1. INTRODUCTION

Nature always stands as a golden mark to represent the outstanding phenomena of mutualism. Traditional knowledge of herb drugs has been transmitted from generation to generation for thousands of years. Scientists and researchers across the world are watching plants as a future source of drugs because herbal medicines have a strong traditional or conceptual base and the potential leads for treating different diseases with fewer side effects. Natural products from plants have been the basis of the treatment of human disease. Ethnopharmacology is the cross-cultural study of how people derive medicines from plants, animals, fungi or other naturally occurring resources. Until now, the field has focused mostly on developing drugs based on the medicinal use of plants by indigenous people. The discovery that indigenous knowledge about medicinal plants may hold clues for curing western diseases has become one of the most widely used arguments for conserving culture and biological diversity (Farnsworth, 1990). The traditional use of plants by indigenous communities reflects the cultural aspects as well as biodynamic elements that have immense pharmacological potential to cure many diseases (Cox et al., 1994, Etkin, 1993).

The various indigenous systems such as Siddha, Ayurveda, Unani and Allopathy use several plant species to treat different ailments (Rabe and Staden 1997). Ayurveda is often referred to as the oldest system of medicine in India. Its origins can be traced back to Vedic and Buddhist medical knowledge, which might have in turn originated from folk healing traditions. The texts that crystallized Ayurveda in its present form were Sushruta Samhita by Sushruta (probably before 700 BCE), Charaka Samhita by Charaka (1st century CE), and Ashtanga hridayam by Vagbhata (8th century CE). Ayurveda is based on the concept of the tridosha that are a set of parameters, which are physico-chemical and functional in nature, imbalances in which are thought to result in various ailments (Nishteshvar and Vidyanath, 2006). Materials of plant origin were primarily used in the preparation of medicines, while those of animal and mineral origins were also utilized. This rich tradition in herbal medicine and the vedic
literature stands proof for the vast knowledge on our traditional systems of medicine. A good number of medicinal plants are found mentioned in the ancient classical literature such as, Charaka Samhitha, Susrata Samhita, Ashtanga Hridaya, etc. It is estimated that about 20,000 species of plants are used as source of medicines in the third world countries (Pushpangadan, 1998). In India, about 7000 species are used for medicine along with a few minerals, metals and animal products. The Folklore systems play an important role in meeting the health care needs of the rural community in India and use more number of plants than in the Indian systems of medicine. The use of herbal medicine is becoming popular due to less toxicity and acceptability than that of allopathic medicines (Agarwal 2005). The nature provides a lot of knowledge about plant wealth and traditionally this information has been passed from generation to generation which has being practiced by the Indigenous group of people of different areas. These groups of people possess the distinct food habits, culture, which reflects the traditional medicine. Ethno medicine may be defined broadly as the use of plants by humans as medicines (Farnsworth, 1990).

India, having two out of the eighteen Biodiversity Hot Spots of the world, is perhaps the largest producer of medicinal herbs in the world. The vast resources of medicinal plants have been extensively used in various traditional systems of medicine. Traditionally each village in Kerala has three or more folk healers and their number is roughly estimated to be about 5,000 (Rajasekharan et al., 2005). The total number of plant species of all groups recorded from India is 43,000 and 3,000 among them are recognized to possess medicinal properties. According to an all India Ethnobiological Survey carried out by the Ministry of Environment & Forests, Government of India, over 8,000 plants are being used in traditional, folk and herbal medicine systems of India. Ayurveda, the most ancient and widespread system of healthcare in the Country, uses about 900 species of plants. Among other systems, Siddha uses 800 species of plants; Unani, 700 species; Amchi or Tibetan system, about 300 species and Modern medicine uses 90 species of plants (Rajasekharan et al., 2005).

Indian subcontinent excels in plant biodiversity having several medicinal properties. It facilitates traditional healers to develop effective therapies against various ailments. Kerala has a rich tradition in Ayurveda from very early period and
contributed much to the development of this system of medicine. Apart from trained Ayurvedic doctors from institutions, there are large numbers of registered as well as unregistered medical practitioners in the state. According to reports, there are 7000 A class and 6000 B class medical practitioners in Kerala (Pushpangadan et al., 1998).

The anthropologist refereed Kerala as a museum of diverse ethnic groups and a variety of traditional systems of medicine. The forests of Western Ghats of Kerala are endowed with a very rich collection of rare medicinal plants, of which many are endemic to the region (Subramanian, 1982). The tribes, living in this region are known to possess great knowledge on the medicinal uses of many of these plants. An abundance of ethno medical information on plant uses can be found in the scientific literature but has not yet been added and compiled into a usable form. Hence ethno botanical documentation and pharmacognostic study are essential in documenting the scientific information regarding the purity and quality of the plant drugs. The detailed pharmacognostical evaluation gives valuable information regarding the morphology, microscopical and physical, chemical and pharmacological characteristics of the crude drugs (Dhanabal et al., 2005; Sharma, 2004).

