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Ethnobotanical Notes on Tree Species of Pir Panjal Biodiversity Park of Baba Ghulam Shah Badshah University, Rajouri, J&K, India

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Abstract

The documentation of traditional knowledge would appear to be the "need of the hour" in view of the current demand for herb based products. Documentation serves to ensure the preservation of traditional information for future generations. It is also a step forward in the creation of a database on ethnobotanical notes. An attempt therefore, has been made here to document the indigenous uses of tree species of the Pir Panjal Biodiversity Park of BGSB University. A total of 28 species belonging to 24 genera and 19 families were observed being used traditionally to cure various diseases and having other uses. Out of these, only six species were natives and 22 were non-native of the Indian Himalayan Region.

Key words: *Diversity, Biodiversity Park, Indigenous Knowledge, Rajouri, BGSB University*

Introduction

Indian Himalayan Region (IHR) has a rich heritage of species and genetic strains of flora and fauna and considered as a Mega Hot Spot of biological diversity (Myers, 2000). It comprises about 18% of India and extends more than 2,800 km in length and 220 to 300 km in width, with an altitudinal range from 200 - 8000m amsl (Anonymous 1997). Its flora includes about 8,000 species of angiosperms (40% endemic), 44 species of gymnosperms (16% endemic), 600 species of pteridophytes (25% endemic), 1,737 species of bryophytes (33% endemic), 1,159 species of lichens (11% endemic) and 6,900 species of fungi (27% endemic) (Singh and Hajra, 1996; Samant et al., 1998a). It hosts, 1,748 species of medicinal plants (Samant et al., 1998a), 675 species of wild

edibles (Samant and Dhar, 1997), 118 species of medicinal plants yielding essential oils (Samant and Palni, 2001), 279 species of fodder (Samant, 1998), 155 sacred plants (Samant and Pant, 2003) 138 plants used in liver disease/ailments (Samant and Pant, 2006). About 121 plants are listed as rare-endangered (Nayar and Sastry, 1987, 1988, 1990). This rich biodiversity is being utilized by the inhabitants of the IHR in various forms including medicine, food (wild edibles), fuel, fodder, timber, for making agricultural implements, fiber, in religious ceremonies and for various other purposes (Samant and Dhar, 1997, Samant*et al.*, 1998 b). It is estimated that 70-80% of the rural population depends on traditional medicine for primary health-care (Titz, 2004). Due to cultural and ethnic diversity in different biogeographic provinces of the IHR, the traditional knowledge base of people varies considerably. Most of the medicinal plants are being extracted for drugs by pharmaceutical industries from wild. This has adversely affected the very existence of a number of plants of high commercial value (Farooquee and Saxena, 1996). Further, with the increasing world demand and renewed global interest in traditional ethnopharmacy coupled with the increasing preference for natural substances in the health care system, the natural stock of medicinal plants of the IHR is under tremendous pressure (Samant et al., 1998; Kala, 2006; Samant et al., 2007).

In India over 2,500 species of ethnobotanical use are known (Jain, 1991). Further, the rich biological diversity of IHR has been put to use by the various native communities from ancient times. The very survival of these resources is now under threat from rapidly expanding human population and concomitant environmental degradation occurring at a fast pace. There are major gaps in the knowledge of biological resources and the means by which biological diversity is maintained (Heywood, 1995). Every community is making use of bioresources for various ethno pharmaceutical purposes. The documentation of traditional knowledge therefore becomes very important for its greater benefit and further extension to other communities. Keeping in view its relevance, a study was carried out on the diversity and ethnobotany of tree species of Pir Panjal Biodiversity Park of Baba Ghulam Shah Badshah University, Rajouri, J&K.

Study area

The present study has been conducted in the Pir Panjal Biodiversity Park of the Baba Ghulam Shah Badshah University, Rajouri. The Pir Panjal Biodiversity Park is spreaded over an area of 437 acres in the Dhanore range of the famous Pir Panjal Himalayan range. The altitude of the Park ranges from 700 – 1200m. The terrain is undulating and rocky with a perennial streamlet passing through the midst, which gets swollen during the rainy season. Climatically, the area faces three main seasons i.e., winter, summer and rainy. Due to typical topography of the area, it supports diverse vegetation ranging from the sub-tropical to temperate types. The inhabitants of the area belong to different cultures and communities, including Gujjars, Bakerwals, Hindus and Muslims, who regularly cater the most of their daily needs from plant resources.

