1. INTRODUCTION
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According to an estimate by World Health Organization, infectious diseases are the world's leading cause of premature deaths, killing almost 50,000 people every day. Among them diarrhoea, cholera, leprosy and tuberculosis are the major cause of ill health in the tropical and sub-tropical countries. Factors such as hot and humid climate, high densities of population, low socio-economic status of the people, paucity of health education, stagnant water bodies, rural conditions and poor protection of drinking water from faecal contamination, further help in the persistence of communicable diseases in the tropics [Pelczar et al, 1995]. India is the largest country of the tropics and sub-tropics and is, therefore, facing the serious challenge of providing health care to its people. Almost any opportunistic pathogen can cause infections but those who can survive in the environment for long periods of time and can develop resistance to antibiotics and disinfectants are particularly important in this respect.

An increase in antibiotic resistant bacteria is threatening world population with recurrence of infectious diseases that were once thought to be under control, at least, in developed countries. In recent years, the ferocity of certain tropical diseases (such as diarrhoea, leprosy, tuberculosis, candidiasis etc.) have even increased because of the development of drug resistant strains of parasites and bacteria due to indiscriminate and non-medical use of specific chemotherapeutic drugs in the past. Unfortunately, the problem of antibiotic resistance is, by no means, confined to human only, dramatic rise in the resistance has been reported in livestock as well [Victoria Hook, 1997] as they are commonly given antibiotics as growth promoters. In addition to this problem, antibiotics are sometime associated with adverse effects on host that include hypersensitivity, depletion of beneficial gut and mucosal microorganisms, immunosuppression and allergic reactions etc. [Idsoe et al, 1968]. The availability of effective exogenous antibiotics is decreasing as a result of increased resistance of the pathogens. In the recent years, it has been recognised and suggested by many leading scientists in the field of chemotherapy [Davis, 1994; Joelle, 1994] that it is high time to explore the innate antibiotics of plant and animal origin as models for new therapeutic agents.

The list of human and animal pathogenic microorganisms is very long. Although, the antibiotic therapy is quite successful in controlling microbial diseases, Still, many pathogens especially the members of the family enterobacteriaceae (Escherichia coli, Shigella, Salmonella etc.) and certain other gram+ve Staphylococci and gram-ve Pseudomonas aeruginosa, Campylobacter etc. have developed resistance to one or
more newer broad spectrum antibacterial drugs [ Ahmad et al, 1994 ; Davis, 1994; Pelczar et al, 1995; Giplin & Milner, 1997; Mitsuhashi, 1998 ].

Staphylococcal diseases may be classified as cutaneous and deep infections, acute toxaemia, including food poisoning, exfoliative diseases, and the toxic shock syndrome. Staphylococcal lesions are characteristically localised in contrast to the spreading nature of Streptococcal lesions. [ Martin et al, 1974 ]. Cutaneous lesions may be of varying severity which include furuncles, styes, boils, abscesses, carbuncles, impetigo and pemphigus neonatorum. Staphylococcus aureus also frequently causes sepsis in wounds and burns and the majority of hospital cross infections are of Staphylococcal origin. In respiratory tract, it causes tonsillitis, pharyngitis, sinusitis and pneumonia. Staphylococcus epidermidis may act as an opportunistic pathogen, causing minor infections such as stitch abscesses. In persons with defective resistance, it can cause even serious illness such as septicemia. It has been reported to cause subacute endocarditis. [ Easmon & Adlam, 1983 ]. Methicillin - resistant Staphylococcus aureus [MRSA] was isolated in the early 1960's and has emerged as one of the major nosocomial pathogens in hospitals. Its resistance is due to β-lactamase production. [ Thompson et al, 1982; Town send et al, 1987 ; Maple et al, 1989; Mulligen et al, 1993 ]. Certain antibiotics are usually chosen for treatment of MRSA infections. However, their use causes unexpected side effects, reduces susceptibility to MRSA by target site alterations, enzyme modification and permeability change leading to resistant strains [Brumfitt and Hamilton - Miller, 1989].

Pseudomonas aeruginosa established itself as one of the most troublesome agent, causing nosocomial infections. The commonest infections caused by Pseudomonas aeruginosa are suppurative otitis, localised lesions, eye and urinary tract infections [ Pelczar et al, 1995].

Members of the family enterobacteriacae commonly produce a number of diseases and the most important are the different forms of diarrhoea. Acute diarrhoea caused by these bacteria is the major cause of morbidity and mortality throughout the world, particularly in infants and children under 5 years of age in the developing countries. It has been estimated that some 500 million cases of diarrhoea occur annually among children under five years of age in the developing countries of Asia, Africa, and Latin America [W.H.O. 1980]. In India, 1.4 million children die annually from diarrhoeal diseases other than cholera. Diarrhoeal diseases are important even in the affluent countries. In USA, for instance, diarrhoea is the second, among the five leading causes of death in children [ Ananthanarayan & Jayaram Paniker, 1990]. Acute
diarrhoea due to bacterial infections can be classified into three groups based on pathogenic mechanisms. The first group exemplified by *cholera vibrio* and enterotoxigenic *Escherichia coli*. The second type is represented by *Shigella* and Enteroinvasive *Escherichia coli*. Third group is typified by *Salmonella* [*Salmonella typhrumurium and Salmonella enteridis* etc.] [Rowland, 1978]. Various strains of *Escherichia coli*, *Shigella*, *Salmonella*, *Campylobacter* and other diarrhoeagenic bacterial isolates all over the world were found resistance to one or more antibacterial drugs. Such strains are found to harbour plasmids conferring resistance to multiple drugs, [W.H.O. 1980; Levey *et al*, 1985, Lamikanra *et al*, 1990].

