Chapter -5

Conclusions

Acute effect of the oral feeding of various extracts of the plant *Coccinia indica* has been observed on blood glucose & antioxidant enzyme- SOD, CAT in the experimental model of alloxan induced diabetes in rats. The ethanolic leaf, aqueous root and their combination with ALA were identified as the effective extracts against the validated animal model of diabetes. Therefore, these extracts were further studied for 30 days to determined their effect on biochemical and histopathological parameters in diabetic animals. The observations are summarized as under –

- Single oral administration of the ethanolic leaf & aqueous root extracts of *Coccinia indica* and their combination with ALA improved the blood glucose level.

- Both the ethanolic leaf & aqueous root significantly enhanced antioxidant activity in alloxanised rats, as judged from 5.45 & 1.98%; 9.98 & 7.28% elevation in SOD & CAT level under their influence, respectively. The extracts and the standard drug glibenclamide showed a similar trend of increasing SOD and CAT activity.
Conclusions

- In diabetic model, both the extracts (ethanolic leaf and aqueous root) were found to be more effective and caused ~ 10 fold greater suppression in blood glucose level than the ethanolic root.

- It is evident from the observed progressive suppression in blood glucose level and elevation in antioxidants level upto 30 days that the antihyperglycemic and antioxidant action of ethanolic leaf and aqueous root extracts is similar to that of glibenclamide. The possible explanation for such an observation may be the stimulation of surviving beta cells to release more insulin. Correspondingly improvements of fructosamine level were also observed.

- Ethanolic leaf extract of *Coccinia indica* has been found to possess a remarkable property of improving alloxan induced hyperglycemia and changing lipid profile in diabetic rats, as judged from a significant decrease in blood glucose, serum triglyceride, cholesterol, LDL levels and increase in HDL-cholesterol after repeated administrations These findings suggest that the extract not only improves glucose homeostasis but also normalizes other biochemical parameters.

- Ethanolic leaf extract significantly lowered the total cholesterol and increased the HDL cholesterol, thereby lowering the atherogenic index, which is very desirable biochemical state for atherosclerosis and ischaemic conditions.

- Aqueous root extract of *Coccinia indica* was observed to produce partial regeneration of the Islet of Langerhans in alloxanised diabetic rats. This along with the improvement noted in blood sugar levels as well as antioxidant parameters such as SOD, CAT indicate that this plant may be of a value in the treatment of Diabetes. Its regenerative activity of pancreas is of special interest because pancreatic regeneration rather than control of hyperglycemia alone is obviously a more rational approach to treating and perhaps in future; curing of Diabetes.
Conclusions

- It is interesting to note that the pancreatic regeneration activity was observed with aqueous root extract while the ethanolic leaf extract act beneficial effects on HDL. Both ethanolic leaf and aqueous root improved the glycemic status and antioxidant status of the alloxan diabetic rats.

- The other interesting observation is a significant improvement in albumin levels in alloxanised rats given this herb. It would be interesting to find out the mechanism of this effect and whether it is observed in other models of hypoalbuminemia. If confirmed in subsequent studies this would be a great potential of clinical interest.

- This indicates the need for further work to define the active principle in both the aqueous root as well as ethanolic leaf extract so as to make it possible to evolve an appropriate dose schedule for diabetes therapy both in experimental animals and perhaps, hopefully clinically in human patients.