'Fourth World botany': documentation and preservation

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India has nearly 67.8 million tribal people belonging to 550 communities of 227 ethnic groups and they lead a nomadic life in about 5000 forested villages[1]. The tribals contribute 8.10% of the total population of India[2]. Each tribal community has its own social and cultural identity. In India, about 116 different dialects and 227 subsidiary dialects are spoken by tribal communities.

The term 'Fourth World' was coined by Canadian thinkers, Manuel and Posluns[3] with reference to Native Canadians, Native Americans, aboriginals of Australia, Maoris of New Zealand and Dalits and tribals of India. Now the term is extended to all oppressed and underprivileged communities in the world. The literature belonging to these people is known as Fourth World Literature, which has acquired political significance in the work of Noel Dyck[4]. Based on this concept the term 'Fourth World botany' has been coined to highlight the importance of documentation and preservation of tribal and indigenous botanical knowledge of the world. All knowledge related to ethnobotany, tribal botany and indigenous botany comes under the Fourth World botany.

Considering the unprecedented rate of deforestation with the current loss of biodiversity and destruction of forest habitats, there is an urgent need for accurate documentation of the knowledge and experiences of the traditional herbalists[5]. A survey was conducted in the Eastern Ghats of Andhra Pradesh (AP), especially Srikakulam and Vizianagaram districts, which reported that about 150 plant species were used by local communities for various purposes[6]. Construction of river valley projects and landscape development have been the order of the day in the entire Eastern Ghats of India. The ethnobotanical information besides listing the traditional uses of plants, helps ecologists, pharmacologists, taxonomists, and watershed and wildlife managers in their efforts for improving the plant wealth of the area[7].

Ethnobotanical studies

The tribal communities have a treasure of knowledge on the utility of plant products of domestic, medicinal and commercial value. Indigenous herbal treatment is a part of the culture and dominant mode of therapy in developing countries like India and South East Asia. The World Health Organization estimated that over 80% of the world population has relied chiefly on traditional medicine[8]. In India, the use of plants for treatment of various ailments dates back to 5000 years[9]. Besides their use as food, fodder and medicine, they are also used in handicrafts. Tribal communities in the Eastern Ghats make drums, mats, umbrellas, plates, ropes and fencing material by using these plants. The tribal people use bark of *Cassia auriculata* as tanning material and wood of *C. fistula* for agricultural tools, but the flowers of both are used as vegetable[10].

The local communities in Vizianagaram district have a wide range of herbal remedies for diabetes, dysentery, helminthiasis and constipation. Leaf part is mostly used than root and stem. Herbal medicine is given mostly in the form of decoction. The stem bark of *Phyllanthes reticulatus* is used in treating pyorrhoea; it was also reported to be used as a tooth cleaner and to relieve headache and general fevers by the Jatapu and Savara tribes in Srikakulam district[6]. The latex of *Ficus benghalensis* is used for boils and blisters, whereas the whole plant is used for treating kidney diseases by tribal communities of Nalgonda region, AP[11]. The leaf paste of *Cipadessa baccifera* is used for cooling effect; however, the Irula tribes of Hasanur hills, Erode district, Tamil Nadu have been using the leaf, root and bark paste for treating psoriasis[12].

Rajasekaran and Warren[13] opine that the ethnobotany plays an increasingly important role in sustainable development and biodiversity conservation. However, the claims of indigenous people with respect to usage of plants in treating various ailments should be validated by clinical trails.

Importance of exploring Fourth World botany, its documentation and preservation

The traditional knowledge related to the use of natural resources, including medicinal plants has been recognized as one of the important assets inherited through generations by the tribal communities[14]. Although several ethnobotanists and anthropologists have made attempts to document the traditional knowledge in various parts of the world, several remote localities and indigenous communities have remained unnoticed[15]. Nowadays, the number of tribal doctors is decreasing because of various reasons. There has been rich ethnobotanical knowledge across the globe, but this is fading due to migration to urban areas, loss of interest among the youth, dependence on modern medicine and extinction of some tribes (vulnerable tribes such as Jarawa in Andaman Islands; http://www.survivalinternational.org/thereyougo). Therefore, there is an urgent need for documentation and preservation of Fourth World botany, that ultimately would have a great potential for research and discovery of new drugs to treat diseases.

