

Towards Revival or Erosion? Understanding the History, Challenges and Future Prospect of Ethnomedicinal Practices in India

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Abstract

The role of ethnomedicinal practices within the Indian system of medicine has been inconspicuous, to say the least. The neglect and marginalization which started with the divergence of other age-old established systems of medicine in India reached its peak during the colonial rule which had gone for quick introduction of scientific approach ignoring in the process underlying merit of the indigenous belief system. The situation began to change with growing awareness about the prospect and possibilities of indigenous methods and therapies thereof. But unrestricted growth of ethnopharmacological research and bioprospecting also put these indigenous groups in possession of knowledge about traditional medicine in danger of losing what they have managed to retain for generations. Through a thematic analysis of secondary information, the present research seeks to understand the history, threats and challenges faced as well as the steps taken by the Government of India for retaining the future prospect of ethnomedicinal practices in India.

Keywords: Ethnomedicinal Practices; Indian Tribes; Commodification; Biopiracy; Intellectual Property Rights (IPR)

INTRODUCTION

Traditional healthcare systems have thrived worldwide for millennia, acting as repositories for knowledge gathered over countless generations. Consequently, it is almost a normal practice with anthropologists to deal with healthcare issues from the perspective of traditional knowledge system. By linking “beliefs about disease causation”, “the experience of symptoms”, “specific patterns of illness behaviour”, “decisions concerning treatment alternatives”, “actual therapeutic practices”, and “evaluations of therapeutic outcomes”, anthropologists have often tried to understand it as part of the cultural system (Kleinman, 1978:86). Even then, barring a few (e.g. Dunn, 1976), most of the anthropological accounts avoid providing specific criteria for making a clear distinction between various kinds of healthcare systems.

Dunn (1976:135) makes a clear distinction between the three types of medicinal system as identified by him. These are, i) *local* medicinal system, which includes the “primitive” and

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“folk” medicine; ii) *regional* medicinal system which includes Ayurveda, Yoga, Unani, Chinese, Mongolian, and Thai, and iii) *cosmopolitan* medicinal system which includes the modern, scientific and western medicine. There is a stark difference in the way knowledge gained from these separate systems are documented and transmitted across generations. The *local* medicinal system, which includes primitive, folk, indigenous and ethnomedicine, is mostly non-codified in nature and restricted to a limited circle of practitioners like village physicians or faith healers (Koning, 1998). The healthcare practices, under this system, revolve around the application of medicinal plants, herbs, and animal parts for therapeutic purposes which are culture-bound and vary widely, depending upon the societal and cultural heritage of different countries, groups and indigenous communities. It often incorporates 'plant, animal, spiritual therapies, manual technique, singularly or in combination, to maintain well-being, as well as to treat, diagnose and prevent illness' (WHO, 2002). The knowledge gained from these traditions is often orally transmitted across generations. The *regional* medicinal systems, on the other hand, are codified in nature and often provide written descriptions of well-defined treatment methods embedded within the rich experiences of particular groups, spread across regions of a country or beyond. The knowledge accumulated from the regional medicinal systems like Ayurveda, Yoga, Unani, Mongolian, and Thai ultimately get diffused within and beyond national boundaries. The *cosmopolitan* medical system of Western biomedicine revolves around sophisticated and scientific medical theories, diagnosis and treatment methods. As a universally acceptable knowledge system, it transcends known political and cultural boundaries.

Interestingly, from around late-19th Century and especially, since the beginning of 20th Century, both the codified *regional* medicinal systems as well as non-codified ethnomedicinal traditions across the globe started facing serious challenges with the inception of standardized universal diagnostic techniques and the discovery of new drug molecules that set the basis of Western biomedicine (WHO, 1999; Erickson, 2008). The situation aggravated further as colonial rulers started popularizing the scientific methods and techniques of Western biomedicine in the colonies held by them. Sustaining the traditional and ethnomedicinal practices became even more difficult for a number of indigenous communities as forest and natural resources started diminishing fast because of the increasing demand of huge developmental activities. Moreover, the growing healthcare disparities across the globe and, more specifically, the outbreak of the pandemic eventually forced many of the indigenous groups to adopt Western biomedicine in a big way and that led to the marginalization of indigenous healthcare systems.

Its effects have also been noted among both the “village” and “tribe-based practitioners” of folk or indigenous medicine in India (Pushpangadan, 2003 cited in Dutta, 2014:280). Due to the emergence of factors such as 'diminishing forest and natural resources', 'curtailment of tribal forest rights' and 'poor implementation of forest policies', the impact on tribe-based practitioners was more profound compared to the village-level, the so-called “faith-healers” that also include the mothers or housewives of the mainstream caste population. The magnitude of this impact can be well understood from the fact that altogether 500 tribal, aboriginal and ethnic communities living in remote places in close association with forests have reported use of around 7500 locally available wild and cultivated plant species and animal products for treating a variety of diseases and disorders (Vedavathy *et al.*, 1998; Silja, Varma and Mohanan, 2008; Datta, Patra and Ghosh Dastidar, 2014). Naturally, it prompted many scholars (e.g. Kala, 2005; Kala, Dhyani and Sajwan, 2006) to believe that ethnomedicinal practices in India is on the verge of decline and it needed a revival. This could be the sequel of many of the early anthropological accounts on ethnomedicinal practices in India (e.g. Mitra, 1923; Boddington, 1925; Roy, 1927; Majumdar, 1933; Biswas, 1934; Hussain, 1950; Neog, 1951; Naik, 1956; Sinha, 1958), describing the complexities of a particular system as it plays out in specific political, cultural, and social contexts (Closer *et al.*, 2022).

