

INTRODUCTION

1.0 INTRODUCTION

Nature is the lifeline of our health as it provides all necessary things for survival. Medicinal plants are nature's gift to human beings to make disease free healthy life and play a vital role to preserve our health. In ancient days people did not have any advanced science and technology to protect their life, but they were well aware of medicinal of medicinal plants to preserve their health. ^{Most} Much of the research has been conducted on the therapeutic potential of secondary metabolites like alkaloids, flavonoids, phenols for cure of disease (Begum and Vimalnath, 2009).

Plants have been valuable source of natural products for maintaining human health. According to World Health Organization, medicinal plants would be the best source to obtain a variety of drugs. About 80% of population of developed countries use traditional drugs derived from the plants need to be explored for developing better and more efficient medicines with fewer side effects (Vinod *et al.*, 2010). Herbals are the oldest form of primary healthcare which had been used by all cultures throughout history. It was an integral part of the development of modern civilization (Das *et al.*, 2008).

Traditional healers and their plant medicines provide the only health care to the majority of people in a curative rather than preventive approach in the developing countries for common ailments. The ready availability and economy of plants as direct therapeutic agents make plants more attractive when compared to modern medicine. As a result, vast literature now exist on the use of traditional medicine with botanist reporting description of plants used for different disease treatments, the phytochemist on chemical constituents and the pharmacologist on the effectiveness of particular plant compound or extracts (Agbor *et al.*, 2007).

In the developed world, reliance on surgery and pharmaceutical medicine is more usual but in the recent years, more and more people are complementing their treatment with natural supplements. Furthermore,

motivation of people towards herbs are increasing due to their concern about the side effect of drugs, those are prepared from synthetic materials. People want to concern their health rather than merely submitting themselves to impersonal health care system. Many botanical and some common dietary supplements are good sources of antioxidants and antiinflammatory compounds (Khalil *et al.*, 2007). *in ref - it is Khalil -*

Medicinal plants have been traditionally used in the treatment of several human diseases and their pharmacological and therapeutic properties have been attributed to different chemical constituents isolated from their crude extracts. Of particular importance, chemical constituents with antioxidant activity can be found at high concentrations in plants and can be responsible for their preventive effects in various degenerative diseases including cancer, neurological and cardiovascular diseases. Thus, the antioxidant properties of plants have a full range of perspective applications in human healthcare. Interestingly, literature data have indicated that the pharmacological properties of crude extracts of plants can be lost after isolation of specific compounds, indicating that part of their pharmacological properties can be related to a combination of different classes of compounds (Pereira *et al.*, 2009).

Medicinal plants have been identified as having high levels of antioxidant activity. Assaying *invitro* may be of value in the design of further studies to unravel novel treatment strategies for disorders associated with free radicals-induced tissue damage (Vadlapudi and Naidu, 2010). Free radicals play important roles in many physiological and pathological conditions. In general, excess of free radicals caused by the imbalance between free radical generation and scavenging may contribute to disease development (Froufe *et al.*, 2009).

Antioxidant properties and other bioactivities of secondary metabolites of plants are of great interest in many fields such as pharmacology and food nutrition industry. It is such a growing tendency that natural antioxidant compounds are being used to replace synthetic

antioxidants due to their side effects (Gao *et al.*, 2007). The consumption of antioxidant has been associated with a reduced risk of the incidence of many oxidative diseases ranging from cardiovascular disorders, diabetes mellitus, cancer, rheumatic arthritis to aging. The use of synthetic antioxidants such as butylated hydroxytoluene, butylated hydroxyanisole, *tert*-butylhydroquinone and propylgallate has been negatively perceived by consumers due to safety and health effects (Lai *et al.*, 2009).

Plants are unique in their ability to produce an extraordinary array of different secondary metabolites. Many of these metabolites have medicinal or toxic attributes. The brine shrimp have been used to detect general toxicity, in teratology screens, ecotoxicology and detection of plant extract toxicity for the past 30 years. It has been established as safe, practical and economic method for determination of bioactivity of plant product (Amoli *et al.*, 2009). The commercial availability of inexpensive brine shrimp eggs, the lower cost and ease of performing the assay make brine shrimp lethality assay, a very useful bench-top method. A number of studies have demonstrated the use of the brine shrimp assay to screen plant extracts. Lethality assay has been used successfully to biomonitor the isolation of cytotoxic, antimalarial, insecticidal and antifeedent compounds from plant extracts (Krishnaraju *et al.*, 2006).

It has been demonstrated that BST correlates reasonably well with cytotoxic and other biological properties. Brine shrimps have been previously utilized in various bioassay systems. There have been many reports on the use of this animal for environmental studies, screening for natural toxins and as a general screening for bioactive substances in plant extracts (Montanher *et al.*, 2002).

The use of phytochemicals as natural antimicrobial agents commonly called "biocides" is gaining popularity. There is growing interest in correlating phytochemical constituents of plant with its pharmacological activity (Vucovic *et al.*, 2007). Natural products from microorganisms have

been the primary source of antibiotics, but with the increasing acceptance of herbal medicine as an alternative form of healthcare, the screening of medicinal plants for active compounds has become very important because these may serve as promising sources of novel antibiotic prototypes. It has been shown that *invitro* screening methods could provide the needed preliminary observations necessary to select crude plant extracts with potentially useful properties for further chemical and pharmacological investigations (Adedapo *et al.*, 2008).

As there are vast renewable resources containing diverse natural products, the search for novel defense compounds from plant continues. Development of plant-based compounds for microbial control is of interest to countries where there is an extensive indigenous flora (Güven *et al.*, 2006). 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. Another big concern is the development of resistance to the antibiotics in current clinical use. In the present scenario of emergence of multiple drug resistance to human pathogenic organisms, this has necessitated a search for new antimicrobial substances from other sources including plants. The antimicrobial compounds produced by plants are active against plant and human pathogenic microorganisms. The substances that can either inhibit the growth of pathogens or kill them and have no or least toxicity to host cells are considered candidates for developing new antimicrobial drugs. (Rajendran and Ramakrishnan, 2009).

The present study has been designed to evaluate the plant *Denolix elata* for the following objectives:

- ♣ To determine qualitatively and quantitatively the phytochemical constituents of *Denolix elata*.
- ♣ To assess the enzymic and nonenzymic antioxidants of different parts of *Denolix elata*.
- ♣ To evaluate the radical scavenging efficacy of different extracts of various parts of the selected plant.
- ♣ To assess the biosafety of the plant using brine shrimp lethality bioassay.
- ♣ To study antibacterial activity of different parts of the plant *Denolix elata*.