



INDIA AS MEGA BIODIVERSITY NATION: A FANTASTIC “ETHNOBOTANICAL MUSEUM”

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ABSTRACT:

Mega biodiverse country is one that contains majority of living species found on the earth. There are 17 mega bio diverse countries in the world. India ranks 9th, in terms of richness of higher plant species. Flora and fauna are most diverse along with food, culture, clothing, languages in India. Biodiversity is due variety of geographical features that include frozen glacier, deep rain forest, fertile valleys, blistering deserts and beaches with palm vegetation India also has islands like Andaman Nicobar, Seychelles, Lakshadweep island which is home to different species of plants. The land occupied for this mega biodiversity is 2.4% of land on the globe which accounts 7.8 % of world recorded species and most of them are preserved and protected our plant wealth by the tribals who are 7.5 % of India's population as they have been using many plants for curing their ailments, to celebrate festivals, ceremony, folklore, vitality and longevity enjoyed by the tribals since time immemorial. Ethnobotany consists of knowledge based on uses of plants applied by tribal community. Linked to Ethnobotany are taxonomy, nutrition, pharmacognosy, phytochemistry, palynology, ecology and conservative biology On the basis of vegetation India has ten zones or phytogeographical regions.. These are all biodiversity places and full of dense forests, they are home to some of earth's unique flora having 17000 species of Angiosperms, 65 species of gymnosperms, 1232 species of pteridophytes, 2850 species of bryophytes, 6990 species of algae, 2075 species of lichens, 14500 species of fungi and tribals are using most of the in their daily life styles.

Key words: - *Ethnobotany, Museum, Angiosperms, phytogeography, forest*

INTRODUCTION:

The year 2010 was declared as the 'International Year of Biodiversity' and the theme for this year's environment day was "Biodiversity: Connecting with Nature" Mega bio diverse country is one that contains majority of living species found on the earth. The main criterion for mega diverse countries is endemism at the level of species, genera and families. A mega diverse country must have at least 5,000 species of endemic plants and must border marine ecosystems (1). India is known for its rich heritage of Biological diversity. The greater the multidiversity of species, greater is the contribution to biodiversity (2).

The large species richness and abundance are due to immense variety of climatic and

altitudinal condition in country. These vary from the humid tropical Western Ghats to the hot desert of Rajasthan, from cold desert of Ladakh and the icy mountain of Himalayas to the warm cost of peninsular India and these includes ecosystem diversity is highest in the world, India is situated at the tri-junction of three realms Afro-tropical, Indo-Malayan and Paleo-Arctic realms, and therefore, has characteristic elements from each of them. India is a remarkably diverse country having linguistic, genetic and cultural diversity (3). The country is recognized as one of the eight Vavilovian centers of origin and diversity of crop plants having more than 300 wild ancestors which are closely related to cultivated plants

There are 25 clearly defined areas in the world called 'hot spots' that support about 50,000 endemic plant species, comprising 20 per cent of the world's total flora. India's defined location of 'hot spots' is the Western Ghats and the Himalaya regions. Approximately 65 per cent of the total geographical area has been surveyed so far. Based on this, over 46,000 species of plants and 81,000 species of animals have been described by the Botanical Survey of India (BSI) established in 1890. The forests India have been classified into 16 types and 251 subtypes by climatic and edaphic conditions. On the basis of vegetation India has ten zones or phytogeographical regions.(4)

There are number of climatic and edaphic factors that make India a mega diverse region.

Climatic factors- Climate of India is a most significant factor that makes a region very diverse because it causes the plants and animals to germinate and adopt and develop its features. India has all different climatic conditions which lead to it being a mega diverse country.

Location- India is located in south Asia, between latitude 6° and 38° N and longitudes 69° and 97° E. The Indian landmass extending over a total geographical area of about 3029 million hectares is bounded by Himalayas in the north, the Bay of Bengal in east, the Arabian Sea in the west, and Indian Ocean in the south.

Rain fall - The annual rainfall varies from less than 37 cm in Rajasthan to 1500mm in Cherapunji. The country experiences three different seasons – winter, summer, and monsoons.

