1. **INTRODUCTION:**

Herbal medicines have been used since the dawn of civilisation to maintain health and to treat diseases. The WHO estimates that about three-quarters of the world's population currently use herbs and other forms of traditional medicines to treat their diseases. Even as we commence the new century with its exciting prospect of gene therapy, herbal medicines remain one of the common forms of therapy available to the world population.

Side effects of conventional medicine, efficiency of plant-derived drugs and growing interest in natural products has increased scientific interest in medicinal plants. A look at the research and investments that are going into medicinal plants looks like; they will continue to play an important role in human health. (Alam, 2007)

Today, there are at least 120 distinct chemical substances derived from plants that are considered important herbal drugs. Statistical data available in USA shows that 41 percent of pharmaceutical development has originated from herbal drugs. As per WHO estimates, 80 percent of about 4000 million inhabitants on this planet rely on plant products. In addition, herbal medicines have a good potential in the emerging nutraceutical industry as these materials are often considered food, as well as, medicines.

*Ficus racemosa* Linn. (glomerata) belongs to the Family Moraceae which is a subdivision of Urticaceae. The family consists of more than 116 genera and about 1632 species chiefly found in the tropics. A large deciduous tree distributed all over India, and ceylon found throughout the year, grows in evergreen forest, moist localities, along the sides of ravines and banks of streams. An evergreen tree 50-60 ft. high; young shoot glabrous, pubescent or scaberulous. Major chemical constituent is Tannins (14%) and others are Leucoanthocyanins, leucocyanadin-3-0-β-D-glucopyranoside and leucopelargonidine-3-0-α-L-rhamnopyranoside. β-Sitosterol, stigmasterol, lupeol, ceryl behenate, α-amyrin acetate. Plant also contains glycoside, tetracyclic triterpene glauanol. According to the literature survey, aqueous extract of the drug possesses antiulcer activity against acute gastric ulcers in animals. It was also found to inhibit acid secretion and to stimulate excretion of gastric juice. It is still used in folk medicine as astringent, antidiabetic, refrigerant, antiasthmatic, antidiarroheal and efficacious in threatened abortions. Glycosides of the ethanolic extracts of the leaves were found to exert hypotensive and vasodilator in animal studies. Extract of
leaves when used locally is found efficacious in inflammation, lymphadenitis, in sprains and fibrositis. A decoction of leaves is a good wash for wound and ulcer.

*Avicennia marina* (Forrsk.) Vierh (Mangroves) belongs to *Avicenniaceae* (Verbenaceae) family, has long been a source of astonishment for the layman and of interest for scientist. *Avicenniaceae* family is a member of true mangrove plants which has one genus, 11 species and several subspecies. *Avicennia* is found growing in the inter-tidal mudflats with extremely limited wave action i.e. below the high watermark along the shores of the seas and oceans. Approximately 55 species of mangroves from 22 genera were distributed in Indian Ocean region. It contains triterpenoids (betulic acid 0.3%, taraxerol 0.06% and taraxerone 0.05%) and traces of hydrocarbon, Sterols (βsitosterol & stigmasterol), triterpene alcohols, iridoid glycosides and high amount of carbohydrates, lipids and proteins. According to the literature survey, Bark as astringent and used as aphrodisiac, for scabies, antifertility agent and has tanning properties. Flowers used for perfumes. Leaves are aphrodisiac and used for toothache. And also been traditionally used for treatment of rheumatism, small pox, ulcers and other ailments. The plant is known for the quality of its honey and the charcoal has special uses.

Of the over 100,000 species of fungi, only about 100 species are pathogenic for animals. Fungi are opportunistic organisms, which are ubiquitous in nature. The last two decades have seen a steady increase in the incidence of systemic fungal infections especially due to opportunistic fungi. Prolonged antimicrobial therapy, invasive procedures, immunosuppressive therapy and the Acquired Immunodeficiency Syndrome (AIDS) pandemic have contributed to the rise in systemic **fungal infections**. (Suthar MP *et al.*, 2010)