However, since the post-Second-World War period, there has been an upsurge in the popularity of ethnomedicine and use of herbal drugs across the world. The effect of this can be seen in India since the 1980s. India's Ayurvedic market itself expanded at a rate of 20 percent per annum from 1987–1996, the highest in world Traditional Medicine (TM) markets (Verma and Singh 2008). Today, almost 80% of the world's population, including rural areas of both developing and developed countries place trust in traditional medicine (Abubacker *et al.*, 2018). In India, it is seen that around 65 percent of the rural population still uses traditional healthcare systems and herbal drugs to meet their primary healthcare needs (WHO, 2003). The lack of Western medical practitioners in rural areas (for detail see Rural Health Statistics, 2021-22), growing instances of drug resistance (Gupta and Birdi, 2017) and scientific understanding regarding the pharmacological values of herbs, plants and animals have also contributed to a large extent to its growing popularity. Nonetheless, this upsurge, despite having the possibility of reviving the ethnomedicinal practices in India, has also made many scholars (e.g. Attisio, 1983; Shiva, 1997; Gollin, 1999; Waker, 2001) apprehensive about the issues of commodification of ethnomedicinal knowledge, the ethical grounding of ethnopharmacological researches and especially, about the increasing biopiracy instances in the absence of adequate legal framework for intellectual property rights (IPR) protection and

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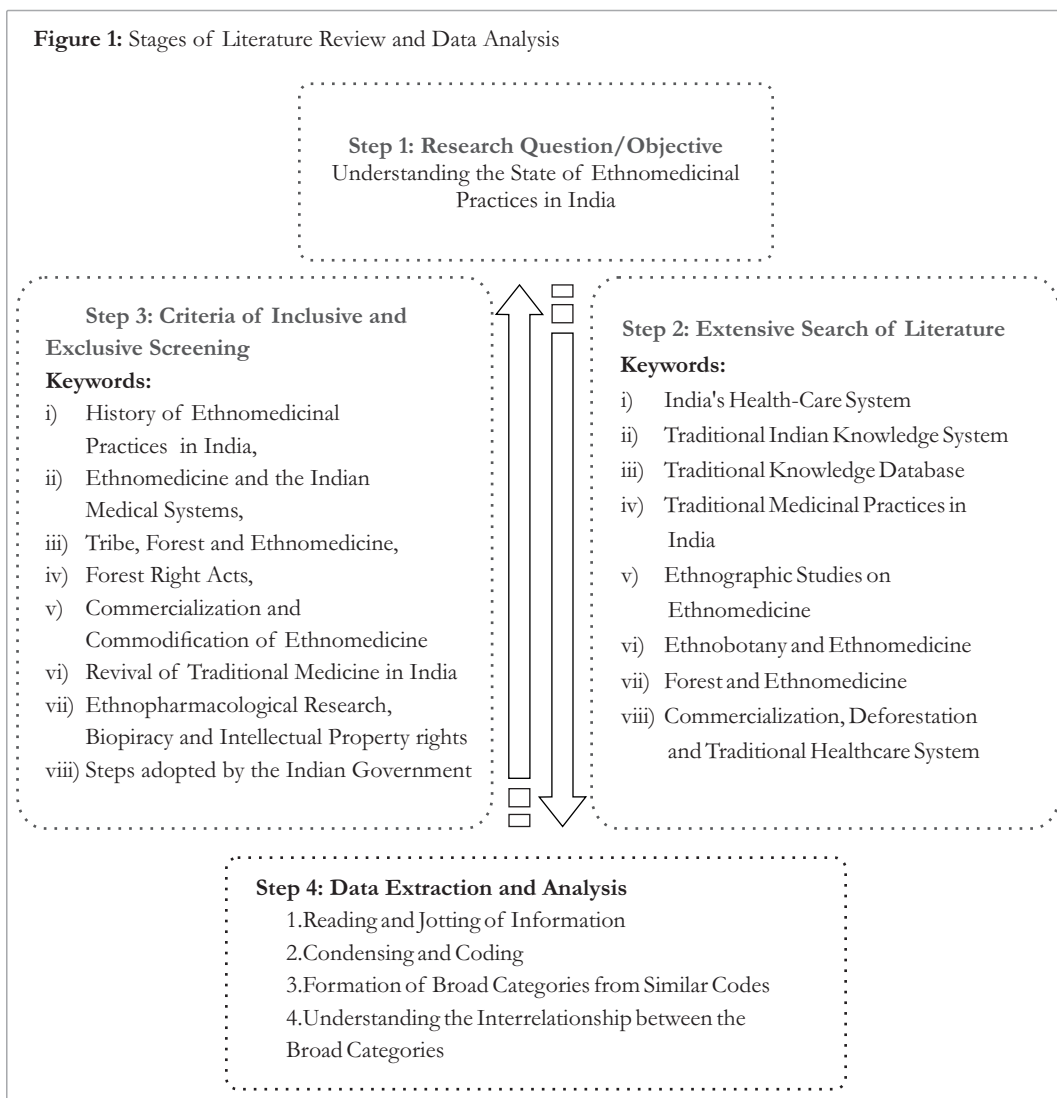
benefits sharing. Clearly, it puts demands on anthropologists to look beyond the *local* ethnomedicinal tradition purely defined from a cultural/interpretative perspective. Perhaps the present period requires these systems to be viewed and analyzed in terms of deriving “insights into the economies, politics, and governance of health systems” in order to be able to contribute something substantial to global public health (Pfeiffer and Nichter, 2008:410; Joshi, 2016; Joshi and Mahajan, 2021).

