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Ethnomedicinal Plant Uses in a Small Tribal Community in a Part of Central Himalaya, India

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INTRODUCTION

India's recognition as one of the four "mega-diversity" countries of the Asia is derived largely from two of its most important bio-diversity "hot-spots": the Himalaya including the north-eastern hills along the northern border, and the Western Ghats in the peninsular India (Ramakrishnan, 2000). Himalaya covers 18% geographical area of the India, which extends over 12 states and broadly categorized in to Northern, North-Eastern and Central Himalaya. Of the total population of the country 6% people are inhabited in this region. Of which 25.08 % are tribal and belongs to many cultural groups viz., Nagas, Kashis, Garos (North-eastern Himalaya) Gaddis (Trans North-western Himalaya) Bhotiyas, Tharus, Rajees, Buxas, Jaunsarees (West Himalaya) which are living in various isolated pockets, in harmony with nature since time immemorial (Nautiyal et al., 2001a) The rich biological diversity of the Himalayan region is managed and utilized by these native communities in a variety of ways. Among the native societies of the Central Himalaya the Raji is one of the under developed and smallest separate tribal society inhabiting forested pockets in Champawat, Pithoragarh and Udham Singh Nagar districts (Samal et al., 2000). They have their own distinct traditions, culture and religious beliefs. This community entirely depends on surrounding forests for their daily requirements, and their traditional agriculture and animal husbandry (which they have brought under practice during recent past) is closely linked with forest ecosystems as elsewhere in the Central Himalaya (Semwal and Maikhuri, 1996; Nautiyal et al., 2001a; Palni et al.,1998; Samal et al., 2000).

The Raji tribal community collect a large variety of wild resources which make significant contribution to their food security and health care system similar to other traditional societies elsewhere in India (Maikhuri and Ramakrishnan, 1992; Rao and Saxena, 1996; Purohit, 1997), and in south east Asia (Sibert and Belsky, 1985; Anderson, 1986; Begossi, 1996). The health care system of 80% population of the developing world is still dependent on their surrounding vegetation/ forests and pastures. They rely on medicinal plants because of their effectiveness, lack of modern healthcare alternatives and cul-tural preferences (Caniago and Siebert, 1998). Therefore, the ethnobiological knowledge of people and listing of plants of particular region are important tools that may help in understanding human-environment interactions. In India there exists over one million community based tradi-tional workers and about 600,000 licensed medical practitioners of traditional systems like Ayurveda, Siddha and Unani. They diagnose and cure different diseases through their own traditional knowledge (Hafeel and Shankar, 1999). Mostly wild plant produces are used by traditional healers as traditional medicine, while some species are also cultivated by them.

In the Central Himalayan region documentation of ethnobotanical knowledge was done by various workers (Paliwal and Baduni, 1988; Semwal and Gaur, 1981; Negi, 1986; 1988; Maikhuri et al., 2000; Nautiyal et al., 2001a) to understand the use of plant species for different purposes. Though some of them have been reported about the medicinal plants uses in health care system among the tribal communities living in similar geographical region (Maikhuri et al., 2000; Nautiyal et al., 2001a) however, small community residing in same area having own traditional knowledge is not documented yet by workers properly. Therefore, the present study is an attempt to document (i) ethnobotanical importance and indigenous knowledge related to plants used by Raji community inhabiting in different pockets/ villages; (ii) dependency of Raji community on herbal and allopathic treatment.

STUDY AREA AND CLIMATE

There are nine villages of Raji tribal community in two districts of Uttaranchal (Champawat and Pithoragarh) spreads over 200 km^2 lying

between 700 and 1700m asl of rugged and mountainous land. The climatic year consists of three seasons summer (April-June), rainy (June – September) and winter (October-February). Average rainfall is 87.6 cms. Of which about 48% occurs in a short period of two months (July – August) featuring a strong mansoonic influence. Monthly maximum and minimum temperature ranges between 32^0C and 15^0C and 15^0C and 0.2^0C, respectively.

BRIEF HISTORY OF RAJI'S AND THEIR MODE OF LIFE AND SOCIO-ECONOMIC BACKGROUND

The total number of households of this specific tribal community was recorded 130 in Champawat and Pithoragarh districts with a total population of 528 (Table 1). The average family size is 4.0 and literacy rate is 32%. The Rajis are basically hunter-gathers were having nomadic mode of life during recent past. At that time they were used caves for their shelter or additionally construct temporary huts in isolated places. However, now-a-days they have established their villages in on the hilly rocks. Exclusively in all the villages, the houses are constructed out of smoothened stones, timbers, while the roof is made up of smooth and plane slates. Each household has a kitchen garden for vegetables and fruits cultivation. The wildly collected and cultivated produces generally used for subsistence livelihood and while the surplus is sold to the market.

