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Indigenous medicinal practices of *Bhotia* tribal community in Indian Central Himalaya

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Indigenous medicine is an important component of indigenous knowledge system, which is widely practiced by tribal communities across India. The paper, based on an empirical investigation, describes the relevance of indigenous medicine and healthcare practices prevalent among the *Bhotia* tribe in Indian Central Himalaya, in terms of their contribution to physical well being of this tribal people. Documentation of more than 40 indigenous medicinal practices revealed that this indigenous knowledge system of medicine effectively serves to the tribal people. However, what is disturbing is the disappearance of the medicinal plants from their habitat under intense anthropogenic pressure and also because of high level commercial use, posing a serious threat to the continuation of indigenous medicinal practices, which may have adverse impacts on physical, social and economic well being of the tribal people.

Keywords: Indigenous knowledge, Ethnomedicine, Indigenous medicine, Indian Central Himalaya, *Bhotia* tribe, Medicinal plants, Conservation

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Indigenous knowledge, understood as the unique local knowledge existing within and developed around the specific conditions of people indigenous to a particular geographical area, is gaining more and more attention. Indigenous knowledge is an essential condition for sustainable development. In India, where the tribes and their tracts constitute very significant parts of the underdeveloped people and area, comprising about 8.13% and 18.70% of the population and area of the country, respectively, the indigenous knowledge system plays a pivotal role in their very survival[1,2]. The tribal communities represent a va+st diversity in socio-economic life, cultural heritage and resource use pattern. Despite their habitation in different zones, the tribal people display commonalities in the economic and social life, with variations necessitated to maintain harmonious coordination between the resource availability and population structure.

The Indian Himalayan Region (IHR) represents nearly 18.5% of the total tribal population of India. More than 175 of total 573 scheduled tribes of India inhabit the Indian Himalayan Region. The Indian Central Himalayan (ICH) region is inhabited by the *Jaunsaries*, the *Tharus*, the *Bhotias*, the *Buxas* and the *Rajis* or *Van-Rawat*, which is a primitive tribe[3]. The *Bhotias*, a transhumant community of Mongoloid origin, inhabit the high altitude regions of the Indian Central Himalaya at Indo-Tibetan and Indo-Nepal borders, a zone of ethnic intermixing and cultural assimilation. They show close racial and cultural affinity to the Tibetans and probably for this similarity the *Bhotia* region is called as *Bod* or *Bhot*, which is synonym for Tibet[4]. Etymologically, the word *Bhotia* is believed to have originated from the term *bhot* or more correctly *bod*, which means Tibet. The eight major *Bhotia* groups are the *Johari, Jeethora, Darmi, Chaudansi, Byansi, Marchha, Tolcha* and *Jad,* and are scattered over eight main river valleys known as Johar, Darma, Byans, Chaudans (Pithoragarh district of Uttarakhand), Mana, Niti (Chamoli district of Uttarakhand), Nilang and Jadung (Uttarakashi district of Uttarakhand). Each of the sub groups is further divided in to several clans and lineages, which regulate marriage alliances and indicate ancestry[5]. Though, the cultural traits of *Bhotias* reflect close links with the

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Tibetans acquired through generations of association through trade, they stand distinct from Tibetans with regards to their character and mode of economy. The culture reveals much closer socio-economic ties with the population inhabiting the middle and lesser Himalayan region of Kumaon and Garhwal.

Families are of both joint and nuclear types and both the males and females have equal right on the affairs and decision making system of the family. Traditionally, the *Bhotias* are traders and their trade with Tibet has been the mainstay of their economy. At present the economic organization of the *Bhotias* is an agglomeration of trade and business, terraced cultivation, pastoralism, woolen industry & service[6]. They have two settlements, the upper or summer settlement, where they stay from May-June to October-November and cultivate limited varieties of crops like buckwheat (*Fagopyrum esculentum* Moench. and *Fagopyrum tataricum* (L.) Gaertn.) and lower or winter settlement, where they stay for rest of the year. In lower settlement, they cultivate wheat (*Triticum aestivum* L.), paddy (*Oryza sativa* L.), maize (*Zea mays* L.), jower (*Sorghum vulgare* Pers.), potato (*Solanum tuberosum* L.), etc. Their herds consist mostly of pack animals like sheep, goat, yak, mules/ponies, etc.

