2. AIM AND OBJECTIVES

Diabetes mellitus, a widely prevalent metabolic disorder, caused by an absolute or relative deficiency of insulin or its function that leads to number of complications, is emerging as a major factor responsible for chronic disability and even death. In spite of the strenuous efforts made by scientists all over the world, very few drugs have been discovered for treatment for this disease. There is therefore, a need for new antidiabetic agents.

Increasing evidence in both experimental and clinical studies suggest that oxidative stress plays a major role in the pathogenesis of both types of diabetes mellitus, namely type 1 and type 2. Oxidative stress, an imbalance between the generation of reactive oxygen species and antioxidant defense capacity of the body, is closely associated with aging and a number of diseases including cancer, cardiovascular diseases, diabetes and diabetic complications.

Diabetes mellitus is in fact a serious vascular disease with poor prognosis, and not just a disease characterized by elevated blood glucose. If adequate attention were paid to this, it would be much easier to relieve the burden of cardiovascular problems in type 2 diabetes patients. One important cardiovascular risk factor in type 2 diabetic people is dyslipidemia. This is characterized by low HDL-c, high serum VLDL-triglycerides, and a preponderance of small and dense LDL. Even slight elevations of LDL-c in type 2 diabetic patients are associated with a substantial increase in cardiovascular risk.

Recently, the uses of herbs and herbal medicaments have been gaining popularity in the treatment of number of diseases including diabetes mellitus. The major merits of herbal medicines are their time tested inherent efficacy, less side effects and low cost. A large numbers of herbal drugs have been studied so far for their antidiabetic activity. Though many plant drugs have proved to be useful in the control of diabetes mellitus, none of them are yet has emerged as a perfect remedy. Hence it was thought worth to explore few more plants for their antidiabetic activity, thus increasing the chances of discovering new therapeutic agents for diabetes mellitus.
Despite its ancestral use in the treatment of diabetes mellitus there are insufficient scientific data to support folkloric medicine. It was proposed, therefore, to screen certain indigenous medicinal plants for the treatment of diabetes and diabetes associated dyslipidemia.

Based on the ethnomedical/tribal information (Pulliah and Chandrasekhar, 2003) and earlier studies (Vadivelan et al., 2010; Hemalatha et al., 2010; Taniguchi et al., 2006), two plants are selected for the present study.

The following are the major objectives of the present study:

- investigations on *Mukia maderspatana* Linn and *Raphanus sativus* Linn for their potential to treat diabetes and diabetes associated dyslipidemia.
- to study the possible mechanism(s) of action of these two plant drugs by targeting biochemical pathways (both *in vitro* and *in vivo*).