceae	Beta-Asarone [(Z)-asarone] about 27.4 to 45.5%, acorenone (20.86%), isocalamendiol (12.75%), epiudesmin and galgravin (Venskutonsis <i>et al.</i> , 2003) [16].	Root extract is used to cure diarrhea and other stomach related problems. Paste of the roots is used for swellings and joints.
2.	<i>Ajuga bracteosa</i> var. <i>densiflora</i> (Wall. ex Berth.) Hook. f.,	Neel Khanti	Lamiaceae	Limonene, α -humulene, β -myrcene, Elemol, Camphene, β -Caryophyllene, α -phellendrene. (Vohra <i>et al.</i> , 2011) [17]	Entire plant is used in powdered form with milk to cure Rheumatism, gout and jaundice.
3.	<i>Angelica glauca</i> Edgew.	Chora/frin	Apiaceae	Important valeric acid, angelic acid, lactones, sesquiterpenes, cadinene, umbelliprenin, terpene alcohol and angelisane resin, etc. (Purohit <i>et al.</i> 2015).	Root powder is applied over aching teeth. It is also taken with water against stomach disorders.
4.	<i>Arisaema jacquemontii</i> Blume.	Polgugj/Hapat Makei	Araceae	Arisaeminone, Triterpenoid 2-hydroxyl diploterol, Glycosides, terpenoids, coumarins, quinines, saponins, tannins, alkaloids, anthraquinones, flavonoids and phenols. (Roshan <i>et al.</i> , 2017) [6]	Rhizomes of the plant is mixed with edible oil and prepared a paste, which is used to massage the affected area in order to regain muscular strength and to treat skin problems such as blisters and pimples.
5.	<i>Asparagus racemosus</i> Willd.	Kashirmuj/ Shatavari	Asparagaceae	Sarsasapogenin and shatavarin I-IV, isoflavone, 8-methoxy-5, 6, 4'-trihydroxyisoflavone-7-O- β -d-glucopyranoside (Negi <i>et al.</i> , 2010) [5]	Roots are crushed with water and used in place of detergent to wash woollen clothes and utensils. Root extract is also used for the treatment of infertility, loss of libido, threatened miscarriage, menopausal problems.
6.	<i>Atropa accuminata</i> Royle ex. Lindl.	Bildona/Brand	Solanaceae	Monoterpene, sesquiterpene, phenylpropanoid, flavonoid and quinine (Jayakanthi <i>et al.</i> 2011).	Root decoction is used in cough and abdominal problems. Decoction of the entire plant is prepared and is taken orally to treat cough.
7.	<i>Berberis lycium</i> Royle.	Bel Chukchin	Berberidaceae	Berberine, berbamine, chinabine, karakoramine, palmatine balauchistanamine, gilgitine, jhelumine, punjabine, sindamine, chinabine acetic acid, maleic acid, ascorbic acid. (Khare <i>et al.</i> , 2004)	Roots are crushed with water and strained it and left out for some time. This strained extract is put in eyes to cure eye diseases.
8.	<i>Bunium persicum</i> Bioss.	Jangli zeer	Apiaceae	Cumin aldehyde, pmentha-1, 3-dien-7-al and p-mentha-1,4-dien-7-al (7). (Sofi, <i>et al.</i> , 2009) [14]	Seeds of this plant is said to have Carminative and stomachic properties.
9.	<i>Datura stramonium</i> Linn.	Datur	Solanaceae	Tigloidin, aposcopolamine, apoatropin, hyoscyamine N-oxide and scopolamine N-oxide 17-20. 6 α -ditigloyloxytropene and 7-hydroxyhyoscyamine (Soni <i>et al.</i> , 2012) [15]	Dried seed powder is mixed with mustard oil and boiled. After cooling, it is applied on joints to relieve pain.
10.	<i>Digitalis lanata</i> Ehrh.	Bethrek	Plantaginaceae	Digitoxin, digoxin, ouabain, oleandrin	Root extract is prepared and given

