General Introduction
Introduction

Evaluation of human life and culture have directly been associated with and influenced by the surrounding environment. Primitive Tribes living closely associated with nature mainly depend on it for their livelihood. A tribe is a group of people in a primitive or barbarous stage of development acknowledging the authority of a chief and usually regarding them as having a common ancestor. The number of tribal people in India is perhaps the largest in the world, after Africa. In the 2001 census, 84.33 million persons were classified as members of Scheduled Tribes, corresponding to 8.2% of the total population. The census lists 461 groups recognized as tribes, while estimates of the number of tribes living in India reach up to 635\textsuperscript{1,2}. The World Health Organization defines traditional medicine as “the health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral-based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to treat, diagnose and prevent illness or maintain well being”\textsuperscript{3}. The traditional systems of medicine together with folklore systems continue to serve a large portion of the population. Ethnic people are highly knowledgeable about the medicinal plants and their medicinal values. These indigenous people are using a historical continuity of resource use, and posses a broad knowledge base of the complex ecological system in their own localities. This knowledge has been accumulated through a series of observation transmitted from generation to generation. According to the World Health Organization (WHO) report, as many as 80% of the people depend on traditional medicine for their primary health care needs\textsuperscript{4}. 
Thousands of years ago Indian practitioners began evolving the art of healing. In many of their writings healers discussed a variety of modalities for healing a person’s body, mind, and spirit. For example ‘Charaka Samhita’, believed to have arisen some 2300 years ago, is thought to be one of the oldest and most important ancient authoritative writings in Ayurveda, one of the main traditional healing systems of India\(^5\). Ayurveda, Unani, Siddha and ‘Prakritika Cikits’ (naturopathy) are the various systems of medicine still prevalent in India besides several types of folk medicines are prevalent in tribal areas of India. They have a rich tradition of the use of plants, minerals and animal products having therapeutic utility\(^6,7\).

There are 33 tribal groups living in Tamil Nadu. They are scattered over wide area. Of the tribal in Tamil Nadu, the palliyans and pulayans live in the Palani Hills. Kanikaran or Kani is living in Kanyakumari district and Tirunelvelvi district. In Tirunelvelvi district these kani tribes are living in Kannikatty, Mayilaru, Inchikuzhi, Kouthalai and Karayar situated in southern end of Western Ghats. The southern end of Western Ghats lies between the longitudes 77\(^\circ\).5’ – 77\(^\circ\).40’ E, and latitudes 8\(^\circ\).5’ – 8\(^\circ\).50’N. About 1800 species of plants are listed to be present in these hills\(^8\). The elevation ranges from 300 to 900m and the annual rainfall is 1500mm. The Kanikarans of Mundanthurai Sanctuary seem to be migrants from Thiruvanthapuram of Kerala state\(^9\) (Fig.1). The indigenous people have deep respect for nature and great value of the plant species importance to them. The Kani tribals residing in deep forest areas are still dependent on medicinal plants for their primary health care and treatment of various diseases. Kani still supplement their food by gathering roots and tubers from the nearby forest area\(^10\).

Large numbers of organic compounds are occurring in plants. They include both primary and secondary metabolites. Primary metabolites are essential for life of the
Fig. 1 Showing the habitat of kanikar Tribes
plants. Secondary metabolites are having well defined functions, especially in the defense mechanism of the plants and are characteristics of the particular biological group. These secondary metabolites have been used in many field of human interest. Some of the field where these chemicals or biologically active principles of the plants are human healthcare, food stuffs, cosmetics, dyes, and drugs etc. Herbal medicines are assumed to be of great importance in the primary healthcare of individuals and communities in many developing countries\textsuperscript{11}. India is a veritable emporium of medicinal and aromatic plants, approximately has more than 25,000 plant species. It has been estimated that out of 15,000 higher plants occurring in India, 9,000 are commonly useful, of which 7,500 are medicinal 3,900 are edible, 700 are culturally important, 525 are used for fiber, 300 for pesticide and insecticide, 300 for gum, resin and dye and 100 for incense and perfume\textsuperscript{12}.

These herbal medicines are easily available, cheaper, time tested and considered safer than some of modern synthetic drugs. There are at least 120 distinct chemical substances derived from plants that are considered as important drugs currently in use in the world, while several other drugs are simple synthetic modifications of the natural products\textsuperscript{13}. The Indian systems of medicine namely Ayurveda, Siddha, and Unani have played a pivotal role in health care management of humanity. Indian systems of healthcare deal with both the preventive and curative aspects of life in a most comprehensive way and close similarity to the WHO’s concept of health. With the passage of time and lack of proper description, voucher specimens and communication gap, the identity of some of these drugs could not be ascertained and confusion started. As a result, a number of medicinal herbs are assigned more than one name and is used more than one crude drug. This controversy resulted in the use of substitutes and adulterants.
Medicinal plants form the backbone of traditional system of medicine in India. Pharmacological studies have acknowledged the value of medicinal plants as potential source of bioactive compounds\textsuperscript{14}. Medicinal plants are rich sources of novel drugs that forms the ingredients in traditional systems of medicine, modern medicines, food supplements, pharmaceutical intermediates, bioactive principles and lead compounds in synthetic drugs\textsuperscript{15}.

