According to the WHO, 80% of the world’s population primarily those of developing countries rely on plant-derived medicines for their healthcare. The plant drugs are considered to be effective, less toxic or free from side effects and relatively cost effective as compared to synthetic drugs. Medicinal herbs with anti hyperglycemic activities are increasingly sought among health concerned diabetic patients. Now the pendulum is swinging backwards in search of new drugs and the value of medicinal plants in the treatment is seeking much attention in modern medicine. Their is a need to validate the efficacy of medicinal herbs scientifically in order to enjoy its maximum benefits.

The present study, aimed for the phytochemical and pharmacological investigations *Allium sativum* and *Nymphaea stellata* for antidiabetic activity. The study on Indian medicinal plant, Garlic (*Allium sativum* Linn. Family: Liliaceae) was initiated, which has been known for its myriad of therapeutic benefits since ancient times. No doubt that garlic is been researched tremendously, since it claims many medicinal values in a unique way where no other herbs can occupy its position. Though enough studies are done still research keeps adding more credentials to its treasure.

The previous studies on garlic preparations and constituents have shown to lower blood sugar level in various diabetic animal models and normalize the different biochemical parameters associated with DM and also alleviate diabetic complications. Even though many studies on garlic have been performed *in vivo* and *in vitro*, still the usefulness of garlic remains unclear to support its therapeutics because of inconsistent and controversial reports.

From the environmental prospective, the byproducts produced by agro-food industry enormous and can be reused which could be a rich source of bioactives. The therapeutic benefits of garlic peel have not been subjected to detailed scientific investigation as it is a discarded product of agro-food industry. Thus, it is anticipated to explore the bulbs and peels of garlic for its biological benefits.

The Reverse Pharmacology Approach has grown into a discipline where its various stages are well defined. This approach is currently being used for Diabetes mellitus (multicentric CSIR project) and is also being used for documenting the lower risk/benefit ratio for the large number of currently used medicinal plants for treatment of diabetes.
Chapter 2

Aims and Objectives

With this in mind, the present study aimed for the detailed and systematic phytochemical and pharmacological evaluation of various extracts and fractions of bulbs and peels *Allium sativum* Linn (Family: Liliaceae) for antidiabetic (antihyperglycemic) activity.

The objectives of the study were,

- To screen garlic bulb and peel extracts/fractions for antioxidant activity.
- To evaluate antidiabetic potential of garlic bulb and peel extracts/fractions.
- To identify and isolate phytoconstituent/s from bioactive extracts/fractions.
- To purify and characterize some of the isolated phytoconstituent/s.