ABSTRACT

Cancer remains as a major public health problem in the world. Cancer being multifunctional in its origin possess heterogeneous nature and is characterized by accelerated and uncontrolled growth, dysregulation of apoptosis, invasion angiogenesis and metastasis. Literature provides evidence for the application of various plants and plant derived products for successful cancer treatment. In the present study we have investigated the immunomodulatory as well as chemoprotective effect of Decalepis hamiltonii (D.hamiltonii) and Solanum muricatum (S.muricatum) and its application in inhibition of inflammation, cancer, and ulcerative colitis.

Administration of D.hamiltonii and S.muricatum has shown significant (p<0.05) increase in total WBC count, hemoglobin level, relative organ weight, bone marrow cellularity, α-esterase positive cells and phagocytic activity of host determining its strong immunostimulation potential.

The chemoprotective effect of D.hamiltonii and S.muricatum inhibited the experimental mice from the adverse effect of cyclophosphamide as evidenced by increased total WBC count, hemoglobin level, relative organ weight, bone marrow cellularity, α-esterase positive cells and significantly decreased the level of SGOT, SGPT, urea and creatinine. The above evidence clearly suggested that the
extracts from *D. hamiltonii* and *S. muricatum* possess strong chemoprotective effect against CTX induced toxicity. The above evidence clearly suggested that the extracts from *D. hamiltonii* and *S. muricatum* strong chemoprotective effect against CTX induced toxicity.

We had studied the anti-inflammatory activity of *D. hamiltonii* and *S. muricatum* plant extract. *D. hamiltonii* and *S. muricatum* treatment could prevent carrageenan and formalin induced paw inflammation in experimental animals. *D. hamiltonii* and *S. muricatum* could reduce Cyclooxygenase (COX-2) and prostaglandin E-2 levels suggesting that the plant extract may interfere in the histamine and prostaglandin biosynthesis pathway and may influence inflammatory mediators.

*D. hamiltonii* and *S. muricatum* treatment showed convincing anti-tumour activity as evidenced by reduction in solid tumour development. In this study *D. hamiltonii* and *S. muricatum* significantly increased the total WBC count and hemoglobin level. Also *D. hamiltonii* and *S. muricatum* significantly decreased the serum GGT and NO levels compared with tumour control group. These results confirm the anti-tumour efficacy of *D. hamiltonii* and *S. muricatum*.

To evaluate the wound healing activity of *D. hamiltonii* and *S. muricatum* we had used excision and incision wound models. The extract on tropical
administration could significantly heal the wound compared with Nitrofurazone standard. The healing effects of test samples were assessed by the rate of wound contraction, hydroxyproline, hexosamine, uronic acid level, tensile strength and histopathological examination. The results showed significant effect in extract treated animals compared with wound bearing control group. The histopathology examination further supported the wound healing effect of *D. hamiltonii* and *S. muricatum*.

Metastasis is one of the hallmarks of malignant neoplasm or cancer which is the leading cause of death in many cancer patients. In the study the anti-metastatic potential of the methanol extract of *D. hamiltonii* and *S. muricatum* was evaluated using the B16F-10 melanoma induced lung metastasis in C57BL/6 mice. *D. hamiltonii* and *S. muricatum* treatment significantly (*p*<0.01) reduced the lung collagen hydroxyproline, hexosamine, and uronic acid levels. Similarly serum sialic acid, GGT, NO, iNOS and COX-2 levels were also significantly inhibited after *D. hamiltonii* and *S. muricatum* treatment compared with metastatic control animals. The levels of proinflammatory cytokines such as TNF-α, IL-1β, IL-6, GM-CSF and IL-2 in the serum of these animals were significantly altered after *D. hamiltonii* and *S. muricatum* treatment. The serum nitric oxide level was also found to be significantly decreased after *D. hamiltonii* and *S. muricatum* treatment. The study reveals that *D. hamiltonii* and *S. muricatum* treatment could alter the
proinflammatory cytokine production and could inhibit the activation and nuclear translocation of p65 and p50 subunits of nuclear factor-kappa B in B16F-10 cells.

Ulcerative colitis is a chronic inflammatory disorder where oxidative stress plays a major role. The aim of the present study was to examine the protective effect of *D.hamiltonii* and *S.muricatum* on acetic acid induced ulcerative colitis (UC) in Wistar Rats. *D.hamiltonii* and *S.muricatum* extracts could significantly increased the glutathione (GSH), Superoxide dismutase (SOD) and could alter Lipid peroxidase (LPO) level compared with colitis control group. The increased NO, iNOS, COX-2, MPO, TNF-α and Lactate dehydrogenase (LDH) during ulcerative colitis was significantly (*p*<0.01) reduced by the *D.hamiltonii* and *S.muricatum* treatment. These results were further confirmed by histopathological analysis.

In conclusion, the results obtained from our study indicate the effectiveness of *D.hamiltonii* and *S.muricatum* in the inhibition of inflammation, tumour and metastasis. *D.hamiltonii* and *S.muricatum* also exhibited a protective role over ulcerative colitis. Therefore the overall efficacy of *D.hamiltonii* and *S.muricatum* might be due to its immunomodulatory effect, chemoprotective and wound healing activity or due to the presence of pharmacologically active ingredients. The present study will shed light in the future to attract new investigations related with drug discovery to cure cancer, colitis and other inflammatory disorders.