The qualitative relationship of the *Bhotias* with its immediate environs and natural resources has evolved through strenuous experiences of difficult survival[7]. These eco-culturally evolved ecosystem specific tools, technologies and practices in the form of indigenous knowledge constitute integral parts of appropriate innovative strategies that effectively conserves resources and allows options for their optimal use also[8-10]. Among the *Bhotia* community, the indigenous knowledge governs almost all important productive resource sectors such as agriculture, forestry and animal husbandry. It revolves around their traditional values of resource use that include subsistence values, socio-cultural values, economic-commercial values, and traditional practices of resource use. The indigenous knowledge of this tribal community serves as a cultural and natural capital, who has a historical continuity of living in harmony with nature with mutual dependence on primary natural resources, and possess a sound knowledge base of the behaviour of the complex ecological system[11]. The role of indigenous knowledge is vital in the sustainable living of the *Bhotia* community, in view of the fact that replication of modern technologies developed elsewhere has not been successful in the terrain where the tribe live in because of mountain specificities, viz. inaccessibility, fragility, marginality, diversity (heterogeneity), niche (natural suitability) and adaptability[12]. The study is aimed at documenting the indigenous knowledge system of medicine and its role in physical well being of the *Bhotia* community, in their resource conservation and socio-economic development. The study tries to explore how the indigenous medicinal system is being able to serve the local people, how it contributes to their scarce economy and how it helps conserve bioresources in around the community.

Methodology

Two sample villages, Darkot and Seepu**,** inhabited by the *Bhotia* tribal community and located in Munsiary and Dharchula Development Blocks, respectively, in Pithoragarh district of Indian Central Himalaya, synonymous with the state of Uttarakhand, were studied. Village Seepu is a high altitude village being located on an altitude of about 3,586 m amsl, while Darkot is located on an altitude of about 1,237 m amsl. The data on indigenous medicine were collected through interviewing the tribal people using open-ended interviews and guided dialogue techniques. As many as 105 respondents were interviewed independently in their villages to document the prevalent human diseases, their diagnostic knowledge for curing the diseases, and medicinal plants and other raw material used in the treatments. The local names of the diseases and plants with medicinal value were recorded from the respondents while interviewing. Later, the plants with medicinal value were identified with the help of the respondents and taxonomists.

Results and discussion

Evolving over a long period of time based on necessities and experiences, indigenous medicinal system is an important component of indigenous knowledge of the *Bhotia* tribal community, which is an important natural resource that facilitates the development process in cost effective, participatory and sustainable ways and plays an important role in resource conservation. In the studied villages, more than 50 indigenous medicines/treatments are being practiced by the *Bhotia* people in healing more than 45 diseases/disorders using about 40 plant species of medicinal value (Table 1). While gathering the medicinal plants from their habitat, the *Bhotia* people

