



Documentation of traditional knowledge related to medicinal plants used against skin disorders from Bandipora district, northern part of Jammu & Kashmir, India

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Abstract

Health is the basic prerequisite for happiness. Any health issue deprives one of happiness even after having all means of enjoyment. Like many other health issues, skin disorders are also becoming more common these days because of various reasons especially unhygienic living conditions, environmental pollution and climate change. In the present study, an attempt has been made to explore the availability of medicinal plants used indigenously for the treatment of various skin disorders in the Kashmir himalayan region of the remote Bandipora district located in the northern part of Jammu and Kashmir. The region is bestowed with medicinal plant resources due to its unique topography and varied habitat conditions. During the study, information about medicinal plants used against various skin diseases were gathered by consulting traditional knowledge holders and local healers having knowledge of the herbs used in the treatment of various human ailments through extensive field surveys. A total of 36 species of medicinal plants belonging to the equal number of genera and 29 different families were collected. Based on the Relative Frequency of Citation (RFC) value, *Rheum emodi* Wall., *Aesculus indica* (Wall. ex Cambess.) Hook., *Cotula anthemoides* L., *Juglans regia* L. and *Calendula officinalis* L. were the most frequently used medicinal plant species in the area. Plants documented in the study can be scientifically validated through phytochemical and pharmacological studies. Besides, this study will also be helpful in the conservation of indigenous medicinal plant wealth and the traditional knowledge for future generations, as the documented plants, once validated scientifically, may result in blanket ban on their indiscriminate exploitation and prevent their population from decreasing below critical levels.

Keywords: Ethnomedicinal knowledge, Kashmir himalayan region, Skin ailments

1. Introduction

Plants fulfill our basic needs like food, fuel, fodder, timber, fruit and medicine (Hameed *et al.*, 2011; Alam *et al.*, 2011; Ahmad *et al.*, 2012). As compared to animals, plants are more important for us due to their diverse collection of biochemicals with a variety of potent biological activities (Cotton, 1996; Buckingham, 1999; Ajaib *et al.*, 2010; Hameed *et al.*, 2011; Alam *et al.*, 2011; Arshad *et al.*, 2014). In traditional healing systems, wild medicinal plants have been used for centuries (Ahmad *et al.*, 2014). Rural people having century's old traditional knowledge mostly rely on plant resources for

multiple purposes. Due to lack of modern medical facilities, they depend mostly on natural resources for disease treatments (Sandhya *et al.*, 2006).

The continuous use of allopathic medicines for the treatment of various diseases is posing a major problem of drug resistance (Iqbal *et al.*, 2017, 2019). Therefore, there is an urgent need for newer and inexpensive drugs that are able to act for longer periods before resistance sets in. In this context, traditional medicines, based largely on medicinal plants, offer a major and accessible source of health care to people living

in developing countries like India where a major proportion of population lives below poverty line and cannot afford modern expensive mode of treatment. Owing to its diverse geographical and habitat conditions, Kashmir Himalaya is known for vast resources of medicinal plants. The ethnic use of these plants as medicine has been probably the only means of curing human population from various diseases (Lone *et al.*, 2014).

Skin protects the body from unfavourable environmental conditions as it forms a barrier between the body and the external environment. Infections due to skin disorders, besides other health issues are becoming more common these days. Environmental pollution not only negatively influences the plant growth by triggering a series of morphological, physiological, biochemical and molecular changes in plants (Mahfoozi *et al.*, 2006) but also has adverse effects on human health (Azzazy, 2020). Although skin disorders are effectively cured by allopathic medicines, but owing to their side effects (Nimesh and Ashwlayn, 2018), unaffordable cost and lack of health care facilities in the remote tough terrains of Kashmir himalayan regions *viz.* Bandipora district, the people mostly prefer traditional mode of treatment as they have strong faith in herbal medicine to which they always have easy access. The aim of the present study was to explore and identify the medicinal plants used traditionally by the local healers for the treatment of various skin diseases in the remote district of Bandipora, Jammu & Kashmir.

