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PROTECTION OF MEDICINAL PLANTS: A LEGAL PERSPECTIVE IN THE STATE OF JAMMU & KASHMIR

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ABSTRACT: The indigenous and traditional health care system based on the rich diversity of plants associated knowledge serves more than 70% of the Indian population. More than 7500 species of plants have been used in Indian medical traditions, and over 2700 documented species of plants are used in classical medical systems of Ayurveda, Unani, and Siddha. About 1800 plants are documented in various Ayurvedic tenets, about 400 in Unani and approximately 500 in the Siddha system. What is of more interest in almost every tribe or forest-based community is the existence of impressive localized knowledge and practices of plant-based ethnomedicine. Western Himalayas are a source of almost fifty percent of medicinal plants used in Ayurvedic, Unani and allopathic systems but there has been little concerted effort towards their indigenous cultivation. Of 2500 such plants grown in wild only 300 species are currently used by 8000 licensed drug manufacturing units. As an integral part of western Himalayas, the State of Jammu and Kashmir is known for its beauty and biological resources. The herbal wealth of wild medicinal plants of high Mountains has not only been a potential source of revenue to the state but also the only relied indigenous health care system of people in the past. Even now Unani and Ayurvedic systems of medicines play a major role in the health care system of the state.

INTRODUCTION: The state of Jammu and Kashmir has shown its unique legal calibre in framing, law on protection of biodiversity even before Indian independence and in the field of medicinal plants a law has been in vogue from as back as 1921 A.D. with the sacred aim of conserving and protecting some valuable medicinal plants [1, 2].

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In its total geographical area of 10, 1387 square kilometers the State of Jammu and Kashmir has a forest area comprising of 20,230 square kilometers. In Kashmir and Ladakh especially local knowledge on medicinal plants abounds and their use has remained an important link between the dwelling communities and the biodiversity of area [3, 4].

The indigenous people have had a close dependence on their local environment, and in the process they have not only developed a stake in conserving the local diversity for their survival but have gained a detailed empirical and qualitative knowledge base about the biological resources. Twice or thrice in the season villagers used to go themselves taking salt for their sheep and they used

to bring back various drugs and roots like Sassurea lappa (*chobi-kot*), the leaves of Gao Zaban *(Maerotomia benthami),* the leaves and seeds of *Hyoscyamus niger,* the henbane and various other non intoxicating drugs resulting in considerable encore to the hill villages. Violets and seeds thus collected were largely exported and had a readily available market through Punjabi traders [1, 4].

Identifying the indigenous communities who have remained the storehouses of traditional Knowledge about, herbal plants the noted colonial writer-cum-administrator W. R. Lawrence gives a Century old account in the following works:

"Hakims have a considerable Knowledge of herbs, and their herb collectors are the shepherds, who spend the summer on the high mountains where most valued plants are found-such samples as the Hakim does not obtain from the shepherds are brought from the druggists. Besides the professional Hakims, there are many 'wise women' in the villages who have considerable knowledge of the properties of herbs, and it is a remarkable fact that nearly every peasant seems to know something about the medicinal powers of plants" [5].

Besides the high mountains, the lakes of Kashmir especially the Dal Lake has remained a viable ecological resource *Nelumbium nucifera* (lotus) possesses high medicinal properties whose fleshy rhizomes also of being tasty and nutritious are utilized against diarrhea, dysentery and dyspepsia, skin disorders and smallpox. Honey collected by bees exclusively from lotus flowers is a valuable tonic and infusion of seeds of *Nelumbium nucifera, Euryale ferox,* and *Nymphaea stellata* has been esteemed as an invigorating tonic. Species of duckweeds (*Lemna sp.*) are cooling, astringent and diuretic and also used for cutaneoio disease and washing eyes. *Potamogeton natans* is reported to be used in homeopathy while Utricularia species are used against cough and to dress wounds. The singhara nut of the lake has remained an easy meal from ages and the jewar (*Euryale ferox*) gives a pleasant seed eaten raw or porched. The bumbh of the lake 'with its long stem and white flower, provides a nourishing vegetable from the former and an agreeable sharbat from the latter. People have also shown great interest in self-cultivation of some plants with medicinal value.

Canabis indica (Bhang) was grown in great profusion along the banks of the river Jhelum and the Vishau and custom prevalent in this behalf was to reserve the land on the river banks up to a distance of fifteen yards on either side for this purpose where occasionally hemp seed was sown realizing much revenue to the state. The close nexus of the indigenous people with the biological resources of especially the medicinal plant life from up hills down to the lakes has resulted in the accumulation of knowledge base which has disrupted and disturbed because of deprivations from customary rights commenced by state even from times when there were no hard and fast rules for protection of wildlife in the state [6].

