CHAPTER – 1
INTRODUCTION

Cancer is one of the most dreaded diseases of the 20\textsuperscript{th} century and spreading further with continuance and increasing incidence in 21\textsuperscript{st} century. Cancer is characterized by uncontrolled cellular growth, local tissue invasion and distant metastasis (Balachandran and Govindarajan, 2005). Cancer is caused by tobacco, chemicals, radiations, infectious organisms, mutation and hormones (Royle et al., 2011; Kuper et al., 2002) and can be treated by chemotherapy, radiation, surgery, hormone therapy, and biological therapy. Natural products, especially of plant origin have been used for the treatment of various diseases for hundreds of years including cancer.

Immunomodulators are substances that can alter the immune response. Immunomodulators include thymosin, cytotoxic agents, corticosteroids and immunoglobulin’s (Singh et al., 2012). Some immunomodulators are naturally present in the body and also available in pharmacologic preparations. There are two types immunomodulators-immunostimultors and immunosuppressant’s (Kamhawi, 2000).

The major cancer treatments to date are chemotherapy, radiotherapy and surgery (Tepper, 2008). Chemotherapy is a potent cytotoxic anti-neoplastic drug which can destroy cancer cells. All chemotherapeutic regimens cause suppression of
the immune system (Joensuu, 2008). Radiation and surgery could lower that risk of local recurrence and distant metastases but could possibly obscure the extent of the tumour due to shrinkage and destruction of the margins of the tumour; this may impact the effectiveness of surgery. Therefore, alternative therapeutic approaches are needed for the management of cancer patients.

Wound healing is a complex process which involves various phases such as homeostasis, inflammation, granulation and maturation (scar formation) (Krisner and Eaglstein, 1993). Metastasis is a process in which cancer cells spread to other parts of the body through blood circulation and lymphatic system. The metastatic process involves tumour cell invasion from the primary tumour, intravasation, arrest and extravasation of the circulatory system to form small tumours (Nguyen and Messague, 2007). A tumour formed by metastatic cancer cells is called as metastatic tumour (Klein, 2008).

Inflammatory bowel disease (IBD) is a group of inflammatory conditions of the colon and small intestine. Ulcerative colitis characterized by chronic inflammation of the colonic mucosa and submucosa, atrophy and possibly dysplasia limited to colon. The extent of disease varies and may involve only the rectum, the left side of the colon to the splenic flexure or the entire colon (Garcia Callejo et al., 2005).
Medicinal plants or their isolated constituents serve as the therapeutic alternatives for several diseases. They have shown beneficial therapeutic effects, including anti-oxidant, anti-inflammatory, anti-cancer, anti-bacterial and immunomodulatory effects.

*Decalepis hamiltonii* belonging to Asclepidaceae is a monogenetic large glabrous climbing shrub native of the Deccan peninsula and forest areas of Western Ghats of India. It finds use as a culinary spice due to its high priced aromatic roots. The reported beneficial effects of *D. hamiltonii* include antimicrobial and potent bioinsecticidal effects (Thangadurai et al., 2002). A novel phenol-bound pectic polysaccharide from *D. hamiltonii* with multi-step ulcer preventive activity was reported (Srikanta et al., 2007). There are reports that the roots of *D. hamiltonii* could be used as a flavoring principle, appetizer, hepatoprotective and antipyretic (Nayar et al., 1978; Srivastava and Shivanandappa, 2006; Lakshmanan et al., 2006).

*Solanum muricatum* is also called as pepino dulce, sweet cucumber and melon pear (Uribe et al., 2011). The weight of the mature fruit is 100 to 300 grams. Ripe fruits contain 9.5% soluble solids, 4.6% carbohydrates, 0.06% acids and 34.25mg (%) vitamin-C. It has high quantities of vitamins and medicinal actions such as hypotensive and antitumour effects (Ren and Tang, 1999).
In the present study we had evaluated the immunomodulatory, chemoprotective, anti-inflammatory and wound healing effect of *Decalepis hamiltonii* and *Solanum muricatum* and its application in inhibiting the tumour growth and ulcerative colitis.