CHAPTER I

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Food and medicine have been the inseparable companions of humans from the very beginning of evolution. They are vital components for mankind from nature. The availability and source of which are directly linked with biodiversity and associated with traditional knowledge. Tropical countries like India have vast biodiversity and possess enormous indigenous and traditional knowledge contributing to the sustainable development and a healthy environment of a nation. The word biodiversity is defined as the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part. This includes diversity within species, between species and of ecosystems. Conservation and sustainable use of biodiversity are the two fundamentals for the development of a sustainable ecosystem. Biological diversity is fundamental to the fulfillment of human needs especially our daily lives and livelihood and constitutes resources upon which families, communities, nations and future generations depend. Every country has the responsibility to conserve, restore and sustainably use the biological diversity within its jurisdiction. An environment rich in biological diversity offers the broadest array of options for sustainable economic activity, for human welfare and for adapting to changes. Loss of biodiversity creates serious economic and social costs for any country.

India is one of the 17 mega diversity countries in the world. With its unique geographical position and wide variety of biological communities, India has a vast store house of natural resources can be sustainably used as food and nutritional supplements (Jain, 1998). The innumerable life forms harbored by forests, deserts, mountains, low land, air and oceans provide food, fodder, fuel, medicine, textiles, etc. Each and every plant in the world is useful in some way or other. Earlier, the plants were utilized based on the “Doctrine of Signatures”, that is, God would mark or sign each plant in some way or other. There are innumerable species, the potential of which is not yet known. It would therefore, be prudent to not only conserve the species those we already have information about, but also species we have not yet identified and described from economic point of view.
The ability of human kind to exploit the natural resources around him to his
advantage has indeed made humans the most successful/ powerful organism on planet
earth. This ability coupled with the capacity to innovate enabled humans to build
material civilizations and development of economic systems and thoughts are all
inherently and intricately interwoven with the biological resources (Pushpangadan &
Kumar, 2005). In India, in ancient times the knowledge about natural plant and
animal life was an integral part of a person’s learning (Jain, 1998). By living close to
nature, the traditional people have acquired unique knowledge about wild flora and
fauna, most of which are new to the people who live away from such ecosystems.
After years of observation, analysis, trial, error, experimentations, the innovative
members of communities have selected and identified variety of uses for these rich
resources. The traditional knowledge, skill and practices thus developed are freely
exchanged, nurtured and nourished usually as common property of the community.
Perhaps due to the increasing commercial interest in the western world in particular
that people began to take greater interest in collecting ethnic information and utilizing
of local natural resources mainly of plants that led to the birth of new science called
ethnobotany.

The term ethnobotany was first coined by Harsh Berger in 1895 to refer to the
study of plants used by the aboriginal people of Australia (Pushpangadan & Kumar,
& Atal (1986) have recognized this science as a multi-disciplinary science comprising
many interesting and useful aspects of Plant Science, History, Anthropology, Culture
and Literature. It deals with relationship between plants and man, especially the
economic uses of plants by primitive tribes, far away from modern civilization and
culture. It brings light to numerous known or unknown uses of plants, some of which
have potentially wider usage. During the last half century, ethnobotany has been
recognized as a valid discipline that played a very material role in the advancement of
many aspects of scientific, sociological and historical studies (Gopalan et al., 1995).
It also includes the botanical and anthropological aspects of material culture and
subsistence economy. From the beginning of civilization, the knowledge and
proximity with plants helped to produce medicine, essential oils and insecticides, etc.
with the help of numerous wild and cultivated plants, people, especially tribals
developed their culture, custom, religious rites, food, medicinal practices, etc. now
ethnobotany is emerging as a powerful branch of science and the scientists all over the world are giving more attention. In our country, the scientists and scholars are working in this new field of knowledge since 1960's and the study has been intensified (Dc Pal & Jain, 1998). Now ethnobotany has expanded enormously, dealing with various aspects of a number of ethno scientific fields such as Ethnomedicine, Ethnobotany, Ethnecology, Ethnopharmacology etc.

The Indian sub-continent is inhabited by 53 million tribal people belonging to over 550 tribal communities that come under 227 linguistic groups and they inhabit varied geographic and climatic zones with diversified plant species, varied culture, rich traditional knowledge system and wisdom. All India Co-ordinated Research Project on Ethnobiology (AICRPE) was operated by the Ministry of Environment and Forest, Govt. of India for 16 years in 27 centers in the Country. AICRPE had made a mapping survey of the tribals and the associated biological system and brought out the lesser known uses of the biodiversity around them (AICRPE Report, 1982-1998). Their vocation ranges from hunting, gathering, cave dwelling nomadic to societies with settled culture living in complete harmony with nature. Forests have been their dwelling place and they totally surrendered themselves to forest settings. The uniqueness is that they have been utilizing the resources without disturbing the delicate balance of the eco-system. Thus tribal communities mostly remained as stable societies and were unaffected by the social, cultural, material and economic evolutions those were taking place with the so called civilized societies.

