Rationale
A scientific investigation of traditional herbal remedies for diabetes may provide valuable leads for the development of alternative drugs and strategies. Alternatives are clearly needed for better management of diabetes because of high cost and poor availability of current therapies for many rural populations, particularly in developing countries. The field of herbal medicines research has been gaining significant importance in the last few decades and the demand to use natural products in the treatment of diabetes is increasing worldwide (Kimpe, 2004).
In recent times many traditionally used medicinally important plants have been tested for their antidiabetic potential by various investigators in experimental animals. A number of plants have been observed to exert hypoglycemic activity through insulin-release stimulatory effects (Prince and Menon, 2000).
Many natural herbs like *Cinnamomum* including other spices are well known to display an insulin-enhancing activity *in vitro* (Khan *et al.*, 1990; Broadhurst *et al.*, 2000). The genus *Inula* is known for diverse biological activities viz. anticancer, antibacterial, hepatoprotective, cytotoxic, and anti-inflammatory properties (Ali *et al.*, 1992). *Inula racemosa*, commonly known as ‘Pushkarmoola’, commercially is a very important medicinal plant of the North western Himalayas. The plant is used in Ayurveda and considered a ‘Rasayana’ used in diabetic treatment (Tripathy *et al.*, 1979). *Salvadora persica* tree or tooth brush tree has been used for ages as an excellent anti-microbial for oral purposes as well as for its varied health benefits such as a bitter, laxative, hypoglycemic. (Alali *et al.*, 2004).
Though the use of these plants have been in practice since time immemorial to treat diabetic and other pathological conditions, no proper documentation of their phytoconstituents or clinical activity have been officially reported. Therefore, this study aims at isolating and documenting the phytoconstituents of these plants and also confirming their hypoglycemic activity through various in-vivo and in-vitro assays.
Research envisaged
The present research work is directed for the identification and characterization of active fractions from the plant, which includes their separation, isolation and purification. It also relates to the chemical characterization of the active extracts and confirmation of their hypoglycemic activity through various in-vivo and in-vitro assays.

Selection of plants
A background for the selection of various plants or plant products was gained from the review of literature. Based on the information reported in the literature following plants have been selected:

1) *Cinnamomum zeylanicum* bark
2) *Inula racemosa* roots
3) *Salvadora persica* roots

Their hydro-alcoholic extracts were evaluated for hypoglycemic activity and characterized chemically using chromatographic and spectroscopic techniques.

Aim
The main aim of the current work was activity guided isolation and chemical characterization of natural products from the selected plants.

Objectives
The experimental work has been carried out to achieve the following envisioned objectives:

- Collection of authentic samples of *Cinnamomum zeylanicum* bark, *Inula racemosa* roots and *Salvadora persica* roots for the study.
- Preparation of extracts and fractions of the selected herbal drugs.
- Preliminary screening of hypoglycemic activity of the plants by in-vitro methods.
- Separation and isolation of phytocomponents from active extracts by chromatographic techniques.
- Structural elucidation of the phytocomponents by spectral data analysis and chemical reactions.
- Supplementing the results of *in-vitro* hypoglycemic activity of the plant extracts by in-vivo data.
Plan of work

- Collection and authentication of plant samples.
- Extraction and fractionation of extracts with different solvents.
- Screening of *in-vitro* hypoglycemic activity of the plant extracts/fractions.
- Isolation and purification of phytoconstituents by chromatographic techniques.
- Characterization of compounds using UV, IR, MS, 1D and 2D NMR, FTIR.
- Structural elucidation by analyzing the spectral data and chemical reactions. Determination of *in-vivo* activity of the extracts.
- Evaluation and comparison of hypoglycemic activity of the plants in *in-vivo* and *in-vitro* models.
References