At present nearly 30\% or more of the modern pharmacological drugs are derived directly or indirectly from plants. The commercial value of various innumerable drugs and pharmaceuticals derived from tropical forest systems on worldwide basis is projected at 20 billion dollars a year\textsuperscript{16}.

Scientists have listed a number of plants with medicinal properties. Bacteria, fungi and viruses are the causative agents of almost all kind of diseases. Infectious diseases are the leading cause of death worldwide, especially with the current increasing trends of multidrug resistance among emerging and re-emerging bacterial pathogens to the available modern drugs or antibiotics\textsuperscript{17,18}. Antimicrobial agents are chemicals that kill or inhibit the growth of microorganisms. Antimicrobial agents include chemical preservatives and antiseptics, as well as drugs used in the treatment of infectious diseases of plants and animals. Antimicrobial agents may be of natural or synthetic origin and they may have a “static” (to inhibit the growth) or “cidal” (to kill) effect on microorganisms. The discovery of antibiotics is one of the great breakthroughs in modern medicine. A lot of infectious diseases became effectively controllable. However, the increasing marketing and use of antibiotics made antibiotic resistance a serious problem in modern medicine. There is a continuous and urgent need to discover new antimicrobial compounds with diverse chemical structures and novel mechanisms of action because there has been an alarming increase in the incidence of new and re-
emerging infectious diseases\textsuperscript{19}. Plants are of constant interest as a source of antimicrobial agents\textsuperscript{20}. Particularly as plant derived medicines have been part of traditional healthcare in most parts of the world for thousands of years. A new approach is being adopted by the natural products industry and plant scientists to develop plants, which contain many unique biochemical compounds, as a renewable resource for improved medical and pharmaceutical products\textsuperscript{21}. Recently, the plant species have been identified that contain nutrients displaying new, beneficial medicinal or therapeutic properties\textsuperscript{22}. The nutritional and medicinal properties of these plants may be interlinked through phytochemicals, both nutrient\textsuperscript{23}.

It has been reported that trace elements play a pivotal role in formation of the active constituents in medicinal plants\textsuperscript{24}. It has been also reported that alteration of trace elemental homeostasis in an organism has direct correlated with different pathological conditions\textsuperscript{25}. Throughout the world, there is increasing interest in the importance of dietary minerals in the prevention of several diseases. Elements such as sodium, potassium, magnesium, calcium, manganese, copper and zinc could reduce several individual risk factors. Edible plants enhanced with minerals could be used as a new source of mineral in more available form than current, inorganically based mineral supplements.

In the developing world, many low-income families exist on a simple diet composed primarily of staple foods that are poor sources of same macronutrients and many micronutrients\textsuperscript{26}. As a result nearly 2 billion people (33\% of the world’s population) are at risk for Iron deficiency and 1.5 billion people are at risk for iodine deficiency\textsuperscript{27}. Fruits and vegetables are valuable sources of minerals\textsuperscript{28}. Diets high in fruits and vegetables are also linked to decrease risk of diseases and their consumption should be encouraged\textsuperscript{29, 30}. So screening of the actual bioactive elements of plant origin
and assessment of elemental composition of the widely used medicinal plants is essential.

Of course in this dimension, pharmacognostical studies, antibacterial activity and phytochemical studies on *Flacourtia indica* (Burm. f.) Merr. (Flacourtiaceae), *Flueggea leucopyrus* (Phyllanthaceae), *Stephania wightii* Dunn (Menispermaceae) and *Ventilago maderaspatana* Gaertn. (Rhamnaceae) are a sustainable step and it further requires a long-term study to evaluate pharmacognostical action as well as therapeutic efficacy and toxicity of plants to establish. The present study pertains to detail pharmacognostical, antimicrobial and phytochemical investigations of four commonly available plants viz. *Flacourtia indica* (Burm. f.) Merr. (Flacourtiaceae), *Flueggea leucopyrus* Willd. (Phyllanthaceae), *Stephania wightii* Dunn. (Menispermaceae) and *Ventilago maderaspatana* Gaertn. (Rhamnaceae).
Scope and Objectives of the Present Work

The main objectives of the present investigations are,

- To provide the ethnobotanical information of traditional healing arts of South India.
- To perform a systematic pharmacognostical study of the leaf, stem and roots of *Flacourtia indica* (Flacourtiaceae), *Flueggea leucopyrus* Willd. (Phyllanthaceae), *Stephania wightii* Dunn (Menispermaceae) and *Ventilago maderaspatana* Gaertn. (Rhamnaceae).
- To carry out the preliminary phytochemical analysis; thin layer and column chromatographic studies.
- To perform isolation and characterization of a phytochemicals from the plant tuber of *Stephania wightii* Dunn. (Menispermaceae).
- To estimate the trace elements present in these four plants such as copper, iron, sodium, barium, zinc etc.
- To study the antibacterial activity of chloroform, ethanol, and aqueous extracts of the four plants *Flacourtia indica* (Flacourtiaceae), *Flueggea leucopyrus* (Phyllanthaceae), *Stephania wightii* Dunn. (Menispermaceae) and *Ventilago maderaspatana* Gaertn. (Rhamnaceae) and the isolated compound from *Stephaania wightii* comparing with standard antibiotics on gram positive bacteria and gram negative bacteria by ‘disc diffusion’ method.
- To study the pharmacological activity of ethanol, and aqueous extracts of *stephanaia weightii* with particular reference to antihepatotoxicity.
References