According to Atkinson (1884), the Rajis may be associated with the "Rajyakiratas of the sacred Hindi scripture "Kiratarjuniya". Sherring (1906), describes them as wild men (Ban-manus) clad in meagerly lion-cloth and claiming "royal origin". Traill (1928) has recorded that Rajis represent themselves as being the descendants of one of the aboriginal princes of Kumaon, who fled to the jungle (forest), with his family, to escape the destruction threatened by a usurper.

Atkinson offers the explanation, that there were two Rajput brothers. The elder one was a hunter and lived in jungle (forest) and the younger one was having cultivated land and had a fixed abode. The elder would have provided necessary wild food to younger for his subsistence. But in the passes of time, the younger brother became Raja and he secluded elder brother to forests. The descendents of the elder brother are now called Raji (royal of forests).

Raji people are locally introduced by the name 'Van-Raut' (king of forests). The Rajis collect variety of wild plants for their subsistence along with hunting and fishing as it is their part of activity for the same. Besides, the manufacturing wooden vessels/ household utensils which they used to barter for cloth, food commodities particularly wheat and rice with the neighboring villages of the region.

Hunting and Gathering

Hunting and gathering contributes an important proportion of the total diet of the Rajis. They collect wild vegetables, fruits, roots and tubers. During 2-3 decades ago they used to kill wild animals, as at that time these were main constituents of their food. Because of the rapid decline in forest cover, the availability of wild animals as food has much reduced over the past. Wildboar, deer, birds (more specifically the pheasants), were constitutes the important game animals of Rajis. Hunting was exclusively a male activity while both male and female share gathering. Generally they used to do this activity during lean period, when scarcity of traditional food items are common. Now they switched towards fishing because of scarcity of wild animals on one side and implementation of conservation policies on the other.

However with the introduction of the recent forest laws, prohibiting use of forest products, the Rajis have been forced to change their mode of life-style. The Rajis have been denotified as scheduled tribe. Govt. of India as well as the state government of Uttar Pradesh has introduced several welfare schemes for their rehabilitation. The Rajis have been allotted land for agriculture, in addition, the government has also constructed permanent houses for their residence under the various schemes such as Jawahar rojgar yojna, Indira awas yojna etc.

The constitution provides for several safeguards for the protection of tribal people in order to promote their economic status and eliminating social disabilities they have been subjected to. Apart from this, there are several education schemes towards betterment of the tribal societies. Towards this end there are schools, institutes,

organizations, that seek to protect them from exploitation by private traders, offering them remunerative prices for their minor forest produce and surplus agricultural products.

The Government of India has introduced many schemes to root out poverty and unemployment in these areas. With the enactment of constitution, the Panchayats have been lately playing a crucial role in promoting economic development and ensuring social justice in tribal areas. However, the bare and unfortunate fact is that even now only three individuals out of the total population are employed- (having government jobs) in Raji tribal community.

METHODOLOGY

A reconnaissaisance survey was carried out in all 9 villages inhabited by Raji tribal community during October 1999 to October 2000 (Table 1). Information on human and animal population, litrecy, landholding, cropping pattern, crop rotation and other socio-economic conditions was collected from elder person of each family of all the villages during household based survey. After completion of primary survey, two basic approaches were used to study the ethnobotanical knowledge in the region. The first one, the interview involved asking questions about use of plants for different purposes (i.e., medicine, food, fuel, fodder etc.). When recording the names of plants forest visit was made with the informant for identification of the specific plants. The second approach, the 'inventory' involved collection of plant specimens and then interviewing the informants for names and uses. These approaches were repeated with the knowledgeable people, elders, traditional healers of nine villages. The general information related to plant part used, purpose and quantity of collection have been provided by elder and knowledgeable men and women. It has further cross-checked during the field visit.

