Phyllanthus watsonii, Orthosiphon stamineus and Melastoma malabathricum are widely used for various biological activities. These plants are identified as rich sources for phytochemical constituents. This provoked us to work on these plants. The present work is carried out to determine the total phenolic compounds, antioxidant activity, antilipase, antihyperlipidemic, antidiabetic and renoprotective activities. Literature survey reflected that the selected plants are reported to possess many pharmacological activities. Though the plants from the same genus of the selected plants possess antioxidant, antidiabetic and antihyperlipidemic activities, there were no reports on the selected plants for the specific objectives undertaken in this research study. Hence we had selected Phyllanthus watsonii leaves, roots; Orthosiphon stamineus roots and Melastoma malabathricum roots for evaluation of antioxidant, antilipase, antihyperlipidemic, antidiabetic and renoprotective activities.

Description of chapters:

This thesis consists of ten chapters. Introduction about obesity, diabetes, role of antioxidants in the treatment of metabolic disorders are discussed in the Chapter 1. The treatment of obesity and type II diabetes and their adverse effects are discussed. In addition, role of free radicals in induction of nephropathy are discussed. Then plants as source of medicine and their role in treatment of disease are discussed and necessity of novel therapeutic uses are discussed. In Chapter 2 deals with the literature review of the selected plants and phytoconstituents identified. This chapter includes presentation of various biological activities
reported for the selected plants. In addition, various phytochemicals isolated from the genus and the selected plants are discussed.

**Chapter 3** describes the objectives and scope of the research study. **Chapter 4** describes the materials and collection of plant material. In this chapter methods for identification phytochemical constituents and determination of total phenolic contents are discussed. Apart from that the toxicity study protocol for evaluation of plant extracts for their safety assessment is assessed. In addition, methods for evaluation of *in vitro* antioxidant activity such as DPPH antioxidant assay, Ferric reducing power assay and Beta-carotene bleaching assay and methods for *in vivo* evaluation of antioxidant activity such as thiobarbituric acid reactive substances, conjugated dienes and catalase are described.

Furthermore, method for determination of lipase inhibitory effect, methodology for assessment of antihyperlipidemic activity is discussed. Also protocol for assessment of extracts for antidiabetic activity in type II diabetic rats is described. Protocol for the glucose tolerance test is discussed. Assessment of plant extract for renoprotective effect in type II diabetic rats is discussed. Histology study protocol for the selected tissues is discussed.

In **Chapter 5**, the obtained results were described and discussed. The results obtained and the possible mechanisms were discussed in detail in **Chapter 6**. Conclusion and scope for further study are discussed in **Chapters 7&8**. **Chapter 9** consists of references and **chapter 10** consists of animal ethics committee approval letter, publications and conference presentation.