Material and Methods

The present study is based on the extensive survey conducted in Biodiversity Park of the University between November, 2007-May, 2008. The samples of the tree species were collected and identified with the help of local flora (Sharma and Kachroo, 1981; Singh et al., 2000) and deposited in the University Herbarium. Information on ethnobotany and local names were gathered from natives of the area. Nativity of the species was determined following Anonymous (1883-1970) and Samant et al., (1998a) and endemism was determined by distribution of the species (Dhar and Samant, 1993). Indigenous knowledge associated with the species is based on the primary survey as well as secondary sources (personal observations and Jain, 1991).

Results

Species Diversity and Utilization Pattern

The present study recorded 28 species belonging to 24 genera and 19 families. These species are the source of medicine, wild edibles, fuel, fodder, timber, agricultural tools etc. for the inhabitants (Fig. 1). The utilization pattern of the species indicated that leaves of 22 species, stems of 12 species, fruit of 11 species, bark of 9 species, root and seed of 4 species, are each used (Fig. 2). The indigenous uses of the species are presented in Table 1. Amongst the families, the Moraceae and Salicaceae (4 spp., each), Euphorbiaceae, Meliaceae, and Ulmaceae (2 spp., each) were dominant. Species richness was maximum in the genus *Ficus* and *Salix* (3 spp., each). In the remaining genera, less than 3 species each were recorded. Fourteen families were monotypic. Notable among these were the Caesalpiniaceae, Fabaceae, Lythraceae, Mimosaceae, Myrtaceae, Oleaceae, Pinaceae, Punicaeae, Rutaceae, Tiliaceae and Urticaceae (Table 1).

Nativity and Endemism

Only six species (*i.e., Quercus leucotrichophora, Melia azedarach, Pyrus pashia, Populus ciliata, Grewia oppositifolia* and *Ulmus wallichiana*) were native to the IHR. Twenty-two species were introduced to the Himalayas from other regions. Only three species *i.e., Pinus roxburghii, Grewia oppositifolia* and *Ulmus wallichiana* were endemic or nearly endemic to the IHR.

Economic Importance

Of the total species, 18 species were used as fodder, 16 as medicine, 12 as fuel, 3 as timber and few for other purposes (Fig. 1 and Table 1).

Discussion

The present study provides comprehensive information on the diversity and indigenous uses of the tree species present in the Pir Panjal Biodiversity Park of the BGSB University, Rajouri. According to a report of the World Health Organization (WHO), over three-fourths of the World population cannot afford modern medicines and have to rely on the use of traditional medicines of plant origin (Rai et al., 2000). Traditional practice of using plant resources has a long history and wide acceptability throughout world. The inhabitants of the region use various bioresources in order to meet their daily requirements. They use different plant parts in various forms to cater to their daily needs.

In the present century, the conservation and sustainable utilization of bioresources are two topics that are generating a lot of attention throughout the world. Therefore, the documentation of information on diversity and indigenous practices should help in the preservation of that knowledge. Information from other parts of the IHR should also be documented; so that a comprehensive database of the plants used for various purposes could be saved for posterity.

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Table 1. Diversity and indigenous knowledge of tree species of Pir Panjal Biodiversity Park of BGSB University, Rajouri, J&K, India.

Family/Taxa	Local Name	LF	Nativity	Parts Used	Indigenous Uses
Caesalpiniaceae					
Bauhinia variegata	Kachnar	T	India Or Burma, China	Bk, Fl Rt, Lf	Medicinal (Diarrhoea, dysentery, fatness, Indigestion, laxative, leprosy, malaria, piles (bleed), scrofula, skin disease, snake bite, syphilis, tumors, ulcers, worms); Edible
Euphorbiaceae					
Emblica officinalis Gaertn.	Amla	T	As Trop	Fr, Sd, Bk, Lf	Medicinal (Asthma, bronchitis, burns, cold, Constipation, cooling, diabetes, diuretic, dysentery, eye complaints, fever, headache, laxative, liver complaints, madness, purgative, revive taste, scorpion bite, stomache complaints, thirst, vaginal complaints, wounds, veterinary stomach disease); Edible
Mallotus philippensis (L.) Muell.-Arg.	Kamela	T	As et Austr Trop		Medicinal
Fabaceae					
Robinia pseudo-acacia L.	Kikar	T	Amer Bor	Lf, St	Fuel, Fodder
Fagaceae					
Quercus leuco-trichophora A. Camus	Banj	T	Reg Himal	St, Lf	Fodder; Fuel; Timber
Lythraceae					
Woodfordia fruticosa (L.) Kurz	Dataki	T	As et Afr Trop	St, Fl, Rt, Infl	Medicinal (Bleed in pregnancy, bone fracture, burns, cancer, carbuncle, cholera, cooling, cough, disrrhoea, dropsy, dysentery, fever, haemorrhage, injuries, loss of appetite in pregnancy, mennorhoea, muscle pain, nausea, night blindness, fever, rheumatism, skin disease, small pox, sores, spleen complaints, sprain, tonic, ulcer wounds, veterinary sores); Edible
Meliaceae					
Melia azedarach L.	Dhrenk	T	Reg Himal	Fr, Lf, Bk, Sh	Medicinal (Anthelmintic, antiseptic, blood purification, hair fall, headache, insecticidal, promote conception, rheumatism, gout, skin disease, vermifuge, wounds); Edible
Toona ciliata L.	Tun	T	Malaya Austral	Bk, Fr, Lf	Medicinal (Antiseptic, dysentery, bronchitis, fever, gastric trouble); Fodder
Mimosaceae					
Albizia lebbeck (L.) Benth.	Sareen	T	Geront Trop	Lf, St	Fuel; Fodder; Timber
Moraceae					
Ficus carica L.	Anjeer	T		Fr, Lf	Edible; Fodder
F. Palmata Frossk.	Fagawara	T	Afr Trop	Fr, Lf,	Medicinal (Dysentery, indigestion, laxative); Edible; Fodder

