SIGNIFICANCE OF THE STUDY

The present study has evaluated several commonly used plants for their antidiabetic potential through prolonged administration of the bioactive plant extracts to experimental animals and evaluating their long term effects. The major thrust of the study has been an enquiry into the insulin secretagogue action of plant components in comparison to the currently available drugs.

The study has evaluated several commonly used spices possessing such an action and paves the way for a nutraceutical approach for dealing with diabetes. Two commonly used plants viz. Kalanchoe pinnata and Cymbopogon citratus lemon grass has been studied with an attempt to isolate, identify and determine the precise mechanism of action. Geraniol and myrecene have been identified from Cymbopogon citratus as the active bioactive components possessing the secretagogue action. The major contribution of this thesis is a study of the antidiabetic and insulin secretagogue potential of Cuminum cyminum, a commonly used spice. Two potential insulin secretagogues viz. cuminaldehyde and cuminic alcohol have been isolated and identified through bioguided fractionation. The mechanism of stimulation of insulin secretion revealed that their action is mediated through closure of K+ ATP channels. The secretagogue action was found to be glucose dependent, which is vital in preventing hypoglycemic shock. The identification and isolation of an inhibitor in the same extract has demonstrated a beta cell protective action and prevention of a beta cell burnout. The diabetic animals treated with the whole plant extract demonstrated better plasma insulin levels and effective fasting blood glucose lowering in prolonged studies as compared to the positive control glibenclamide, although in vitro studies has demonstrated the latter to be a more effective secretagogue. This finding would be very vital in formulating insulin secretagogues along with such components that can control their damaging action and pave way for better treatment of diabetes mellitus in a cost effective manner.