				and proscillaridin (PDR for herbal medicines, 2000).	to treat any blockage in the arteries of heart.
11.	<i>Plantago major</i> Linn.	Jungli Isabgol	Plantaginaceae	Plantamajoside and Verbascoside (Zubair, 2010).	Seeds are used in gastric complaints, burning sensation in stomach and dysentery. Leaves are applied to bruises.
12.	<i>Plantago lanceolata</i> Linn.	Kashur gul	Plantaginaceae	Phenylethanoids, acteoside (verbascoside), cistanoside F, lavandulifolioside, plantamajoside and isoaceteoside (Murai <i>et al</i> , 1995)	The leaves are astringent and used to wound inflamed surfaces and sores when applied to throat. The seeds are used with sugar as a drastic purgative. Leaf extract taken for cough and urinary disorders and also as a cooling drink.
13.	<i>Plantago ovata</i> Fork.	Isabgol	Plantaginaceae	Hemicellulose, composed of xylan backbone linked with arabinose, rhamnose, and galacturonic acid.	Seeds are used as laxative to cure constipation and other stomach ailments like gastritis, cramps, bloating etc.
14.	<i>Ranunculus arvensis</i> Linn.	Trelmug	Ranunculaceae	Alkaloid, Phenol, Flavonoid and Saponin (Hussain, 2011),	The plant is used in the treatment of intermittent fevers, gout and asthma.
15.	<i>Rheum webbianum</i> Royle.	Pambchalan	Polygonaceae	Anthraquinone, crysophanic acid or crysophan, emodin, Stilbene glycosides (including rhaponticin and rhapontigenin or rhaponticin), rheo-tannic-acid (tannin), resins (Tayade <i>et al</i> . 2012)	The roots, stems, leaves and leaf-stalks are purgative and are beneficial in treating indigestion, abdominal diseases, and flatulence. The roots are diuretic, laxative, purgative, febrifuge and used against indigestion and gastritis etc.
16.	<i>Rubia cordifolia</i> Linn.	Manjistha	Rubiaceae	Anthraquinones and their glycosides, naphthoquinones and glycosides, terpenes, bicyclic hexapeptides, iridoids, carboxylic acids and saccharides were isolated from various parts. (Qiao <i>et al.</i> , 1990).	It is a blood purifying herb. It detoxifies the blood, removes stagnant blood and dissolves obstructions in the blood flow.
17.	<i>Swertia petiolata</i> Royle.	Chirayta	Gentianaceae	Steroids, tannins, phenolics, saponins, alkaloids, flavonoids and glycosides (Bader, 2014).	Extract of entire plant is prepared and applied to cure skin diseases and ulcers.
18.	<i>Thymus linearis</i> Benth.	Jangli ajwain	Lamiaceae	Thymol (47.59%), γ -terpinene (30.90%), and p-cymene (8.41%) (Boruga <i>et al.</i> , 2014).	Decoction of the aerial part is prepared which is believed to have Antifungal properties.
19.	<i>Trillium govanianum</i> Wall. ex D. Don	Tripatri/Naag chhatri	Melanthiaceae	Steroids, glycosides, terpenoids, sterols, saponins, sapogenins and flavonoids. (Sharma, 2017)	Root is said to have Analgesic, anti-inflammatory, anticancer and antifungal properties.
20.	<i>Valeriana jatasmansi</i> Jones.	Mushki Bala/Budjeeth	Lamiaceae	Decursidin, decursitinB, decursitinA, 3'(S)-acetoxy-4'(R)-angeloyloxy-3', 4'-dihydroxanthyletin, 8-acetoxy-pathchouli alcohol and dibutyl phthalate (Mao <i>et al.</i> , 2015).	Decoction of the root stock and leaves is a beneficial remedy for acute stomachache.
21.	<i>Viola odorata</i> Linn.	<u>Banaphsha</u>	Violaceae	Glycoside-methyl salicylate, an alkaloid violine, a glycoside-violequarcitin which is identical to rutin, and saponin (Kotach <i>et al</i> . 2017).	Decoction of the aerial parts is given to cure cough, asthma burning sensations and body ache.

Conclusion

The selected twenty one medicinal plants are the source of the secondary metabolites i.e., alkaloids, flavonoids, terpenoids, phlobatannins and reducing sugars. Medicinal plants play a vital role in preventing various diseases. The anti-diuretic, anti-inflammatory, anti-analgesic, anticancer, anti-viral, anti-malarial, anti-bacterial and anti-fungal activities of the medicinal plants are due to the presence of the above mentioned secondary metabolites. Medicinal plants are used for discovering and screening of the phyto-chemical constituents which are very helpful for the manufacturing of new drugs. The phyto-chemical analysis also have commercial interest in both research institutes and pharmaceuticals companies for the manufacturing of the new drugs for treatment of various diseases. Thus we hope that studies focusing on phyto-chemical properties in the local

plant of the study area will be helpful in dealing with different diseases of this particular region.

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