2.1 Hypothesis

Diabetes mellitus is associated with high rate of morbidity and mortality. The available treatment for diabetes is mainly of allopathic origin and associated with many adverse drug reactions. Herbal drugs are the oldest known healthcares available to mankind, enlisted in naturopathic, ayurvedic, homeopathic and other medicine systems obtained from natural sources. Being obtained from natural sources the toxicity profile is low for herbal drugs and possesses characteristics like low/minimum cost, complete accessibility and enhanced tolerance.

Hence it is essential to explore the treasure of plant medicines to be utilized for treatment of diabetes with amputating risk of adverse drug reactions and the cost factor of treatment.

2.2 Objective of Research Work

The main objectives of the present study are as follows:-

1. To prepare the ethanolic extracts of the *Citrus maxima* fruit peel & *Anvillea garcinii*
2. To do phytochemical evaluation of the ethanolic extracts of the *Citrus maxima* fruit peel & *Anvillea garcinii*
3. To study the anti-diabetic activity of the ethanolic extracts of the *Citrus maxima* fruit peel & *Anvillea garcinii* by using animal models
4. To study responses to standard Acetylcholine (ACh) on isolated rat preparation
2.3 Plan of Work

The research work is primarily divided into two sections i.e. Phytochemical Evaluation and Pharmacological Screening of Plant Extracts.

2.3.1. PREPARATION OF PLANT EXTRACTS

2.3.1.1 Preparation of crude extract:
2.3.1.1.1 *Citrus maxima* fruit peel crude extract
2.3.1.1.2 *Anvillea garcinii* crude extract

2.3.1.2 Preparation of the ethanolic extracts:
2.3.1.2.1 Ethanol extract of *Citrus maxima* fruit peel
2.3.1.2.2 Ethanol extract of *Anvillea garcinii*

2.3.2. PHYTOCHEMICAL EVALUATION OF PLANT EXTRACTS
2.3.3. PHARMACOLOGICAL SCREENING OF PLANT EXTRACTS

2.3.3.1 STREPTOZOTOCIN INDUCED DIABETES IN RATS

2.3.3.1 A) to study antidiabetic activity of plant extract after oral administration in streptozotocin induced diabetic rats.

2.3.3.1 B) to determine the concentration of biochemical parameters [cholesterol (TC), triglyceride (TG) and HDL-cholesterol] in rat serum

2.3.3.2 ORAL GLUCOSE TOLERANCE TEST (OGTT) IN RATS

2.3.3.3 IN VITRO STUDY IN RATS

2.3.3.3.1 Responses to standard Acetylcholine (ACh) on isolated rat ileum preparation

2.3.3.3.1 A) to study responses to standard Acetylcholine (ACh) on isolated rat ileum preparation in normal rats

2.3.3.3.1 B) to study responses to standard Acetylcholine (ACh) on isolated rat ileum preparation in diabetic rats

2.3.3.3.1 C) to study responses to standard Acetylcholine (ACh) on isolated rat ileum preparation in *Citrus maxima* fruit peel extract treated rats

2.3.3.3.1 D) to study responses to standard Acetylcholine (ACh) on isolated rat ileum preparation in *Anvillea garcinii* extract treated rats

2.3.3.3.1 E) to study responses to standard Acetylcholine (ACh) on isolated rat ileum preparation in Glibenclamide treated rats
2.3.3.3.2 Responses to standard Acetylcholine (ACh) on isolated rat colon preparation
2.3.3.3.2 A) to study responses to standard Acetylcholine (ACh) on isolated rat colon preparation in normal rats
2.3.3.3.2 B) to study responses to standard Acetylcholine (ACh) on isolated rat colon preparation in diabetic rats
2.3.3.3.2 C) to study responses to standard Acetylcholine (ACh) on isolated rat colon preparation in *Citrus maxima* fruit peel extract treated rats
2.3.3.3.2 D) to study responses to standard Acetylcholine (ACh) on isolated rat colon preparation in *Anvillea garcinii* extract treated rats
2.3.3.3.2 E) to study responses to standard Acetylcholine (ACh) on isolated rat colon preparation in Glibenclamide treated rats

2.3.3.3.3 Responses to standard Acetylcholine (ACh) on isolated rat rectum preparation
2.3.3.3.3 A) to study responses to standard Acetylcholine (ACh) on isolated rat rectum preparation in normal rats
2.3.3.3.3 B) to study responses to standard Acetylcholine (ACh) on isolated rat rectum preparation in diabetic rats
2.3.3.3.3 C) to study responses to standard Acetylcholine (ACh) on isolated rat rectum preparation in *Citrus maxima* fruit peel extract treated rats
2.3.3.3.3 D) to study responses to standard Acetylcholine (ACh) on isolated rat rectum preparation in *Anvillea garcinii* extract treated rats
2.3.3.3.3 E) to study responses to standard Acetylcholine (ACh) on isolated rat rectum preparation in Glibenclamide treated rats