Chapter - I

Introduction
INTRODUCTION

Early experiences of man on food received great importance for preservation of human health and it represents a long history of human interactions with the environment. Following domestication of agricultural crops, the heritable knowledge obtained by consuming plants became the basis for development of ethnomedicine. The ancient knowledge on the harmful or beneficial effect of plants have been regularized by some traditional consultants and they made verbal prescription or ban the use of certain plants or some plants in certain combination which were coming out as “Sidha” or “Nisidha” food items. However, the inquisitiveness of human mind is an ever ending process and as a result of interaction with the environment, certain questions are still appearing: “Is something left to screen and what might be the cause of ‘Nisidha’. Will it be possible to exclude the harmful effect by using the recent technology if it has good medicinal value.” It is well known that early man recognized their dependence on nature in both health and illness. The use of medicinal plants as traditional medicine is well known in rural areas of many developing countries (Sandhu and Heinrich, 2005) and for centuries, plants have been used throughout the world as drugs and remedies (Anon, 1997). The entire Middle East has a rich history of herbal healing. There are texts surviving from the ancient cultures of Mesopotamia, Egypt and India that describe and illustrate
the use of many medicinal plants products (Duraipandiyan, 2006). In India the Charaka Samhita, the principal Ayurvedic book on internal medicine described 582 medicinal plants and the Sushruta Samhita, the main book on surgery listed 600 herbal remedies. There are about 500,000 species of plants on the earth and about 13,000 plant species worldwide are known to have been used as drugs world wide (Das et al., 1999). In Assam the traditional healers are still consulted as a first choice for treating man and animals in low-income group such as farmers, people of small isolate villages and native communities. The people of Assam have learnt the art of incorporating the medicinal value of some of the traditional medicinal plants into their food in the form of spices, curry or juices. There are large number of reports on the use of plants in traditional healing by either tribal or indigenous communities and such types of traditional medicine blended readily in to the socio-cultural life of the Assamese people (Dutta, 1985).

Plants used for traditional medicine contain a wide range of substances to treat chronic as well as infectious diseases. A vast knowledge of how to use the plants against different illnesses have accumulated in areas where the use of plants is of great importance (Diallo et al., 1999). The properties or the activities of the chemicals that can kill, inhibit or increase immunity and resistance to infection are generally termed as antimicrobial agents (Anon, 2006). Following the advent of penicillin in 1950 it was thought that the traditional plant medicines used for treating infectious diseases would not exist and the health
need would be possible through elimination of infection by use of organisms based antibiotics, but before the outset of the new millennium it is realized that although there are records of launching two or three antibiotics in every year (Clark, 1996) and inspite of progress made in the understanding of microbiology and their control, the incidence of epidemics due to drug resistant microorganisms pose enormous public health concerns. These negative health trends call for a renewed interest and plant extracts as source of alternative medicine have gained importance again in the late 1990. Scientists from diverse fields are investigating plants with an eye to their antimicrobial usefulness and have found literally thousands of phytochemicals which have effects on all types of microorganisms in vitro investigations. Kela and Kujefi (1995) reported that antibiotics are not only the antimicrobials and healing power or antibacterial properties are sought from plants in the world in order to meet the microbial challenge (Adomi, 2006). The medicinal value of plants lies in some chemical substances that produce a definite physiological action in the living body (Duraipandiyan, 2006) and the most important of these bioactive compounds of plants are reported to be alkaloids, flavonoids, tannins and phenolic compounds (Edeoga et al., 2005). Other secondary metabolites of plants such as lectins, polypeptides, various amino acids and glycolsides have been reported to be effective antimicrobial agents (Cowan, 1999). Fauci (1998) put forwarded a solution for development of new treatment by giving more emphasis on the
development of new antimicrobials, while the development of drug resistance in human pathogens against commonly used antibiotics has necessitated a search for new antimicrobial substances from other sources including plants (Erdogrul, 2002). There are many reasons behind the renewed interest on traditional medicinal plants. One of the reasons is the development of resistance to antibiotics and chemotherapeutic agents due to abuse and indiscriminate use of these drugs (Reuter, 2005). Other reasons of antimicrobial agents from microbial products include high cost, uninteractable to viruses and the effective life span of these therapeutic agents are limited (Cowan, 1999). On the contrary, Green medicine is safe, affordable and have profound therapeutic benefits, interactable to viruses and longer effective life span (Cowan, 1999). Iwu et al. (1999) described that this interest on natural products is a result of factors such as consumer’s dissatisfaction with conventional medicines, change in laws for more liberal advertising and national concerns for health care cost. It is reported that sales of botanical products in USA have been increased from $3.1 billion in 1986 to $10.4 billion dollars in 1996 (Anon, 1998). A market based illustration projected that the plant based anti-infectives make up 24 per cent of the pharmaceutical market (Anon, 1994) and world wide spending on new sources of plant based anti-infectives is increasing (Alper, 1998) According to WHO, more than 80 per cent of the world’s population relies on plant derived antimicrobials for their primary health care needs. It is reported that the infectious diseases
account for approximately one half of all death in tropical countries and mortality rates from infections are increasing in the developed countries (Iwu, 1999). Pinner et al. (1996) projected a compilation report of death from infectious diseases and reported that infectious diseases ranked 5th in 1981 had become the 3rd leading cause of death in 1992. It is also reported that infectious diseases are the underlying causes of death in 8 per cent of the cases including respiratory tract infection and HIV/AIDS in the USA. Antimicrobials are indispensable for elimination of infectious diseases and at present scenario, screening of medicinal plants for antimicrobial activities is important for finding potential new compounds for therapeutic use. The phytochemical research based on ethnopharmacological information is generally considered as an effective approach in the discovery of new anti-infective agents from higher plants.

The North East India is rich in forestry. There are some plants in this region which are not commonly found in the other parts of India and almost all plants of this region have medicinal value (Dutta, 1985). The medicinal and aromatic plants of Assam have enormous potentialities. The trade in such plants is picking up at global level and Assam can easily command markets worldwide and cultivation along with processing and export would prove to be a boon for this region.
The screening and detection of antimicrobial properties of the plants has lot to do in exploitation and use of natural resources of Assam. The present study was undertaken to screen some medicinal plants of Assam with special reference to their antibacterial properties and to select a potent plant extract for detailed study which may be useful in developing new compounds to combat infectious diseases with the following objectives:

1. Selection and identification of some medicinal plants of Assam.
2. Screening of selected plants for their selective/specific antibacterial activities.
3. Selection of one the most potent plant extracts.
4. Clinical evaluation of the most potent plant extracts in experimental animals and birds.