Aims & Objectives
Diabetes mellitus is multiple defects in the pathophysiology of the disease and its complications are too complex and are imprecisely understood, though hyperglycemia is the hallmark of diabetes, the pathogenic links appear to be beyond hyperglycemic consideration (Gueusekaran, 2002). It is now clear that diabetic hyperglycemia leads to oxidative stress and glycation of proteins thereby causing increased production of free radicals and also a sharp reduction of antioxidant defenses (Tiwari et al., 2002). In brief, oxidative stress has been suggested to be the major factor in the pathogenesis of diabetic complications. Reports clearly revealed that people of Indian origin are prone to diabetes (Shaw et al., 1999), India, China and United States of America contain a large number of people suffering from diabetes irrespective of the socioeconomic conditions. Keeping India and China in mind the deliberations at the International Conference on Health Research for Development held at Bangkok in 2001 emphasized that each country needs to be able to generate knowledge relevant to its own situation to allow it to determine its particular health problems, appraise the measures available for dealing with them and choose the actions likely to produce greatest improvement in health (International Organization Committee, 2001). After a thorough analysis, experts opined that India needs to strengthen research on diabetes. A wide variety of therapeutic agents are available today with a range of action to fight against hyperglycemia. The efficacy of these agents is compromised in several ways.

Many of the drugs act only on a part of the pathogenic process and only to a partial extent (Defronzo, 1999). All the available drugs can lower the blood glucose level to some extent for a short time and the effect is also transient. Moreover, all these drugs are expensive and cause toxicity / side effects and fail to control the sequelae and complications of the disease (Stern, 1999). Now people are irritated with thick, sticky extracts that clogged up their syringes and vexed with various emerging and available hypoglycemic drugs and their side effects. Under these circumstances, the modern approach for the control of multifactorial pathogen city of diabetes is a multimodal therapeutic approach by choosing and using traditional plants with various effective active principles to treat the whole disease and also the same should provide appropriate caloric and therapeutic nutrients as nutrition plays an important role in diabetic therapy (Shils et al., 1999). Current scientific evidence demonstrates that much of the morbidity and mortality of diabetes can be mitigated by aggressive treatment with diet, exercise and
new pharmacological approaches to achieve better control of blood glucose levels. Furthermore, the possibility of preventing the onset of diabetes using dietary supplements and herbal medicines has attracted considerable attention.

An intact native preparation may contain dote and antidote (Ponda et al., 1998) probably to mitigate side effect(s), if any, of the active (principles) components. Therefore, a majority (88%) of the global population has turned to plant derived medicines/therapeutic methods (Samy et al., 1999). Literature mapping indicates Aloe vera to be a source of nutrients and innumerable active principles to treat diabetes and the related complications. Since a long time, Aloe vera has been proposed as a potential source of active principles and components for the treatment of life style related diseases such as diabetes and many other manifestations.

The Aloe vera species is popular with modern gardeners as a putatively medicinal plant and due to its interesting flowers, form and succulence. This succulence enables the species to survive in areas of low natural rainfall, making it ideal for rockeries and other low-water use gardens (Yates, 2002). The species is hardy in zones 8–11, although it is intolerant of very heavy frost or snow (Random House, British Broadcasting Corporation, 2008). The species is relatively resistant to most insect pests, though mealy bugs, scale insects and aphid species may cause a decline in plant health. (Kemper, 2008) In pots, the species requires well-drained sandy potting soil and bright sunny conditions. The use of a good quality commercial propagation mix or pre-packaged "cacti and succulent mixes" are recommended as they allow good drainage (Coleby-Williams, 2008). Terracotta pots are preferable as they are porous (Coleby-Williams, 2008). Potted plants should be allowed to completely dry prior to re-watering. During winter, Aloe vera may become dormant, during which little moisture is required. In areas that receive frost or snow the species is best kept indoors or in heated glasshouses. Large scale agricultural production of Aloe vera is undertaken in India, (Vaibhav Varma, 2008), Australia, (Australian Broadcasting Corporation, 2008) Cuba, (www.invasor.cu, 2008) the Dominican Republic, China, Mexico, (www.dominicantoday.com, 2008) Jamaica, (www.jamaica-gleaner.com, 2008) Kenya and South Africa, (www.allafrica.com, 2008) along with the USA (www.resourceinvestor.com, 2008) Though studies have conflicting results, aloe may help support proper blood sugar levels in people with diabetes or similar disorders (Ghannam et al., 1986; Okyar et al., 2001).
In addition to humans, spontaneous diabetes is a common occurrence in many animal species such as monkeys, cats, dogs, tree shrews, ground squirrels, foxes dolphins, hippopotami, antelopes and most farm animals and all these occasionally become diabetic (Mordes et al., 1981). Besides, animals can be rendered diabetic by a wide variety of experimental procedures. Both spontaneous and experimental models have been used effectively to study etiologies, complications, treatment and prevention of diabetes. Owing to species availability and susceptibility to the diabetogenic effect of Alloxan and based on success achieved in earlier studies, Alloxan induced diabetic wistar rats model is recognized as an ideal model for various in vivo nutritional and diabetic evaluation experiments as well as for studies on (β cell regeneration / protection (Chattopadhyay et al., 1997).

The present work was undertaken to study the antidiabetic property and other beneficiary effects, of *Aloe vera* extract.

**The main objectives of the study are:**

- To evaluate the beneficial effects and Protective role of Plant Extract of *Aloe vera* against Alloxan induced Diabetes.
- To select the dose of plant extract of *Aloe vera* in reducing hyperglycemia at different time periods.
- To observe the changes in carbohydrate profiles (Total Carbohydrate, Glycogen, Glucose) levels in diabetic rats and diabetic treated rats with plant extract of *Aloe vera*.
- To determine the role of plant extract on activities of antioxidant enzymes in the tissue of liver and Testis in both control and experimental rats.
- To determine the role of plant extract on activities of oxidative enzymes in the tissue of liver and Testis in both control and experimental rats.
- To observe the changes in lipid metabolic profiles (Total cholesterol, Triglycerides, MDA) levels in diabetic rats and diabetic treated rats with plant extract of *Aloe vera*.
- To study the histological changes in Pancreas, liver and Testis tissues before and after the treatment in both control and experimental rats with *Aloe vera* extract.