PREFACE

Diabetes is a chronic disorder characterized by fasting hyperglycemia, which afflicts large numbers of people of all social conditions throughout the world. The personal and public health problems of diabetes continue to grow despite of exciting advances in virtually every field of diabetes research and in patient care. A recent publication by the WHO links 3.2 million deaths worldwide to diabetes each year. Depending upon the nature of the disease, insulin and certain synthetic oral hypoglycemic agents are widely used in its treatment. But these drugs are endowed with side effects and they fail to give a long-term glycemic control. Thus, medicinal plants and some active components isolated from them are now preferred as an alternative treatment strategy for diabetes. *Cocos nucifera* is a large palm belongs to the family Arecaceae. It is the sole species of the genus cocos. Previous studies carried out in our laboratory revealed that coconut and its products contain several bioactive compounds with therapeutic properties. In *Cocos nucifera*, the flowers and the branched stalk are called inflorescence. So far, no scientific studies have been conducted to find out the effects of inflorescence in controlling diabetes and associated complications. The current study was an attempt in this direction. Thus the present work was carried out to investigate the effects of the young inflorescence of *Cocos nucifera* in experimental diabetes.

This thesis incorporates the results of biochemical and pharmacological studies carried out using immature *Cocos nucifera* inflorescence (Cnl) on chemically induced diabetes in rodent model. The findings of these studies are presented and discussed in various chapters. A detailed review of diabetes mellitus, therapeutic measures, phytochemicals, coconut products and Cnl is given in introduction. The various methods and analytical procedures used for these studies are given in chapter two. The third chapter is divided in to two sections. The first section deals with the preliminary dose response studies using Cnl in diabetic rats, while the second part discuss the effects of Cnl on carbohydrate metabolism in normal and diabetic states. Chapter four is concerned with the phytochemical screening using solvent extracts of Cnl. Fifth chapter depicts the *in vivo* effects of different solvent extracts of Cnl on antioxidant status in diabetic rats. Chapter six has two sections; of which the former deals with the effects of feeding different
levels of methanol extract of Cnl (MEC) in glucose homeostasis and the latter describes the effects of MEC on TCA cycle enzymes, oxidation of proteins and lipids, erythrocyte membrane stability and inflammatory marker in diabetic rats. The comparative effect of MEC with antidiabetic drug, metformin in type 2 diabetes is discussed in chapter seven. Chapter eight deals with the isolation and characterization of active components from MEC. Ninth chapter is concerned with the effect of active component of MEC on mitochondrial oxidative phosphorylation and lysosomal marker enzymes in diabetic rats. The mechanisms of antidiabetic action of the active component isolated from MEC are discussed in chapter ten. Eleventh chapter summarizes the findings of the above mentioned investigations.