INTRODUCTION

During ancient times itself India's knowledge on medicinal plants was wide and comprehensive. There are many Vedic texts which stand as a proof of their vast knowledge on herbal medicines. Although the ancient system of herbal medicine was prevalent throughout the country, it suffered a severe setback with the introduction of Allopathic medicines. But currently it is observed that there is a more scientific approach to the Vedic day's store of knowledge of medicinal plants. In the ancient classical Ayurvedic texts 'Charaka Samhita', 'Susruta Shamita' and 'Astanga Samhita' a good number of medicinal plants are found to be mentioned. But many of them still remain to be properly identified.

Man has used plants to treat common infectious diseases and some of the traditional medicines are still included as part of the habitual treatment of various maladies (Heinrich et al., 2004). Plants are natural reservoir of medicinal agents, almost free from the side effects normally caused by synthetic chemicals. A number of modern drugs have isolated from natural sources and many of these isolations are based on the uses of the agents in traditional medicine (Chatterjee and Pakrashi, 1992; Chopra et al., 1956; Kirtikar and Basu, 1935). Ethnobotanical and ubiquitous plants serve as a rich resource of natural drugs for research and development (Kong et al., 2003). WHO report depicts that plant based products or its derivatives accounts for nearly 28 % of drugs available in the market (Newman et al., 2003). Natural product and their derivatives have historically been exploited as a valuable source of noval therapeutic agents (Koehn and Carter 2005). India is bestowed with rich and diverse resources of plant wealth including an enormously large number of medicinal plants. They are extensively used as antitumor agents, antidiabetics, purgatives, anti-inflammatory drugs, antioxidants and antidots (Jeyabal et al., 2008).
In India, majority of population use traditional medicines for primary healthcare. Researchers are looking for new leads from the traditional medicinal plants, which will help to develop better drugs against microbial infections. One third of the world's population relies on plants and plant extracts for healthcare. Thus the importance of developing active compounds from plant for new drugs has become a prime importance for many researchers and pharma industries (Anonymous, 2001).

Kerala has wide variety of plant life and most of us are not aware of the importance of preservation and protection of these plants. Medicinal Plants constitute an important component of the plant resource spectrum of Kerala. Recent analysis shows that out of 4600 estimated flowering plants in Kerala, about 900 possess medicinal values. Of these, 540 species are reported to occur in forest ecosystems. Over 150 species of plants that are either indigenous or naturalized in Kerala are used in the Indian system of Medicine like Ayurveda and Siddha. The rural folk and tribal communities make use of about 2,000 species of lesser-known wild plants for various medicinal uses. About 60 to 65% of plants required for Ayurvedic medicine and almost 80% of plants used in Siddha medicine are found in the forests of Kerala. Forests of Kerala are endowed with a large number of medicinal plants. An authentic publication on this integral component of forest resources is still lacking and therefore very little information is available on the medicinal properties of many species. The shrinking habitat of the medicinal plants and the ever increasing demand for the raw drugs pose great threats to some species that are in the verge of extinction. Intensive studies on indigenous medicinal plants and germplasm collection of the various species are therefore very effective (Sala- 1995).
Phytochemical importance of plants

Plants are excellent chemical factories certainly more efficient than our modern laboratories in many respects. Production mandate of the plant lab can be changed merely by genetic manipulation and or by alteration of nutrient supply. The precise control over reaction conditions allows plants to synthesize chemical compounds, called phytochemicals that can be truly remarkable both in structure and function. Plants cannot run away from predators, and so they have both mechanical defenses, such as thorns and chemical defenses to avoid being eaten. In nature, of course, these chemicals are intended to cause sickness in, would be predators, but in small doses or when altered through appropriate chemical procedures the same molecules can have therapeutic effects. One of the defences plant has perfected to fight against various stresses is by way of synthesis and storage of some substances. It is called as toxic principles or medicinal compounds (Hetherington, 1996).

The role of phytochemicals as mediators of chronic degenerative diseases such as cancer, diabetes and coronary heart disease has an evolutionary basis. The omnivorous ancestors of modern human ingested non-nutrients as well as nutrients from plants, phytochemicals are a normal component of human dietary physiology. Contemporary populations living in a traditional subsistence life-style not only ingested phytochemicals as part of the diet but also from herbal medicines, beverages, food additives, tooth brushes and masticants. Their patterns of plant consumption offer insight into how human ancestors in such environments could have thrived as hunters and scavengers without suffering the ill-effects often associated with a high fat diet (Johns, 1996).

