Introduction
CHAPTER I

INTRODUCTION

Since the dawn of civilization humans have learned to use plants and plant-derived products as remedies for various ailments, perhaps by taking cues from animals or through trial and error, leading to the discovery of various home-made remedies. Such practices are seen in traditional cultures, often followed by village, old-aged or tribal medicine men. Knowledge of herbal medicine has been documented since the time of the civilizations of Mesopotamia (2900 B.C.), Egypt (1500 B.C.), China (1100 B.C.), India (1000 B.C.), Greece (300 B.C.) and Rome (100 A.D.) and from various religious texts such as the Bible, Vedas and many others besides. Ancient Chinese medicine and Ayurvedic medicine of India are practiced in their home countries even today, and such traditional knowledge from the east together with those of the Greco-Romans have been passed on to the West through careful preservation by Arabs and Persians. In addition, western monasteries preserved the traditional knowledge (such as those of the Druids) from England to Germany, through the medieval dark ages.

80% of the population in developing countries rely on traditional medicines for their primary health care (Bannerman et al., 1983; WHO, 1985; Duke, 1992; Farnsworth & Soejarto, 1991; Pei Shengji, 2001; Saleema et al., 2002; Setzer et al., 2006) and the global demand for herbal medicine is not only large, but growing (Srivastava, 2000). 85% of these traditional medicines involve the use of plant extracts. This means that about four billion people depend on natural products as their primary source of medication.
1.1 TRADITIONAL MEDICINES IN INDIA

India is one of the twenty five hot spot of mega-biodiversity countries in the world endowed with rich biodiversity possessing 17,500 species of flowering plants of which 7,500 are known for medicinal uses (Shiva, 1996; Dhar et al., 2002). This proportion of medicinal plants is the highest known for medical purposes in any country of the world for the existing flora (Kala et al., 2006). They can be placed into the following three categories: (i) plants of codified knowledge used in organized systems of medicine like Ayurveda, Unani and Siddha, (ii) plants of empirical knowledge used in ethnomedicine or folkmedicine based on oral (undocumented) information being passed from one generation to the next and (iii) plants of scientific knowledge which have been investigated pharmacologically and chemically, and their active principles used in modern medicine or have provided valuable leads for partial or total synthesis of new drugs.

1.1.1 ETHNOBOTANY

The term Ethnobotany was first used and applied by J.W. Harshberger in 1885 to the study of “Plants used by primitive and aboriginal people” and its scope was much elaborated later (Faulks, 1958; Ford, 1978).

Ford (1978) defined ethnobotany as a study of plant-people relationship with three objectives in mind namely, to identify what plants are significant; to discover how the people of a culture classify, identify, and relate to the plants; and to examine how their perception of the plant world actually guides their actions and concomitantly structures the floral environment. It follows, therefore, that the mode of interaction between a people and the elements of a forest near it is a function of its botanical
knowledge. Hence, adequate scientific information on forests and forest dynamics enhance a judicious use of forest products. This is the main focus of any forest conservation strategy. Ethnobotany refers to the scientific study of the botanical knowledge of a social group and its use of locally available plants, is a field of study in which taxonomists have taken interest in recent years (Oladele, 1988). The ultimate goal of ethnobotany should be to identify drugs to alleviate human illness through a thorough analysis of plants alleged to be useful in human cultures throughout the world. An emergent trend in ethnobotanical studies has been the use of quantitative methods and models to describe patterns of plant use and availability in surveys or assessments of natural resources (e.g., Prance et al., 1987; Phillips and Gentry 1993a & b; Johns et al., 1994; Begossi, 1996; Hoft et al., 1999; Hanazaki et al., 2000; Luoga et al., 2000; Cunningham, 2001; Wong et al.. 2001).

Vast ethnobotanical knowledge exists in India from ancient time. Written records of the use of plants for curing human or animal diseases in India can be traced back to the earliest scripture of the Hindus, the Rigveda (4500-1600 B.C.) (Jain, 1994). The Indian system of herbal medicine and its plant-drugs caught the attention of the west since the beginning of the colonial days. Study on ethnobotany was initiated as an official programme in the Economic Botany section of Botanical Survey of India since its very inception in 1954 which published a paper on subsistence economy of India (Janaki Ammal, 1956). Right from its beginning, the documentation of traditional knowledge especially on the medicinal uses of plants, has provided many important drugs of modern day (Anonymous, 1994; Cox and Ballick, 1994; Fabricant, 2001).
Ethnobotanical investigation has led to the documentation of a large number of wild plants used by tribals for meeting their multifarious requirements (Anonymous, 1990). In India, organized study of ethnobotany is of recent origin (middle of the twentieth century). In the All India Coordinated Research Project on Ethnobiology (AICRPE - 1992-1998), over 10,000 wild plants species were reported to be used by tribals for meeting their primary health care, food and other material requirements. Out of 8,000 wild plant species used by them for medicinal purposes (with over 1,75,000 specific preparations/applications), about 2,000 are found to be new claims and worthy of scientific scrutiny. Out of 4,000 wild species used as edibles (as subsidiary food/vegetables), about 800 are new information and at least 250 of them are worthy of attention to be developed as alternative sources of food that the world would need in the future. Similarly, out of over 600 wild plant species used by tribals for making fibre and cordage, 80 are promising for commercial exploitation. Out of 500 plant species used as fodder, 100 are worth recommending for wider use and out of the 325 wild plant species used by tribals as piscicides and pesticides, at least 180 are quite promising to be developed as safe biopesticides. Almost all the plants used as gum, resin, dye, incense and perfumes are worth investigating since there is a revived interest the world over for natural sources of these products.