Forest Act, the Wildlife (Protection) Act: The enactment of the Forest Act, 1930 has commenced centralized and commerce-oriented management of natural resources. The Act strictly regulates the access of local communities to forests. The Forest Act considers wild trees, timber and forest produce as an important source of revenue. Along with it some important herbs and medicinal plants continue to be regarded as minor forest produce. The Government has wide powers to regulate the sale and removal of trees and forest produce. In addition to the exploitative scheme envisaged under the Forest Act, the ever increasing and unbridled heartless exploitation of forest resources even after the colonial rule has been attributed to the implementation of misguided economic policies focussing exclusively on planning for productivity.

No doubt that rural and the tribal people too are making greater use of the forest resources than they did in the past, but this has been marginal when compared to the demand by the industries and the urban sector [6, 7]. While the Forest Act, 1930 enumerated multiple ways of snaking traditional users and managers of forests as offenders, their further alienation was accelerated with the enactment of Wildlife Protection Act, 1978 declaring many areas as national parks, wildlife sanctuaries, game reserves, *etc*.

The Act is modeled on the lines of the central Wild Life Protection Act, 1972 which itself has borrowed the model of protected areas from the west. The worst effect of de-recognition of the local people and their traditional practices is that

they have lost a considerable part of their very large store of knowledge related to wild biodiversity on the one hand while the population of certain species of wildlife has considerably gone down due to overexploitation, poaching and habitat destruction [8, 9].

The Kuth Act, 1978 (1921 A.D): Kuth Act, 1978 was enacted for the conservation, preservation, and protection of *Kuth* plant *(Sassurea lappa)* and its produce in J & K state and to guard against illicit cultivation, extraction, possession and export thereof. It prohibited the cultivation, extraction, possession, transport, export & sale of *S. costus* or the manufacture of any substance or preparation containing *S. costus* except by permission. Violators can be arrested without a warrant and be punished by a jail term of up to 2 years or a fine which may extend to INR 5000 or both. This is indicative of the seriousness the state placed on control of the trade in *S. costus.*

To stem the sudden decline in the numbers of medicinal plants in Jammu and Kashmir, the state government recently repealed the Kuth Act. The move is expected to encourage local people to cultivate medicinal and aromatic plants on their land, with technical know-how being provided by the authorities. "Earlier, under the Kuth Act, cultivation of these plants involved cumbersome procedures. Now any individual can participate in the activity [10].

Medicinal Plants in State of Jammu and Kashmir: The Medicinal Plants growing in the forests of Jammu & Kashmir are mostly in the form of Herbs and Shrubs, both annual and perennial. Usually, the ripening time is July to October. Natural regeneration is obstructed by many reasons which include biotic interference, poor seed set, poor seed viability, and harsh climatic conditions. Efforts have been made in the state to undertake cultivation of different Medicinal Plants which are of commercial importance and include [11]:

Temperate Zone Medicinal Plants (Herbs and Shrubs): *Rheum emodi, Aconitum heterophyllum, Saussurea lappa, Digitalis purpurea, Dioscorea deltoidea, Artemisia maritina, Atropa belladona, Podophyllum hexandrum, Picrorrihiza kurooa, Valeriana wallichi, etc.*

Sub-Tropical Area (Herbs & Shrubs): *Acorus calamus, Boerhaavia diffusa, Gloriosa superba, Rauvolfia serpentina, Tinospora cordifolia, Vitex negundo, Coolebrokia oppositifolia, Solanum surratense, Celastrus paniculata, etc***.**

Sub-Tropical Area (Tree Species): *Acacia catechu, Aegle marmelos, Cassia fistula, Emblica officinalis, Sapindus mukrossi, Terminalia arjuna, Terminalia belerica, Terminala chebula, etc.*

Cold Arid (Ladakh) Zone: *Hiphophae rhamnoides, Artemisia spp., Rheum emodi, Rumex sp. etc.*

Distribution of Medicinal Plants: In case of J&K first very intensive survey of Kuth fields was conducted in the year 1993 as there was a lot of demand for Kuth. As reported by different agencies the locational distribution of Medicinal Plants in the state is given in **Table 1** as [13, 14, 15].

