CHAPTER 1: INTRODUCTION

1.1 Historical background

From the time immemorial, plants have been widely used as curative agents for variety of human ailments. The application of plants as medicines dates back to prehistoric period. There is evidence since early Vedic period of plants being used for a wide range of medicinal purposes. They have in fact been used in a continuous unbroken tradition for over four millennia. *Rigveda*, the oldest repositories of human knowledge written between 4500-1500 B.C. mention the use of 67 plants for therapeutic use. *Yazurveda* enlists 81 plants whereas *Atharvanaveda* written during 1200 B.C. describes 290 plants of medicinal value. *Charaka Samhita* (900 B.C.) describes 341 medicinal plants and *Susruta Samhita* (600 B.C.) mentions 395 medicinal plants (Pullaiah, 2002).

In A.D. 77, the Greek surgeon Dioscorides published "*De Materia Medica*", which was a catalog of about 600 plants in the Mediterranean. It also included information on how the Greeks used the plants, especially for medicinal purposes. In 1542 Leonhart Fuchs, a Renaissance artist, led the way back into the field. His "*De Historia Stirpium*" cataloged 400 plants native to Germany and Austria. John Ray (1686–1704) provided the first definition of "species" in his "*Historia Plantarum*". In 1753 Carl Linnaeus wrote "*Species Plantarum*", which included information on about 5,900 plants.

The 19th century saw the peak of botanical exploration. Alexander von Humboldt collected data from the New World, and the James Cook's voyages brought back collections and information on plants from the South Pacific. Edward Palmer collected artifacts and botanical specimens from people in the North American West (Great Basin) and Mexico from 1860s to 1890s. During this period, the field of
"aboriginal botany" was established which drew attention of all forms of the vegetable world used by aboriginal people for food, medicine, textiles, ornaments and more (Powers, 1873). Leopold Glueck, a German physician was the first individual to study the emic perspective of the plant world at the end of 19th century. His published work on traditional medicinal plants used by the rural people in Bosnia (1896) was considered as first modern ethnobotanical work (Choudhary et al., 2008). The term "ethnobotany" was first used by a botanist named Harshberger, John W. (1896) while he was teaching at the University of Pennsylvania. He defined Ethnobotany as the science of denoting the uses of plants by the aboriginal people. Ethnobotanical knowledge encompasses both wild and domesticated plant species and is rooted in observation, relationship, needs, and traditional ways of knowing. Such knowledge evolves over time, and is therefore always changing and adding new discoveries, ingenuity and methods.

Beginning in the 20th century, the field of ethnobotany experienced a shift from the raw compilation of data to a greater methodological and conceptual reorientation. This is also the beginning of academic ethnobotany. Richard Evans Schultes is considered as the father of modern ethnobotany for his studies of indigenous peoples’ uses of plants in America. His botanical fieldwork among Native American communities led him to be one of the first to alert the world about destruction of the Amazon rainforest and the disappearance of its native people. He collected over 30,000 herbarium specimens and published numerous ethnobotanical discoveries. His book “The Plants of the Gods: Their Sacred, Healing, and Hallucinogenic Powers” co-authored with chemist Albert Hofmann, is considered as his greatest popular work (Richard Schultes and Albert Hofmann, 1979).
Although the concept and definition of the science of ‘Ethnobotany’ was cleared respectively by Powers and Harshberger, the elements of this science appeared in India even before. García da Orta (1563) published a book ‘Coloquios dos simples e drogas e cunas medicinas da India’. It informed about 50 common taxa of medicinal significance and other utilities as gathered around Goa and in Malabar. This is truly the first book in print form on Indian plant species especially with line drawings. It is not only a milestone in the history of ‘Ethnobotany’, but also a landmark for the science of Pharmacognosy in Indian context. Acosta (1578) also published a book ‘Tractado de las drogas y medicinas de las Indias Orientalis’. He informed more than 50 Indian medicinal plants from Malabar.

Roxburgh (1832), during his floristic investigations particularly in South India, noted on medicinal uses of herbs apart from their botanical identification and vernacular names. Since 1873, Sir George Watt studied economically important plant species especially in Manipur and the adjacent Burma region for about a decade. He provided nearly 3000 local names of plant products and their uses as obtained from various regions of India. Later, Bodding (1925, 1927 & 1940) published medicines used by Santal tribe and other useful plants. Dr. E. K. Janaki Ammal, as an official programmer in the Economic Botany Section of BSI, studied food plants of certain tribals of south India (Janaki Ammal, 1956). She lit the lamp of ‘Scientific Indian Ethnobotany’ by creating an ‘Ethnobotanical Section’ at the Central Botanical Laboratory, B.S.I., Allahabad in 1960. Dr. S. K. Jain made an intensive ethnobotanical study of Central India and impressed the Indian scientists from different disciplines (Jain, 1963a, 1963b, 1963c & 1963d).