OBJECTIVE AND METHODS

Here, we have explored the history and divergence of India's traditional medicinal systems as well as the emergence of medical pluralism and its interrelationship with the ethnomedicinal practices in India as could be seen from a “critical medical anthropological” perspective (see Mullings, 1987; Singer, 2004)¹. For so doing, we followed some of the basic steps (as depicted in Figure 1) necessary for writing a review article (see Templier and Paré, 2015; Paré and Kitsiou, 2017). Our initial focus was on searching pieces of literature on “India's Healthcare System”, “Traditional Indian Knowledge System”, “Traditional Knowledge Database”, “Traditional Medicinal Practices in India”, “Ethnographic Studies on Ethnomedicine”, “Ethnobotany and Ethnomedicine”, “Forest and Ethnomedicine”, and “Commercialization, Deforestation and Traditional Healthcare System” extensively. After reading the title and abstracts of literature that could be derived from our initial search, we had to screen them and consider only those pieces of literature focusing on “History of Ethnomedicinal Practices in India”, “Ethnomedicine and the Indian Medical Systems”, “Tribe, Forest and Ethnomedicine”, “Forest Right Acts”, “Commercialization and Commodification of Ethnomedicine”, “Revival of Traditional Medicine in India”, “Ethnopharmacological Research, Biopiracy and Intellectual Property Rights (IPR)” and “Steps Adopted by the Indian Government” for their use in the next stage. Naturally, our research objective had to be refined with the introduction of new developments. Based on their relevance to this particular study, we extracted, collated, compared, jotted down, articulated and analyzed necessary pieces of information using techniques commonly used for “thematic analysis” (Braun and Clarke, 2006, 2012; Braun, Clarke and Weate, 2016).

The thematic categorization and analysis of the collected information was done in four subsequent phases (see Sharon, 2004; Saldana, 2009). We read all the selected pieces of literature during the first phase. During the second phase, we collated and condensed similar sets of information into smaller analyzable units or codes such as “early root and diversification of ethnomedicinal practices in India”, “plurality, foreign influence and marginalization of ethnomedicine”, “forest degradation and diminishing natural resources”,

“poor implementation of forest policies and curtailment of forest rights”, “development induced displacement and detachment from natural resources” “resurgence of public interest on ethnomedicine and commodification of indigenous knowledge”, “growth of ethnopharmacological research, bioprospecting and biopiracy concerns”, and “government effort for protecting the violation of intellectual property rights”. During the third phase, based on similarities between some of the aforementioned codes, we categorized and articulated them



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together into 'broad categories' of themes like “history of Indian medicine systems and ethnomedicinal practices in India”, “persisting and recently emerging threats and challenges to ethnomedicinal practices in India” and “efforts made for protection and revival”. Finally, during the fourth phase, we tried to explain the interconnections between these broad categories to show how several of the persisting as well as recently emerging political-economic factors and preventive measures adopted by the Indian government are affecting the status of many indigenous communities practicing ethnomedicine. The whole article has been organized into different sections as given below:

A brief overview of the origin and divergence of India's healthcare system is provided in the first section. In the sub-section, apart from sketching a historical trajectory of how some of the more established systems of Indian medicine like *Ayurveda* and *Siddha* have been influenced by foreign ones like *Unani*, Homeopathy and Allopathy, we pinpoint on the role and interrelationship that Indian ethnomedicinal traditions had with those other important components. In the following section, we assess the impact that some of the persisting as well as recently emerging threats and challenges like 'diminishing natural resources', 'curtailment of forest rights', 'commodification of indigenous knowledge', 'biopiracy' violation of intellectual property rights' are making on the future prospect of ethnomedicinal practices in India. In the third section, we discuss the relative effectiveness or non-effectiveness of the steps taken by the Indian government to resolve some of these aforementioned issues. Finally, in the concluding section, we have tried to suggest a few conceivable ways through which ethnomedicinal practices in India can be sustained even in the face of growing threats posed by ethnopharmacological research, commoditization and commercialization.

A BRIEF HISTORY OF INDIAN MEDICINAL SYSTEM AND ETHNOMEDICINAL PRACTICES IN INDIA

The history of India's medicinal system is quite rich and diverse. On one hand, there are prominent codified traditional medical sub-systems such as Ayurveda, Yoga and Siddha, the knowledge of which can be acquired from the Charak Samhita, Yoga-Sutra of Patanjali or other authentic textual materials of the Vedic and post-Vedic periods. On the other, it has several non-codified ethnomedicinal traditions, the practices of which can be associated with different Indian tribal and indigenous groups who had acquired the knowledge of medicinal plants from their forefathers by observing and staying close to nature (Dvivedi, 1890; Sigreist, 1987; Kumar, 2010). Throughout history, both these codified and non-codified medicinal traditions have drawn sustenance from one another. Therefore, understanding the history of ethnomedicinal

practices in India would require a holistic understanding of the entirety of the Indian system of medicine. One needs to understand how different subsystems like Ayurveda, and Siddha came into existence, how they diverged from ethnomedicinal practices and how they came under lasting influence of foreign-based subsystems like Unani, Homeopathy, and Biomedicines (Khare, 1996; Kumar, 2010).

The Early Root and Diversification

While there has not been any clear reference to the actual inception of the use of medicinal plants in India, many scholars (e.g. Siddique *et al.*, 2021; Ahmad, 1999; Ahmad *et al.*, 2014; Khan and Musharaf, 2014) trace back its origin to the period of the Indus Valley Civilization, more specifically, to the Vedic period which demonstrated early understanding and utilization of medicinal plants. These scholars believe that the concept of ethnobotanical medicines which originated in Greece, later got diffused among the Arabs and Indians aided by the Aryan invasion and domination over the earlier pre-Caucasoid Dravidian settlers between 2000 BC and 1500 BC. The Mesopotamian, Sumerian, and Egyptian influences that the Aryans carried along with them, led to the emergence of written *hymns*, which eventually gave rise to the writing of formulations for treating different diseases during the Vedic period. Perhaps due to this, some of the earliest references to herbal remedies and healing practices come from the Vedas, the oldest scriptures of Hinduism. The Rigveda during 4500-1600 BC, for example, refers to some of the earliest recorded medicinal plants (Siddique *et al.*, 2021: 2683). All of these, laid the foundation for Ayurveda and other traditional Indian systems of medicine. Some others like Ravishankar and Shukla (2007: 320) believe that Ayurveda, one of India's oldest systems of medicine, has diverged from the non-codified systems of medicine during this period. While the influence of changing geopolitical scenarios and cultural exchanges cannot be undermined, the proposition of the relatively independent origin of Ayurveda is rooted in highly diversified ethnomedicinal practices found across the world among the Native Americans, Egyptians, Greeks, Australians, Chinese, and Indians (see Abbas *et al.*, 2019). More so, because the pre-Caucasoid Dravidian settlers in the Indian subcontinent predate the Aryan Invaders (Sigreist, 1987). These scholars believe that the non-codified nature of the ethnomedicinal practices had already existed among the pre-Caucasoid Dravidian settlers. Aryans might have just introduced a system of codification and documentation, as a result of which one finds more references to the use of medicinal plants and treatment of diseases in later Vedic texts like *Atharvaveda* (Rishi *et al.*, 2016).