RESULTS

The Raji people generally used 50 plant species for medicinal purposes. Their mode of uses and used for, described in table 2. The species which are mentioned in this table is generally known to all the knowledgeable persons of all villages of this tribal community. However, mode of uses is restricted to the traditional healers only. Of the total 50 species 3 are common which preferred by all the traditional healers of Raji tribe to curing the different ailments. A detailed household survey was conducted, involving all 130 households of the nine villages of Raji people. The head of each household was interviewed to understand their dependency on herbal and allopathic treatment. Most of the respondents (60-65%) were found dependent on herbal treatment (Fig. 1). And for 11 major ailments assessed in detail for the present study (Fig. 2) the fever, spasm, delivery, jaundice, head ache, toothache and skin diseases are mostly cured by herbal treatment while applying traditional medicine prescribed by traditional healers. Generally people preferred allopathic treatment to cure only some particular diseases like fracture, tuberculosis etc. The survey showed that in all the villages the majority of the people

Table 1: Population distribution of Rajis in Kumaon region

District	*Block*	*Village*	*Number of families*	*Population*		*Total*
				Female	*Male*	
Pithoragarh	Dharchula	Kimkhola	28	54	70	124
		Ganagaon	15	23	25	48
		Chiphaltara	9	13	11	24
		Total	52	90	106	196
	Didihat	Kuta-chaurani	16	34	38	72
		Madanpuri	7	13	15	28
		Kateula	5	7	10	17
		Total	28	54	63	117
	Kanalichhina	Jamtari	20	42	43	85
		Aultari	12	21	25	46
		Total	32	63	68	113
Champawat	Champawat	Khirdwari	18	38	46	84
Total			130	245	283	528

Table 2: Detail description of the plants, collected from wild used for medicinal purposes by the Raji tribal community of Central Himalaya

Botanical Name	*Local name*	*Family*	*Part used*	*Mode of use and used for*	*Number of villages using species*	*% of the people preference*
Ageratum conzoides	Ganya, Shaukia ghas	Asteraceae	Stem, Leaves	The powder of plants is applied on wounds of cattle infected with maggots and paste of leaves applied on cuts.	6	75
Aconitum baulfouri	Bis	Ranunculaceae	Tuber	The paste of tuber is used to cure snakebite.	3	80
Achyranthus aspera	Ulta-kana	Amaranthaceae	Stem, Leaves	The paste of stem and leaves used as ointment to cure headache.	4	85
Ajuga parviflora	Ratpatti	Lamiaceae	Leaves, roots	Paste of the leaves used to cure headache, root extract used to cure Typhoid fever.	3	80
Acorus calamus	Baj	Araceae	Root	Used for cough and abdominal diseases.	4	75
Angelica glauca	Chhipi	Apiaceae	Roots	Fresh dry roots chewed during stomachache and gout.	3	100
Arnebia benthamii	Lal-jari	Boragihnaceae	Roots	The dry roots are first dipped in mustered oil, and then applied on hair to prevent them from falling.	3	90
Bauhinia variegata	Kweral	Caesalpiniaceae	Leaf, Flower	Young leaves and flower buds are eaten raw, it is useful in blood purification and Dysentery.	6	60
Berberis aristata	Kirmur	Berbiridaceae	Roots	The semisolid of bark of roots used as anti-fever and diarrhea ,same as jaundice. The spikes of plant are useful in skin diseases.	5	100
Bergenia ligulata	Shilphora	Saxifragaceae	Rhizome Leaves	Dried leaves grained into powder and boiled with water used to cure cold and cough.	2	100
Betula utilis	Bhojpatra	Betulaceae	Resin	Admixture of the resin of B.utilis, seed kernels of P. persica ground in to paste and then mixed with honey this is eaten by women during pregnancy to provide internal strength and also to control miscarriage.	2	100
Boerheavia diffusa	Punarnav, Ula	Nyctaginaceae	Flower	The Rajis rely that the sucking of flower and inflorescence reduce their fat.	4	20
Callicarpa arborea	Bhatmyoli	Verbinaceae	Leaves, Stem	Juice of plant applied to curing mouth-sores of children.	3	100
Calatropis gigantea	Amaka	Asclepiadaceae	Latex	Latex is massaged on the rheumatic part of the body. It is also applied on toothache.	3	92
Calotropis procera	Amaka	Asclepiadaceae	Latex	Latex is applied in tooth-ache	4	89
Cedrus deodara	Dyar	Pinaceae	Wood	Oil extracted from the wood used to cure the skin diseases of sheep and goats, known as Makku disease.	3	100
Cinnamomum tamala	Tej-pat	Lauraceae	Bark	The internal dry bark of stem called ‘darchini’ used to cure diarrhea.	4	73
Clematis grata	Bela	Ranunculaceae	Leaves	Leaf paste is applied on cuts.	3	61
Costus speciosus	Nirvishi	Zingiberaceae	Rhizome	Paste of rhizome is applied on boils (A hard tumor on body.)	3	93
Cynodon dactylon	Doob	Poaceae	Roots, Shoots	Used to offer water to gods used in religious folk method of curing jaundice	9	100
Dactylorhiza hatagirea	Hathjari	Orchidaceae	Tuber	The decoction of tuber mixed with milk, sugar and spice is given to the patient for quick recovery from fever.	3	63
Dalbergia sissoo	Shisham	Papilionaceae	Bark	Paste of bark is applied on a particular kind of body-ache called ‘Jakdan’	5	40
Debregeasia velutina	Tushyar	Urticaceae	Bark	Paste of bark applied externally on forehead to relieve from headache.	4	32