Table 1—Indigenous medicinal practices of *Bhotia* tribal community

Plant name/Local name	Family	Uses
Aconitum heterophyllum Wall. (*Atees*)	Ranunculaceae	Half tablespoon ground dry root is taken with boiled water during fever. Root is also chewed and sucked twice a day to control abdominal pain and vomiting.
Acorus calamus L. (*Gurbach*)	Araceae	Dry root boiled with mustard oil is applied on the sprain region.
Allium cepa L. (*Piyaj*)	Liliaceae	Water extract of crushed/ground onion is given to control vomiting.
Allium sativum L. (*Lahsun*)	Liliaceae	Till (*Sesamum indicum* L.) oil heated with spilled bulbs of garlic after cooling is poured in to the ear to reduce earache.
Allium stracheyi Baker. (*Jambu*)	Liliaceae	A clean cloth dipped into leaf decoction is applied on wound.
Amaranthus paniculatus L. (*Choulai)*	Amaranthaceae	Warm stem is touched to the affected parts of the body.
Angelica glauca Edgew. *(Gandrani)*	Umbelliferae	Powdered dry root is taken with boiled water to control vomiting and abdominal pain. Powdered root mixed with water is also applied on boils and ulcers.
Arisaema tortuosum (Wall.) Schott. (*Bankh*)	Araceae	Rhizome paste in water is applied on the body part stung by snake or scorpion.
Arnebia benthamii (Wall. ex G. Don.) Johnst. (*Laljari*)	Boraginaceae	Root paste in mustard oil is applied on the affected parts of skin suffering from skin disease.
Artemisia spp. (*Kunjarpati*)	Asteraceae	Filtered juice of ground green leaves is applied on cuts and wounds.
Butea frondosa Roxb. (*Dhak*)	Leguminosae	Cooked flower mixed with half glass of water is given for curing urine infection.
Bergenia ligulata (Wall) Engl. (*Pashanbhed*)	Saxifragaceae	Dry rhizome is chewed to remove kidney stone.
Betula utilis D. Don. (*Bhojpatra*)	Betulaceae	Filtered green bark juice with water is applied on ear to relief earache.
Brassica campestris L. (*Sarsoun*)	Brassicaceae	Hot mustard oil is applied on the burns.
Capsium annum L. *(Mirch)*	Solanaceae	Paste is applied on the part of the body bitten by dog.
Carum carvi L. *(Thoya or kala jeera)*	Apiaceae	Fried powdered seeds is taken with boiled water to relieve from indigestion.
Dactylorhiza hatagirea (D. Don) *Soo. (Hatha Jari)*	Orchidaceae	Powdered dry root is taken with water for the treatment of diabetes. Dry root decoction with a little of salt is taken for vigour and vitality.
Delphinium brunonianum Royle. *(Kasturi kamal)*	Ranunculaceae	Leaf extract with water is filtered and applied on burn, cuts, boils and pimples.
Delphinium denudatum Wall. *(Nirvisi)*	Ranunculaceae	Root decoction is taken for blood purification and also applied on snake or scorpion bitten region.
Dioscorea spp. (Harvish)	Dioscoreaceae	Dry rhizome paste is applied on cuts, boils and pimples.
Hardeum vulgare L. *(Jaun)*	Poaceae	Seed paste is applied on head to relief from headache.
Malva verticillata L. *(Tankh Jhar)*	Malvaceae	Root decoction is taken during urine tract infection.
Megacarpaea polyandra Benth. *(Rookhi)*	Brassicaceae	Filtered juice of ground green leaves is taken during fever.
Morus alba L. *(Shahtoot)*	Moraceae	Fruit juice is taken against cough and cold.
Myrica esculenta Buch.-Ham. ex D.Don *(Kaphal)*	Myricaceae	Threshed dry outer layer of fruit is inhaled before sleeping to relieve from cough, cold and headache.
Myristica fragrans Houtt. *(Jayphal)*	Myristicaceae	Fruit paste is applied on neck or chest to get relief from cough.
Picrorhiza kurrooa Royle ex. Benth. *(Kutki)*	Scrophulariaceae	Root decoction is taken during fever. Root is also sucked and chewed to get relief from abdominal pain.
Pinus wallichiana A. B. Jacks. *(Kail)*	Pinaceae	Heated resin is applied on the fractured portion of bone.
Portulaca oleracea L. *(Jark)*	Portulacaceae	Leaves are cooked without spice and oil and taken with food during jaundice.
Psidium guajava L. *(Amrood)*	Myrtaceae	Leaves are chewed to get relief from blisters in mouth.

Contd.

