PREFACE

Current anti-inflammatory drugs target the cyclooxygenase (COX) enzyme involved in the metabolism of arachidonic acid to prostaglandins which are lipid mediators of inflammation. Long term use of these drugs in conditions of chronic inflammation has been found to cause several serious side effects like renal failure, cardiovascular disorders and gastric ulcer formation. The side effects of the drugs are reported to be caused by the formation of harmful leukotrienes from the alternate lipoxygenase (LOX) pathway of arachidonic acid metabolism. The focus has now shifted to the development of dual COX/LOX inhibitors for enhanced activity. The inhibition of both the pathways will result in fewer side effects as evidenced by the ongoing clinical trials of licofelone, a dual inhibitor. Medicinal plants are the next safe solution for the development of drugs for acute and chronic inflammatory conditions. The use of medicinal plants for such treatments has been present in the ayurvedic and folklore traditions of India. Scientific work that details the mechanism of action and the bioactive constituents involved are being conducted.

The work is divided into five parts and the thesis also follows a similar description. Part I deals with the screening of medicinal plants selected on the basis of reported anti-inflammatory activities for the dual inhibition of LOX/COX enzymes. The plant *T. cordifolia* was selected for further studies.

Part II deals with the evaluation bioactivity of the *T. cordifolia* plant extract in terms of antioxidant and anti-inflammatory action. The extract was subject to bioactivity guided fractionation followed by the identification and characterization of the bioactive fractions.
Part III includes the evaluation of effect of the plant extract and bioactive fractions on the production of proinflammatory cytokines from LPS induced monocytes and monocyte derived dendritic cells.

Part IV deals with the mass spectral identification of bioactive molecules in the bioactive fraction of *T. cordifolia*.

Part V deals with the molecular docking studies of the bioactive compounds to the COX/LOX target proteins.

The thesis work concludes with a general summary of the work followed by references and list of publications.