Shah (2002) shares some of his experience on studying ethnobotany and says that the ethnobotanical study of any ethnic region is an interesting and never-ending subject, which ought to be pursued keeping in view subjects like ethnopharmacology, linguistics, phytochemistry apart from the main study of anthropology and botany and at the same time the study should be undertaken in such a way that apart from recording the traditional and cultural knowledge of the ethnic community, the plant wealth may also
bring economic benefits in a sustainable and manageable way in the light of modern advances.

1.1.2 ETHNOMEDICINE

Ethnomedicine deals with information pertaining to social adaptation, deviant behavior, illness, disease, medical taxonomy, folk medical knowledge, and systems of medical care. Ethnomedicine, which may be defined broadly as the use of plants by humans as medicines, is a highly diversified approach to drug discovery that involves observation, description, and experimental investigation (screening) for possible biological/medicinal properties from indigenous drugs. It is based on botany, chemistry, biochemistry, pharmacology, physiology and other disciplines such as anthropology, archaeology and history that contribute to the discovery of natural products with medicinal activity (Rivier and Bruhn, 1979). Ethnomedicine refers to the study of traditional medical practice which is concerned with the cultural interpretation of health, diseases and illness and also addresses the healthcare seeking process and healing practices (Krippner, 2003). The practice of ethnomedicine is a complex multi-disciplinary system constituting the use of plants, spirituality and the natural environment and has been the source of healing for people for millennia (Lowe et al., 2000). According to the World Health Organization (WHO, 2003) ethnomedicine has maintained its popularity in all regions of the developing world and its use is rapidly expanding in the industrialized countries (WHO, 2003), for example, in China traditional herbal preparation account for 30–50% of the total medicinal consumption. In Ghana, Mali, Nigeria and Zambia, the first line treatment for 60% of children with malaria is the use of herbal medicine. In San Francisco, London and South Africa, 70% of people living with HIV/AIDS use traditional medicine. Today the annual global market for herbal medicine stands at over
US $60 billion (WHO, 2003). Western trained physicians should not ignore the impact of ethnomedicine on their patients. Research interest and activities in the area of ethnomedicine have increased tremendously in the last decade (Williams, 2006). Since the inception of the discipline, scientific research in ethnomedicine has made important contribution to the understanding of traditional subsistence, medical knowledge and practice. It is interesting to note that the ethnomedicinal uses of plants is one of the most successful criteria used by the pharmaceutical industry in finding new therapeutic agents for the various fields of biomedicine (Cox and Balick, 1994). Some outstanding medicinal drugs which have been developed from the ethnomedicinal uses of plants include: vinblastine and vincristine from *Catharanthus roseus* (the periwinkle) used for treating acute lymphoma, acute leukaemias *etc*, reserpine from *Rauwolfia serpentina* (Indian snake root) used for treating hypertension, aspirin from *Salix purpurea* (willow) used for treating inflammation, pain and thrombosis and quinine from *Cinchona pubescens* (cinchona) used for treating malaria.

### 1.1.2.1 ETHNOMEDICINE AND DRUG DISCOVERY

World Health Organization (WHO, 2002) has recognized the importance of traditional medicine and has been active in creating strategies, guidelines and standards for botanical medicines. Commercially, these plant based drugs are worth about US$ 14 billion a year in the United States and US$ 40 billion worldwide. Americans paid an estimated US$ 21.2 billion for services provided by alternative medicine practitioners (Eisenberg, 1998). A 1997 survey estimated that over 12% of adults had used herbal medicine during 1996 compared with 2.5% in 1990, resulting in a business of US$ 5.1 billion (De Smet 2002). Today, in U.S. 57% of drugs sold in the market contain at least one major active compound currently or once derived from plants (Grifo and Rosenthal,
Lilly Research Laboratories markets several million dollars worth of vincristine and vinblastine – the periwinkle derivatives used to treat childhood leukaemia and Hodgkin’s disease. The US National Cancer Institute regularly earmarks large appropriations to screen 50,000 natural substances for activity against cancer cell lines and the AIDS virus. China, Germany, India and Japan, among others, are also screening wild species for new drugs.