It was observed in our study and also that by Ayyanar and Ignacimuthu[16], that the roots of *Hemidesmus indicus* are commercially exploited as excellent source of soft drink during summer season. Due to over-exploitation, there is a great danger of its extinction. Hence, efforts must be made to protect this species from this region by involving the local communities. In the West Kameng district, Arunachal Pradesh, plants such as *Gymnocladus assamicus*, *Rhododendron* spp., *Quercus* spp., *Daphne paparacea*, *Thuja occidentalis*, *Manihot esculentum* and *Illicium griffithii* have been conserved by the tribes because of their religious beliefs, faiths and taboos; they consider the forest patches as sacred groves[17]. Sacred groves help in the preservation of medicinal plants and natural vegetation around the globe.

Pharmaceutical researchers acknowledge that screening plants on the basis of information derived from traditional knowledge saves time and resources. Therefore, detailed studies on these Fourth World claims regarding validation, isolation of active principles, pharmacotoxicological tests and clinical trials to assess their efficacy and safety are required[18].

Territorial rights and benefit sharing

Indigenous people and tribals living in the forests have a long association with nature and a deep understanding of it. They should be recognized as rightful, equal partners in the development and conservation of natural resources and their territories[6]. Because of religious beliefs and certain taboos, some forest pockets are protected by the tribes as sacred groves. In India, the Biological Diversity Bill (No. 93 of 2000), Wildlife Protection Act, 1972, and the Protection of Plant Varieties and Farmers' Rights Act, 2001, support the tribal people for conservation of sacred groves and their own territories. M. S. Swaminathan also pointed out that tribal communities of India have the first right to get benefits from such resources[19].

The interior tribal communities of the study area do not allow the general public and officers of the Welfare Department unless there is permission from the hamlet headman. They feel that the forest is their own property and outsiders may harm their culture and forest resources. In 1874, the Scheduled District Act kept substantial Adivasi (aboriginals) areas outside the normal administration. Later, the administration classified most Adivasis as 'Schedule Tribes' and established 'Scheduled Areas' designed to protect them from incursion and also granting colonial administrators considerable discretionary powers over the areas[20]. The 1901 Land Revenue Code also prevented the sale of tribal land without permission of the District Collector.

The Convention on Biological Diversity (CBD) is the most important treaty dealing with infinitely complex but fragile diversity of life on Earth. Regulating access to genetic resources and equitable sharing of commercial benefits of biodiversity has been the most contentious issue in the negotiations under CBD[21]. The Nagoya Protocol-2010 adopted by the Tenth Conference of Parties (CoP), provides the framework to facilitate access and benefit-sharing. In the recently concluded CBD (2012) held at Hyderabad, the Prime Minister of India Manmohan Singh announced US$ 50 million for conservation of biodiversity We hope this fund would strengthen the institutional mechanism for biodiversity conservation in India and also to attain CBD objectives.

In India, efforts of the government-sponsored National Innovations Foundation and NGOs like SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions), MSSRF (M. S. Swaminathan Research Foundation), FRLHT (Federation for Revitalization of Local Health Traditions) provide a platform to build the registration and benefit-sharing systems at the grossroot level[1].

Koopman[22] has comprehensively dealt with the problems of proprietory recognition of traditional knowledge associated with biological material. Traditional knowledge is developed on cultural and religious lines, instead of competitive industrial context, and it is often communicated and applied openly. Traditional knowledge is confronted with lack of novelty and inventivity. Prathapan and Rajan[21] also discussed the legal problems encountered in the proprietary recognition of indigenous knowledge.

In spite of all the above hurdles, there is a need to evolve some strategy to grant proprietory right to traditional knowledge that passes from one generation to the next. Recently, the Tropical Botanic Garden and Research Institute (TBGRI) developed an indigenous knowledge system that supports adequate compensation to tribal people[1]. The model has got wide acceptance throughout the world, because it recognized the resources rights and intellectual property rights of a community, that have been acquired through traditional knowledge over generations[23,24]. In future, more effective benefit-sharing mechanisms should be evolved, so that improvement of socio-economic conditions of tribal communities and effective conservation of biodiversity would be achieved.

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