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In due course, the tradition of Ayurveda was consolidated further, which could provide a far more integrated approach to health and disease through a well-defined conceptual framework. Over time, this consolidation process had given rise to two major schools of medicinal practitioners - *Dhavantri* (physicians) and *Atreya* (surgeons) within Ayurveda. Each of these schools had its own compilations (*Sambita*), namely, *Charaka* and *Susbruta Sambita* respectively. *Charaka Sambita* contained medicinal knowledge of around six hundred drugs of plant, animal, and mineral origin. *Susbruta Sambita* contained references of dissection and operative procedures along with the usage of more than 100 kinds of surgical instruments including scalpels, scissors, forceps, specula, etc., about 650 drugs, and other related topics such as anatomy, embryology, toxicology, and therapeutics (Ravishankar and Shukla, 2007:320). Needless to say, the ethnomedicinal practices have gradually been pushed to a position of relative unimportance as a result of consolidation of new medical subsystems, creating doubts about the efficacy of the oral nature of the knowledge system and its dependence on magico-religious rites for the treatment of diseases. However, a large section of the tribal and rural Indian population, though availing modern healthcare facilities in the form of diagnosis and clinical treatment, have not altogether lost faith in the medicine man and practitioners of traditional medicine, who could still continue with their healthcare practices after inheriting the non-codified knowledge regarding the medicinal usage of rare plants and animals (Reddy *et al.*, 2023).

Plurality, Foreign Influence and Marginalization of Ethnomedicinal Practices

Today, with seven recognized systems of medicine like Ayurveda, Yoga, Unani, Siddha, Homoeopathy, Neuropathy, Sowa Rigpa and a large number of tribal and folk healers, India's healthcare system probably depicts the best example of medical pluralism (Prasad, 2002; Dutta, 2014). However, the plurality that one observes today didn't leave any trace during the Vedic period right after the emergence of Ayurveda. In all probability, the plurality of medicinal practices seems to have emerged as a result of the interaction and encounter between India's folk and foreign medicinal knowledge systems in keeping with the major trend of historical transformation during the medieval and contemporary periods (Holley and Cherla, 1998:11-12).

India's geopolitical context during the post-Vedic period was entirely different. During this period, India was more like a bunch of small kingdoms and urban centers that were culturally, economically and politically in interaction with one another. While the western part of India, especially the Punjab and Doab regions, were dominated by Sanskrit-speaking Vedic Aryans, the eastern part of the Ganga -Yamuna riverine plateau was under the influence of

Buddhists and Jains , who had their own inscriptions (Pali and other vernacular languages) describing the use of medicines, surgical procedures, trepanation, purges and emetics, practices consolidated from all levels of society (Basham, 1976:24-30; Sigreist, 1987). It can also be a period during which the codified knowledge of Ayurveda spread across the continent and took different forms with the Sanskrit-speaking Vedic Aryan influence eventually spreading eastward from the Punjab and Doab region towards the Middle Gangetic plains, and southwards, the region which could boast of their own socio-cultural and linguistic identities. The emergence and flourishing of the Siddha system in South India between 2500 and 1700 BCE, which combined ancient medicinal practices, spiritual disciplines, alchemy and mysticism, can be considered as one of the most prominent examples of this phenomenon of intermingling (Narayanaswamy, 1975; Encyclopedia of Britannica 2017). One even comes across references of Siddha medical practices in some of the earliest Tamil writings (one of the principal Dravidian languages). At the same point of time, the Buddhist monks embarked upon carrying and disseminating the knowledge of other Indian medical systems westward to Persia and Central Asia, China and Southeast Asia (Basham, 1976; Sigreist, 1987).

Nonetheless, the emergence of pluralism within the Indian medicinal system in the real sense started only at the beginning of the medieval period, when India started witnessing the coming together of diverse cultures and traditions, including the arrival of Persian, Arab, and Central Asian influences through either conquests or migrations. Opening of sea and land trades, particularly relating to the exports of silk and spices, also resulted in linkages between the Near East and East and Southeast Asia further, which helped in the diffusion of knowledge and materials. The Graeco-Arab system of Medicine (Unani) which had already incorporated elements from Egypt, Greece, Persia, India, and China started getting more emphasis (Poulakou-Rebelakou *et al.*, 2015), only after the Muslim conquest of India from 1221 AD onwards (Basham, 1976:39; Kumar, 2010). Finally, Unani became popular in India in around 1350 AD under the Arab rulers. Later, the principle of Ayurveda was integrated with Persian and Arabic medicine around 1526 AD (Bala, 1982; Rabishankar and Shukla, 2007; Poulakou-Rebelakou *et al.*, 2015), giving rise to Unani Tibb, a system that emphasizes the balance of bodily humors (phlegm, blood, yellow bile, black bile) and the use of herbal formulations, cupping therapy, and dietary interventions.

The Indian medicine system became more plural in nature from around 1500 BCE as practitioners of Indian medicinal systems started drawing inputs from the ideas and concepts of Western medical practices brought by the settling European traders with them (Kumbhakar,

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2019). During the initial period at least, the *Vaidyas* and *Hakims* often adopted the ideas and concepts of biomedicine and mixed them with India's already existing and vibrant medical tradition. Finally, the introduction of Homoeopathy to India during the 18th Century further pluralized the field of Indian medicine (Daniel, 1984; Prasad, 2002). With time, the knowledge of Homeopathy got assimilated into the Indian culture and was enriched like any other traditional system.