Being given that plants have been used by humans (often hundreds or thousands of years), one could therefore expect many bioactive compounds obtained from such plants to have low human toxicity. Therefore the goals of using plants as possible leads for therapeutic agents are four fold:

a) to isolate and characterize bioactive compounds for possible use as drugs, e.g., the cardiac drug digoxin, as well as morphine and taxol;

b) to produce bioactive compounds of novel or known structures as lead compounds for semisynthesis to produce pharmaceuticals that may display lower toxicity and for which patents can be acquired, e.g., metformin, verapamil etc.

c) to use agents as pharmacologic tools; and

d) to use the whole plant or part of it as a herbal remedy, e.g., garlic, bitter melon.

1.2 APPROACHES TO DRUG DISCOVERY USING PLANTS

Plants have long been very important sources of drugs and many plant species (like microbes) have been screened to see if they contain substances with therapeutic activity. Many plant drugs of long-standing usage were discovered by investigating the
scientific basis of old folk remedies to determine the active ingredient in the concoction. Several reviews are available in the literature pertaining to approaches for selecting plants as candidates for drug discovery programs (Phillipson and Anderson, 1989; Verpoorte, 2000). The discovery of digoxin from foxgloves (an old discovery) used to treat heart failure is a classical example whilst a recent discovery in the form of paclitaxel (discovered in yew leaves) has shown promising anti-cancerous properties. In earlier times, all drugs and medicinal agents were derived from natural substances and most of these remedies were obtained from higher plants. Drug development is a complex process, and only companies with considerable investment in research and development can afford to bring drugs from conception to market. Today, many new chemotherapeutic agents are obtained synthetically, based on "rational" drug design. The study of natural products has many advantages over synthetic drug design. The former leads to materials having new structural features with novel biological activity. In this context not only do plants continue to serve as possible sources for new drugs, but chemicals derived from the various parts of these plants can also be extremely useful as lead structures for synthetic modification and optimization of bioactivity. The starting materials for about one-half of the medicines we use today come from natural sources. There is no doubt that the future of plants as sources of medicinal agents for use in investigation, prevention, and treatment of diseases is very promising. In the context of isolation and screening for chemicals that may possess medicinal properties from plants, different approaches can be used. The following is a brief summary of the current approaches being used by scientists to isolate and characterize these agents.
1.2.1 Random selection followed by chemical screening

This technique is also known as phytochemical screening approaches whereby the plants are analysed for alkaloids, terpenes and flavonoids etc. This approach has been used in the past and is still being used in the developing countries. The tests are simple to perform, but false-positive and false-negative tests often render results difficult to assess. More important, it is usually impossible to relate one class of phytochemicals to specific biological targets; for example, the alkaloids or flavonoids produce a vast array of biological effects that cannot be usually predicted well in advance.

1.2.2 Random selection followed by one or more biological assays

In the past, plant extracts were evaluated mainly on experimental animals, primarily mice and rats. The most extensive of these programs were sponsored by the National Cancer Institute (NCI) in the United States and the Central Drug Research Institute (CDRI) in India. More than 35,000 species have been screened \textit{in vitro} primarily. However between the period 1960-1981, the NCI has sponsored \textit{in vivo} screening for biological properties emanating from these plants. Two major pharmaceutical agents namely taxol and camptothecin were discovered through the program. Several other plant-derived compounds have turned out to be unsuccessful in human studies. The above process has been discontinued since 1986 onwards by the NCI who have from then on embarked on a quest to continue to collect and screen plants using a battery of 60 human tumour cell lines and have also initiated screening of plants for anti-HIV activity \textit{in vitro}. Calanolide A. has been discovered through this program and is currently in its Phase I clinical trials.
1.2.3 Follow-up of biological activity reports

These reports showed that the plant extracts had interesting biological activity, but the extracts were not studied for their active principles. The literature from the 1930s through the 1970s contains these types of reports.

1.2.4 Follow-up of ethnomedical (traditional medicine) uses of plants

Several types of ethnomedical information are available especially in the different cultures mainly in the Asian and African continents. It is of no denying facts that plants used in organized traditional medical systems, Ayurveda and traditional Chinese medicine have flourished as systems of medicine in use for thousands of years. These systems which include practice and theory are still in place today because of their organizational strengths, and they focus primarily on multicomponent mixtures. There are still certain beliefs in Western medical science that still view such systems as lacking credibility and validity despite the fact that these plants are undeniably still being widely used by a wide section of the population of poorer countries on this planet. One should however recognize that adverse effects from those widely used plants are not well documented, and efficacy of these plants and plant mixtures is more difficult to assess by Western scientific methods.