2. Materials and methods

Bandipora is a remote northern district of Jammu & Kashmir spread over an area of 398 sq. kms within geographical coordinates of 34° 64' N latitude and 74° 96' E longitude, and at an average altitude of 1701 meters (AMSL). The district is naturally gifted with scenic beauty in the form of snow-capped mountains, lush green forests and meadows, sparkling streams and rivers, and picturesque Wular lake the largest fresh water lake of Asia. This floristically rich area has sizable population of tribal communities and forest dwellers (Fig. 1).

Field surveys were undertaken to visit as many remote rural areas as possible. During surveys, a total of 54 traditional knowledge holders and local healers were interviewed. The information collected from them regarding herbs used for the treatment of various skin diseases were recorded

and samples collected for herbarium purpose. A standard herbarium procedure (Miller and Nyberg, 1995) was followed to prepare herbarium specimens of the collected medicinal plants and then identified with the help of available floristic literature (Kirtikar and Basu, 1933-35; Wali and Tikku, 1964; Javeid, 1968; Nasir and Ali, 1970-1987; Nawchoo and Kachroo, 1995). The International Plant Names Index (<http://www.ipni.org>) was strictly followed for the botanical nomenclature of each plant species.

Apart from this, a statistical tool - Relative Frequency of Citation (RFC) (Tardio and Pardo-Santayana, 2008) was used to quantitatively analyze the ethnomedicinal information obtained from surveys. This helped to check out the local importance of each plant species. RFC is given by the frequency of citation (FC, the number of informants mentioning the use of the species) divided by the total number of informants participating in the survey (N), without considering the use-categories.

$$RFC = FC/N$$

Where (0<RFC<1)

RCF values will be high (near 1) if there are many use reports for a plant, implying that the plant is ethnomedicinally important and near 0 if there are few reports related to its use.

3. Results and discussion

During surveys, a total 36 species of medicinal plants belonging to equal number of genera and 29 different families were reported to be used indigenously by local populace for curing about 20 different types of skin ailments. All the collected and identified species are enumerated alphabetically with their botanical name, vernacular name, common name, family, method of preparation, mode of administration and RFC values (Table 1).

Man has been dependent on plants for his basic needs *viz.*, food, shelter, clothing, fuel, medicine, paper, etc. since time immemorial. There are thousands of plants used in traditional medicine by different cultural groups throughout the world (Subramoniam, 2014). Plants contain high amounts of antioxidants and biologically active compounds and thus act as targets for the discovery of new drugs (Gautam *et al.*, 2012; Thakur and Azm, 2013). During present study, an attempt was made to explore and identify the medicinal plants used traditionally by the

