CHAPTER – 6: SUMMARY AND CONCLUSION

The phytochemical analysis of ASE and LSE could be used to document the quality of the ingredients used in the formulation of DIA-2. The HPTLC fingerprints developed for ASE, LSE and DIA-2 could be used for their identification/quality control analysis.

The results from the in vitro antioxidant and antidiabetic assays revealed that DIA-2 could exhibit synergistic antioxidant and anti-diabetic activity.

The results from the in vitro studies using 3T3-L1 adipocytes suggest that DIA-2 may inhibit adipogenesis synergistically when compared to its individual extracts. The inhibitory effect of DIA-2 on adipogenesis could be mediated in part through the down regulation of the mRNA of adipocyte specific transcription factors and genes involved in the adipocyte lipid metabolism. DIA-2 may also have anti-diabetic effects at least in part through up regulation of GLUT-4 protein in 3T3-L1 adipocytes. DIA-2 also exhibit antioxidant potential and may be helpful in combating the oxidative stress during diabetes mellitus.

The results from the in vivo efficacy study revealed that the HFD/STZ induced altered levels of plasma biomarkers, carbohydrate metabolising enzymes, glycogen, oxidant/antioxidant status and histopathological changes were restored by DIA-2 administration for 14 days comparable to that of rosiglitazone treatment. Interestingly, DIA-2 restored the above said altered parameters near to normal level without gain in body weight which is the most commonly encountered side effect with the use of conventional antidiabetic agents, particularly insulin, insulin secretagogues, sulfonylureas and thiazolidinediones.

The acute oral toxicity studies showed no mortality or morbidity or toxic signs on oral administration of DIA-2 at 2000 mg/kg. The repeated oral toxicity studies showed no treatment-related toxicity in rats of either sex following 28-days oral administration of 62.5, 125 and 250 mg/kg body weight of DIA-2. The
histopathological examination of all organs in the male and female rats treated with 250 mg DIA-2/kg/BW for 28 days revealed no treatment related abnormalities and remained similar to those of control animals.

In conclusion DIA-2 is orally safe; it possesses potent anti-diabetic and anti-oxidant activity and could be used in the management of diabetes mellitus.