During the 1980’s Ministry of Environment and Forests, Government of India also launched an all India co-ordinated project to document ethnobotanical uses of
plants by indigenous people in India which was participated by many research institutions and universities of the country. From the study, the department recorded 200 plant species from Arunachal Pradesh used for treatment of 44 different diseases (Hynniewta, 1984), 286 plant species from Assam for treatment of 40 different diseases, 526 plant species from Nagaland for treatment of 83 different diseases and 194 plant species from Tripura for treatment of 50 diseases and ailments (Hynniewta, 1987). Jain and Sumitra Srivastava (2001) gave graphic review of Indian ethnobotanical literature of about 1250 publications during 1982 to 2000. According to the All India coordinated project on Ethnobiology about 7500 wild plant species are used for medicinal purpose by the tribal communities and 950 are found to be new claims and are worthy of scientific scrutiny (Pullaiah, 2002).

1.2 Traditional medicine

Now, the medicinal plants are extensively utilized throughout the world in two distinct areas of health management. They are traditional system of medicine and modern system of medicine. The traditional system of medicine mainly functions through two distinct streams (1) Local or folk or tribal stream and, (2) Codified and organized Indian system of medicines like Ayurveda, Siddha and Unanni. During the last few decades, use of traditional medicine has expanded globally and has gained popularity. It has not only continued to be used for primary health care of the poor in developing countries, but has also been used in countries where conventional medicine is predominant in the national health care system.

According to WHO, traditional medicine is defined as “the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health, as well as in the prevention, diagnosis, improvement or treatment of physical
and mental illnesses”. Practices of traditional medicine vary greatly from country to country, and from region to region, as they are influenced by factors such as culture, history, personal attitudes and philosophy. The traditional herbal medicines are relatively safer and cheaper than synthetic or modern medicine (Akinnibosun et al., 2009). A great deal of information about the traditional uses of plants is still intact with tribal peoples. But the native healers are often reluctant to accurately share their knowledge to outsiders (Sood et al., 2001).

1.3 Pharmacological Study

Pharmacology is the branch of science concerned with the study of drugs and how they affect living organisms. Medicinal plants contain biologically active substances in their extracts, which have an inhibiting action towards the microbes (Thillai Sivakumar and Venkataraman, 2010). Any compound that can modify the biological function of living organisms can be considered as a drug. Most of the drugs today are obtained from natural sources or semi synthetic derivatives of natural products and used in the traditional systems of medicine (Sukanya et al., 2009). Momordica charantia L., a member of the family Cucurbitaceae is much used medicinal plant against various human diseases in the Bellary district. The leaves and fresh fruits of this plant are used in the treatment of diseases such as menstrual disorders, respiratory problems, skin diseases, diabetes, jaundice, abdominal pain, kidney stones, leprosy, piles, rheumatism, malaria and other types of fever. This plant is also used as anthelmintic and laxative. It is a common food in Indian cuisine and has been used extensively in folk medicine as a remedy for diabetes (Sathish Kumar et al., 2010). The fruit and leaves contain alkaloids, glycoside, saponin like substances, rennin an aromatic volatile oil mucilage (Leelaprakash et al., 2011). As a part of pharmacological study, the antimicrobial activity of M. charantia L. was
conducted using methanolic extract of leaves and fruits against pathogenic microbes. In order to test the soil type with the antimicrobial efficacy, plants were collected from two types of soils i.e. black and red soils.

1.4 Statement of the problem

Bellary, one of the districts in Karnataka has a population density of 300 inhabitants per sq.km. People in the district exhibit a vast diversity in their culture, tradition and living system. The district has a rich heritage of herbal medicine. Most of the tribal, rural and poor people in the district use traditional medicine for various ailments. There is increasing threat to wild plant resources and their habitats because of over exploitation (Hoft et al, 1999). Natural habitats represent repositories of medicinal plants and indigenous ethnobotanical knowledge. These biotic and cognitive resources are threatened by vegetation removal and culture change (Voeks, 1996).

Ethnomedicinal information like any other form of traditional knowledge is verbally transmitted from generation to generation, and hence in danger of extinction as older people die and younger generations fail to learn the traditional way of life. This situation is worsened by rapid socio-economic, technological and environmental changes (Tabuti et al, 2003). Indigenous knowledge about uses of wild plant resources such as medicinal plants is disappearing fast from traditional communities (Bagine et al., 1997). Urbanization, mining, agricultural expansion and other developmental works have also resulted in the decline of interest in traditional culture as well as vegetation in the district.

The available literature revealed that ethnobotanical work has not been carried out earlier in Bellary district. Hence, there is an urgent need to document and preserve all information on medicinal plants used by tribal and rural communities in the district.
before it is completely lost. Documenting the indigenous knowledge through ethnobotanical studies is important for the conservation of biological resources and their sustainable utilization.

1.5 Overall Objective of the Study

To investigate the medicinal plants used in the treatment of various human diseases by the traditional healers, farmers and other knowledgeable persons in Bellary district.

1.6 Specific Objectives

i. To document the traditional knowledge on medicinal plants used in the Bellary district.

ii. To test the antimicrobial activity of a selected effective medicinal plant used in the district.

iii. To test the antimicrobial efficacy of a medicinal plant in relation to soil type.

1.7 Significance of the Study

The study was aimed at generating useful data on medicinal plants that could be used for the treatment of various human ailments. The results of this study will provide some baseline data, which could lead to further research, and hopefully development of natural products for the control and treatment of diseases. The study will also help in creating awareness in the conservation and protection of medicinal plants in the district.