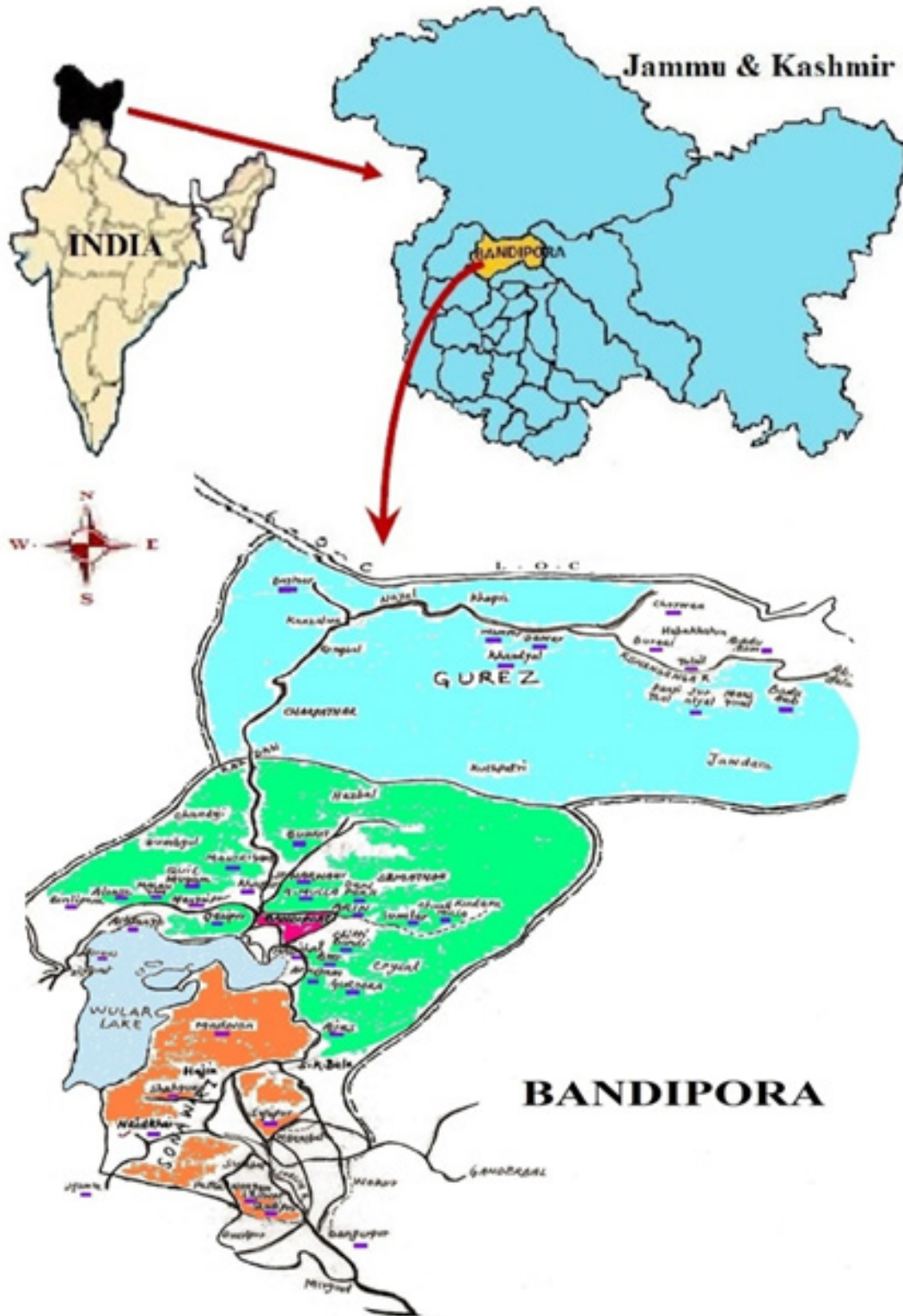


Fig. 1. Location of study area

Table 1. List of indigenously used medicinal plants documented in the study with their RFC values

Botanical name	Vernacular name	Common name	Family	Mode of administration	No. of use reports	% of all use reports	RFC value
<i>Aconitum violaceum</i> Jacquem. ex Stapf	<i>Mohand</i>	Monkshood	Ranunculaceae	Dried roots after crushing are mixed with mustard oil to make paste which is applied on painful boils to cure them.	3	0.97	0.05
<i>Adiantum capillus-veneris</i> Linn.	<i>Gevtheer</i>	Maidenhair fern	Pteridaceae	Decoction is used to wash scalp to prevent hair loss and cure dandruff.	6	1.95	0.11
<i>Aesculus indica</i> (Wall.ex Cambess.) Hook	<i>Haandoon</i>	Indian horse chestnut	Hippocastanaceae	Fruits after crushing are boiled in water to prepare a form of medicated decoction which is used to wash feet to cure chilblains.	21	6.84	0.38
<i>Allium cepa</i> L. var. <i>aggregatum</i> G. Don	<i>Praan</i>	Potato onion	Liliaceae	Roasted bulb is tied tightly with a muslin cloth on boils to help them to ripe, burst and to evacuate the pus.	4	1.30	0.07
<i>Amaranthus retroflexus</i> Linn.	<i>Ganhaar</i>	Pigweed	Amaranthaceae	Plant is burnt to obtain ash which is gently applied on scalp and then washed with water to cure dandruff.	4	1.30	0.07
<i>Anagallis arvensis</i> Linn.	<i>Charisaban</i>	Scarlet pimpernel	Primulaceae	Herb is crushed to obtain juice which is applied externally to cure eczema.	11	3.58	0.20
<i>Berberis lycium</i> Royle.	<i>Kaodauch</i>	Indian lycium	Berberidaceae	Dried root is rubbed on slate to which few water drops are added to form paste which is used as an antiseptic on wounds. Root cuttings are burnt on one end to emanate oil on opposite end. This oil is used in the treatment of eczema.	16	5.21	0.29
<i>Bergenia ciliata</i> (Haw.) Stemb.	<i>Zakhmihyat</i>	Hairy bergenia	Saxifragaceae	Root powder is applied on non-healing wounds to prevent infection and stimulate healing process.	4	1.30	0.07
<i>Brassica oleracea</i> L. var. <i>caulorapa</i> DC.	<i>Haakh</i>	Collard greens	Brassicaceae	Fresh leaf is gently placed in a warm mixture of mustard oil, turmeric and salt till it becomes soft. It is then tightly tied with muslin cloth on painful corns to help them to ripe and burst.	7	2.28	0.12