The Western Ghats of south-western India and the highlands of south-western Sri Lanka, together form one of the most densely populated biodiversity hotspots in the world. The Western Ghats alone harbours approximately 5,000 species of vascular plants belonging to nearly 2,200 genera; about 1,700 species (34 percent) are endemic (found nowhere else) (Anonymous, 1998). In traditional medicine a number of such plants are used, which is very effective, however, the huge block in promoting the use of herbal drugs are the lacking of the scientific evaluation and standardization. Further, confusion in the identification of medicinal plants and their substitutes, adulteration, lacking of valid and reliable scientific information for their therapeutic efficacy are some of the major problems concerned. Standardization of herbal medicines and quality control of the plant raw materials used as phyto-drugs are the most important challenges in bringing any of the acceptances of ethno botanical knowledge of concerned people. In 1996, WHO has brought out guidelines for the assessment of herbal medicines with the objective of defining basic criteria for the evaluation of quality, safety and efficacy of phyto-drugs. The assessment includes assessing the
crude raw drugs, preparation, finished product and stability studies and their biological activity.

**NEED AND SIGNIFICANCE OF THE PRESENT INVESTIGATION**

Plants and plant extracts have been used for the treatment of skin disorders for centuries (Augustin and Hoch, 2004; Avalos and Maibach, 2000). Because of increasing resistance to antibiotics of many bacteria, plant extracts and plant compounds are of new interest as antiseptics and antimicrobial agents in dermatology (Augustin and Hoch, 2004; Blaschek et al., 2004; Norton, 2000). Skin is the largest organ of the body, accounting for about 15% of the total adult body weight. Skin is a major part of the body contact with the outside world. It performs many vital functions, including protection against external physical, chemical, and biologic assailants, as well as prevention of excess water loss from the body and a role in thermoregulation. The skin is continuous, with the mucous membranes lining the body's surface. As long as skin is intact, this tough, flexible outer covering is remarkably resistant to infection. Because of its exposed state, it is frequently subjected to cuts, punctures, burns, chemical injury, hypersensitivity reactions and insect or tick bites. These skin injuries provide a way for pathogens to enter and infect skin and underlying tissues.

Skin diseases occur worldwide and amount to approximately 34% of all occupational diseases encountered (Abbasi et al., 2010). They affect people of all ages from neonates to the elderly and constitute one of the five reasons for medical consultation. Skin disorders affect 20-30% of the general population at any one time. These are prevalent in tropical regions (Davis et al., 1980). Socio demographic factors play pivotal roles in determining the pattern of skin disease (Rea et al., 1976). Skin diseases have been of major concern recently due to their association with the Human Immunodeficiency Virus and Acquired Immunity Deficiency Syndrome (HIV/AIDS). Njoronge et al., (2007) and Tschachler et al., (1996) stated that more than 90% of HIV infected individuals develop skin and mucosal complications at some stage during the disease. Skin ailments present a major health burden in both developed and undeveloped countries. For example, in the United States, skin infections caused by methicillin-resistant Staphylococcus aureus (MRSA) result in approximately 126000 hospitalizations while invasive MRSA results in approximately 94 360 infections and
18,650 deaths each year, a rate which exceeds that of AIDS (Quave et al., 2008). According to the World Health Organization (WHO, 2012), burns has also been a serious public health problem due to the global increase in burn mortality rates. Burn victims are also susceptible to serious and often fatal *Pseudomonas aeruginosa* infections (Lim, 1998). Socio-economic environment such as household overcrowding play an enormous part in the spread of skin infections (Hay et al., 2006). Furthermore, hot and humid climatic conditions exacerbate skin infections. Although mortality rates for skin diseases are relatively low, they impact significantly on the quality of life and are often persistent and are difficult to treat. Traditional medicinal resources, especially plants have been found to play a major role in managing skin disorders (Abbasi et al., 2010).

Infectious diseases, particularly skin and mucosal infections, are common in most of the tribal inhabitants due to lack of sanitation, potable water and awareness of hygienic food habits. An important group of these skin pathogens are the fungi, among which dermatophytes and *Candida* spp., besides certain pathogenic bacteria are the most frequent (Desta, 1993). Furthermore, in the last few years, the numbers of immune suppressed and immune compromised patients, who frequently develop opportunistic systemic and superficial mycoses such as candidiasis, dermato-mycosis, fungal infections etc., have increased dramatically (Li et al., 2007; Ribbon, 1988; Diamond, 1991). This is mainly due to the non-availability of effective antimicrobial drugs for systemic infections and toxicity of available drugs like amphotericin-B (Maddux and Brarrerie, 1980; Saral, 1991). Thus there is an increased need for the development of alternative anti-pathogenic substances. One possible approach is to screen local medicinal plants in search of suitable chemotherapeutic antibacterial and antifungal substances. The traditional herbalists prescribed various preparations of medicinal plants in treating ailments such as itch, eczema, scabies and skin diseases (Chopra et al., 1992; Behl et al., 1993).