			Arab Ind Or	La	
F. racemosa L.	Trimbal	T	Reg Himal Burma	Lf, Fr	Edible; Fodder; Fuel
Morus alba L.	Toot	T	As Temp	Fr, Lf	Edible; Fodder
Myrtacea					
Syzygium cumini (L.) Skeels	Jamum	T	As et Austr Trop	Bk, Lf, St, Sd	Medicinal (Anemia, astringent, blisters in mouth, cancer, colic, diabetes, diarrhea, digestion complaints, dysentery, piles, pimples, stomachache, tonic); Edible
Oleaceae					
Olea ferruginea Royle	Kohu	T	Europe Austral	Lf, St	Fodder; Fuel
Pinaceae					
Pinus roxburghii Sargent**	Chir	T	Asia Minor Afghan	Sd, St	Medicinal (Boils, bone fracture, cracks in sole of feet, leprosy, other skin diseases, snake bite, sprain, swelling, ulcers, urine complaints); Edible; Fuel; Timber; Agricultural tools
Punicaceae					
Punica granatum L.	Darooni	T	Europe Austr Maurit	Rt, St, Fr, Lf	Medicinal (Anthelminitic, stop bleeding, child birth, miscarriage, cholera, cooling, cough, diarrhea, dysentery, eye complaints, pimples, stomachache); Edible
Rosaceae					
Pyrus pashia Buch.-Ham. Ed D. Don	Kainth	T	Reg Himal	Lf, Fr	Medicinal (Eye complaints); Edible; Fuel; Fodder
Rutaceae					
Zanthoxylum armatum DC.	Timbru	T	Reg Himal China	Fr	Medicinal; Edible
Salicaceae					
Populus ciliate Wall. Ex Royle	-	T	Reg Himal	Bk, Wd	Medicinal (Bone fracture); Fodder
S. alba L.	Bais	T	Ind Or Malaya	Lf, St	Fuel; Fodder
S. babylonica L.	Bais	T	Reg Caucas As Bor	Lf, St	Fuel; Fodder
S. tetrasperma D. Don	Bais	T	Ind Or Malaya	Lf, St	Fuel; Fodder
Sapindaceae					
Sapindus mukorossi L.	Rantha	T	As Trop	Lf, Sd	Medicinal; used for other purposes
Tiliaceae					
Grewia oppositifolia Buch.-Ham. Ex Roxb.**	Tapan	T	Reg Himal	Lf, St, Bk	Medicinal (Eruption, fever, veterinary, bone fracture as splinter); Fodder; Fiber; Fuel
Ulmaceae					
Celtis australis L.	Kharik	T	Europe As Temp Ind Or	Lf, Rt, Bk	Fodder; Fuel
Ulmus wallichiana Planch. **	Manu	T	Reg Himal	Bk	Medicinal (Bone fracture, bone dislocation)
Urticaceae					
Debregeasia salicifolia (Gaud.) Rendle	-	T	As et Afr Trop	Fr, Lf	Fodder; Edible

Abbreviations used: LF=Life form; T=Tree; ** =Near Endemic; Bk=Bark; Fl=Flower; Fr=Fruit; Infl=Inflorescence; La=Latex; Lf=Leaf; Re=Religious; Rt=Root; Sd=Seed; St=Stem; Wd=Wood

Fig. 1. Utilization pattern of the tree species in Pir Panjal Biodiversity Park

Fig. 2. Use pattern of the tree species in Pir Panjal Biodiversity Park

Abbreviations used: Lf=leaves; St=Stem; Fr=Fruit; Bk=Bark; Rt=Root; Sd=Seed; Fl=Flower; Infl= inflorescence; La=Latex; Wd=Wood; and Wp=Whole Plant