Table 2: Contd...

Botanical Name	*Local name*	*Family*	*Part used*	*Mode of use and used for*	*Number of villages using species*	*% of the people preference*	
Dioscorea belophylla		Vantaud	Dioscoreaceae	BulbThe Rajis believe that the roots and bulbils first roasted in burning ash, then eaten is beneficial in blood purification.		4	32
Eulophia dabia	Salum misri	Orchidaceae	Rhizome	Rajis chew its rhizome during cough and cold.	4	41	
Euphorbia royleana	Syuna	Euphorbiaceae	Latex	Boiled cacti (syuna) are applied on internal wounds and strain. Latex applied on the horn injury of cattle.	4	39	
Eurya acuminata	Chakdwari	Theaceae	Bark	The bark of plant is ground in to a paste and taken as a remedy for Scurvy and various skin diseases	5	42	
Ficus cunia	Khinwa	Moraceae	Leaves, Seeds	Seeds of this plant are given to cattle to remove any obstruction in their throats (Bhekuna) caused by grass or fodder.	6	39	
Ficus racemosa	Belia belta	Moraceae	Latex	Latex is applied externally on wounds.	6	41	
Ficus religiosa	Peepal	Moraceae	Latex	Admixture of latex of F. religiosa and F. palmata is used as rustic medicine (believed to be anti-spasmodic).	5	100	
Ficus roxburghii	Timul	Moraceae	Fruit	Fruit are administered to children in hyperacidity.	9	49	
Melotheria heterophylla	Gwal-kakri	Cucurbitaceae	Ripe fruit, leaves.	Fruits are edible and the paste of leaves used as an ointment to cure headache and in skin diseases.		5	62
Myrsine semiserrata	Gontha, Imila-kanchi	Myrsinaceae	Fruit	Maximum the number of Raji women, take its fruit in menstrual disorder.		5	50
Ocimum sanctum	Tulsi	Lamiaceae	Leaves	Leaves taken during cough and cold, are also used as the substitute of tea. Its plant is worshiped.	4	100	
Pinus roxburghii	Salla	Pinaceae	Resin	Resin of plant applied to sprains and septic wounds. Also this is mixed with ash of bark of *B. utilis* and plastered on fractured bone for quick recovery.	9	91	
Podophyllum hexandrum	Van-kakri	Podophyllaceae	Roots	Paste of roots applied on chronic wounds 'Nasoor'. Fruits also used as vegetable.	5	39	
Potentilla fulgens	Bajradanti	Rosaceae	Root	Paste of root applied around the infected teeth, to relieve from toothache.		3	93
Pueraria tuberosa	Birali-bela	Papilionaceae	Roots	Roots are administered orally to female mammals for sexual excitement.		8	62
Pyracantha crenulata	Ghingharu	Rosaceae	Roots, fruits	Root extract boiled with water and bathed to cure body pain.	5	49	
Reinwardtia indica	Pyomli	Linaceae	Shoot	Crushed shoots are applied to maggot infected wounds and in various skin diseases.	5	91	
Rheum emodi	Dolu	Polygonaceae	Rhizome	The admixture of paste of rhizome and turmeric powder applied externally on internal injuries.	4	89	
Rhododendron arboreum	Buransh	Ericaceae	Leaves, flowers	Paste of leaves is useful in wounds and cuts, also used for cold and cough.		3	62
Ricinus communis	Dalda	Euphorbiaceae	Seeds	Oil extracted from seeds is used on rheumatic pain or any type of joint pain.	5	59	

Table 2: Contd..