1.3 THE VALUE OF ETHNOMEDICINE

At first interest in the western countries especially the United States, was directed towards antifungal and antiviral agents from traditional medicinal plants. The approach was to send scientists including botanists as well as physician teams to tropical areas to assess firsthand the use of plants by traditional healers and to collect interesting plants and assess them for validity in the Shaman laboratories. It is extremely difficult to assess the value of any approach to the use of higher plants to develop new drugs. Several active
compounds were discovered. Unfortunately many failed to live up to the promise. Many plants/extracts were either toxic or failed in the clinic. A successful candidate that emerged from such programs is SP-303, an oligomeric proanthocyanidin. SP-303 has proven to be clinically efficacious and is currently marketed as a dietary supplement for diarrhoea. In addition, a major effort has also been directed toward discovery of novel antidiabetic agents, which resulted in the discovery of several patented compounds like cryptolepine, maprouneacin.

Based on the ethnomedicinal information, a total of 122 compounds were identified and 80% of these compounds were used for the same (or related) ethnomedical purposes (Fabricant and Farnsworth, 2001). Further, it was discovered that these compounds were derived from only 94 species of plants (Farnsworth and Soejarto, 1985; Farnsworth et al., 1985). Some of the prominent commercial plant-based medicinal compounds include colchicum, colchicine, betulinic acid, camptothecin, topotecan, CPT-11, 9-aminocamptothecin, delta-9-tetrahydrocannabinol, beta lapachone, lapachol, podophyllotoxin, etoposide, podophyllinic acid, vinblastine, vincristine, vindesine vinorelbine, docetaxel, paclitaxel, tubocurarine, pilocarpine, scopolamine among others.

1.4 TRIBALS IN INDIA

India has over 67.8 million tribal people belonging to 550 communities of 227 ethnic groups as per the classification made by anthropologists on linguistic basis. They inhabit about 5,000 forested villages or lead a nomadic life in the forest. Each tribal community has a distinct social and cultural identity of its own and speak a common dialect. There are about 116 different dialects and 227 subsidiary dialects spoken by tribals in India. About 75% to 80% of the Indian population of over 1 billion live in the villages across the various ecosystems from cold deserts of Leh/Ladakh, temperate and
subtropical Trans-Himalayas, deserts of Rajasthan, wild and semi arid regions of Central and North West, rainforests of Eastern Himalayas to South Western ghats, to the coasts to the islands of Andaman and Nicobar and Lakshadweep. The people living in these agroclimatic zones have, by trial and error, or experimental and empirical reasoning, select and make use of the plants and animals around them to meet their day to day requirements of life, which we call traditional knowledge/folk knowledge. Out of the known 17,500 flowering plant species, village folk of India use around 5000 species and most of them are fairly well known and somewhat documented in local literature. About 2000 of them are well-researched. But the tribal communities, who live in and around the forests, use about 10,000 wild plant species for meeting their varied requirements, and almost 6000 of them are lesser known or hitherto unknown to the scientific world.

1.4.1 TRIBALS IN TAMIL NADU

The tribals in Tamil Nadu include Adiyani, Aranadan, Eravallan, Irular, Kadar, Kammara Kanikaran or Kanikkar or Kaniyan or Kanyan, Kattunayakan, Kochu Velan, Konda Kapus, Kondareddis, Koraga, Kota, Kudiya, Kurichchan, Kurumbas or Kurumans, Maha Malsar, Malai Arayan, Malai Pandaram, Malai Vedan, Malakkuravan, Malasar, Malayali, Malayekandi, Mannan, Melakudi, Mudugar, Muduvan or Muthuvan, Palleyan or Palliyan or Palliayar, Paniyan, Sholaga, Toda and Uraly. Ethnobotanical data should be recorded before they vanish due to the influence of modern civilization.

1.4.1.1 MALAYALI TRIBALS

About 0.2 million population of Malayali tribes have been reported from Tamil Nadu (Jain, 1981) residing at Yelagiri and Jamnamarathur hills of North Arcot district (Nayar and Khaleefathullah, 1995; Viswanathan, 1989 and 1997), Kolli hills and
Shervaroyan hills of Salem district (Ansari et al., 1993).

Literally Malayali means "Mountain Men," or "Men from the mountains". They are hill tribes found in the mountains of Aranootrumalai, Bodhamalai, Kalrayan, Kollimalai, Pachaimalai, Palamalai, and Shervarayan hills of Salem district. They are in no way connected with the Malayalis of Kerala state regardless of the similarity of names. These people are recognized as scheduled Tribes in Tamil Nadu, of erstwhile Salem district, at present bifurcated and presently located in Namakkal district of Tamil Nadu. The Malayali tribals speak Tamil as their principal language and mother tongue. Influence of Sanskrit and Hindi are found in their dialects by way of Jain names for children. Consequently many of the local names of plants agree almost completely with Tamil names for many plants found scattered in various literature.

