CHAPTER I

1. INTRODUCTION

1.1. MOTIVATION AND BACKGROUND

Higher plants have provided the basic necessities of life such as food, shelter and clothing to human beings from the very beginning of human civilization. In addition to that they have also been the most important source of medicine for the treatment of various ailments since time immemorial. Although there has been considerable development in the areas of synthetic drug chemistry and antibiotics, plants still occupy an important place in traditional and modern system of medicine. Realizing the toxic effects of the synthetic drugs, the herbal medicine and the foods that derived from plants has become an alternative choice even in well developed countries. Traditional medicinal plants with rich medicinal value are utilized as folk remedies and as pharmaceutical formulation in modern system of medicine. Some of the main phytochemicals that a medicinal plant contains includes: polyphenols, alkaloids, flavonoids, steroids, tannins, terpenoids (Hill 1952).

The screening of natural products and extracts for anti-microbial activity has clearly showed that medicinal plants represent a potential source of newly invented antibiotics (Afolayan 2003). The genetic ability of microbial pathogens becoming resistant against widely used antibiotics, became a major
threat to human worldwide (Sathishkumar et al. 2009). The usage of medicinal plants and the phytochemical components contained in their extract can be a significant alternate in therapeutics and also be helpful in dealing with the threats of multi-drug resistant microbial pathogens (Basso et al. 2005).

Anti-oxidant, when it is present at low concentrations delays or significantly prevents oxidation of cells. Over production of free radicals leads to cellular damage by reacting with various bio-molecules of the body. It is reported that antioxidants prevent oxidative stress caused by ROS and free radicals. In nature, there are a wide variety of naturally occurring anti-oxidants which are different in their composition, physical and chemical properties, mechanisms and site of action. Medicinal plants rich in flavonoids, vitamins, polyphenols, and anthocyanins are reported to possess remarkable anti-oxidant activity. Anti-oxidant activity is neither restricted to a particular part of the plant nor the specific families.

Wound healing is a complex but a natural process characterized by 3 phases: inflammation, Proliferative (tissue formation) and Maturation (tissue remodelling) phase (Sidhu et al. 1999). Burns are known to be one of the most common forms of injury which became an important cause of disability and death in the world. More than a million people suffer from burn injuries annually (Ezzati et al. 2009, Upadhyay et al 2011).

Burn wound healing is commonly discussed in the science and medical literature and always there is a need for effective healing medication. In burn injuries, allergic reactions and skin irritations are the most important adverse effects of topical antiseptic agents and disinfectants, which reduce the rate of skin repair and increase the rehabilitation period (Upadhyay et al. 2011).
Traditional formulation of wound medicine, especially the herbal and other medicinal products deployed worldwide, are still under scientific evaluation for their properties in the treatment of wounds. Herbal products could be extensively preferable due to their widespread accessibility and efficacy with less or no toxicity and are cost effective than allopathy drugs (Upadhyay et al. 2011). However, modern scientific methods should be applied to confirm the claims about the therapeutic effects of herbal compounds (Chaudhari and Mengi 2006).

1.2. OBJECTIVES OF THE RESEARCH

On considering the above importance, the following objectives were undertaken to evaluate the wound healing activity of *Lobelia trigona* Roxb.

The objectives are:

1. To screen, quantify and characterize the phytochemical profile of *Lobelia trigona* Roxb.
2. To evaluate the *in vitro* antimicrobial activity of *Lobelia trigona* Roxb.
3. To study the *in vitro* anti-oxidant property of *Lobelia trigona* Roxb.
4. To evaluate the *in vitro* wound healing activity of *Lobelia trigona* Roxb.
5. To evaluate the *in vivo* wound healing activity of *Lobelia trigona* Roxb.