Botanical Name	*Local name*	*Family*	*Part used*	*Mode of use and used for*	*Number of villages using species*	*% of the people preference*
Rumex hastatus	Chalmore	Chenopodiaceae	leaves	Aerial parts,The Rajis rely that, the Juice of leaves makes strong to internal heart.	4	91
Saussurea costus	Kut	Asteraceae	Tuber	Decoction of the tuber is used to cure stomachache and typhoid fever.	5	63
Solanum xanthocarpum	Jhauria baigan	Solanaceae	Seeds	Seeds are used in tooth -ache.	4	49
Solanum indium	Kanthkari	Solanaceae	Roots	Decoction of roots used to cure jaundice.	5	33
Syzygium cumini	Jamun	Myrtaceae	Bark and seeds	Sap of the bark is useful for diarrhea and seeds used as anti-diabetic.	3	69
Tinospora cordifolia	Gurj	Manisoermaceae	Stem	The semi solid of stem extract and water kept in a pot for one night, than the white ppt. sediment 'Sat' applied externally on head to cure headache and fever.	6	81
Zanthoxylum alatum	Timur	Rutaceae	Seeds	Seeds are used to quick recovery from toothache, soft twigs of plant are used as toothbrush.	3	89

Fig. 1. Dependency on herbal and allopathic medicine

Fig. 2. Dependency on herbal and allopathic treatment to cure eleven ailments

are preferred herbal treatment in comparison to allopathic treatment. And the villagers of Kuta-chaurani, Ganagoan, Chiphaltara and Aultari are found more dependent on traditional medicine in comparison to Khirdwari, Madanpuri and by Katyola villages (Fig. 3).

For a variety of medicinal uses Raji tribe is found dependent maximum on herbaceous vegetation followed by tree and shrubspecies and least on climbers (Fig. 4). For the preparation of traditional medicine, this tribal community used different parts of the plant species. Maximum they used roots (29%) followed by leaf (19%) and latex

Fig. 3. Peoples' preference for herbal and allopathic: treatment in nine villages of Raji tribal community.

& resin (12%), bark/stem (10%) and least flowers of the plants (Fig. 5). Based on this survey it is noted that female are more informative than the male and they have indepth knowledge about the

plant species in used traditional health care system.

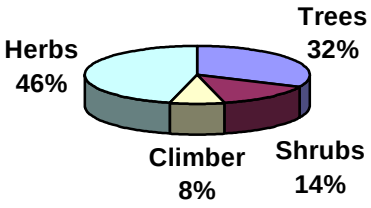

Fig. 4. Medicine procured by Rajis from the different categories of plant species

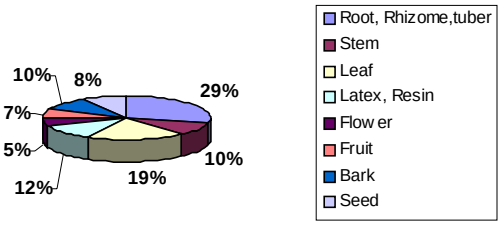

Fig. 5. Preferential plant parts being used by Rajis, for the documented 50 species

DISCUSSION

Based on the present study it has been found that the Raji tribal community of Kumaon Himalaya is rich in ethnobiological knowledge and this knowledge is being transmitted from one generation to another. Similar information related to human plant interactions of many tribal communities from different parts of the world have been reported by various workers from time to time (Fanshawe, 1948 a,b; Danks, 1945; Farnsworth et al., 1988; Johnston and Colquhoun, 1996; Hafeel and Shankar, 1999; Nautiyal et al., 2001b). But in the present study the people of a tribal community inhabiting in different villages is having their own traditional ethnobotanical knowledge. This is because of distance of the settlements from the urban or nearest market centres. Though they shares indigenous knowledge among their villages. The socio-economic structure in tribal communities is markedly different from that of non – tribal or advanced group of people (Mohanty, 1999). Their livelihood totally dependent on their ecological surroundings and they use very simple technology to sustain their life which seems totally conservative. About 50 plant species are reported from wild which are used by Raji's of Kumaon Himalaya only for medicinal purposes. Other studies from the Himalayan region (Maikhuri and Ramakrishnan, 1992; Farooquee and Saxena, 1996; Sajeev and Sashidharan, 1996; Rao, 1995; Farooquee and Rao, 1998; Caniago and Siebert, 1998; Olsen, 1998; Samal et al., 2000) also indicated that dependency of tradi-tional societies on the wild collections for subsis-tence needs.

