CHAPTER: 1

INTRODUCTION
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It is an indisputable fact that these days there is an immense awareness and concern for Biodiversity throughout the world. The urgent need for conserving the Biodiversity is well realised. Assessing and understanding all the components of biological realm is a prerequisite for studies and conservation activities on Biodiversity. It is pertinent to quote our erstwhile Prime Minister, late Smt. Indira Gandhi, who said, “the survival of human race is dependent on the survival of animal and plant life”.

Although Man is at the top rung of the evolutionary ladder, and has supremacy of life form, with his inquisitive caliber, the interdependency and web of life form for sustained life on earth, his is a contemporary and true realisation.

In the course of evolutionary history, man has always been striving for betterment of life through utilization of plant and animal resources. Due to his close relationship with nature, he developed a unique understanding and knowledge on utilisation of biological wealth. He observed animals eating certain plants and naturally tried to imitate by gathering his food. Further, he also developed and stored medico knowledge to heal his wounds and so also sought protection from rains and hailstorm by using plant material. Subsequently, man discovered various methods of preservation and promotion of health and cure of various ailments by using wild plants and animal’s dead or live parts. Consequently, he developed a storehouse of knowledge regarding efficacies of plants and wild animals.

Thus, man was initially dependent upon plant and animal kingdom, which was the only source to support the life system. As man started his journey to move away from Mother Nature, he seemed to be more prone to many diseases. Since ages, plant based medicaments have been man’s prime therapeutic weapons and are still in tune with life of a common man for treating large number of
diseases. As one goes deeper into the study of plants and animals used in traditional medicine, the more one perceives new possibilities of finding additional plant derivatives.

The process of evolution of plant kingdom took place long before the advent of man. During human evolution, man was directly exposed to plants and animals for his existence. This knowledge made man to surpass all other creatures existing on this planet. Tribals dwelling in the dense forests used to get their basic requirements like food, shelter, and body coverage from forest resources. Nature was also so kind that during the last thousands of years it has been benevolent for the tribal community. Socio-economic change is universal truth and no society whether primitive or modern is left untouched by its impact. People mostly welcome change as it offers a variety to existing pattern and variety is considered as the spice of life, particularly for the aboriginal people.

Ethnobiology tries to focus on the very critical understanding of modes and scope of the interactions between man and nature habitats (including plants and animals). Ethnobiology must have been the first knowledge for man to acquire to satisfy his hunger, healing his wounds and curing his ailments by means of biological resources.

Ethnobiology is defined as a study of interaction of human societies, especially primitive human societies like tribal and aboriginal communities with the surrounding habitats. Power (1874) used the terms “Aboriginal botany” which meant study of the plants used by aboriginals for food, medicine, shelter, textiles, fabrics, ornaments, etc. The term “Ethnobotany” was first coined by J.W. Harshberger (1885), over a century ago, where he described it as the study of plants used by primitive and aboriginal people. Robbins, et al. (1916) gave a broad definition of the Ethnobotany as the investigation and evaluation of the knowledge of all phases of life amongst the primitive societies and plant environment with respect to life, customs, beliefs and the history of tribal people.
Vestal and Schultes (1939) said that Ethnobotany is a part of economic botany. Jones (1941) rendered a concise definition of ethnobotany as a study of the interrelationship of primitive man and plants. Castetter (1944) confirmed ethnobotany as a study of the botany of man in primitive state of culture. According to the well-known ethnobotanist Schultes (1962), ethnobotany is "the study of the relationship which exists between people of primitive societies and their plant environment". In simple words, it is an anthropological approach to botanical science.

Faulks (1958), one of the foremost, and author of a book on ethnobotany entitled "An Introduction to Ethnobotany", discussed the field inquiry details and information to be collected while studying ethnobotany, viz., plants concerning domestic animals (such as veterinary medicine and fodder), plants used as food, fat, oil, flavour, household equipments, clothing, cordage, cosmetics, playing instruments, musical instruments, walking sticks, trade and medicines, etc.

The term "Ethnobotany " is not new to India. Kirtikar and Basu (1935) have stated, "The ancient Hindus should be given the credit for cultivating what is now called ethnobotany". Jain (1987) said, it is the total natural and traditional relationship and the interactions between man and his surrounding plant wealth. Wickens (1990) defined ethnobotany as ‘the study of useful plants prior to their commercial exploitation and eventual domestication’.

The exact relationship of man and plants according to Jain (1995) can be classified into two major categories (a) abstract and (b) concrete. The abstract relationship includes faith in the good and bad powers of plants, taboos, totem, sacred plants, worshipping and folklore e.g., some plants are closely associated in tribal mythology. For instance, in the present area it was observed that *Terminalia bellirica* is supposed to be sacred for Katkari tribals.
The concrete relationship includes food, medicine, house building, agricultural implements and other domestic uses of plants e.g. almost all Hindu families cultivate the plant *Ocimum americanum* in their courtyard, the purpose seems to be that the leaves are always handy for curing common colds, sore throat and cough.

