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Ethnic Medicinal Knowledge: An Ancient Knowledge for the Healthcare and Livelihood of the People of Indian Himalaya

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Abstract

Indigenous or traditional medicine plays an important role since time immemorial. The use of indigenous knowledge is being practiced by several communities and tribal groups in different parts of the Hindukush Himalayan region. The Shivalik Himalaya is the newest mountain chain of the world and having very rich biodiversity. There are several ethnic groups present in this region with their diverse knowledge about the medicinal plants and having their own medicinal system, however much of the information is diminishing rapidly as most of the older people are no more and the next generation is not keen to know this valuable knowledge. The review focuses on the importance of the ethnomedicinal knowledge and the studies carried out in the Himalayan region specifically Indian Himalayan region. The Intellectual property right is also a major concern with respect to the ethnomedicinal knowledge. There is an urgent need of the conservation of the high valued medicinal plants as the exploitation in this area is being done rapidly and the conservation is still a need of the hour. The ethnomedicinal knowledge could

serve as the precursor for the Drug discovery process and requires a scientific standardization and validation for their quality and efficacy.

Keywords: Himalaya, Indigenous knowledge, traditional, ethnic

Introduction

Healthcare is one of the most important aspects for humans and animals toward enhancement of the life expectancy. The better the healthcare services of a country better will be the prosperity of a nation. India is known for its cultural diversity and primordial knowledge from an ancient era. Several saints who contributed for the healthcare improvement were native to India viz. Charaka, Sushruta who worked in the Ayurveda and Surgical science and Patanjali who contributed in the field of Yoga and meditation which is now-a-days in a great demand all over the world. Recently United Nation has declared to celebrate 21st June every year as the “International Yoga Day” on the recommendation of Honorable Prime Minister of India Mr Narendra Modi with a huge support of more than 150 countries of the world.

The Rig-Veda written during 4500 BC to 1600 BC is believed to be the oldest repository of human knowledge about medicinal usages of plants in Indian subcontinent [1]. Due to changing life style, extreme secrecy of traditional healers and negligence of youngsters, the practice and dependence of ethnic societies in folk medicines is in rapid decline globally, therefore, ethnobotanical exploitation and documentation of indigenous knowledge about the usefulness of such a vast pool of genetic resources is deliberately needed [1-10]. According to WHO, traditional medicine is defined as “diverse health practices, approaches, knowledge and beliefs incorporating plants, animal and/or mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain well-being, as well as to treat, diagnose and prevent illness [11]. Natural products considered as promising candidates for drug discovery and they still continue to play an important role in future also [12]. The tribal and ethnic communities throughout the world are having very strong cultures, customs, religious

rites, cults, taboos, myths, folk tales and folk songs, food and medical systems and for this they often utilize numerous wild and cultivated plants and various animals, birds, insects, etc. There are various tribes and different ethnic communities who believed in their own traditional systems of medicine. Several tribal communities are living in the Indian Himalayan region and utilizing their own system of mitigation and treatment. When we talk about the Indian Himalayan region; it constitutes a diverse flora and fauna as well as the considerable diversity in people living in this region. Ethnobiology or ethnographical biology is the association of these plants and animals with various cultural practices [13]. To consider the importance of the ethnic medicinal knowledge the review focuses on the importance of studies related to the ethnobotany/ethnopharmacology of the Indian Himalayan region.

The Himalayan ecosystem: treasure of biodiversity

The Indian Himalayan Region (IHR) is having geographical coverage of over 5.3 lakh km² which mainly comprises of huge mountain ranges extending over 2500 km in length between the Indus and the Brahmaputra rivers and raising from low-lying plains to over 8000 m above sea level and is around 300 km at its widest part with an average width of 80 km, which is also the world's highest mountain chain, so that the Himalaya is characterized by a very complex geologic structure, large valley glaciers, snowcapped peaks, river gorges and rich vegetation [14]. The Shivalik Himalaya is the youngest mountain chain present on the earth and is believed to be less stable geologically and geomorphologically. It is therefore necessary to preserve the Himalayan region without more destruction mainly the deforestation and green felling. The Himalaya is one of the most diversified and complex geological system among the global mountain system. It also separates the northern part of Asian continent from South Asia [15]. This region is also known as a 'water tower of the earth', this is due to the presence of water bodies throughout the area, it is estimated that 10–20% of the area is covered by glaciers and remaining 30–40% under seasonal snow cover [16]. The eastern Himalaya is considered as a cradle of flowering plants as it harbors about 8000 species of flowering plants and the western Himalaya supports over 5000 species of flowering plants, attempts for conservation of threatened Himalayan medicinal plants were also carried out [17,18]. The complete Indian Himalayan