The sustainable extraction of wild plant species particularly for medicinal purposes by this tribal community from the forested areas indicated that almost all families are dependent on wild plant produce for medicinal purposes to a large extent. Based on the survey which was conducted on peoples' preferences on traditional health care system vis-a-vis allopathic treatment reveal that most of the people ranging form 60-65% of total population of Raji are still dependent on herbal treatment and also preferred it, and only 35-40% people were preferring allopathic treat-ment, that too, for some particular disease(s) like tuberculosis, rheumatism, asthma, bone fracture, etc. Same views were expressed by Maikhuri et al. (1998), Nautiyal et al. (2001a) while studied the traditional knowledge related to medicinal and aromatic plant species in Bhotiya tribal com-munities of Garhwal Himalaya. The reasons for their dependency on the herbal treatment is due to their faith and conviction about the treatment process and unavailability of health service in the village or near by areas (Nautiyal et al., 2001a). In the present study among the knowledgeable persons having knowledge related to traditional, health care system the women are found more aware about the same in comparison to men. However, Leach (1994) and Rocheleau (1995) reported that women tend to be more responsible for family and especially child health care and therefore have greater familiarity with medicinal plants and this makes them rich in ethnobotanical knowledge.

Various conservation policies have been implemented by the Government in the region for the conservation of biological resources since last two to three decades. But the traditional knowle-dge is eroding very fast (Maikhuri et al., 1998, 2000; Nautiyal et al., 2001a, b).

The erosion of traditional knowledge is due to lack of sustainable development policy towards promoting traditional knowledge based progra-

mmes. There is a rapidly growing resurgence throughout the world of interest in natural medicine. Pharmaceutical researchers acknowledge that screening plants on the basis of information derived from traditional knowledge saves billion dollars in time and resources (Hafeel and Shankar, 1999). However, why the traditional knowledge is eroding in the societies is unexplained. The reasons for such erosion are perhaps rapid socio-economic and cultural changes, lack of incentives for economic upliftment of local people according to their ecological surroundings and political will. Another crucial factor responsible for such changes are the pressure of modernization, cultural homoni-zation and migration of youth from tribal area to semi urban or urban areas to take up job and employment. Due to policy failure and lack of incentives through which these people may be encouraged, the traditional rules and regulations of old tribal people are now being questioned by the young generation. Consequently, the younger generation of these communities not willing to apprentice to learn the knowledge with the elderly people. If, changes which are taking place in these communities at this alarming rate remain to continue then knowledge related to ethnobotany will vanish from the region. Similar factors were believed to be the reason for the loss of traditional ethnobotanical knowledge in Iban community in Sarawak, Malaysia (Jarvie and Perumal, 1994). Changing values, land and resource conflicts, and the absence of apprentices threaten persistence of traditional medicinal plant use in many traditional societies (Comerford, 1996; Voeks, 1996; Caniago and Siebert, 1998). Several workers (Maikhuri et al., 1998; Semwal and Maikhuri, 1996; Rao and Saxena, 1996) rightly mentioned that the crop and medicinal plant genetic resources can not be conserved and protected without conserving/ managing of the agro-ecosystem or natural habitat of medicinal plants and the socio-cultural organization of the local people. The same may be applied to the protection of indigenous knowledge related to use of medicinal and other wild plants. Introduction of medicinal species in degraded government and common lands could be another option for promoting the rural economy together with environmental conservation, but has not received attention in the land rehabilitation programs in the Himalaya area (Nautiyal et al. 2001b).

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KEY WORDS Tribal Community. Traditional Knowledge. Medicinal Plants. Traditional Health Care System. Conservation, Socio-economic Development.

ABSTRACT The Raji tribe a smallest group among the native societies of Central Himalaya, inhabiting in Kumaon region bordering to Nepal, has strong faith and belief in traditional health care system, *viz*. herbal treatment. The living condition of Rajis is extremely poor and neither they have better access to modern health care and nor they have information pertaining to the same. The 50 plant species are documented here pertaining to the uses in traditional health care system of this under developed tribal community. The importance of documenting indigenous knowledge base related to ethnobotany, as described here becomes important in view of rapid socio-economic and cultural changes.

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