Follow-up research on other traditional uses of medicinal plants, such as for the treatment of stomach ailments, sexually transmitted infections (STIs), respiratory complaints etc. have been given sufficient attention, but still lacking is attention given to the ethno botanical plant use for skin diseases in remote geographical areas. The aim
of the present study was to collect ethno medicinal knowledge from lay people in Malabar area of Kerala (northern Kerala) for the application of medicinal plants as a treatment for skin disorders. This is the first survey done in this region which specifically focuses on dermatological ailments.

**IMPORTANCE OF VALIDATION:**

The documentation of traditional knowledge aids in the preservation of indigenous culture, identifies threatened species and contributes to the conservation and management of plant diversity (Berkes *et al.*, 2000, Watson *et al.*, 2003). In addition to documenting the traditional knowledge related to medicinal plants, scientific validation of traditional medicinal plants has been an important path of recent research (Uprety *et al.*, 2010). Validation is performed by *in-vitro* or *in-vivo* experiments or by isolation of important secondary metabolites that are useful for treating particular types of diseases or disorders (Taylor *et al.*,1996; Adzu *et al.*, 2004; Rokaya *et al.*, 2012). In addition, previously published studies can also aid in establishing links between traditional uses and modern scientific knowledge (Gaire *et al.*, 2011). The practice of seeking evidence helps in identifying important medicinal plants and may also lead to the development of new or important pharmaceutical drugs with future bio prospecting potential (Newman *et al.*, 2007; Douwes *et al.*, 2008).

Collection of ethno medical information especially in the poor countries or developing countries remains primarily an academic endeavour of little interest to most industrial groups. Findings from this screening study have provided important baseline data regarding possible biological properties of the indigenous plants. As far as we are aware, it is the tradition in Kerala that for most ailments and symptoms, lay people still rely heavily on the use of medicinal plants despite the fact that not much is known about the possible beneficial and side effects of the species being used. There are a number of crude drugs for skin diseases where the plant source has not yet been scientifically identified. Importance of scientific validation in addition to documenting the traditional knowledge related to medicinal plants has been an important path of recent research. From the tradition medicines, only about 6% have been screened for biologic activity, and a reported 15% have been evaluated phytochemically (Verpoorte, 2000). Screening methods becoming more advanced and available, these numbers will
change, but the primary discriminator in evaluating one plant species versus another is the matter of approach to finding leads. There are some broad starting points to selecting and obtaining plant material of potential therapeutic interest.

Herbal formulations have reached extensive acceptability as therapeutic agents for several diseases. The development of authentic analytical methods which can reliably profile the phytochemical composition, including quantitative analyses of marker/bioactive compounds and other major constituents, is a major challenge to scientists. Standardization is an important step for the establishment of a consistent biological activity, a consistent chemical profile, or simply a quality assurance program for production and manufacturing of herbal drugs. WHO provided specific guidelines for the assessment of the safety, efficacy and quality of herbal medicines as a prerequisite for global harmonization. Standardization of herbal formulations is essential in order to assess the quality of drugs, based on the concentration of their active principles and therapeutic effect of ingredients in each dose. (Yadav et al., 2008). Herbal product cannot be considered scientifically valid if the drug has not been authenticated and characterized in order to ensure reproducibility in the manufacturing of the product. Moreover, many dangerous and lethal side effects have recently been reported, including direct toxic effects, allergic reactions, effects from contaminants, and interactions with herbal drugs. Standardization of herbal raw drugs include passport data of raw plant drugs, botanical authentification, microscopic & macroscopic examination, identification of chemical composition by various chromatographic techniques and biological activity of the whole plant. Macroscopic and microscopic evaluation and chemical profiling of the herbal materials for quality control and standardization have been reported earlier in Indian Herbal Pharmacopoeia, (2002), British Herbal Pharmacopoeia, (1996), Quality Control Methods for Medicinal Plant Materials (1996) etc..

AREA SELECTED FOR THE SURVEY:

The documentation of indigenous knowledge on the utilization of local plant resources by different ethnic groups or communities is one of the main objectives of ethno botanical research (Sasi et al., 2011). In Kerala the major tribal communities are nearly forty in number. Some of them are still nomadic and living in the forests.
(Joseph & Antony, 2012). There is a need to re-emphasize and enhance research in natural products, especially because only a small fraction of plant species have been investigated so far from Malabar region of Kerala.