It is estimated that today, plant materials are present in, or have provided the models for 50% of western drugs (Robbers et al., 1996). About 10% or our leading drug in cocaine, crack, hashish, heroin, marijuana, and opium) now contain phytochemicals still extracted
directly from the higher plants (Duke, 1993). Thus plants still have a great potential for producing new drugs of great benefit to mankind.

Among the 2,50,000 species of higher plants only about 5 to 10% of them are chemically investigated (Nahrstedt, 1996). Since many drugs such as quinine and artemisinin (Wright and Philipson, 1990), taxol and camptothecin (Debernardis et al., 1996) were isolated from plants and because of the increased resistance of many microorganisms like malaria parasites to established drugs, investigation of the chemical compounds within traditional plants is necessary (Philipson, 1991).

Pharmacognosy

Pharmacognosy is the study of drugs of natural origin. The term comes from two Greek words: "pharmakon" meaning drug or medicine, and "gnosis" meaning knowledge. The American Society of Pharmacognosy defines pharmacognosy as "the study of the physical, chemical, biochemical and biological properties of drugs, drug substances or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources". It is also defined as the study of crude drugs. Crude drugs is referred to the natural product that has not been advanced in value or improved in condition by any process or treatment beyond that which is essential for its proper packaging and prevention from deterioration. The main goal of pharmacognosy is to assess the value of raw materials and to ensure that the final product is the required standard. Strict standardization procedures and pharmacognostical studies of medicinal plants would reduce drastically much of the accidents in wrong prescriptions of traditional herbal medicines. WHO has developed several guidelines for carrying out standardization procedures of raw herbal products, which basically include pharmacognostical, physico-chemical, pharmacological and toxicological methods to standardize herbal materials or products. Microscopic and macroscopic standards could be drawn out where a plant can be differentiated from another plant which may look
similar in external appearance. Currently, genetic fingerprinting and the use of analytical quality-control equipments like HPLC and HPTLC are performed on a large scale for standardization and identification of herbal drugs. Photochemistry has evolved as a major branch of pharmacognosy in developing markers for the purpose of identification and standardization. It would also be worthwhile to draw a pharmacognostical scheme for all controversial species of plants where the information could be made available officially which would always serve as a useful reference (Kumar, 2007).

The major hindrance in the amalgamation of herbal medicines into modern medical practices is the lack of scientific and clinical data and the better understanding of the efficacy and safety of the herbal products. To ensure the quality and safety of its products and practices, standardization is of vital importance (Gogtay et al., 2002). Herbal medicine has been enjoying renaissance among the customers throughout the world. However, one of the impediments in the acceptance of these formulations is the lack of standardization and quality control profiles. Owing to the complex nature and inherent variability of chemical constituents of plant-based drugs, it is difficult to establish quality control parameters (WHO, 2000).

According to regulatory guidelines and pharmacopoeias macroscopic and microscopic evaluation and chemical profiling of the botanical materials is used for quality control and standardisation. Thin layer chromatography (TLC) and high performance thin layer chromatography (HPTLC) are available tools for qualitative determination of small amount of impurities. Also many analytical techniques such as volumetric analysis, gas chromatography (GC), column chromatography (CC), high performance liquid chromatography (HPLC) and spectrometric methods are also frequently used for quality control and standardization (Swatantra and Kushwha, 2010).
Antimicrobial Activity of plants

The mergence and spread of multidrug-resistant (MDR) bacterial pathogens have substantially threatened the current antibacterial therapy. The number of multi-drug resistant microbial strains and the appearance of strains with reduced susceptibility to antibiotics are continuously increasing. MDR bacterial infections often lead to increased mortality, longer length of stays in hospitals, and higher cost of treatment and care. In developing countries, synthetic drugs are not only expensive and inadequate for the treatment of diseases but also often with adulterations and side effects. Therefore, there is need to search new infection fighting strategies to control microbial infections.