After effectively analyzing the man-plant relationship it is easier to understand its interdisciplinary nature. There are many more interdisciplinary aspects of Ethnobotany i.e. ethnopharmacology, ethnomedicine, ethnogynaecology, which have been perpetuating from one generation to another for ages.

More than 300 million indigenous people, forest dwellers and artisans live in more than 70 countries in habitats ranging from the Arctic to the rain forests of Asia and South Africa. China and India together have more than 150 million indigenous people and tribals. At least 5,000 indigenous groups can be distinguished by linguistic and cultural differences (Maheshwari, 1996). There are around 427 tribal communities all over India.

Next to Africa, India has the largest number of tribal population in the world. The total population of Scheduled tribes in India as per 1991 census, is 6.78 crores, which is nearly 8.01% of the total population in the country. At present our country is witnessing the emergence of Ethnobotany as a distinct academic branch of the natural sciences. Realising this, the Government of India, Ministry of Environment and Forests, New Delhi launched a project entitled "All India Coordinated Research Project on Ethnobiology" in 1983. Its second phase for filling the remaining gaps of the first phase is also almost complete.

World Health Organisation (WHO) has estimated that about 80% of world's population cannot afford synthetic medicines and they have to depend on traditional medicines, majority of which are being derived from plants, which include an estimated about 1,650 herbal formulations. We have examples like
Philippines Government encouraging the use of herbal medicines due to its low cost. Thus, the Earth Summit or Rio-conference was held in 1992 for conservation and sustainable utilisation of biodiversity, in which 90% of the nations participated.

In the Western World, in particular, the developing concept that natural is better than 'chemical' or 'synthetic' has led to the evolution of neo-western herbalism that is the basis of an ever expanding industry. In the United States, often guised as food, or food supplements known as nutraceuticals, these formulations are readily available for those who wish self-medication. Within the system, in particular are plants that lack ethno-medical verification of efficacy or safety.

Given the universally accepted objective of improved health for all by the year 2002 AD, health policy makers of India had considered ways and means of integrating indigenous healing system into the national health delivery system. In spite of this, by and large, the solutions offered by these planners often fail because they do not fit in with the local environment. Indigenous medicinal knowledge is based and built by many years of experience through trial and error method. It has been continuously threatened with extinction due to scientific development and the introduction of western medicines. Intensive efforts, therefore, should be made, especially, in India to record and document the remaining indigenous knowledge on traditional medicine of various tribes before it is lost forever. The danger of extinction is further aggravated by continuous influx of younger generation towards urban areas in search of easy money.

A proper interaction between indigenous herbal knowledge and modern western medicine may prove profitable to provide improved health for all. Realising this, there were some efforts from NGO's resulting in the Foundation for Revitalization of Local Health Traditions (FRLHT), Bangalore. In Maharashtra, FRLHT, Bangalore have funded a project "Honya Koli Medicinal plants conservation area, Kharpud", established in 1997-98, under the taluka Rajgurunagar, Pune District.
The aim of this project is to conserve and protect medicinal plants through village people.

In the same sense, from the Government of India, Honorable Prime Minister Sri A.B. Vajpayee has assured all support of the government for promotion of traditional systems of medicines. He also further asserted that without promotion of Indian System of Medicines, the goal of health for all couldn't be achieved. He also lauded the role of about 5,000 ayurvedic practitioners working in rural areas. Possibility of appointing a Minister and increasing of budget allocation to the system were some of the assurances.

In the worldwide concern, US also backed global fund to save world biodiversity to conserve the world's seed varieties and protect crop diversity from national disaster and war, other threats (CSIR report, Mar.03).

Based on a review study of tribal health, disease and treatment noted that quite often it is said that the tribes are so traditional that they do not use modern facilities. It was observed during the present studies that although, the state Government has provided pucca houses to the tribals, they prefer to stay in the huts built aside the house and lodge their domestic animals inside pucca houses. This shows that how deeply embedded are their beliefs and culture (Choudhary, 1980).

**ROLE OF ETHNOBOTANY WITH PRESENT SCENARIO**

**TRADE AND PATENTS**

India has agro-climatic conditions; its rich biodiversity places it among the 12 mega diversity centers. The Tropical Botanic Garden and Research Institute (TBGRI), Trivandrum has estimated that nearly four-fifths of the drugs of pharmacopoeia are occurring wild in India and about 50% of 45,000 plants recorded in India have medicinal or aromatic values. Besides, the country is the
home for 95,000 animal species. Being blessed with one of the richest biodiversity bases in the world, India stands to gain immensely by evolving and marketing its own eco-technological products internationally (Chengappa, 1995).

