6. **SUMMARY**

- The fruits of *Solanum nigrum* and heartwood of *Acacia catechu* were evaluated for preliminary phytochemical investigations, various ash and extractive values, antidiabetic and antihyperlipidemic activities.

- Preliminary phytochemical screening indicated that the fruits of *Solanum nigrum* contained alkaloids, flavanoids, steroids and phenolic constituents and Heartwood of *Acacia catechu* contained flavanoids, tannins and phenolic constituents. Quantitative estimation of both the plant revealed the presence of phenolic constituents might be responsible for the antidiabetic and antihyperlipidemic potential of the plant.

- Our study reveals that the ethanolic extract of *Solanum nigrum* fruits and *Acacia catechu* heartwood does not produce any toxicity and could be safely used for therapeutic purpose at the doses employed in the studies.

- The antihyperglycemic and antihyperlipidemic effects were observed ethanolic extract of *Solanum nigrum* fruits and *Acacia catechu* heartwood. The findings of the present study indicate a number of positive effects of the plant in rats with STZ-induced disturbances as regards to lipid profile, antioxidant status, and glucose tolerance. Thus, *Solanum nigrum* and *Acacia catechu* can be beneficial in the control of diabetes, abnormalities in lipid profiles and oxidative stress through activation of antioxidant enzymes. The possible underlying mechanism is delaying or inhibiting glucose absorption at intestinal level or decreasing the endogenous glucose production in liver.

- The antidiabetic potential of the ethanolic extract of *Solanum nigrum* fruits and *Acacia catechu* heartwood were studied in the STZ- Nicotinamide induced type 2 diabetic model. Significant reduction in fasting blood glucose levels were observed in the treated diabetic animals. Serum insulin levels were not altered in the animals treated with the ethanolic extract of *Solanum nigrum* fruits and *Acacia catechu* heartwood. Hence, the antihyperglycaemic activity may be probably through an extra-pancreatic mechanism. In diabetic rats
treated with the ethanolic extract of *Solanum nigrum* fruits and *Acacia catechu* heartwood, a significant increase in activity of antioxidant enzymes was observed. This might reflect the antioxidant potency of the ethanolic extract of *Solanum nigrum* fruits and *Acacia catechu* heartwood. The reduction in blood glucose levels may prevent glycation and subsequently prevent the inactivation of antioxidant enzymes. However, possible involvement of other mechanisms cannot be excluded at this stage.

- Treatment with the ethanolic extract of *Solanum nigrum* fruits and *Acacia catechu* heartwood effectively controlled the fructose-induced hyperglycemia by reducing blood glucose levels without affecting insulin levels. Thus glucose lowering effect of *Solanum nigrum* and *Acacia catechu* supports the antihyperglycemic effect observed in STZ- Nicotiamide induced type 2 diabetes. Further, fruits of *Solanum nigrum* and heartwood of *Acacia catechu* suppress the fructose induced increases in the concentration of triglycerides, cholesterol, VLDL and LDL.
Future Directions

- Investigations are required to elucidate the exact mechanism of action for the efficacy of *Solanum nigrum* and *Acacia catechu* in the metabolic disorders. Attempts should be made to isolate the active principle of *Solanum nigrum* and *Acacia catechu* responsible for such activities.