1.4.1.1.1 Genesis of Malayali Tribes in Salem district

According to inscriptional evidences, they appear to have migrated from Kanchipuram between seventh and eleventh centuries. Malayali tribes are supposed to be the descendants of the Kanchipuram Vellalars (Rajannan, 1992). They sometimes assume the name of Kanchi Mandalam Vellalar. They are also known as the Kaarkatha Vellalar to distinguish from the Kongu Vellalar and also as Kaaraalar (Rulers of the Clouds) or Kaaraala Mudhali. One of their proverbs states, "Without the blossoming of the clouds in the sky, there will be no blossoming of flowers on earth". Some believe that they are descendants of the original hunting tribes, Vettuvar, who were widespread in all of the mountains of this district.

1.4.1.1.2 Three folktales on origin

All Malayalis strongly believe in their common origin of which three versions exist (Rajannan, 1992). All the three versions agree on the essential central theme of their
emigration from Kanchipuram in search of a promised land where they could freely practice their religion of worshipping Lord Kariraman.

One of the folktales states that the founders of this tribe came with their followers from Kanchipuram where their ancestors were living a dissolute life of irreligion and beastly behaviour. In order to reform them into the religion of Kariraman, the leaders (numbering more than ten) led a group carrying the Lord's insignia (umbrella, flywhisk, flag) away from Kanchipuram seeking their promised land. They found it in the Eastern Ghat mountains of Dharmapuri, Salem and South Arcot districts and established settlements and temples in many places. The Gurupeetam was established in the Chittheri hills of the Dharmapuri district.

Another folktale says that the Malayalis were Kaaraalaar or Kaaraala Mudhali Vellalar of Kanchipuram who emigrated about 800 years ago to avoid religious persecution from the Brahmins. Their patron god, Lord Kariraman, finding himself uncomfortable at Kanchipuram moved to these hills. Three brothers, Periya Annan, Nadu Annan, and Chinna Annan came here in search of their Lord. Periya Annan went and settled in the Servarayans while Nadu Annan went to the Pachaimalais and Chinna Annan to Manjavadi, a village in the ghats between the Servarayans and Thaenanda Malai.

Third folktale says that a group of twelve persons (Adhiyan, Alavadaiyaan, Araiyan, Karu Mudhani, Kokkiri, Kuruvili, Maradhaiyan, Nedunthiri, Pandiyan, Perunthi, Semmudhali, and Thaenandai) with their retinue left Kanchipuram in search of their God, Kariraman, carrying God's image with them. They found Him in the Kalrayans among the Vettuvars who refused to restore the God to the group. In the ensuing battle, the Vettuvars were defeated but the God stuck to the site and asked the victors to stay with
Him. Later, three brothers from the group (the eldest, the middle and the youngest) went on a hunt to kill a boar named *Veeramalai Panri* (Tam. *Panri* = boar). It was wounded in the Javvadhu Mountains ran all over the country and fell dead on the Kolli Malai. Following a dispute in sharing the pork, the brothers decided to go their ways separately. The eldest Periya Annan chose to stay in the Kalrayan, the middle Nadu Annan decided to settle in the Kolli Malai, and the youngest Chinna Annan went to the Pachaimalai.

**1.4.1.2 BODHAMALAI MALAYALIS**

Bodhamalai tribals - Malayalis are the group of the Kollimalai Malayalis residing in the hamlets of *Kutta Malai, Kizhur, Kurinjiyur* and *Melur* of the present Namakkal District (erstwhile Salem district) in Tamil Nadu.

**1.4.1.2.1 Genesis of Bodhamalai Malayalis**

It is believed that the Malayali tribals have migrated from Kollimalai hills, to escape harassment by Kurumbar and Vanniyar of the plains. They are grouped into several Kulas including Kasakali, Kocha Maniyan, Masiyan, and Sirakali. "Sirakali" is the name of a form of Mother Kali. It is interesting to note that a Goddess named Sara Kali (Queen Kali) was worshipped by European Gypsies who are said to have originated from India. They called Sara Kali as "their mother, the woman, the sister, the queen". The Bodhamalai Malayalis worship many minor deities besides, such as Andiappan, Bodhamalai Siddhan, Mariamman, Periya Sadaiyan, Periyasamy, Pillaiyar and Saelaikatti Karuppu. They also offer prayers at the Siddhar kovil, now a mountain near Melur. On the way to Melur hamlet there is a small pillar icon under the Neem tree. The Melur Pillaiyar temple contains a small iconic statue of the elephant-faced God along with a quantity of aniconic neolithic stone tools collected from various places of the mountain. Bodhamalai Malayalis acknowledge Kollimalai as their place of origin. In recognition of
this unbroken relationship they agreed to pay an annual tribute, known as the **Kollimalai Mariyadhai**, (Honor to Kollimalai) to the Malayalis of Kollimalai hills. In 1860, an internal tribal dispute was settled in Kizhur at a meeting of the elders in which Sirakali Annamalai Kavundar was recognized as the headman and Arappalli Kavundar was appointed as the **Manthiri**. The decision recorded on a copper plate was partly destroyed in the Great Fire of 1974, which destroyed almost all the houses of the Melur hamlet.