There have been some initiatives in this direction. For instance, the Central Drug Research Institute (CDRI), Lucknow has sought a patent on Brahmi plant, which is supposed to be a memory rejuvenator. Yet to make a quantum leap in world market, India has to go beyond hawking the occasional chawanprash or neem soap and more into new frontiers of eco-technology. Many Indian products have already been patented by outside agencies without the least assertion of ownership rights to India.

In this regard, Indian scientists are developing world’s first herbal contraceptive pills using a 2500 years old recipe (Asian age, Delhi dated 29 Mar. 03.). In addition, Ministry of Culture is planning to launch a mission to conserve country’s folk mythology, rituals, music, dance and such oral traditions (Times of India, March 03).

It is true that the natural resources of India are very rich genetically and are creating new era in research work. Initially vital genetic material of both flora and fauna was being stolen from Southeast, Northeast and Himalayas and supplied to other countries though Indian agents. If the legislation in this context is implemented, India can fight for acquiring the rights through internationally agreed Convention on Biological Diversity.

After much of deliberation, the M.S. Swaminathan committee has finalized a draft, which was presented to the then Prime Minister, Sri I. K. Gujral, who is said to have approved it. The committee has proposed a national biodiversity fund through which any benefits accruing from the use of indigenous knowledge will be shared with local communities. The much-awaited legislation on country’s...
biological wealth has since been passed in 2002, which will expedite the
documentation of indigenous knowledge and might check bio-piracy in India.

Indian Government is already deeply concerned for examining the laws and
process of patenting of the Bio-derivatives. With the issues on patenting turmeric
plant the Government have serious concern related to patents. It is understood
that thousands of applications are awaiting the deal. The Government is believed
to have taken cognisance of the same and allocated funds besides appointing
special staff.

Dr. Mashelkar, Director General, Council of Science and Industrial Research
(C.S.I.R), New Delhi recently remarked that most of the knowledge is being
passed from one generation to other by verbal means. We have shown laziness
to document the things because of skepticism. As in turmeric Patenting, India
could not win the case of Azadirachta patent because it could not produce
documentary evidence corroborating the indigenous knowledge belonging to
India. Recently, 160 wild, traditional, medicinal plants are screened and the
process is in progress for patenting.

Close on the heels of basmati rice being patented by Rice Tec Inc company of
USA, the company has developed a new variety from Basmati rice. But the well-
known fact is that Basmati rice is native of India. Besides this, there are more
patents on turmeric, ginger, Neem, black pepper, natural products and other
medicinal plants of which most of the medicinal plants are from China & India.
In the year 2000, Karela, Jamun and brinjal have been patented by another
American Company, Cromak Research Inc. under number US 6900240 for anti-
diabetic products. India will be a great looser if it does not have any documentary
evidence about indigenous knowledge belonging to India, as it happened in case
of Neem. For this purpose, efforts have been initiated in India to prepare
database using modern technology and make it known to the world. Thus, it can
avoid lengthy procedures in canceling patents of others (CSIR report, Jan-2000).
Similarly, "Indian curry" was patented by Japan. Siko Ipson Corporation of Japan prepared a clock depending upon Vata, Pitta & Kaffa, and the principles of Ayurved and which has been approved in US. Thus, the original principles of Indian ayurved are exploited to explain the time of a day, which is coming close to the concept of biotic clock.

These ample examples show the failure of the Govt. to protect the national interest. Now, Ayurved experts should think as to how the objections can be raised against such patents. It is high time to ponder over the matter for conservation and protection of our inherited, priceless knowledge of medicament.

The Ministry of Health and Family Welfare has initiated a series of measures to protect the traditional systems of Medicine and Homeopathy. The measures include constitution of an expert group to advise the Department of Indian Systems of Medicine and Homeopathy (ISM & H) on various patent related issues and setting in motion agents to gather information from patent offices in different parts of the country on patents applied in India and other countries. The Central Council for Research in Ayurveda & Siddha, Unani and Homeopathy have also been asked to set up patent cells to gather relevant information on the basis of work done by other Ministries with regard to ISM &H drugs. In this context, the National Medicinal Plant Board has been set up under Govt. Resolution notified on 24 Nov. 2000. The main object of the board is overall growth of medicinal plants sector in the country.