Failures of drug treatment in fungal infections combined with improvements in performances and standardization of antifungal susceptibility testing have drawn attention to the problem of antifungal resistance and its underlying mechanisms. Resistance to these antifungals has been reported worldwide and in India over the years with varying frequencies. Due to these reasons the search for new antifungal agents from natural sources has intensified. Phytotherapy is based on the use of active principles contained in plants or vegetables. Plants contain many components that are important sources of biologically active molecules which not only serve as a reservoir for new potential drugs and drug prototypes, but also for probes of fungal biology. So the plant derived antimycotics are attracting the
attention of botanists and mycologists. Moreover, plant derived drugs are natural, cheaper, safer, eco-friendly and within the reach of the current medical community. The plant derived antimycotics will create a revolution in the field of a new generation of fungicidals for human mycotic diseases.

In humans, fungal infections range from superficial to deeply invasive or disseminated, and have increased dramatically in recent years. The treatment of mycoses has lagged behind bacterial chemotherapy and fewer antifungal than antibacterial substances are available. Therefore, a search for new antifungal drugs is extremely necessary. (Duraipandiyan et al., 2011)

Cancer is a class of disease in which a group of cells display uncontrolled growth (division beyond the normal limits), invasion (intrusion on and destruction of adjacent tissues), and sometimes metastasis (spread to other locations in the body via lymph or blood). These three malignant properties of cancers differentiate them from benign tumors, which are self-limited, and do not invade or metastasize. Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems. Cancerous cells are also called malignant cells. (Fodde R et al., 2002; Merlo LM et al., 2006)

Cancer is not just one disease but many diseases. There are more than 100 different types of cancer. Most cancers are named for the organ or type of cell in which they start – for example, cancer that begins in the colon is called colon cancer; cancer that begins in basal cells of the skin is called basal cell carcinoma. Complete removal of the cancer without damage to the rest of the body is the goal of treatment. Sometimes this can be accomplished by surgery, but the propensity of cancers to invade adjacent tissue or to spread to distant sites by microscopic metastasis often limits its effectiveness. The effectiveness of chemotherapy is often limited by toxicity to other tissues in the body. Radiation can also cause damage to normal tissue. (Kleinman HK et al., 2001) Every year, 10 million people are diagnosed with cancer & out these 6 million die due to this. Although there are 100 different forms of cancers but more than 80% of cases involve just 14 types of cancers mainly.

Most of the commonly used cytotoxic anticancer drugs were discovered through random high-throughput screening of synthetic compounds and natural products in cell-based cytotoxicity assays. In-vitro cytotoxicity assays have been used to rapidly evaluate the
potential toxicity of large numbers of compounds, to limit animal experimentation whenever possible, and to carry out tests with small quantities of compound. Evidence for the utility of \textit{in-vitro} cytotoxicity tests allows us to screen compound libraries to remove potentially toxic compounds early in the drug discovery process. Early identification of toxic effects can help us to prioritize between chemical series and identify Structure-Toxicity Relationships and thereby reduce cost of downstream drug development. (Liu B \textit{et al.}, 2004)

Bioassay systems for anti-tumor activity were established using the screening process to guide the fractionation and separation of crude extracts. The \textit{in-vitro} tests are usually used as initial or primary screening in cytotoxic assays of crude extracts at dilutions of less than 0.1% to as low as 1 ppm. (Suffness, 1989) It is more sensitive than the \textit{in-vivo} system, which requires high extract concentrations and often shows no activity although the material has been shown to be active in the \textit{in-vitro} assay. With this screening approach, mechanism of action is not a primary determinant in selecting agents for further development and as a result, none of the current drug directly targets the molecular lesions responsible for malignant transformation. (Sausville EA \textit{et al.}, 1999)

It is important to note that there are a number of advantages of \textit{in-vitro} testing that would save evaluation time and expense. These include species specificity of the analysis, the feasibility of using only small amounts of test substances and the possibility for doing mechanistic studies. However, the active extracts and compounds have to be further tested \textit{in-vivo} to confirm the anti-tumor activity because some of the active compounds, which have been tested \textit{in-vitro}, may be metabolized as non-active compounds by the \textit{in-vivo} test. The effects of compounds or drugs on animal organs and the symptoms displayed by the animal are detected only by \textit{in-vivo} tests. (Itharat A \textit{et al.}, 2007)