### 1.4.1.2.2 Malayali Tribals Settlements in Bodhamalai

In Bodhamalai hills, the tribal settlements are seen in four major places namely Kizhur, Kurinjiur, Kuttamalai and Melur.

**Kizhur**: Literally means ‘Lower town’ in Tamil is a village in the Bodhamalai hills with 76 houses. The hamlet covers an area of about 166 hectares. According to a twelfth century inscription of **Veerapandiyan** found here, the Bodhamalai Malayalis were required to pay a homage tax to the Kollimalai Malayalis in recognition of their tribal primacy.

**Kurinjiur**: A term indicating a village or hamlet in brush-woodland (**Kurinji** denotes **Phlebophyllum kunthianum** Nees (=**Strophilanthes kunthianus** (Nees) T. And. ex Benth.) with 38 houses in the hamlet.

**Kutta Malai**: A mountain peak with an elevation of 985 m, literally means short mountain in Tamil with about 32 houses in the hamlet and covering an area of about 184 hectares. It is also pronounced and spelled as **Gidamalai**, or **Keddamalai**. The Mountainous country around it was known as the Kuttamalai Nadu and formed a division of Kongu Nadu.

**Melur**: Means ‘Upper town’ in Tamil, a village with about 96 houses in the hamlet on the Bodhamalai Mountain covers an area of about 184 hectares. More than
twenty Pandukal tombs, including a fallen menhir, are found on the nearby peak among a grove of sandalwood trees. Most of them have been disturbed and the interior dolmens exposed. The Malayalis believe that they are remnants of forts and palaces of an extinct race of Pandiya raja and that they, like the Irish Leprechauns, were very small in size, used mushrooms for umbrellas and employed rabbits for ploughing and riding. A heap of Neolithic stone tools, collected from the fields and banks of a stream, are worshipped by the residents as Pillaiyar, the elephant headed God. A Forest fire in 1974, when most of the people were away attending a festival, destroyed the entire hamlet.

1.4.1.2.3 Population

Bodhamalai hills comes under the Panchayat of Kizhur, occupying about 357 hectares and the total population residing here is 1434 (as per Census collected on field trip during the year 2001) with 252 huts in 4 hamlets. Most of them are illiterate.

The number of huts and their population are

<table>
<thead>
<tr>
<th></th>
<th>No. of huts</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>Kelur</td>
<td>76</td>
<td>249</td>
<td>220</td>
</tr>
<tr>
<td>Kurinjiyur</td>
<td>38</td>
<td>126</td>
<td>101</td>
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<tr>
<td>Kidamalai</td>
<td>32</td>
<td>146</td>
<td>97</td>
</tr>
<tr>
<td>Melur</td>
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<td>261</td>
<td>234</td>
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<tr>
<td>Total</td>
<td>252</td>
<td>782</td>
<td>652</td>
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1.4.1.2.4 Culture and Religious practices

Malayalis are essentially Vaishnavites, worshipping Kariraman but their belief includes elements of Saivism. Kariraman appeared in the form of a Siva lingam and the offering of the devotees include images of the Nandhi. Kariraman is worshipped also in many other forms such as Karivaradha Perumal, Perumal Linga Andi, Servarayan, and Varadharaja Perumal. In addition, they also worship Nadukals and a number of
tribal and village deities including Avathara Amma, Ilaya Raman, Kali Amman, Kali Yogi, Mari Amman, and Thaila Amman. They offer meat and intoxicating liquor to the minor deities. Their major festivals occur in January-March when they sing songs relating to their legendary origins. As they were driven from their homes by brahmin persecution, they do not employ brahmin priests to officiate in at their religious ceremonies; instead they raise priests from among themselves. They name their children after their God and a number of other village deities. Even Jain names are not uncommon as their mountains were once the abode of Buddhist-Jain monks. They are clannish as is the general case with all mountain people. Their ancient system of internal administration includes an officer, Kaariyakaarar for each hamlet. He performs marriages and death rites. Each Nadu is under the control of an UrKavundar who settles all disputes. The affairs of a group of Nadus are managed by the Pattaakaarar whose influence is considerable. Succession to these offices is hereditary. Under the British rule, the Gum was also assisted by an advisor known as Mudippukaran (Man of the Knotted Bag, or the One who Kept Accounts by tying knots on strings). He was responsible for collecting and delivering the tax money to the government. The chief Guru, titled Kulasekaran (Keeper of the Tribe), is sometimes called the Thaenanda Kavundan thereby referring to either one of their ancestors or the original group whose descendants occupied the Thaenanda mountain. The Guru is assisted by a Manthiri (minister) whose job is hereditarily held by a Thaenanda Malayali. In 1930, the Guru Lakshmana (of Kerala vamsam, Vishnu gothram.) installed his son, Lakshmana, as the new Guru in Chittheri in 1931. On the Kalrayan mountain, the Malayali chieftain was called Dhorai. If the Dhorai fails to bring some game down on a formal hunt held during the January Pongal festival, it was customary for the priest to cut off the kudumi (top knot) of the chief.
1.4.1.2.5 Life Style and Myth