However, India's social and political landscape began to change in the early 1800s, with the London-based East India Company taking control of the then Bengal and neighboring areas. The British officers, the followers of Western medicine, used to treat most of the existing Indian medicinal systems as inferior to the European ones, as these were based on magico-religious beliefs rather than scientific principles. They therefore were in favor of improving some of these existing Indian medical systems along the course of Western medicine (Banerji, 1979; Kumbhakar, 2019). The frequent outbreaks of epidemics such as cholera, smallpox and malaria, during this period also played a crucial role in establishing and popularizing Allopathic medicine among the Indian population (Ravishankar and Shukla, 2007; Ruhil, 2015). The subsequent period saw the establishment of medical colleges and the introduction of courses and degrees in medicine. Needless to say, the preference given to building and strengthening the knowledge of allopathic medicine through these courses not only marginalized some of the codified Indian medicine systems like Ayurveda, Siddha, Unani, but it further pushed some of the non-codified systems of ethnomedicinal practices in India that were already marginalized by the existing codified systems of Indian medicine (Dutta, 2014) to the brink of oblivion.

SOME OF THE PERSISTING AS WELL AS RECENTLY EMERGING THREATS AND CHALLENGES TO ETHNOMEDICINAL PRACTICES IN INDIA

While maintaining a marginal existence all throughout, ethnomedicinal practices and their practitioners in India have faced multifaceted threats and challenges from different quarters. There could be no two opinions about the neglect and marginalization of indigenous beliefs and practices prompted by the application of Western biomedicine universally during the colonial period. After India's independence, developments like 'diminishing natural resources due to forest degradation', 'erosion of ethnomedicinal knowledge due to curtailment of tribal forest rights' and 'detachment from natural setting due to development-induced-displacement' emerged as some of the major impediments standing in the way of sustenance of the ethnomedicinal traditions. Currently, ethnomedicinal practices and their practitioners are facing a new set of challenges in the form of 'commercialization and commodification of indigenous

knowledge' and 'increasing biopiracy concerns' at a time when there has been a resurgence of public interest in ethnomedicine and/or herbal medicine contributing to the growth of ethnopharmacological research throughout the world.

Forest Degradation and Diminishing Natural Resources

The process of agricultural development, urbanization and industrialization which began during the colonial rule gained momentum even after independence. Studies (e.g. Davidar *et al.*, 2010; Aggarwal *et al.*, 2009) have shown how exploitation by a huge forest-dependent population beyond the carrying capacity of the forest has led to its large-scale degradation. The decrease of India's forest cover by 36700 ha between 2007 and 2009 primarily in tribal and hilly regions corroborates this claim (MoEF, 2009). Others (e.g. World Bank, 2006; Bahuguna and Upadhyay, 2002) consider the low productivity of Indian forests and anthropogenic factors such as overgrazing, shifting cultivation, and vulnerabilities to forest fire to be the prime causes of forest degradation. But whatever might be the cause, there could be no denting of the fact that the habitats of medicinal plants were destroyed as people began clearing forests for agricultural activities or settlement purposes. The loss incurred directly impacted the availability and accessibility of traditional medicinal resources. Furthermore, disruption of the ecological balance necessary for the growth and sustainability of medicinal plants and deforestation² contributed to soil erosion, changes in climate patterns, and loss of water sources, all of which were detrimental to the growth and propagation of medicinal flora (Upadhyay *et al.*, 2007). This had its impact on the health and well-being of indigenous communities and was equally responsible for jeopardizing their cultural heritage and traditional knowledge systems (Roy Burman, 1982; Chakraborty, Kosariya and Chakravarty, 2015). In the process, many communities have lost valuable insights into the uses and properties of medicinal plants, which have been developed over centuries of observation and experimentation.

Curtailment in Tribal Forest Rights Owing to the Conceptual Bias and Poor Implementation of Forest Policies

No doubt, the effort of sustaining the ethnomedicinal practices by different indigenous groups has been hindered by the conceptual bias and poor implementation of India's forest policies curtailing tribal forest rights to a significant extent. Despite the presence of several other anthropogenic factors, tribal communities were often held responsible for forest degradation in India (Choudhuri and Roy, 2017; World Bank, 2006; Bahuguna and Upadhyay, 2002). In the name of "forest conservation", curtailment in the tribal forest rights started when the British imposed Forest Acts in 1865, 1978 and 1927 that took its final shape in the form of National Forest Policy (1952) after India's independence. This policy categorically stated that "claims of

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communities near forests should not override the national interests.” “Relinquishment of forest land for agriculture was permitted only in very exceptional and essential cases”, it was further stated. Understandably, the implementation of such policies made life extremely hard for many tribal communities whose subsistence and livelihood activities revolved around the collection of food, timber and bamboo for the construction of house, collection of firewood for cooking and keeping them warm in the winter, using medicinal plants for treating common ailments.

India's forest policies reflected retention of such a colonial outlook till 1988 and continued safeguarding the industrial and commercial demands in the name of “national interest”. This scenario began to change with the inception of Joint Forest Management (JFM). Although the new Forest Policy of 1988 retained the “spirit of conservation”, it tried to protect India's natural heritage by preserving the natural capacity of forests through a more people-centric approach (Sunder and Jeffery, 1999). Instead of jeopardizing the basic requirements of the rural and tribal people residing near the forests, its aim was to restore the ecological balance.

However, prolonged deprivation and insecurities caused by lack of land tenure and access rights, lack of recognition of community conservation initiatives in forest management, lack of recognition of traditional governance and resource ownership in tribal areas, and threats to community lands and forests from development projects have already done a lot of damage leading to food insecurity and health-related consequences (Hegde and Enters, 2000; Chakrabarty and Mitra, 2010). These are directly responsible for disrupting the continuity of ethnomedicinal knowledge among many tribal communities by denying them access to the natural resources available in the forests of their ancestors that formed the basis of their indigenous healthcare practices. In fact, this lack of opportunity to have direct access to their natural environment has certainly curtailed the possibilities of contextual learning necessary for understanding and utilization of medicinal plants. That has made the oral transmission of ethnomedicinal knowledge from older to younger generations very difficult, if not impossible, due to which many ethnomedicinal traditions in India have been on the verge of extinction.