Botanical name	Vernacular name	Common name	Family	Mode of administration	No. of use reports	% of all use reports	RFC value
<i>Calendula officinalis</i> Linn.	<i>Hameshbahar</i>	Marigold	Asteraceae	Paste obtained after mixing cow butter with crushed leaves and flowers is applied on boils, burns and abscesses to get relief from pain and prevent pus formation.	17	5.53	0.31
<i>Cedrus deodara</i> (Roxb. ex D. Don) G. Don	<i>Devdoor</i>	Deodar	Pinaceae	Oil obtained after heating wood pieces is used against skin rashes, eruptions and itching. It is also used to cure alopecia in goats.	5	1.62	0.09
<i>Cotula anthemoides</i> Linn.	<i>Thulibabuel</i>	Babuna	Asteraceae	During winter hot water extract of the herb is used to wash feet to get relief from chilblain.	21	6.84	0.38
<i>Cuscuta reflexa</i> Roxb.	<i>Kuklipoth</i>	Dodder	Cuscutaceae	Paste obtained after mixing of powder of dried herb with mustard oil is used to cure skin diseases. It is also massaged gently on scalp to prevent hair loss and to cure dandruff.	9	2.93	0.16
<i>Datura stramonium</i> Linn.	<i>Datur</i>	Thorn apple	Solanaceae	During winter hot water extract of seeds is used to wash feet to cure chilblains. Fresh leaves are rubbed on body parts stung by insects to relieve pain and itching.	14	4.56	0.25
<i>Euphorbia wallichii</i> Hook.f.	<i>Gur-dood</i>	Wallich spurge	Euphorbiaceae	Latex applied externally to cure warts.	4	1.30	0.07
<i>Ficus carica</i> Linn.	<i>Anjeer</i>	Fig	Moraceae	Milky latex applied topically to cure eczema.	9	2.93	0.16
<i>Inula racemosa</i> Hook.f.	<i>Poshkar</i>	Indian elecampane	Asteraceae	Paste made by mixing root powder with ghee is applied on wounds to prevent infection and stimulate healing process.	3	0.97	0.05
<i>Juglans regia</i> Linn.	<i>Doem</i>	Walnut	Juglandaceae	Root bark is used as an antiseptic tooth brush to clean teeth and tongue and to heal mouth ulcers.	21	6.84	0.38

Botanical name	Vernacular name	Common name	Family	Mode of administration	No. of use reports	% of all use reports	RFC value
<i>Jurinea dolomiaea</i> Boiss.	<i>Guggal dooph</i>	Himalayan dolomiaea	Asteraceae	Paste obtained after mixing root powder with mustard oil and common salt is applied on wounds to help them to heal and on boils to help them to ripe and burst.	5	1.62	0.09
<i>Linum usitatissimum</i> Linn.	<i>Alish</i>	Flax/ linseed	Linaceae	Chewed seeds are spitted on painful and pus filled boils.	3	0.97	0.05
<i>Morus nigra</i> Linn.	<i>Tul kul</i>	Black mulberry	Moraceae	Chewed fresh leaves are applied on boils as paste to help in their ripening, bursting and evacuating the pus. Paste is also applied on burns and wounds to stimulate their healing process.	4	1.30	0.07
<i>Oryza sativa</i> Linn.	<i>Daani</i>	Rice	Poaceae	Rice flour after mixing with water is applied externally on jaws below ears to cure mumps in children. Froth formed after boiling rice is collected by ladies and applied as antiseptic on freshly pin holed ears.	12	3.90	0.22
<i>Phytolacca acinosa</i> Roxb.	<i>Brand hakh</i>	Indian poke	Phytolaccaceae	Oil obtained from dried root cuttings is used by ladies for curing nipple swelling.	3	0.97	0.05
<i>Podophyllum hexandrum</i> Royle	<i>Wunwangun</i>	Himalayan may apple	Podophyllaceae	Root powder is mixed with mustard oil to make paste which is used as a remedy to skin rashes and eczema.	2	0.65	0.03
<i>Prunus persica</i> (Linn.) Batsch	<i>Chenun</i>	Peach	Rosaceae	Paste, made by mixing ash of the burnt fruits with mustard oil is applied on fresh burns to prevent blister formation and stimulate quick healing.	10	3.25	0.18
<i>Rheum emodi</i> Wall.	<i>Pumbchalan</i>	Himalayan rhubarb	Polygonaceae	Rhizome powder is sprinkled on ulcers, burns and non-healing wounds for quick healing.	31	10.09	0.57
<i>Rubia cordifolia</i> Linn.	<i>Majaith</i>	Common madder	Rubiaceae	Hot water extract of shoot is used to wash feet to cure diabetic ulcers.	3	0.97	0.05

