

## Chapter IV

### Summary and Conclusion

Type 2 diabetes is becoming an epidemic increasing social and economic burden on the society. It is evident that generation of reactive oxygen species may play an important role in the etiology of diabetic complications. This hypothesis is supported by evidence that many biochemical pathways strictly associated with hyperglycaemia can increase the production of free radicals. They can interfere with healthy function and reproduction of the cell. Thus it causes oxidative damage to the genetic material (DNA). Alkaline single cell gel electrophoresis assay involves the lysis of the membrane and then the unwinding of the damaged DNA, which in turn is stretched out by electrophoresis. In case of healthy individuals, DNA damage is less as compared with individuals suffering from diabetes, cancer, ones subjected to irradiation, individuals undergoing heavy exercises etc. where the damage is high. Also there is an increase in the damage with increase in age. Sister chromatid exchange study involves the breakage of both DNA strands followed by an exchange of whole DNA duplexes. It occurs normally in cells during mitosis or cell division but when genotoxic agents damage a cells' DNA, the rate of SCE increases. By viewing the various reports on DNA damage caused by oxidative stress and diabetes, present study was undertaken to evaluate the genotoxic damage in Type 2 diabetic subjects by means of comet assay and SCE study with normal controls as negative controls and diabetic controls as positive controls.

An Ayurvedic medicine *Enicostemma littorale* Blume (*mamejava*) is proved to have antidiabetic effect. When diabetic patients were given a *ghanavatti* of this medicine, there was a reduction in blood glucose level, glycosylated hemoglobin level, fasting insulin level, total cholesterol, and triglycerides levels. The present study thus confirms its antidiabetic effect along with proving its genoprotective effect as there was a significant reduction in the cells' DNA damage in comet assay and the frequency of SCE in diabetic patients after 2 months of treatment with *E. littorale*.

Thus, present study shows hyperglycaemia induces genotoxic damage. It also shows that *E. littorale* has antidiabetic and genoprotective effect.