Detachment from Natural Resources due to Development-Induced-Displacement

The process of displacing people from the originally settled area has been going on for a long time, especially since India's independence. Construction of roads, dams, barrages, power plants, nuclear plants, mining and coal industries invariably resulted in the relocation of a huge number of indigenous people from their original settlement areas. Many of these people fall into the category of 'Internally Displaced Population' (IDPs). Despite all of these, the government's lack of empathy and uncompromising attitude towards the problem could be well understood

from a recent verdict given by the Supreme Court (SC) on February 13, 2019, by which it directed the state governments to evict an estimated one million members of Adivasi and other forest communities. This does not merely mean evicting a million Adivasis and members of other forest-dwelling communities from the habitat, but also poses a serious threat to the autonomy, liberty, dignity, and most importantly, to their right to life and health (Nadimpally, Venkatachalam and Fatima, 2019).

The magnitude of this problem could very well be estimated as around 50 million people have been displaced due to development projects in over 50 years. The 21.3 million development-induced IDPs include people displaced by dams (16.4 million), mines (2.55 million), industrial development (1.25 million) and wildlife sanctuaries and national parks (0.6 million) (IDMC, 2007; Negi and Ganguly, 2011). Understandably, the mass exodus that followed often results in poor economic status, conflicts, food insecurity and most importantly, lack of access to natural resources and plants necessary to sustain ethnomedicinal practices, eventually making an impact on the health status of tribal groups in India. The empirical evidence also shows that many tribal communities lag behind the national average on several vital public health indicators, with women and children being the most vulnerable. For example, a drastic change in traditional health practices among the Baiga tribal community of Chhattisgarh caused by the development-induced-displacement has reduced their indigenous ethnomedicinal knowledge system almost to the level of extinction (Azeez and Sebastian, 2016). Most importantly, incidences of non-communicable diseases (NCDs) like cancer, diabetes, and hypertension, which were almost unknown among the Indian tribal population, are growing fast (SAMA, 2017). Harmful effects of disturbing the naturally-maintained balance have made their appearance in a big way.

Resurgence of Public Interest in Ethnomedicine and Commodification of Indigenous Knowledge

However, since the post-Second World War period, there has been a resurgence of public interest in ethnomedicinal practices or alternative medicinal systems (Dutta, 2014: 283). This renewed interest stemmed from various factors, including dissatisfaction with modern medical practices, the craving for holistic and culturally appropriate treatments, and the recognition of the ecological significance of traditional medicinal plants. The popularity of medicinal plants, herbal drugs, herbal cosmetics, and nutraceuticals across the globe actually started increasing from the late 1960s onwards. The import value of traditional materials for pharmaceutical and cosmetic use was around USD 52.9 million in 1967. This value grew to USD 71.2 million in 1971 and then showed a steady annual growth rate of approximately 5-7% till the mid-1980s (Attisso,

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1983). The growth could be seen in the light of the report of the Food and Agriculture Organization (FAO) in 1995, which shows that around 20% of the drugs in modern allopathic medicine have been derived from plant sources. The worldwide sales figures of herbal medicine of 30 billion US\$ in 2000 as against 60 billion US\$ in 2002 may give an idea of this massive growth (Grain and Kalpavrikash, 2002; WHO, 2002).

With discoveries of potentially effective anti-cancer agents in plants such as turmeric (Ovadje *et al.*, 2015; Aggarwal *et al.*, 2006; Aggarwal, Surh and Shishodia, 2007) as well as a rapidly growing herbal remedies market (Verma and Singh, 2008), this upsurge for the utilization of traditional medicine for mainstream healthcare purposes has gathered momentum in recent times. The renewed interest in Yoga, Ayurveda, or alternative medicine in Europe and America (Kurup, 2004) has also raised the possibilities of increasing commodification of indigenous knowledge (Bode, 2006). With increasing global popularity and demand in the world market, India's medicinal plant resources have come under heavy pressure. Simultaneously, increased unsustainable exploitation and unrestricted export of India's valuable resources to foreign countries, particularly to the consumers in Western countries, have certainly posed a threat to many Indian ethnomedicinal traditions by exposing them to a form of producer-consumer hierarchy, in which healthcare choices were more open and individualistic at the beginning. Besides, it has been observed that most of the indigenous communities in India often lack an adequate knowledge about the legal framework for protection of rights, which has also made the task of safeguarding their traditional knowledge from cases of misappropriation and exploitation rather difficult. Instead, the lack of any prescribed model for fair benefit sharing makes these communities more vulnerable to instances of marginalization and disenfranchisement. Under this producer-consumer hierarchic model, the indigenous communities, in most cases, fail to avail the benefits derived from the commercialization of their cultural heritage.

The Growth of Ethnopharmacological Research: Bioprospecting and Biopiracy Concerns

The growing demand for ethnomedicinal plants in the world market has also resulted in a growth spurt in ethnopharmacological research. Looking at the prospect of discovering new drug molecules from ethnomedicinal herbs and plants and doing business with them in the world market, pharmaceutical companies, biotech firms, and herbal supplement industries have been giving considerable efforts to combine the expertise of chemical, biological, and pharmacological sciences for the understanding and documentation of indigenous uses of various plants and animals. However prolonged exploitation of indigenous knowledge for

commercial gain also questions the ethical grounding of some of the ethnopharmacological researchers (Shiva, 1997; Barnett, 2006), pointing at their inability and unlawful practices concerning the violation of intellectual property rights, benefit sharing, and cultural appropriation.