The state of Kerala borders with the states of Tamil Nadu on the south and east, Karnataka on the north and the Arabian Sea coastline on the west. The Western Ghats, bordering the eastern boundary of the State, form an almost continuous mountain wall, except near Palakkad where there is a natural mountain pass known as the Palakkad Gap. The area selected for survey in the present study is Malabar region of Kerala. It included the northern half of the state of Kerala. Kasaragod, Kannur, Wayanad, Kozhikode, Palakkad, Thrissur and Malappuram are the districts coming under Malabar region (Plate.1). It is an area of southern India lying between the Western Ghats and the Arabian Sea. This part of India was a part of the British East India Company-controlled State, when it was designated as Malabar District. Folk medical knowledge in South India was very strong because parts of southwest India are biodiversity hotspots and have a very large collection of medicinal plants.

Geographically, the Malabar Coast, especially on its westward-facing mountain slopes, comprises the wettest region of southern India as the Western Ghats intercept the moisture-laden monsoon rains. Malabar endowed with more than one-half of the geographical area starting from Thrissur to Kasaragod in the northern part of Kerala and also blessed with more than one-half of the total inhabitants of the state. The biodiversity of the Western Ghats is the main component of the biodiversity of Kerala. Evergreen forests are its main biological treasure house. Favorable climate and soil conditions and other affable physical factors are responsible for the biological richness. In Kerala humidity is very high at an average of 70 percent. Structurally, Kerala has different geo-physical areas such as forests, marshes, mangroves, ponds, seashores and deltas. The Western Ghats is classified in to three regions, viz., South (81N to 121N), Central (121N to161N) and North (161N to211N) Western Ghats (Dahanukar et al., 2004). The forests and hills of this region is a treasure house of about 700 medicinal plants (Padmavathy and Mekala, 2013).

The data collected from this area revealed that it is very effective for the treatment of skin disorders. As far as the available literature is concerned, certain plants
yet to scientifically validated. It is very important to validate the traditionally used medicinal plants because nowadays there is an increase in demand, use and popularity for traditional medicine throughout the world, therefore documentation and scientific validation of those plants is the need of the hour. In traditional systems of medicine, the drugs are primarily dispensed as water decoction or ethanolic extract. Fresh plant parts, juice or crude powder are used as medicines. Thus medicinal plant parts should be authentic and free from harmful materials like pesticides, heavy metals, microbial or radioactive contamination. Plants are a rich source of active ingredients for health care products, with many blockbuster drugs being directly or indirectly derived from plants. However, many high value plant-derived natural products remain undiscovered or unexplored for their pharmacological activity. The WHO has emphasized the need of exploring the plant derived drugs and to ensure the quality control of medicinal plant products by using modern techniques and applying suitable standards (Raina, 2003).

The present study envisage to conduct a survey and documentation on the medicinal plants used for the skin disease among the tribes and traditional healers of Malabar area and to scientifically validate the most potent plants from the survey.

**SELECTION OF THE PLANT FOR PRESENT STUDY**

When selecting a plant for the study, four basics methods are usually followed (Suffness & Douros, 1979):

a) Random choice of plant species  
b) Choice based on ethno medical use  
c) Follow up of existing literature on the use of the species  
d) Chemotaxonomic and pharmacognostic approaches

Comparison of the four methods showed that the choice based on ethno medical use has given about 50% more positive leads than other methods. Based on the Choice based on ethno medical uses, survey of the plant used for the skin disease of Malabar region has been made in the present work. In the light of third and fourth approach five plants were selected for further scientific study.

Considering the above points, the objectives set forth are:
- Review of Literature for:
  - General aspects of medicinal plants
  - Ethno-Botanical survey of medicinal plants used for the skin
  - Reported pharmacological activity of medicinal plants ailments
  - More enquires on selected medicinal plant and their reported activities
- Survey, documentation and Taxonomic studies on the ethno botanical plants used for the skin disease of Malabar region
- Micromorhological studies of the selected plant.
- Pharmacognostic study of the selected plant
- Physicochemical study of the selected plant
- Phytochemical study of the selected plant
- Anti-microbial study of the selected plant
- Developing a composite botanical, anatomical and phytochemical profile of selected plant that can be used as a marker key for quality checking of raw drugs.

The study includes Ethno botanical survey of plants used for the skin diseases and its analysis and scientific validation studies. Special emphasis was given for pharmacognostical and chemical finger printing of genuine raw drug and its useful parts using modern analytical techniques like HPTLC, GCMS for quality standardization.

It is earnestly anticipated that this study will give a comprehensive list of medicinal plants used for skin disease by the tribals and traditional healers of Malabar region of Kerala India. It is also expected that through bio-prospecting of the selected plant, the details of the plant species will be scientifically validated for the future benefit of the researchers and herbal industry.