Sunlight- The days in summer are long and in winter short. With up to approximately 14 hours the longest days are in June. On the other hand the longest dark nights happen in winter (in the southern hemisphere it is the other way around). In December a night in New Delhi last almost 14 hours.

Edaphic Factor-Soil- Soils in India vary widely, having been formed by the various agents of weathering such as wind, water and temperature. Climate, composition of parent rock and even altitude play a role in the types of soil found in different parts of the country. Indian soils support varying kinds of vegetation, depending upon the mineral content, moisture-holding capacity and levels of acidity. Different types of soil give life to different kind of vegetation depending upon region to region and the weather conditions. Example in Rajasthan Bajra, millet, barley is grown, Rice, sugarcane is grown in Bihar, Bengal because these require comparatively more water than other crops apples, tea, and coffee is grown in mountain soil. Similarly, cotton is grown in Maharashtra because of black soil, then we also have Ran of Kutch (salt pan) where apart from salt pan we can also see migratory bird called flamingo etc

Forests: Different types of Forest are found in India. In tropical region climatic forests having luxuriantly growing lofty trees which are more than 45 metres in height. The shrubs, lianas (woody climbers) and epiphytes are abundant because of high rainfall. These forests are found in Andaman and Nicobar Islands, Western coasts and parts of Karnataka (N. Canara), Annamalai hills (Koorj), Assam and Bengal. In some regions semi evergreen forests are found like along the western coasts, eastern Orissa and upper Assam where annual rainfall is between 200 to 250 cm. They are characterized by giant and luxuriantly growing intermixed deciduous and evergreen species of trees and shrubs. The important plants in these forests are the species of *Terminalia*, *Bambusa*, *Ixora*, *Dipterocarpus*, *Garcinia*, *Sterculia*, *Mallotus*, *Calamus*, *Albizzia*, *Elettaria*, *Pothos*, *Vitis*, *Shorea*, *Cinnamomum*, *Bauhinia*, etc. Orchids, ferns, some grasses and several other herbs are also common. The families with high percentage of endemic species include Berberidaceae

(98%), Saxifragaceae (92%), Ranunculaceae (72%), Rosaceae(70%), Melastomaceae (56%), Balsaminaceae (44%), Acanthaceae (38%) and Asclepiadaceae (32%). In addition to the above India also possess 40 species of insectivorous plants, 130 species of primitive plants, 130 species of parasites and 70 species of saprophytes (5). India has many endemic plant and animal species. Among plants, species endemism is estimated at 33%. More than 140 endemic genera but no endemic families (6)

In Mahabaleshwar, Coorg, Karnataka, parts of Assam, Panchmarhi and other parts of M.P. wet hill broad leaves forest found. The important plants found in the wet hill forests of south are the species of *Eugenia*, *Randia*, *Terminalia*, *Elegans*, *Murraya*, *Gymnosporia*, *Atylosia*, *Ficus*, *Pterocarpus*, *Lantana*, etc. while those of the north are *Castanopsis*, *Calamus*, *Alnus*, *Quercus*, *Betula*, *Schima phoebe*, *Cedrella*, *Garcinia*, *Populus* etc. India's biodiversity is estimated to be over 45,000 plant species representing about 7% of the world's flora and India stands tenth in 25 most plant-rich countries of the world. Its variety of animal life represents 6.5 per cent of world's fauna. Being one of the oldest and largest agriculture societies, India has at least 166 species of crop plants and 320 species of wild relatives of cultivated crops. The vegetation ranges from xerophytic in Rajasthan, evergreen in the North-East and the Ghat areas, mangroves of coastal regions, conifers of the hills and the dry deciduous forests of central India to alpine pastures in the high reaches of the Himalaya. India has a number of alternative medicines, like Ayurveda, Unani, Siddha and Homeopathic systems that are mainly based on plant based raw materials in most of their preparations and formulations. Herbal preparations for various purposes including pharmaceutical and cosmetic purposes form part of the traditional biodiversity uses in India.