As is the case with many other parts of the world, the issue of biopiracy has emerged as one of the major concerns in India. Table 1 depicts some of the most prominent cases of biopiracy in India. Filing of a patent by the US multinational corporation W.R. Grace for inventing an antifungal spray from *Neem* was not good news for those holding a brief for the indigenous medicine, given the fact that it has been used for the treatment of all kinds of human and animal diseases in India for a long period of time. Interestingly, the US Patent Office approved their application in 1994. A similar thing happened in 1995 when two scientists from the University of Mississippi filed a patent for discovering the anti-inflammatory properties of *Haldi* (Turmeric), which again was already in use in Ayurveda. Even though both patents were revoked later, the fact that they were granted patent without checking their origin and community attachment shows two important loopholes in the whole system. First, given the growing demand, individuals or institutions are constantly on the lookout for monopolizing and misappropriating the knowledge and the genetic resources of the indigenous communities, though not fully tested scientifically. Second, in most cases, the legal framework for the protection of indigenous knowledge has been inadequately developed to be of any meaningful application.

The issue has become all the more alarming because the global economy of the international trade of herbal products has been increasing at the rate of 15% annually. More than 1000 Companies have annual revenues exceeding US\$ 60 billion from around 29,000 herbal substances, made up of bulk of the herbal products as well as the raw materials sourced from biodiversity-rich countries in Asia, Africa, and South America (Srirama *et al.*, 2017: 651). Again, this heavy pressure on ethnomedicine and increasing cases of ethical violation seem to be interrelated.

EFFORTS MADE FOR THE PROTECTION AND REVIVAL

India's traditional healthcare scenario didn't change readily after independence. Initially, the perception that giving more importance to traditional medicine would be a balancing act on the Western medicine and clinically-based scientific pursuits carried little weight. The Government of India, despite recognizing the role of the traditional systems of medicine and the need for their revival, continued with its policy of almost total reliance on the Western medicine and

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drug-induced therapeutic control (Deo, 2013; Kumar and Pal, 2018). However, a shift of paradigm came through the National Health Policy of 1983, which officially acknowledged the traditional systems of medicine as, “our rich, centuries-old heritage of medical and health sciences” (Priya, 2012:122). Since then, the Indian government has taken considerable steps for the protection and revival of the indigenous healthcare systems.

Table 2: Important Cases of Biopiracy in India

Year	Name of the Item and its Indigenous Use	Act of Biopiracy/Illegal Patenting
1994	<i>Neem</i> , which is used as an effective medicine for almost all types of human and animal diseases because of its insect and pest-repellent properties	U.S. multinational corporation W.R. Grace claimed the patent for creating the antifungal spray Neemax.
1995	Turmeric (<i>Haldi</i>) which is used to treat inflammation, sprain and wounds	Two scientists from the University of Mississippi were granted US patent 5,401,504 on the use of turmeric in 1995
1999	Pepper which is used for the treatment of skin	Patent granted by US patent office to Raman; Amala Lin; Zhixiu Robert; Charles Hider
2006	Ashwagandha which is used for the treatment of insomnia, depression, gastric ulcers and convulsions	Natreon Inc., the US Multi-National has been granted the patent by the European Patent Office (EPO)
2006	Ginger (<i>Zingiber officinale</i>) which is used for the treatment of cough and cold	Nicholas John Larkins, London was granted a patent by the US Patent Office for 8 ginger formulations
2010	Anar (<i>Punica granatum</i>) which is used for the treatment of diarrhea, Ulcer	Toyoharum Hozumi, Takao (Matsumoto): US Patent

The establishment of the Department of Indian Systems of Medicine and Homeopathy (ISM&H) in March 1995 was one such attempt in that direction. To decrease the existing gaps in accessing healthcare services in the country, the government took the initiative of revamping Ayurveda, Yoga, Unani, Siddha and Homeopathy (AYUSH) by bringing them under one head in November 2003 and then upgrade it to the “Ministry of AYUSH” later in 2014 (Samal, 2015; Khatri and Sinha, 2018). Getting recognition for Ayurveda, Yoga, Sowa Rigpa, Unani, etc. as India's intangible cultural heritage from the UNESCO is another important step in this regard. It has helped India in establishing its claim as the country of origin of these

traditions, which in turn has restricted the cases of unlawful filing of patents by individuals or multinational pharmaceutical companies up to an extent.

The government has also taken measures for intellectual property rights protection, prevention of the misappropriation of indigenous knowledge, as well as developing a suitable legal framework for fair benefit sharing. India's stand against acts of unlawful patenting was evident on many occasions. The challenge made by the Indian Council of Scientific and Industrial Research (ICSR) against unlawful patenting of *Haldi* on grounds of lacking novelty as a result of which all patents were revoked in the year 1997 or overturning of patent on *Neem* held by the US multinational company in the year 2000 (Kumar, 1997; Sharma *et al.*, 2018) were few such examples. However, the implementation of the Geographical Indication of Goods (Registration and Protection) Act 1999³, which tried to provide collective rights to the holders of the traditional knowledge belonging to a particular geographical area, can be considered as one of the first firm steps in this direction. Besides, to prevent exploitation and to protect Indian traditional knowledge from wrongful patents made mainly at International Patent Offices, the Indian government also created a digital repository, namely, the Initiation of Traditional Knowledge Digital Library (TKDL) in the year 2001 (Fredrickson, 2022). This repository contains details of India's varied traditional knowledge forms (including that of varied traditional healthcare systems). Implementation of the Biological Diversity Act 2002 is another step by which provision has been made for fair and equitable sharing of the benefits arising out of the utilization of genetic resources (Gadgil, 2003). India has been trying hard to restart negotiations with the World Trade Organization (WTO) on protecting traditional medicinal knowledge from being exploited by big corporate houses. The signing of the Nagoya Protocol by the Government of India in 2010 on access to genetic resources and fair and equitable sharing of benefits arising out of their utilization (Schindel, 2015) is an important step in this regard.