A number of other bacteria like Streptococci and Staphylococci etc. are also able to penetrate through mucosa, skin lesions or through hair follicles, provoking bacterial infections. These infections occur as local purulences (e.g. furuncles, ulcers, phlegmons, inflammations of the oropharynx and tonsillitis) which, subsequently, become generalized as a blood infections (e.g. septicemia). Within the last few years, manyfold increase in local infections have been observed [Brantner and Green, 1994].

Similarly, the increased incidence of fungal infections and scarcity of chemotherapeutic agents are also of serious health concern. Fungal infections may be classified as (i) superficial and (ii) deep seated (systemic). Superficial infections are more common and comprise of the various types of tinea or ringworm affecting the skin, hair and nails. Systemic mycoses occur in varying degree of severity, ranging from asymptomatic infections to fatal diseases. A third type of infection is opportunistic and caused mainly by fungi that are normally avirulent such as *Candida*, *Mucor*, *Penicillium* and *Aspergillus* etc. [Tortora *et al*, 1992]. Opportunistic fungal infections are the major cause of mortality and morbidity in immunocompromised hosts [Rinaldi, 1991]. Due to rapid rise in cases of AIDS, certain mycoses such as disseminated candidiasis and invasive aspergillosis have also risen in frequency [Diamond, 1991]. Several fungal pathogens which include *Candida albicans*, dermatophytes and other pathogenic yeasts are posing serious health problem. *Candida albicans*, a notorious opportunistic dimorphic yeast causes a variety of clinical forms of illness ranging from localized cutaneous candidiasis in healthy individuals to life threatening systemic candidiasis in immunocompromised hosts [Datta *et al*, 1989]. In the last two decades, there have been an increase in the incidence of candidiasis which is attributed to the wide spread use of broad spectrum antibiotics and immunosuppressive drugs.

The present antifungal agents have their own limitations such as poor absorption, development of resistance in the fungi and toxicity to the hosts. Thus our means of
combating fungal infections are poor and incompetent. In the present scenario of microbial drug resistance against old and newer antimicrobial drugs, the design and development of newer drugs have become greatly important and are urgently required. There are many ways to obtain entirely new compounds but the most common and valuable approach is to either screen new microbial strains or medicinal plants in search of new antimicrobial compounds. Since medicinal plants represent rich source from which antibacterial and antifungal chemotherapeutic agents could be obtained and the search of new antimicrobials is no longer restricted to the products of microbial origin.

The Pharmacopoeias of many countries of the world include even today a large number of drugs of plant origin. Although synthetic pharmaceuticals now dominate the drug market, medicinal plants continue to hold a strong position in international health care. Around 25% of prescription drugs are still extracted or derived from plants [Pushpangadan and George, 1997]. The bend towards re-exploration of plant wealth in technologically advanced countries like U.S.A., Germany, Japan and France not only improved the quality and quantity of natural product research but has also led to increased interest in such products, all over the world [Dahanukar and Hazra, 1995]. Herbal products of increasing sophistication are infiltrating the mass markets.

There is an emergence of strong rethinking on the need to integrate western and traditional remedies. Awareness of the importance of natural heritage and biodiversity is growing. India is fortunate as it has one of the world's richest flora with about 120 families of plants comprising 1,30,000 species. The use of about 2,400 of these plants have been mentioned in Ayurvedic and Unani texts and many others are used by tribal groups [Dahanukar and Hazra, 1995]. This rich wealth of medicinal flora abounds in India especially in the Himalayan ranges extending from south-east to north-west. The Gangetic plains, the eastern and western ghats and the arid and semi-arid zones of the country provide immense scope to procure the drugs for the pharmaceutical need of the Indian system of medicine. This wealth is surplus and can easily be utilised to feed our drug industry for the crude source. Nearly 50% of the plants used in the pharmaceutical codex are reported in India with certain variations in the species [Ahmad, 1993]. The W.H.O. report that 80% of the world population rely chiefly on traditional medicines and major part of the traditional therapies involves the use of plant extracts or their active constituents [Olayiwola, 1993].

Plants are valuable for modern medicine in four basic ways - (i) they are used as source of direct therapeutic agents, (ii) they serve as raw materials base for the elaboration of more complex semi-synthetic chemical compounds, (iii) the chemical
structures derived from plant-substances can be used as models for new synthetic compounds and finally, (iv) plants can be used as taxonomic markers for the discovery of new compounds.

Keeping in view of the problems of microbial therapy, potential use of medicinal plants in this therapy and lack of concentrated efforts in our country, the present investigations have been planned with the following aims and objectives: -

1. to screen a large number of Indian medicinal plants used in traditional system of medicine against bacterial and fungal isolates.
2. to study in details the antibacterial and antifungal activities along with the determination of minimum inhibitory concentrations (MICs).
3. to examine the cytotoxicity of selected plant extracts.
4. preliminary phytochemical screening of strongly active plant extracts to characterize partially the antimicrobial principles.
5. to evaluate the synergistic action of the possible formulations of one or more combinations of selected plant extracts.