Indian scientists developed an "Herbal Care Kit" with 14 herbal drugs to be used for common colds, fever, headache, cold, cuts, wounds, diarrhoea and dysentery. All these endemic herbal plants are going to become a part of genetic library. The gene bank of medicinal and aromatic plants has been set up which is funded by Department of Biotechnology under the Union Ministry of Science & Technology and so also by G-15 countries. Other national gene banks are also being established at the Central Institute of Medicinal and Aromatic plants, Lucknow.
Indian Biodiversity is genetically very rich, but it does not have the technology to harvest its resources like other developing countries. Hence, our country had been exporting much of biodiversity and getting very little in return. TBGRI scientists have estimated that 25 rare and useful species of India are nearing extinction due to over-exploitation by foreign drug companies through Indian agents e.g. *Coptis teeta*, the source of berberin, a multi-ailment drug. *Commiphora mukul* used in preparing the drug Gugulipid, which is an indigenously developed anti-cholesterol drug, is also vulnerable.

Today, India in the form of industrially exploitable genetic resource is yet to create even an inventory of its copious gene-wealth. The inventory is indispensable because we should have genetic profile of our plants on the basis of which, according to Biodiversity Convention, we can claim the benefits derived from plants. Hence, a country like India should take up the work independently as Australia has done it. India certainly has such capacity. After signing the Biodiversity Convention, Australia has imposed a ban on the export of all plants and microorganisms whose genetic potential was still to be evaluated. Of late, Malaysia and China also have started the same practice. Many countries are conserving their resources, as they know it well that very soon the genes are going to rule the world. The TBGRI has listed the plants used in traditional medicine according to their conservation status (threatened, rare or endangered). Thus, the bioprospecting programme includes conservation of medicinal and aromatic plant species, their chemical, biological and pharmacological screening and DNA library and the identifying genes, which are having therapeutic values. Our biotechnologists have developed processes, which allow us to synthesize the drug or compound without the plant. Consequently, it will protect the exploitation of our forest wealth. In this regard, National Chemistry Laboratory...
(NCL) is developing health byte (Chips) for DNA screening to detect diseases that becomes low cost method for detecting and treating them (CSIR report, March 03).

REASONS FOR UNDERTAKING THE PRESENT WORK

The forest area and its environment play a prominent role in the lives of tribal and aboriginal people. Since a long period, indigenous people are dependent on forests and its elements for their basic needs e.g., spiritual, cultural and economic requirements and through that, these people have developed and maintained their traditional unique knowledge systems regarding plants and animals. Now, their traditional life style for survival is threatened due to deforestation, semi-modernization and colonization.

Both laymen and men of science round the universe have given the expression to certain anxieties about the man-biogeos relationship almost reaching a breaking point as man seems to have set no limit to his exploitation of natural resources. To some, such anxieties are real, as man according to them, has almost reached a point of no return with most of natural resources being depleted.

The Western Ghats have now been identified among the 18 biodiversity hot spots in the world that need to be preserved (Chengappa, 1995). The Ghats possess extremely high endemism and some life forms are confined to highly specialised and ecological niches. Further, western ghats sustain about 10 biodiversity hot spots, out of which Pune District and its nearby districts are one. Therefore, the foremost need of the hour is to study the ethnobiology of such spots, as these may be lost due to the new urban life style or competition.

Many parts of the forest cover, however, are highly fragmented and shrinking rapidly due to the new constructions for style living and industrialization. The
The process of deforestation began early as per the requirements of a man who dwelled in forests and transformed these lands for agricultural purpose. Subsequently, the climax evergreen cover was cleared by Britishers to cultivate crops like tea and cardamom. Pune and neighboring districts of Maharashtra State are unique where the semi-evergreen and moist deciduous forests are one of the best of their kind. Many industries are there in Pune district e.g., the Sahara group constructed Sahara city near Ambawane village 26 km away from Lonavla where some tribal youths are employed where they earn their livelihood. But most of the tribal people are going to forests for day-to-day jobs, not much interested to dwell in forest areas, as they want to earn more money to get enough changes in daily lifestyle.

According to 1991 census record, the tribal population of Maharashtra is 73.18 lakh i.e. 9.27% of the total population of Maharashtra. The population of the Katkari tribal in Pune district is around 12,054, who dwell in various parts of the district e.g., Vadgaon, near Lonavla, Khandala, Ambavane, Pedsyapur, AF Dam, Mulshi Dam, Bhoje, Kune, Sawla, Khandi Dam, Katraj Ghat, Shinoli, Bhimashankar and Junnar areas where the main profession of this tribe is fishing, farming in rainy season for rice and keeping cattle. Recently, shetkari (Katkari) tribe of Ambegaon taluka has made a record for the yield of rice in the year 2000-2001.

The tribal population in the selected area of studies has a rich heritage and knowledge on the usage of plants and animals in their environs. Therefore, it is thought worthwhile to record this information for bringing out new uses by assertion through research and future economic utilization for bioscience.