Botanical name	Vernacular name	Common name	Family	Mode of administration	No. of use reports	% of all use reports	RFC value
<i>Salix acmophylla</i> Boiss.	<i>Kril veer</i>	Brook willow	Salicaceae	Leaves are chewed to make paste which is spitted on boils to help them to ripe, burst and to release the pus.	7	2.28	0.12
<i>Saussurea costus</i> (Falc.) Lipsch.	<i>Kouth</i>	Costus/ kuth	Asteraceae	Paste of root powder and mustard oil is used to cure various skin diseases, by its external massages in exposed sun light.	3	0.97	0.05
<i>Senecio chrysanthemoides</i> DC.	<i>Bagghu</i>	Groudsel	Asteraceae	Juice obtained after crushing leaves and flowers is applied on skin rashes, eruptions, eczema and minor cuts.	4	1.30	0.07
<i>Solanum tuberosum</i> Linn.	<i>Alua</i>	Potato	Solanaceae	Fresh tubers are crushed to prepare lotion which is applied on burns for quick relief from pain and blister formation.	13	4.23	0.24
<i>Tribulus terrestris</i> Linn.	<i>Meitcher kund</i>	Puncture vine	Zygophyllaceae	Plant ash is mixed with cow butter to prepare paste which is applied on burns.	5	1.62	0.09
<i>Urtica dioica</i> Linn.	<i>Soi</i>	Stinking nettle	Urticaceae	Root powder sprinkled over minor cuts to prevent infection and stimulate healing.	10	3.25	0.18
<i>Valeriana jatamansi</i> Jones	<i>Mushkibala</i>	Indian valerian	Valerianaceae	Root powder mixed with mustard oil and made a paste which is applied on wounds for healing.	2	0.65	0.03
<i>Viburnum grandiflorum</i> Wall. ex DC.	<i>Kilmunch</i>	Cranberry bush	Caprifoliaceae	Pieces of stem wood are placed in an earthen pot which is heated externally from below. This causes an oil to ooze out from pieces of wood which accumulates at the bottom of the pot. The oil is then collected and used externally against eczema.	2	0.65	0.03
<i>Vitis vinifera</i> Linn.	<i>Dauch</i>	Grape vine	Vitaceae	Twigs of the plant are incised to collect the sap which is used to wash hair to prevent hair loss.	9	2.93	0.16

local population for the treatment of various skin diseases in one of the remote districts of Kashmir *i.e.*, Bandipora district. A total of 36 medicinal plants, mostly collected from wild (except *Oryza sativa* and *Brassica oleracea*), were used in the form of crude formulations by the people of the area for curing various skin ailments. In majority of the cases leaves of the plants were harvested for medicinal purposes but sometimes underground parts such as roots and rhizomes were also collected. For harvesting of underground portions, plants were completely uprooted. Water was frequently used in the preparation of formulations probably because of its easy availability and more effectiveness in isolating the substance of therapeutic value from the medicinal plants.