region (IHR) constitutes nearly 50% of the total flowering plants of which 30% flora is endemic to the region in India. The presence of Himalayan glaciers is like a blessing of the nature to this region due to these several ever flowing Himalayan Rivers and natural sources of water are present and contributing to various energy production sources and has made this region very fertile to the agriculture point of view. The region is not only providing the livelihood to its people but any adverse effect in this region could be dangerous to entire world especially with respect to the climate change. The Indian Himalayan region is also prone to earthquakes and most of the part mainly in the Uttarakhand state comes within zone IV or zone V. Cultural diversity is one of the important aspects of the Himalayan region. Several cultural groups are available here and having their own beliefs, customs and lifestyle.

Role of traditional medicinal knowledge in IHR

The Indian Himalayan region is a rich repository of the traditional knowledge and biological resources. Biological resources and traditional knowledge play a key role and are being used in the various pharmaceutical, cosmaceutical and food industry and it is a well established fact that the history of traditional knowledge is too long in the evolution of modern pharmaceuticals as well as food crops. The contribution of herbal medicine dates back so far as the Indus Valley civilization in 2600 BC; Chinese and Ayurvedic medicines developed by local people and are still used today. Folk and traditional knowledge is a very important knowledge for the upliftment of the modern pharmaceutical research. The traditional knowledge acts as the basis for the initial screening and can help to isolate the medically significant compounds from plants. A number of modern drugs such as anti-cancer drugs, antibiotics, anti-malarial drugs, and analgesics etc. were developed from plant and animal resources based on traditional knowledge. The Convention on Biological Diversity (CBD) calls not only for parties to respect, preserve, and maintain the knowledge, innovations, and practices of indigenous and local communities as defined under Article 8(j) of the CBD, but also for the promotion and wider application of this knowledge with the approval and involvement of the holders of the knowledge. Article 8(j) further encourages involving local communities in the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices while ensuring the

conservation and sustainable use of biodiversity [19].

Ethnomedicinal studies in the Indian Himalayan region

Several ethnomedicinal and ethnoveterinary studies were conducted in the Himalayan region. In the northeast region Sharma *et al.*, [20] studied the presence of medicinal plants of Mizoram area and it was revealed that in rural societies of Mizoram, India, traditional methods of treatment are followed in the majority of the population, there was a great diversity of plants and important knowledge of potential therapeutic applications of several plant species. The recuperation and preservation of this knowledge is unquestionably of high importance in view of the deforestation underway in Mizoram and surrounding areas. In another study of eastern Himalaya [21] traditional remedies for the treatment/management of diabetes was conducted by the researchers. First time use of *Dillenia indica*, *Colocasia esculenta*, *Cinnamomum impressinervium*, *Euphorbia ligularia*, *Amomum linguiforme*, *Garcinia pedunculata*, *Solanum indicum*, *Sterculia villosa* and *Tabernaemontana divaricata* were recorded for diabetes and its complications.

The valuable contribution of Joshi and Shah [9] is very important in the western Himalayan region; they carried out extensive work in the ethnobotany of Kumaon region of India and presented in an outstanding way and recommended that ethnobotanical studies should be carried out with their phytochemical and pharmacological studies. In the Tarai (foothills of Himalaya) region Mathur and Joshi, (2013) performed an ethnobotanical study during 2008–2010 to highlight the uses of the diverse flora [22]. Their study sites included Lalkuan in Nainital district and Kichha Tehsil (covering Pantnagar) of district Udham Singh Nagar. Various studies were carried out in Nepal for the documentation of the native flora and fauna of Nepal. The researchers documented the uses of plants in traditional herbal medicine for treatment of human and veterinary ailments in four village development committees in the Humla district of western Nepal and determined the homogeneity of informant's knowledge on medicinal plants suitable for different ailment categories and the most preferred plant species used to treat each ailment category in the study areas [23]. Most medicines were prepared in the form of powder and used

orally; roots were most frequently used plant parts. The uses of 93 medicinal plants were not mentioned in any previous studies. Gastro-intestinal ailments have the highest ICF (informant consensus factor 0.40) whereas ophthalmological uses have the lowest (zero) ICF. *Mentha spicata* and *Rumex hastatus* has the highest Fidelity Level (FL) (100% each) both being used for gastro-intestinal ailments and *Delphinium himalayai* has the lowest (47.4%) for veterinary uses.