Plant name/Local name	Family	Uses
Punica granatum L. *(Anar)*	Lythraceae	Leaves are boiled in half litre of water with ten rose leaves till the extract is reduced to half of its volume. Filtered extract with some butter is given for curing epilepsy / hysteria.
Rheum emodi Wall. *(Dolu)*	Polygonaceae	Root paste cooked with mustard oil is applied on the wound and plastered with clean cloth. Also root paste with water is applied on wound, boils and pimples.
Rosa sp. *(Gulab)*	Rosaceae	Leaf paste is applied on boils and ulcers. Juice extracted from leaves of red rose is taken against urine infection of children.
ssurea costus (Falc.) Lipsch. *(Koot)*	Asteraceae	Powdered root is taken with boiled water to get relief from fever, abdominal pain and asthma. Powdered root mixed with water is also taken against dysentery.
Saussurea obvallata Wall. *(Brahmakamal)*	Asteraceae	Seed oil is applied on the head twice a day as a remedy for headache and mental problems. Flower is also cooked with taga misri and taken against urine tracts infection.
Stephania elegans Hook.f.& Thoms *(Gangeri)*	Menispermaceae	Cooked rhizome is taken with food to relief from lung disease.
Swertia chirayita (Roxb.) Buch. *(Chiratia)*	Gentianaceae	Filtered leaf juice is taken against fever.
Ulmus wallichiana Planch. *(Chammermwa)*	Ulmaceae	Bark paste is applied on the fractured portion of bone with the help of clean cloth.
Viola sp. *(Banspa)*	Violaceae	Decoction of dried flowers with tea is taken to get relief from fever, common cold and cough.
Zanthoxylum alatum Roxb. *(Timoor)*	Rutaceae	Seeds are chewed to control toothache. Also soup made from seed epicarp with salt is taken against gastric problems, common cold and cough; cooked seed is given during dysentery.

avoid collecting plants those are infected by insects, pests, and any other disease. Plants affected by toxicity, sunstroke, hailstorms, high velocity winds, fire and floods are also not collected to be used for preparation of indigenous medicines/ formulations[13].

The indigenous medicine and healthcare practices are threatened as the bioresources on which they are dependent are depleting with weakening and even disappearing of institutions and practices of safe-guards those have evolved from the cultural contours of the *Bhotia* tribal community to ensure regulated use of bioresources. Further, the ruthless exploitation through unscientific and non-regulated collection of medicinal plants in the recent times by pharmaceutical industries also disturbed the regulatory practices, thereby, threatening and endangering plants of medicinal value. The *Bhotias* follow a number of other regulations, such as maturity of the plants, height of the plants, patterns of branching, colour and other morphological characters, while collecting medicinal plants so as to ensure that the medicinal plants do not die out or disappear from their natural habitat. These regulations are getting diluted under commercialization. Commercial collection of medicinal plants also ignores other regulatory guidelines relating collection of parts of medicinal plants. For example, the branches are collected when they are fully grown during springs and rains, and young leaves are collected during flowering and ripening of fruits by the *Bhotia* people[13]. Ineffective state management control over the sale of medicinal plants has resulted in over extraction[14]. It is because of the reason that, though, there are prohibitory regulations and restrictions introduced by the Government in the use of medicinal plants and many a medicinal plants are banned for use, clandestine collection of such banned medicinal plants are in regular practice[15].

Seventeen Himalayan medicinal plants, including more than half of them used by this tribal community, are listed in the Red Data Book of Indian Plants. In addition, several other taxa, although not listed, have reached a stage of critically endangered category[16]. What is required is a secured control of Government over collection and sale of medicinal plants through stringent regulation. The indigenous knowledge system for its own continuation, demands the protection and conservation of bioresources. A successful programme with conservation in focus must incorporate scientific input compatible with social needs and aspirations embracing societal and cultural principles as base for its foundation[17]. A faithful documentation of indigenous knowledge system and possible value addition will help to the confidence building of the practitioners, promote their economy and help to the process of conservation.

Conclusion

This analysis of the indigenous medicinal practices of the *Bhotia* tribal community establishes that indigenous knowledge is a hard-earned experience of the tribal/ indigenous community, which ensures physical well being to them, promotes their economy and conserves their resources. Since, the existence of the indigenous medicine is largely dependent on bioresources, the tribes have evolved socially approved regulatory practices and adaptive strategies to conserve the bioresources. However, these regulatory practices and adaptive strategies, that were vibrant, are weakening. Simultaneously, there is a need for effective state intervention over use and conservation of bioresources, particularly medicinal plants. This process necessitates assessment of adequacy of laws, policies and action plans promulgated in the above context. A more refined approach could be empowering the tribal people to ensure a culturally sensitive response that will serve to protect the tribe's traditional linkages with their natural resources.

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