Significance of the selected Medicinal Plants

_Embelia ribes Burm_, is a threatened woody shrub belongs to the family Myrsinaceae, which is mostly found in the moist deciduous forests of the Western Ghats, India, Sri Lanka, Malaysia and South China. The plant is popularly known as Vidanga or Bashmak or Krimigna (Sanskrit) in Ayurveda and it is used as one of the adjuvant in most of the drug preparations including the treatment of anti-inflammatory to relive rheumatism and fever. The fruit which is bitter in taste is used for the treatment of tumors, ascites, bronchitis, jaundice and mental disorders seeds are used as antibiotic, anthelmintic, antituber-culosis, alterative and simulative. Leaves are astringent, demulcent, depurative and useful in pruritus, sore throat, ulcers of mouth, indolent, skin diseases and leprosy. The traditional medical practitioners residing in the vicinity of the Lakkinakoppa forest range of Bhadra Wild Life Sanctuary, are being used the tender leaf paste of this species to cure cut wounds and leprosy.
*Chonemorpha fragrans* is an endangered medicinal plant. It is used in different preparations such as sudarsanasavam and kumaryasavamin Ayurvedic system (Srinivasan et al., 2001). Phytochemical investigations have revealed the presence of steroidal alkaloids, such as chonemorphine and funtumafrine in *C. fragrans*. Camptothecin, a well-known anticancer alkaloid has been detected in ethanolic extracts of stem with bark and callus cultures derived from *C. fragrans*. The plant has a variety of pharmacological activities such as antiamoebic, antipyretic, antidiabetic, anti-parasitic, anthelmentic, anticancer, celiac disease, skeletal muscle relaxant and gynecological disorder.

The entire plant including leaves, roots, bark and stem is used in Ayurveda for medicinal preparation. Leaves are used in the form of churna/extract or in combination with the other plant materials in their formulation. Metal analysis of leaves shows a high percentage of metals like calcium, iron, copper and manganese along with the other metals. These results may help in development of new drug formulations. The plant is useful in treatment of fever, stomach disorders, skin diseases and inflammations.

Recent studies have shown that the alcoholic extract of *C. fragrans* is effective as an antidiabetic medicine and muscle relaxant. The plant is a high source of metabolites including camptothecin, chonemorphine and funtumafrine. Camptothecin which is a plant derived monoterpenoid alkaloid is used currently in several medicines against various types of cancers. Very few families of plants have shown the presence of camptothecin especially the families including Apocynaceae and Icacenaceae. This compound has shown a broad spectrum antitumor activity against a broad spectrum of cancers and is used in the treatment of lung, uterine, cervical and ovarian cancers. Camptothecin targets topoisomerase I and inhibits its activity by binding to the topoisomerase I-DNA binary complex there by inducing single strand breaks of cellular DNA.
Kakkayam is located in the northern part of Kerala and is situated at a distance of 70 Km from Calicut city. The International Union of Conservation of Nature (IUCN) has selected the biodiversity zones of Kakkayam as one of the best due to its wide varieties of floras and faunas. There are several endangered floras and faunas which include: elephant, deer, black monkey, medicinal herbs, wild orchids, rare butterflies and birds. The evergreen forest helps to conserve all these rare species. A study of the rich floral diversity of the Kakkayam forests in the Western Ghats made by the Malabar Natural History Society (MNHS) calls for urgent conservation measures to protect the region from further degradation. The study has been conducted by the society as part of its intensive data collection drive in the region.

The rapid assessment could identify more than 680 species of flowering plants in the forests. Of these, 226 species are endemic to the southern Western Ghats. Five kinds of vegetation are noted during the study: West coast tropical evergreen forests, West coast semi-evergreen forests, Southern moist mixed deciduous forests, southern hill top tropical evergreen forests and grassland.

**Objectives:-**

With this background the present study aims to investigate the following

- To investigate and understand the unique pharmacognostical features of the two chosen species namely *Embelia ribes* and *Chonemorpha fragrans*
- To analyse and understand the chemical potential of the chosen species
- To study and understand the nature of chemical constituents by using modern techniques such as HPLC, FT-IR and GC-MS.
- To understand the antimicrobial potential of *Embelia ribes* and *Chonemorpha fragrans*.
- To investigate the effect of the chosen species on cancer.