The term Ethnobotany was first coined by an American botanist John William Harshbarger, in 1896 in an attempt to study the plants used by the primitive and aboriginal people. Since then it has been defined as the traditional knowledge of indigenous communities about surrounding plant diversity and how various people make use of indigenous plants found in their localities. It is the study of a region's plants and their practical uses through the traditional knowledge of a local culture and people (7). An ethnobotanist thus strives to document the local customs involving the practical uses of local flora for many aspects of life, such as plants as medicines, foods, intoxicants and clothing (8), often referred to as the "father of ethnobotany" (9). Ethnobotany has been defined as the study of direct interaction between humans and plants (10). As ethnobotanical studies have emphasized the use of plants by hunter gathered and agricultural societies, it is often assumed that it is restricted to those societies only. As plants play important role in almost every realm of human activity, Ethnobotany encompasses many field including botany, biochemistry, pharmacognosy, toxicology, medicine, nutrition, agriculture, ecology, evolution, sociology, anthropology, linguistic, history and archeology (11,12,13). Nearly 6,500 native plants are still used prominently in indigenous healthcare systems. India has about 563 tribal communities having age-old traditional knowledge through their long association with the forest. They were accumulated valuable knowledge on the use of wild plants in their daily life fulfilling their every need in all seasons. Together with a host of non-timber forest product such as gums, resins, fruits, nuts, oil, dyes and medicinal plants, the value of forest products, both for subsistence and industrial use, is increasing exponentially. Forests are also the most important source for fibre for paper and pulp industries, with

bamboo occupying the key position (14). Historically all medicinal preparations were derived from plants, whether in the simple form of plant parts or in the more complex form of crud extract, mixture etc. Today a substantial number of drugs are derived from plants. Therefore on the basis of above information, it is said that India as mega biodiverse country is a perfect “ Ethnobotanical museum”

On the other side, all of us know that each and every plant contains some or other medicinal property and for that tremendous or hazardous deforestation is going on to prepare medicines. One more important cause of deforestation is our growing population and for that to solve the question of their residence and transportation to fulfill their needs large numbers of plants are cut down. The removal of trees without sufficient reforestation has resulted in habitat damage, biodiversity loss, and aridity. Deforestation causes extinction, changes to climatic conditions, desertification, and displacement of populations, as observed by current conditions and in the past through the fossil record (15) developed from plants which are active against number of diseases. Between 2000 and 2012, 2.3 million square kilometres (890,000 sq mi) of forests around the world were cut down.(16). According to the Global Forest Resources Assessment 2020 the global rate of net forest loss in 2010–2020 was 7 million ha per year (17). To preserve the rich biodiversity, ten biosphere reserves have been set up in specific biogeographic” zones: the biggest being in the Deccan Peninsula in the Nilgiris covering Tamil Nadu, Andhra Pradesh, and Karnataka. Others include the Nanda Devi in Uttarakhand in the Western Himalayas, the Nokrek in Meghalaya, Manas, and Dibru Saikhowa in Assam, the Sunderbans in the Gangetic plain in West Bengal, Similar in Orissa, the Great Nicobar and the Gulf of Mannar in Tamil Nadu (18) Also Twenty one wetlands, and mangrove areas and

4 coral reef areas have been identified for intensive conservation and management purposes. The Ministry of Environment and Forests constituted the National Afforestation and Eco-development Board (NAEB) (19). The exploitation of land and forest resources by humans along with hunting and trapping for food and sport has led to the extinction of many species in India in recent times (20). Plants are considered sacred (eg: *Ocimum santum* or Tulsi) or find mentions in mythological stories are used in religious rituals (eg: *Nelumbo nucifera* or Indian Lotus). These are the deep associations between biodiversity and culture presents us with a unique opportunity for their conservation.