Some of the plants such as *Rheum emodi*, *Aesculus indica*, *Cotula anthemoides*, *Juglans regia* and *Calendula officinalis* were comparatively more preferred for the treatment of various skin ailments since their RFC values (Fig. 2) ranked highest with values of 0.57, 0.38, 0.38, 0.38 and 0.31 respectively. These positions correspond to the fact that medicinal uses of these plants against skin ailments were reported by highest number of informants and as RFC values directly depend on the number of informants mentioning use of the plant (FC). The preferential use of these plants may be due to the promising results after their use against various skin disorders. Moreover, the people of the area have strong belief that these plants are quite effective in curing skin ailments because these plants have been previously brought into use by their forefathers after generations of experimentation.

Majority of the plants collected and identified in this study were facing anthropogenic pressures such as over-grazing, deforestation, agricultural expansion and over exploitation for the purposes other than medicinal use. Earlier workers also had the same findings during their studies (Rashid *et al.*, 2008; Lone and Bhardwaj, 2013). All such activities are becoming a main cause of rapid depletion of these precious resources. Not only this, the indigenous knowledge about medicinal plants possessed by the local people is decreasing each passing day at an alarming rate due to disappearance of traditional cultures (Yousuf *et al.*, 2012). Many plants reported

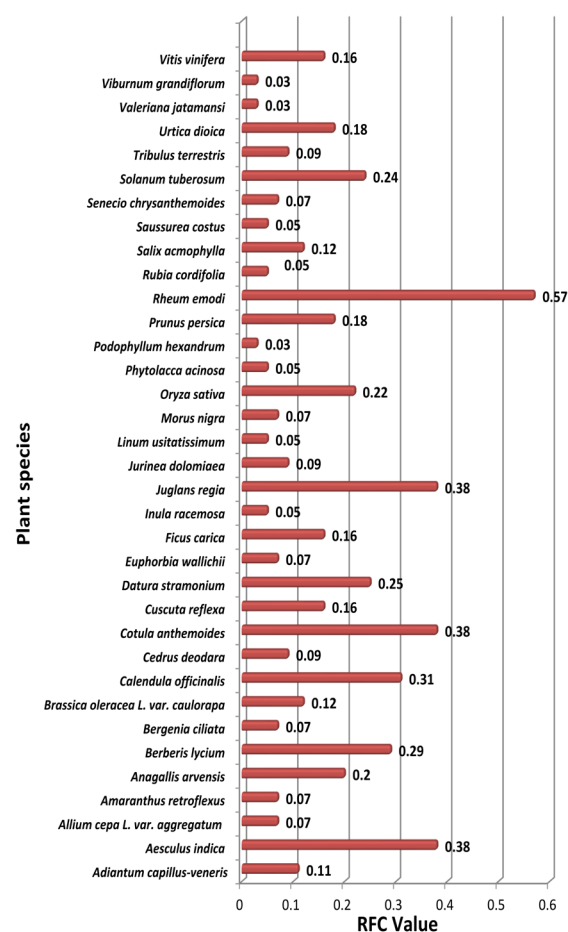


Fig. 2. Plants with corresponding RFC values

during the present study were completely uprooted for harvesting underground parts. This practice of uprooting may pose a great threat to the survival of these plant species by decreasing the seed production and consequently population size of the species. Thus, in order to maintain the minimum threshold population of the species, conservation efforts are extremely important. Further, due to increasing demand of raw materials at local, national and international markets, some plants are arbitrarily harvested for commercial purposes. The trade of this kind will continue, till the existence of seller and buyer. Because of all these reasons, certain plants, collected and identified in this study, such as *Saussurea costus*, *Rheum emodi*, *Podophyllum hexandrum*, *Jurinea dolomiaea*, *Inula racemosa*, *Aconitum violaceum* and *Valeriana jatamansi* find their places in the critically endangered, endangered and vulnerable lists of latest IUCN threat categories. Thus, the population of these

medicinal plants will shrink day by day if their exploitation continues unabated. This is a matter of great concern as these plants are the backbone of our original medicine system. Therefore, it is of utmost importance to conserve this medicinal treasure, otherwise in near future such plants will be completely wiped out from their natural habitats.

4. Conclusion

The information on ethnomedicinal treasure of knowledge generated in this study will be helpful to a major proportion of Indian population living below poverty line and who either do not have access to modern health care facilities or cannot afford the same due to the cost factor involved. Every existing species of plant in nature is indispensable which has taken very long time to evolve and exists in the present form. Documenting native knowledge through efforts like this study will be important for the conservation of biological resources and their sustainable use.

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