Traditionally, Malayalis have lived in perfect balance with nature using the available resources for their simple life. Their houses are small, and the shape varies from rectangular to pyramidal-like, and are simple thatched structures with the roofs constructed by erecting long bamboos pegged down at intervals and thatched with the grass *Themeda cymbaria* Hack.. The walls are of slit bamboo coated with mud. The roof is conical and thatched with the long coarse grass and has no windows. There is no separate room for kitchen and they use firewood collected from the forest for cooking purposes. Sometimes kerosene may be used for cooking provided by the Tamil Nadu state government through public distribution schemes. There is no electrical power supply and they use solar battery provided by the Tamil Nadu government or kerosene lanterns for light. Each hut stands in a yard surrounded by a palisade of wattled bamboos. On some mountains, the villages resemble cluster of enlarged beehives, houses being circular and raised on wooden piles about two feet above the ground. A large common hut at the outskirts of the village serves as a tribal meeting place and a guest house to the visitors from the plains. It probably was a youth dormitory in the olden days. Their dress materials are very simple in spite of the cool climate. Men wear a 2m long dhothi and shirt to cover their body and women generally wear sarees with blouse. The aged widows wear only white sarees without blouse. Their ornamentals are a special aluminium made bangles on the wrist of the hand and the traditional practice of wearing big ear rings known as *thodu*. The working men wear a *kovanam* (loin cloth) in agricultural fields. Mostly they eat *Thinai* (*Setaria italica*), and *Saamai* (*Panicum miliare*) as staple food and only rarely include rice as food during festivals. They grind their corn grains in stone or wooden made traditional grinders and the paddy is pounded in wooden traditional
When a girl attains puberty, she is kept in a separate hut for a period of 7-30 days. She is given a bunch of *Clausena dentata* leaves and a long needle used for untangling hair *maikothi* by her aunt. The girl is given holy (purifying) baths everyday and is given nutritious food. On the last day of this period, the maternal uncle presents certain gifts and she is permitted inside the house after the purification ceremonies. During childbirth also such purification ceremonies are conducted on the 13th and 15th day after childbirth.

**1.4.1.2.7 Marriage**

Marriages are allowed within their *kulas* (clans). Due to modernization, love marriages are also common. Child marriages are completely abolished. The custom of marrying one's *murai penn* (rightful bride, usually the daughter of one's maternal uncle) even if she happens to be older than the groom is still prevalent. Parallel cousins do not marry, but cross-cousins normally have to marry each other when both attain age. Next *Parisam* is a custom among the Malayalis which exists to give bride-price, both in cash and kind in the presence of elders and close relatives of the groom in the bride’s house. Once the bride-price is fixed, wedding day also gets fixed on the same day. All their marriages usually take place in the bridegroom's village. A *pandal* (a shady structure prepared out of interwoven bamboos and coconut palm & *Cycas* leaves) is prepared in front of the house of the bridegroom a day before the wedding. The same structure is prepared also in front of the house of the closest relative of the bride who happens to reside in the bridegroom's village. Marriages are settled by elderly persons in the family and *Urkoundan*, after getting the acceptance of the bride. The bridegroom places a *Thali*
on the bride's neck which is tied by the Urkoundan. Thali is a gold medal inscribed either with the name of the husband or the figurine of a goddess. It is threaded on a string which is coloured yellowish with turmeric paste. Brahmins are not appointed to perform the marriage functions. After the marriage ceremony is over, the customary practice of Moi giving is performed. Moi is the traditional offering of formal gifts of cash by the family relatives who have come to celebrate or attend the marriage. Each family in the village as well as relatives of the couple from other villages have to offer Moi, both to the bride's and the bridegroom's families. The amount presented by each person is carefully noted on paper and announced aloud to all those present. The festive marriage dinner is provided to all. The custom is to slaughter one or two pigs for every wedding since pork was the main dish of the festive meal. Nowadays there are several tribals who do not eat pork and therefore to accommodate them and some non-tribal friends from the plains, pork is generally not served at wedding meals. This is observed more strictly in the villages on the periphery of the hills which have maximum contact with the people in the plains. In the interior, however, pork is still served in the weddings.