TABLE 1: DISTRIBUTION OF MEDICINAL PLANTS IN J & K

Forest Division	Location	Common Species
Sub Tropical Zone (1000-6000 ft above msl)		
Ramnagar forest division	Kalounta, Saamnabarj, Dudu	*Emblica officinalis, Sassaurea lappa, Berberis sp, Viola odorata, Jurinea macrophylla*
Nowshera forest division	Forest Reserve Nowshere, Thandapani Closure, and Taryath	*Emblica officinalis, Gloriosa superba, Acorus calamus, Pistacia integreima, Zanthoxylum armatum*
Jammu district	Binyal/Sungal, Nandini, Akhnoor, Chinota, Mathwar, Tarmundal, Utterwani	*Adhatoda vasica, Gloriosa superba, Emblica officinalis, Terminalia chebula* and other Sub Tropical species
Kathua forest division	Kathua	*Emblica officinalis, Acacia catechu, Terminalia belereca* and other Subtropical species
Sub Tropical to Temperate Zone (3000 & 6000 to 10000 ft above msl)		
Rajouri district	Rajouri, Budhal, Shesrak Forest	*Jurinea macrophylla, Valeriana vallichi, Acorus calamus* and other Temperate and subtropical species

Billawar forest division	Banjal, Bani Basholi, Sukrala, Sarthal	*Emblica officinalis, Sassaurea lappa, Jurinea macrophylla, Valeriana wallachi, Dioscorea deltoidea, Terminilia chebula*
Temperate to Alpine Zone (6000-10000) ft above msl		
Bandipora forest division	Athwattu, Tragbal	*Sassaurea lappa, Jurinea macrophylla, Aconitum heterophyllum, Artmisa sp, Atropa balladona, Podophyllum emodi*
Langate forest division	Bangus, Reshwari	*Sassaurea lappa, Dioscorea deltoidia, Aconiturum heterophyllum*
J.V forest division	Rafiabad, Gabbewar, Kazinagh, Uri, Botapothri	*Sassaurea lappa, Dioscorea deltoidia Podophyllum emodi, Atropa belladona, Artimisia sp, Jurinea microphylla*
Pirpanjal Forest division	Tosamaidan, Doodhpathri, Yousmarg, Dalwan	*Sassaurea lappa, Dioscorea deltoidia, Aconiturum heterophyllum, Picrorrhiza kurooa, Podophyllum emodi, Atropia balladona, Artemisia sp, Jurinea microphylla*
Anantnag Forest division	Daksum,Qazigund, Kuther Tral, Chandanwari, Batakote, Simthan, Margan Top	*Sassaurea lappa, Dioscorea deltoidia, Podophyllum emodi, Atropia balladona, Artemisia sp, Jurinea microphylla, Rheum emodi*
U.F Division srinagar	Zabarwan Dhara	*Sassaurea lappa, Picrorrhiza kurooa, Podophyllum emodi, Artemisia sp, Jurinea microphylla*
Kehmel forest division	Tangdhar, Ramhal, Deera	*Sassaurea lappa, Dioscorea deltoidia, Aconiturum heterophyllum, Podophyllum emodi, Artemisia sp, Jurinea microphylla*
Shopian forest division	Hirpora, Kungwattan	*Sassaurea lappa, Dioscorea deltoidia,Aconiturum heterophyllum, Artemisia sp, Jurinea microphylla.*
Marwa forest division	Chattroo, Simthan, Marwa	*Sassaurea lappa, Dioscorea deltoidia, Jurinea microphylla. Aconiturum heterophyllum*
Kishtwar forest division	Kishtwar, Padder, Machail	*Sassaurea lappa, Dioscorea deltoidia, Jurinea microphylla*
Doda forest division	Keshwan and Kotal	*Sassaurea lappa, Dioscorea deltoidia, Jurinea microphylla*
Badderwah forest division	Chinta, Jai, Seoj	*Sassaurea lappa, Viola odourata, Valeriana wallachi, Aconitum heterephyllum, Berberis lycium, Podaphyllum emodi*
Batote forest division	Marmar, Sanasar. Gandrhi	*Sassaurea lappa, Taxus sp.*
Mohore forest division	Sangladan, Gool, Mahore	*Berberis Sp, Jurinea macrophylla, Sassaurea lappa*
Alpine to Cold arid zone (10000 ft above msl)		
Leh forest division	Nobra, Nyoma, Choglamsar, Durbak	*Hiphophae rhimnoides, Artemisia sp, Rheum emodi, Rumex sp.*
Kargil forest division	Drass, Parkhchik, Penzila, Rangdum, Padam	*Innula racemosa, Hiphophaie rhamnoides, Sassaurea lappa, Aconitum heterophyllum*

The forests of Sindh Forest Division are bestowed with a wise variety of Medicinal plants. To determine the percentage presence and frequency of different medicinal species a general survey during 2004 in this Division has been conducted by the DFO working plan, laying 166 sample plots of 0.1 Ha each with 6640 quadrates, randomly and the results as depicted in its revised working plan of 2004-05 to 2013-14 are given in **Table 2** as under [16, 17]:

TABLE 2: PERCENTAGE PRESENCE AND FREQUENCY OF DIFFERENT MEDICINAL SPECIES A GENERAL SURVEY DURING 2004-2013 DFO WORKING PLAN