CONCLUSION:

The biodiversity is not only genes, species, population, community and ecosystem only but also it refers to productivity, nutritional status, biocontrol, biofertilizers, bioenergy, breeding strategies, livelihood, lifestyle, endogenous knowledge with ex-situ and in-situ conservation. We have a lot of endogenous species of flora and fauna in all ecosystems. They are part of traditional biodiversity. Though many crops like rice sugarcane, mango, jute, citrus, banana, bazra, jwar etc, arose in India and spread throughout the world, a large proportion of the Indian biodiversity is still unexplored.

Today the field of ethnobotany requires a variety of skills: botanical training for the identification and preservation of plant specimens. A great deal of information about the traditional uses of plants is still intact with tribal people and they are not ready to share it with outsiders so the knowledge of wild plants for food, medicine, and fibers, among others, was left out of the picture, resulting in a distorted view of which plants were actually important to them. They use forest plants, weeds, fruit plants, vegetables, spices,

ornamental plants, ferns and many others as traditional medicine and preparing agricultural implements. To collect proper information, we have to develop a long-term commitment and genuine relationship with the tribals. India being a mega biodiversity country fulfills all the requirements of tribal people including problems of nutrition, health care and life support system, social customs, mythological association or faith in plants, cottage industries, economic upliftment, conservation of biodiversity and sustainable use of plant resources and proved as complete and fantastic Ethnobotanical museum.

REFERENCES

1. "Biodiversity, Australia State of the Environment Report 2001 (Theme Report): The meaning, significance and implications of biodiversity (Megadiverse countries)". 2014-12-11. Retrieved 2018-07-02
2. Myers, N. et al. Nature 403, 853–858 (2000)
3. India, a Country Study United States Library of Congress, Note on Ethnic groups
4. Karanth, P. K. (2003) Evolution of disjunct distributions among wet-zone species of the Indian subcontinent: Testing various hypotheses using a phylogenetic approach Current Science, 85(9): 1276-1283
5. Rakesh Sinha et al 2010 Enviro New, News letter, Vol. 16, No 4, 2010
6. Botanical Survey of India, 1983.
7. "Ethnobotany". www.fs.fed.us. Retrieved 2 May 2018.
8. "Ethnobotany". www.eplantscience.com. Archived from the original on 14 April 2018. Retrieved 2 May 2018.
9. Kandell, Jonathan (13 April 2001). "Richard E. Schultes, 86, Dies; Trailblazing Authority on Hallucinogenic Plants". *The New York Times*. *The New York Times Company*. Retrieved 2 May 2018.
10. Ford, R.I. 1978a. Ethnobotany: Historical diversity and synthesis. Pages 33-49 in R.I. Ford, ed., The nature and status of Ethnobotany. Anthropological papers no.67. museum of anthropology, University of Michigan, Ann Arbor.
11. Balick, M.J..1990. Ethnobotany and the identification of therapeutic agents from the raon forest. In bioactive compounds from plants. Edited by D.J. Chadwick & J.Marsh. Ciba Foundation Symposium no. 154,
12. Black, Leonard W. and Hugh C. Cutler.2001. Plants from the past .University of Alabama press.
13. Cook, F. E.M. 1995. Economic Botany Data Collection Standard. Edited by H.D.V. Prendergast . Royal Botnaical Garden ,Kew, United Kingdom. Cotton,
14. Pragati Ghosh :2017
15. Sahney, S.; Benton, M.J. & Falcon-Lang, H.J. (2010). "Rainforest collapse triggered Pennsylvanian tetrapod diversification in Euramerica". *Geology*. **38** (12): 1079–1082. Bibcode:2010Geo....38.1079S. doi:10.1130/G31182.1
16. "Facts About Rainforests" Archived 22 October 2015 at the Wayback Machine. The Nature Conservancy. Retrieved 19 October 2015.
17. Tiyasha M. (2015), <https://www.environmentalpollution.in/india/india-as-a-mega-diversity-nation/3150>
18. "Global Forest Resource Assessment 2020". www.fao.org. Retrieved 26 May 2020.

19. Ministry of Environment and Forests constituted the National Afforestation and Eco-development Board (NAEB) in August 1992

20. Vivek Menon (2003). *A field guide to Indian mammals*. Dorling Kindersley, Delhi.

