Chapter 2

Scope of the Present Investigation
The traditional medicines are originated from plant sources that normally do not form the constituents of routine diet. In every period, every successive century from the development of humankind and advanced civilizations, the healing properties of certain medicinal plants were identified, noted, and conveyed to the successive generations. The benefits of one society were passed on to another, which upgraded the old properties, discovered new ones, till present days. The continuous and perpetual people's interest in medicinal plants has brought about today's modern and sophisticated fashion of their processing and usage.

Natural products and herbal remedies used in traditional folk medicine have been the source of many medically beneficial drugs because these drugs elicit few side effects, relatively cheap, affordable and claimed to be effective. Further, most of our marketed medicines are distillations, combinations or reproductions or variations of substances, which are abundantly found in nature. Our forefathers recommended some of the substances, which are abundantly found in nature long before their value was demonstrated and understood by scientific methods. We should not dismiss any common heritage of our knowledge unless and otherwise proved negative by the modern methods of scientific validation.

*Pithecellobium dulce* is one such herbal known to possess wide array of pharmacological actions and has been widely used for various ailments.
The objectives of the present investigation include

- Phytochemical screening of *Pithecellobium dulce* pod pulp extract was performed for the qualitative analysis of various bioactive ingredients.

- Oral administration of graded doses of *P. dulce* pod pulp extract for different time intervals to the control and diabetic groups of rats indicate the non toxic nature of the extract.

- Oral glucose tolerance test was performed to study the effect of the *P. dulce* pod pulp extract in the maintenance of glucose homeostasis.

- The levels of fasting blood glucose, glycosylated hemoglobin (HbA1c), and plasma insulin were determined in control and experimental groups of rats.

- The activities of marker enzymes such as AST, ALT and ALP and the levels of urea, uric acid and creatinine in control and experimental groups of rats were analyzed.

- The activities of carbohydrate metabolism enzymes such as glucokinase, pyruvate kinase, glucose-6-phosphatase, fructose-1,6-bisphosphatase, glucose-6-phosphate dehydrogenase, glycogen synthase and glycogen phosphorylase in liver tissues along with
liver glycogen content of control and experimental groups rats were assayed.

- The role of *P. dulce* pod pulp extract on diabetic dyslipidemia was assessed by analyzing the composition of lipid profile such as triglycerides, cholesterol, free fatty acids, phospholipids and lipoprotein cholesterol content in plasma, liver and kidney tissues.

- Chronic hyperglycemia in diabetes is associated with oxidative stress. Hence, the status of oxidative stress markers and the levels of enzymatic as well as non enzymatic antioxidants were assayed in plasma, pancreas, liver and kidney.

- The histological and ultrastructural observations were made on pancreas, liver and kidney tissues revealed the tissue protective nature of the pod pulp extract.

- The antibacterial activity of ethanolic extract of *P. dulce* pod pulp was tested against clinically important Gram positive and Gram negative bacteria. The inhibitory effect was assessed by well diffusion method. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were determined by serial dilution method.
The antifungal properties of ethanolic extract of *P. dulce* pod pulp were tested against common pathogenic fungal strains. The fungicidal effect was assessed by disc diffusion method. The minimum inhibitory concentration (MIC) and minimum fungicidal concentration (MFC) were also determined by serial dilution method.

The results obtained were discussed in the light of relevant available literature.