Finally, looking at many indigenous communities' heavy reliance on forest and forest products for livelihood activities and preservation of their traditional healthcare system, the government has changed its perception regarding the implementation of forest-based policies and programmes. By promulgating the Forest Rights Act of 2006 and Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Rules, 2007, community rights over forest resources, especially by the indigenous communities have been given due recognition (Perera, 2009). Under the new provisions, the deprived sections are now entitled to live in the forest under the individual or common occupation for habitation or self-cultivation for livelihood and to have access to use or dispose of minor forest produce.

WHAT IS THE WAY FORWARD?

All of these put us in a situation of dilemma. Should we leave these non-codified Indian ethnomedicinal traditions in isolation, many of which are on the verge of extinction? Firstly, leaving these indigenous groups in isolation is likely to increase healthcare disparities between them and the mainstream populations (Casagrande, 2005: 85). Secondly, this will further hasten the process of decline of traditional healthcare practices among many indigenous groups, which are already diminishing fast owing to the scarcity of plant and animal resources. Due to this, many scholars (e.g. Ambasta, 1986; Maheshwari, Singh and Saha, 1986; Jain, 1991; Holley and Cherla, 1998; Vedavathy *et al.*, 1998; Kala, 2005; Silja, Varma and Mohanan, 2008; Datta, Patra and Ghosh Dastidar, 2014; Abubacker *et al.*, 2018) have stressed upon the requirement for documentation of such oral and indigenous knowledge sets around the use of medicinal plants and animals, intergenerational transmission of which have become very difficult, if not impossible. However, the indiscriminate documentation of these indigenous knowledge sets increases the risk of sudden spurt in ethnopharmacological research and the allurements of bioprospecting, which may lead to the commodification of indigenous knowledge, biopiracy, illegal patenting and violation of intellectual property rights (Shiva, 1997; Gollin, 1999; Waker, 2001; Bode, 2006). And that is exactly what is happening to many ethnomedicinal traditions in India and across the globe. What could be the way forward then?

The answer to this question may be sought from the following options. First is the 'synergy approach', which advocates for enhancing scientific knowledge in conformity with the culture and history of concerned communities. Second is the 'syncretic approach', which advocates for the merging of both the traditional and modern systems to form a new system of better acceptability. Third is the 'complementarity approach', under which one system provides support to another albeit the choice of mode and treatment method are based on evidence. Needless to say, because of its “epistemic subsidiarity” (Jasanoff, 2013; McGonigle, 2016:224), the third approach would be more suited to resolve the issues surrounding the meaningful sustenance of ethnomedicinal traditions in India and across the globe, which are threatened by growing acts of bioprospecting, violation of intellectual property rights and claim of unlawful patents and inadequate sharing of benefits. The “ontological plurality” of the third approach may help in evidence-based acknowledgement and acceptance of indigenous or ethnomedicinal traditions' contributions, which can reduce the overall workload on the Indian healthcare system. While complementing one another, both the Western biomedicine and ethnomedicinal

systems may be able to provide quality healthcare to all at a time, including those indigenous groups who mostly live in rural and remote areas (Payyappallimana, 2010; Sen and Chakrabarty, 2017).

Developing an adequate legal framework for the protection of indigenous rights amid the existing conceptual disparity regarding the ownership of intellectual property rights (IPR), as displayed by two of the most important international bodies like the Convention on Biological Diversity (CBD) and Trade-Related Intellectual Property Rights (TRIPS), has also been a challenge, to say the least (Kartal, 2007; Pushpangadan *et al.*, 2017). While CBD acknowledges the IPR of the collective wisdom and common resources of the communities as a sovereign property, TRIPS recognizes IPR as the monopolistic rights of individual or corporate innovators. In this situation, developing appropriate policies and a conducive and enabling legal framework for undertaking ethical yet sustainable efforts of bioprospecting and biotechnological innovations, while giving adequate attention to the administrative and legal aspects of IPR protection, is far from easy. Side by side, realising the additional functions of benefit-sharing, conservation and the sustainable use of biodiversity associated with traditional knowledge are becoming more and more difficult. But hopefully, the Government of India of late has become more sensitive to all these issues. Forming legislation such as the Patent Second and Third Amendment Acts (2002, 2005), Biodiversity Act (2002), and Plant Variety Protection and Farmers' Rights Act (PVPFR Act, 2001) are a few important steps. These legislations are meant to safeguard the sovereign rights of the country over its biological resources, protect the indigenous knowledge systems associated with biological diversity, and recognize the farmers' rights to save, use, exchange, share, or sell the plant varieties that they have developed, improved and maintained over many generations. The case of Tropical Botanical Garden Research Institute (TBGRI), which developed the antifatigue, immuno-enhancing herbal formulation named 'Jeevani' with the help of indigenous knowledge and resolved to share 1:1 of the license fee and royalty with the Kani tribe, is the first known model of profit-sharing in India. The Ministry of Environment, Forest and Climate Change (MoEF, 2014) has brought out a regulation under 'Guidelines on Access to Biological Resources' and 'Associated Knowledge and Benefits Sharing Regulations, 2014', which advocates sharing of benefits ranging from 0.1 to 0.5 % of the annual gross ex-factory sale of the product (Pushpangadan *et al.*, 2017: 114). These are indeed positive steps, the proper implementation of which may give a boost to the prospect of indigenous medicine in India.

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NOTES

1. A critical understanding, by contrast, involves paying close attention to what Mullings (1987) has called the “vertical links” that connect the social group under study to the larger regional, national, and global human society and to the configuration of social relationships that contribute to the patterning of human behavior, belief, attitude, and emotion.
2. ISFR estimated the growing stock per ha of forest area both in 2009 and 2011 to be around 58.46 m³ per ha of forest area. This is far below the global average of 130.7 m³ /ha and the South and Southeast Asian average of 98.6 m³ /ha for the corresponding period (FAO, 2010).
3. See Act No 48 of 1999, vide notification no. S.O. 1051(E), dated 15th September 2003 for details.

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