Botanical name	Local name	No. of Quadrates of occurrence	Total no. of quadrates studied	Frequency percent
Rheum emodi	Pambchalan	2921	6640	44.00
Allium atropurpureaum	Van-Pran	736	6640	16.58
Jurinea macrophylla	Dhup	2109	6640	31.76
Aconitum heterophyllum	Patis	302	6640	4.55
Artimisia sp.	Tethwan	4111	6640	61.91
Podophyllum emodi	Van Wabgon	3724	6640	56.08
Viola odorata	Bunafsha	3935	6640	59.26
Malva sylvestris	Sochal	3306	6640	49.79
Picrorrhiza kurooa	Kour	103	6640	1.55
Lavatera cashmiriana	Reshakhatmi	1034	6640	15.75
Adiantum venusatum	Geo-theer	4276	6640	1.9

Juniperus communia	Vethur	124	6640	1.9
Sassaurea lappa	Kuth	498	6640	7.50
Sedum crassips	Pla-nuner	283	6640	4.26
Asplenuem falcatum	-	312	6640	4.69
Glycyrrheza glabra	Kahzban	447	6640	6.73
Doiscorea deltoidea	Kanes	3411	6640	51.37
Valeriana wallachi	Mushkbala	2103	6640	31.67
Foeniculum vulgare	Junglibadyana	1806	6640	24.40
Colchicum luteum	Suranjan talakh	236	6640	3.55
Innula racemosa	Poshkar	502	6640	7.56

The J & K State Forest Research Institute (SFRI) has conducted a quick survey in Gurez-Tilel valley with altitude ranging from 2300-5209 m for Medicinal Plants distribution. *Artemisia brevifolia* & *Saussurea costus* are reported the most important plants found in abundance.

Steps Taken by Forest Department in Protection of Medicinal Plants: The J & K Forest Department has established nurseries and is further in the process of revival of old Drug Farms in phased manner for production and propagation of germplasm/nursery stock required for planting out in the field to supplement the depleting stocks of naturally growing species in the wild **Table 3**. The main herbal species grown include *Pyrethrum sp. Atropa belladonna, Veleriana wallichi, Artemisia sp. Dioscorea deltoidea, Digitalis sp. Lavendulla sp. etc.* [10, 11, 12]

TABLE 3: LIST OF VARIOUS NURSERIES ESTABLISHED BY J & K FOREST DEPARTMENT

Name of the drug	Location	Established during	Total area (ha)	Effective area (ha)	Plant potential
Dedranbagh	Ganderbal	2004	03	03	2.0
Mujmandoo	Anantnag	1998	30	03	1.32
Pathribal	Co-69/V, kukernag Anantnag	1958	23	10	8.00
Dandipora	Co-5/V, Duksum Anantnag	1958	08	6	3.0
Malhar Nursury	Ganderbal	2006	2.5	2	1.00
Chuntibagh	Co-39/G, Gulmarg	1963	20	9.75	7.00
Dadikote	Co-74/N, Kehmil kupwara	1963	18	12	6.5
Herbal garden	Co-38/ Gulmarg Tangmarg	2003	3	1.25	1.5
Jajjar kotli	Jammu	2000	.5	.25	.80
Harya chak	Kathua	1995	.5	.4	1.00
Manyal / Rajouri	Rajouri	2011	1.0	.75	1.20
Choglamsar	Leh	-	-	-	-

The efforts of the Forest Department has resulted in bringing 1093 ha under the programme in Jammu & Kashmir during 4 years from the period 2009-10 to November 2012 with planting mainly of different herbal species along with other trees and shrubs which suit most to the locality [18, 19].

CONCLUSION: It is now a fact that TK plays an important role in the global economy and is valuable not only to those who depend on it in their daily lives but also to modern industry and agriculture. Rampant bio-piracy deprives the holders of TK of any benefits. Loss of biodiversity and associated TK will not only deprive the world of a unique knowledge-base but also threaten the very survival of local communities. Communities and countries that are rich in bio-diversity and knowledge of traditional medicine may gain if they can share in trade and investment benefits provided their knowledge is used with PIC, and they participate in the design of benefit streams from trade and investment that arise from the global development of the healthcare industry. However, the TK does not lend itself easily to concepts of property in any form of known IPRs. To hail it as a sui generic is inadequate without a system of use rights and obligations that can be created and operated at least at a national level.

Feeling a dire need to protect and supplement the depleted Medicinal Plant resource, efforts have been made by the J & K forest department to take intensive and extensive measures for their conservation and development. For conservation and replenishment of natural stocks, extraction of all MFP (actually termed NTFP) except Gucchies

and Anardana from the forest were banned in the J&K State for 5 years since 2004 vide PCCF Notification no. PCCF/MFP/Extraction/111-14 dated 29.06.2004. The government of J & K has identified the "Cultivation of Medicinal and Aromatic Plants" as a thrust area in its State Forest Policy 2011.

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