Apart from the Ayurvedic, Unani, Siddha and Homeopathy system of medicine the Sowa-rigpa system is one of the important traditional medicinal systems mainly used in the Ladakh region of India. The researchers very interestingly studied the Sowa-rigpa system of traditional healing which has been practiced from time immemorial in western Ladakh but its existence is in jeopardy today [24]. The study recorded 160 plants and further stated that traditional healing system (THS) is taking care of 30% of public healthcare. Only 36 traditional healers are left in this region of which 67% was found along the Wakha-chu Valley, followed by the Lower Indus Valley (17%) and the Suru Valley (16%). The major threat for the traditional knowledge was also seems there as the transfer of knowledge to the next generation is very low and the reason behind this was supposed to be the low income and continuously deteriorating social status of healers. One of the very important aspects was incorporated in the study that lack of interest in young generation in adopting this system may pose a threat to the survival of Sowa-rigpa. In Jammu and Kashmir, India the researchers studied traditional medicinal uses of plants practiced by the people residing in far flung and remote areas of the Bandipora [25]. In different studies from Nepal, the ethnobotany and traditional use of plants extracted from the vulnerable alpine zone in the Dolpa, Humla, Jumla and Mustang districts of Nepal, the abundance of plant species is used as traditional medicines [26]. Some of the very important species were *Allium wallichii*, *Cordyceps sinensis*, *Dactylorhiza hatagirea*, and *Rheum australe*. The genera *Aconitum*, *Allium*, *Arisaema*, *Berberis*, *Corydalis*, *Gentiana*, *Hippophae*, *Juniperus* and *Rhododendron* each possessed two species with ethnomedicinal use. The ethnomedicinal status was also carried out in context with ecological assessment in the Garhwal Himalaya [27]. The sub Himalayan tract of Uttarakhand was also studied for the ethanobotanical studies [28-30].

Bhutan is another neighboring country of India and an important country of Himalaya. The Bhutanese traditional medicine (BTM) was assessed which was integrated with the mainstream biomedicine in 1967 to provide primary health care services in the country. Researchers from Bhutan studied on the experienced practitioners of Bhutanese traditional medicine (Drung-tshos and Smen-pas) and reported that there were many similarities with materia medica, pharmacopoeia and the principles and concepts of ethnopharmacology and ethnobotany with its mainstream Tibetan medicine [31].

Traditional knowledge and IPR issues

It is a matter of fact that the exploitation of traditional knowledge is being carried out at an alarming rate by the modern herbal medicine, various pharmaceuticals, food, perfume, and cosmetic industries. It is believed that indigenous and local people are increasingly becoming victims of piracy. This is due to the reason that several patents are filed and granted for non-original inventions that are directly or in a roundabout way based upon the traditional knowledge hence does not fulfill the fundamental necessities for patentability. Turmeric and Neem patents are some of the examples of such patents where the wound healing property of turmeric and pesticidal property of neem were both patented. The Patent Law is now recognizing the traditional/folklore knowledge. The indigenous or traditional knowledge is not just because of the distant past. The most valuable thing behind this knowledge is a living body of knowledge that is developed, sustained and passed on from generation to generation within a community which is integrated with the social, cultural and spiritual identity of the specific community. The current IPR system is not able to easily protect the traditional knowledge as such, as the system typically grants protection for a limited period to inventions and original works by named individuals or companies. Its living nature also means that “traditional” knowledge is not easy to define [32].

Livelihood generation through traditional knowledge

There is an urgent need of proper standardization of these reported claims. Further the value addition of the plants could be take place by evaluating the reported claims scientifically

and establishment of these herbs by proper standardization. Exploration of the traditional knowledge is also required, which is very limited now-a-days due to either the non availability of the traditional practitioners as because of natural death and/or due to the lack of interest in the younger generation about this knowledge. Further the ethnopharmacological studies and the scientific standardization of this indigenous knowledge could lead to establish these medicinal plants for the service of humanity globally and could serve as the lead for new drug development. Another aspect of promoting the socioeconomic status of the people living in the Himalayan region is to promote the proper cultivation of the medicinal plants native to this area and to make a proper distribution channel for the marketing of these crops.

Conclusion

Traditional knowledge is a crucial knowledge and could serve as a lead in the drug discovery process. The Himalayan region is serving by its diverse flora and fauna to the people of the country and neighboring country like Nepal, Bhutan etc. The value addition to this knowledge by the proper standardization of the plants is required. The sustainable development mainly in the cultivation aspect is highly required to preserve the biodiversity of the Himalayan region as several plant species are in verge of extinct.

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