Traditional communities living close to nature have over the years acquired unique knowledge about the use of living biological resources. Modernization, especially industrialization and urbanization have endangered the rich heritage of knowledge and expertise of age old wisdom of the traditional communities. Any study on the utilization of local or traditional knowledge of tribes revealed that, they possess precious knowledge on the specific uses of large number of wild plants and animal parts, the uses of many are hitherto unknown to the outside world. Living close to nature, the aboriginal and indigenous tribal communities are the real custodians of the unique traditional knowledge system and wisdom about ambient flora and fauna with rich heritage of phytomedicine or ethnomedicine (Singh & Jain, 2003). Out of 45,000 species of wild plants, 7500 species are used for medicinal purposes. The World Health Organization has been promoting a movement for
'Saving plants for saving lives' (WHO, 2006). This is because of the growing understanding of the pivotal role medicinal plants play in providing herbal remedies to health.

The Western Ghats region of Kerala is a great emporium and treasure house of ethno botanical wealth. The most outstanding feature of the vegetation of the Western Ghats is the development of tropical rain forests (Subramanyam & Nayar, 1974). The Tribal communities inhabiting in the Western Ghats region of Kerala have unique healing practices for curing various ailments by using the medicinal plants from the surroundings. Ethnobotanical studies in Kerala have revealed useful data and information on a number of plants used by the rural as well as tribal communities for various human ailments. These include, information on the use of several unique traditional land races of rice varieties (Manilal, 1981), spices (e.g. *Piper* spp., *Curcuma* spp., *Zingiber* spp., *Cinnamomum* spp., and wild medicinal plants such as *Trichopus zeylanicus* ssp. *travancoricus* (Bedd.) Burkill ex Narayanan (Arogyapacha), *Decalepis arayalpathra* (Joseph & Chandras.) Venter, (Amrithapala), *Andrographis paniculata* (Burm. f.) Wall. ex Nees (Kiriyath), *Coscinium fenestratum* (Gaertn.) Colebr. (Maramanjil), *Phyllanthus amarus* Schum. & Thonn. (Keezharnelli), etc. Some of these ethnomedicinally important plants have shown promising pharmacological and biological activities (Nambiar, *et al.*, 1985).

The success story of Arogyapacha (*Trichopus zeylanicus* Gaertn. ssp. *travancoricus* (Bedd.) Burkill ex Narayanan), an ethnomedicinally important plant used by the Kani tribes of Agasthyar hill ranges of Southern Western Ghats studied by the Scientists of Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) in Kerala amply demonstrate not only the tremendous potential of such lesser known wild plant species in the development of scientifically validated herbal drugs and pharmaceuticals but also the importance of indigenous knowledge associated with biodiversity as vital leads to drug and pharmaceutical prospecting (Pushpangadan *et al.*, 1988). The hitherto untapped wild plant resource wealth of Kerala and the associated indigenous knowledge system provide ample scope and opportunities for commercially viable bioprospecting enterprises.

It is to be noted that all the available information regarding ethnobotany should be collected and documented for future use. With the rapid intrusion of modern civilization, the ancient tribal tradition and culture is in the verge of extinction. Based
on the ethno botanical studies, many alkaloids and other important chemicals have
been isolated from plants by using modern techniques of chemical analysis and
isolation methods. Despite many shortcomings, the number of users for herbal drugs
are increasing in the developing as well as the industrialized world. Traditional herbal
medicines, although currently serving the health care needs of majority of the world’s
population can be increased further and broadened in terms of safety and efficacy,
provided that, some basic principles of drug preparation, evaluation and uses are
brought into practice.

The concept of developing drugs from plants used in indigenous medical system
is much older, while in some cases direct links between a local and biomedical use
exists, in other cases the relationship is much more complex (Heinrich and Gibbons,
2001). Ethnobotany and ethnopharmacology have variously been seen as a tool for
drug discovery (Schultes, 1962), a mode of ascertaining conservation (Cox, 1997), as
threat to the integrity of indigenous cultures or as a field of research which will
require the development of novel forms of partnership between indigenous people
and researchers (Laird, 2002).

The message is clear that phytotherapy acts as a bridge between traditional
medicine and modern medicine. The development of plant derived drugs have always
been a multi-step procedure starting with a crude extract followed by the standardized
extract and ending up with isolated constituents. Ethnobotanical study in particular
offers immense scope and opportunities for those engaged in bioprospecting
particularly in drugs/chemicals and gene prospecting. It is estimated that, about 75%
of the 120 biologically active plant derived compounds presently in use worldwide
have been derived through follow-up researches to verify the authenticity of data
from folk and ethnomedical uses (Farnsworth, et al., 1985). Quite often sufficient
quality control and drug standardization is lacking for traditional recipes.
Ethnopharmacological leads have resulted in the introduction of new single molecule
drugs but have a greater role to play if crude extracts are accepted for clinical use in
the West (Raghu Bir S. Rawat, 2006).

However, quite surprisingly little attention has been paid to the historical
development of such orally transmitted, indigenous knowledge systems. It is often
apparent and argued that they are under the threat of disappearing, but continuity and
change in traditional, orally transmitted knowledge systems about medicinal as well
as food plants has only rarely been at the focus of research projects. An exhaustive floristic work has been done related to botany in Kasaragod district. However ethnobotanical studies regarding indigenous origin of medicine in Kasaragod district are limited. In this context I have selected the present topic entitled “Ethnobotanical studies of Kasaragod district of Kerala State with special reference to Koraga and Mavilan tribes”. The ethnopharmacological evaluation of two selected plant species from the ethnobotanical leads have also been included. Thus, the orally transmitted valuable traditional information would be recorded for forthcoming research, with solid scientific basis, which in turn may lead to the development of novel drug designs and may also contributed for benefit sharing.