There are no dowry demands but if bride's parents willingly present a few sovereigns of gold, the same amount is presented to the girl by the bridegroom's parents also and giving money depends on their wealth. The parents of both sides may sometimes offer their livestock such as cattles, cows and pigs to their newly married couple.

They do not unwillingly force a girl into marriage, at the sametime remarriage is allowed to widows. If a young unmarried Malayali tribal girl dies, the body is decked as if she was a bride. A young man is sent into the room to spend a night embracing the body. In the morning, the body in treated as that of a married woman and is buried. Divorce is permitted after paying a fine at the panchyat. If the wife wants divorce for
genuine reasons, she is entitled to receive alimony expenses from the husband for her sustenance. Remarriages are permitted after paying a fine and the children born from the previous marriage go with the mother to the step father's house.

1.4.1.2.8 Death and other funeral functions

If death occurs in the hamlet, the tribals gather and take part in the funeral ceremony. The dead body is buried and they make it into a tomb known as Padukal. There are more than 20 padukal as seen at the top and the tribals worship these padukals as they believe their ancestors are still alive. There is no cremation except for suicidal case or in case of severely diseases. The dead body is taken to the burial ground in paadai (byre) made of fresh bamboo sticks and leaves of coconut or phoenix trees. Betel leaves, areca nuts, are buried along with the dead body.

1.4.1.2.9 Festivals, God and Worship

Pongal festival is the main festival celebrated in mid-January with all its charm and gaiety and the tribals offer thanks to the gods like sun, earth and cattle. People prepare the meal sweet pongal and offer it to the deity along with coconut, banana, flowers, turmeric and sugarcane. Adi is another festival celebrated during mid July. During this festival the unmarried girls worship the goddess Amman to get married soon. But nowadays Diwali festival is also celebrated and the children fire crackers and wear new clothes. The tribes worship Mahaavir idols, and they call it as Samanadi pattan and Pillayar idols during Ganesh Chadhurthi festival during the month of September without sacrificing any animal. A common feast is arranged by the members of the family once in three or five years to honour the departed souls of the family. They sacrifice pigs, goats to appease them and also for their well being and for a good harvest.
1.4.1.2.10 Public community hall

The Malayali tribals residing at Melur hamlet gather together at the public community hall during evenings and discuss all matters. This public community hall was constructed by them and is made up of mud wall with thatched roof with bamboo sticks and grasses. Sometimes divorce cases, rape cases and any other domestic problems are also discussed and the final verdict will be announced by Leader.

1.4.1.2.11 Occupation

In the past, their main occupation was hunting, fishing, and collection of NTFP (Non Timber Forest Products) such as honey, fruits from the wild, agriculture, etc. Nowadays fishing is habitual along monsoonal streams only during rainy season because of lack of permanent water reservoirs and their main occupation is agriculture.

1.4.2 GOVERNMENT SCHEMES FOR MALAYALI TRIBALS

1.4.2.1 EDUCATION

Mostly the tribals are illiterate but their childrens have opportunity to get free education and food from the Government primary school which has only one teacher at Melur. After 5th standard all the students have to go to the plains for continuing their studies.

1.4.2.2 SOLAR ENERGY

Due to lack of electricity facilities at the hill top of Melur, the state government has provided a solar battery to all the houses to harness the solar energy for their daily activities. Moreover a Television with a small room constructed by bricks has been provided to them for recreation and also for watching any other programmes.
1.4.3 WATER CONSERVATION

Malayali tribals residing at Melur hilly hamlets solely depend on only one open well for their daily needs. They conserve water resources by traditional knowledge. An underground tank-like structure is created by digging a pit of about 2m x 2m x 5m with piles of rocks arranged horizontally above at the top with 1-2cm gap interval between them so as to allow the water flow down back to the soil. Day-to-day activities such as bathing, washing of clothes, vessels etc. are operated above the tank to allow the flow of all the waste water underground. This traditional practice plays a crucial role in water conservation by maintaining the ground water level and also creating a clean environment for hygienic life by avoiding the stagnation of waste water in and around their houses. The provision for seepage helps in recharging the ground water level throughout the year, even in dry season.

1.5 OBJECTIVES OF THE PRESENT STUDY

A number of ethnobotanical explorations have been conducted among the Malayali tribals of Tamil Nadu (Viswanathan, 1989 and 1997; Nayar and Syed Khaleefathullah, 1995; Geetha et al., 1996a, and 1996b) but so far no ethnobotanical investigation has been systematically carried out among the Malayali tribals of Bodhamalai hills. Keeping this in mind, an ethnobotanical study inventory has been conducted on the Malayali tribals in Bodhamalai hills to

i. study the interrelationship with the natural resources for their sustainable life

ii. identify the medicinal plant resource base of Bodhamalai hills