Chapter: 6
Summary and Conclusion

6. SUMMARY AND CONCLUSION
Management of diabetes without any side effects is still a challenge to the medical system. Nevertheless, natural supplements are widely used around the world to treat diabetes, but medical research does not support their effectiveness. Therefore, the search for natural supplement from medicinal plants is being intensified probably because of its fewer side effects, readily availability and low cost. Thus the scientific validation of medicinal plants traditionally used in the treatment and management of diabetes is necessitated. In present study alcoholic and aqueous extract of various parts of *A. nilotica* were tested for antioxidant and antidiabetic activity. The results of antioxidant activity postulated that bark alcoholic and aqueous extract showed a significant concentration dependant scavenging activity in all models. The effect on oral glucose tolerance test and hypoglycemic activity in normal rats were studied and results showed that bark alcoholic and aqueous extracts of *A. nilotica* exhibited remarkable potential as evident by decrease in blood glucose level, in comparison to control group. Thus the results of OGTT and hypoglycemic analysis inferred that bark alcoholic extract of *A. nilotica* possess maximum potential to reduce blood glucose level in normoglycaemic rats next to it is bark aqueous extract. The bark alcoholic and aqueous extract were further tested for its antidiabetic potential in alloxan induced model. The result implies that bark alcoholic extract significantly reduced blood glucose level. By considering the above results, experimental animals of bark alcoholic extract treated groups were further pharmacologically investigated, involving effect on body weight, serum insulin, serum lipids, lipid peroxidation, glycogen level, total antioxidant enzymes and histopathological studies. Results of investigated pharmacological parameters were statistically compared with control group and found that, animals treated with bark alcoholic group showed maximum potential to resorted the body weight, serum insulin, total cholesterol, total glycerides, low density lipoprotein, very low density lipoprotein, glycogen level and total antioxidant enzymes, high density lipoprotein, lipid peroxidation as normal which reflects the stimulation of β cells of pancreas to produce more insulin.
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Results of histopathology studies of showed that bark alcoholic possess significant potential to maintain or restored the normal histoarchitecture of pancreas, liver and kidney. By considering the potential of bark alcoholic extracts of A. nilotica, they were further fractionated by ethyl acetate and n-butanol using solvent-solvent fractionation process and again subjected to screening for antidiabetic potential. Results showed that ethyl acetate fraction of bark alcoholic extract exhibited maximum potential to reduce BGL in diabetes induced experimental rats. Results of investigated pharmacological parameters were statistically compared with control group and found that, animals treated with ethyl acetate fraction showed maximum potential to resorted body weight, serum insulin, total cholesterol, total glycerides, low density lipoprotein, very low density lipoprotein, glycogen level and total antioxidant enzymes, high density lipoprotein, lipid peroxidation as normal. Results of histopathology studies showed that ethyl acetate fraction maintain or restore the normal histoarchitecture of pancreas, liver and kidney. Now in conclusion, based on traditional claim A. nilotica plants were comparatively investigated against medication induced diabetes and to establish the therapeutic properties of these plants in traditional medicine. Therefore, plants parts were investigated in this dissertation and the conclusions and scientific contributions are summarized:

- Among plants parts, alcoholic and aqueous extract of bark exhibited maximum potential to blood glucose level in alloxan induced diabetic rats. In preliminary study it was found that bark alcoholic extract possess remarkable potential.
- Concerning the biological effects, the alcoholic extract of bark were fractionated and pharmacologically reinvestigated and result revealed that ethyl acetate fraction exhibited remarkable potential.
- In conclusion, this dissertation increases the pharmacological knowledge of plant A. nilotica, which support their use in traditional medicine.
- However, the field is further open to investigate the possible mechanism of action and to establish complete safety profile for better clinical utility.
Figure 6.1: Schematic diagram of antioxidant and antidiabetic potential of A. nilotica plant parts

Collection and authentication of plant parts of A. nilotica

A. nilotica

Extraction

Bark

Seeds

Leaves

Roots

Alc. Ext. (ANB, Alc. Ext.)

Aq. Ext. (ANB, Aq. Ext.)

Alc. Ext. (ANS, Alc. Ext.)

Aq. Ext. (ANS, Aq. Ext.)

Alc. Ext. (ANL, Alc. Ext.)

Aq. Ext. (ANL, Aq. Ext.)

Alc. Ext. (ANR, Alc. Ext.)

Aq. Ext. (ANR, Aq. Ext.)

Antioxidant, OGTT and Hypoglycemic activity

Bark Extract showed remarkable potential

Antidiabetic activity

ANB, Alc. Ext

Solvent-solvent fractionation

Ethyl acetate fraction F-A

n-butanol fraction F-B

Remaining aqueous fraction F-C

Maximum potential