CONCLUSIONS

In the present study we have shown the effects of flavonoid rich fraction of *Anethum graveolens*, *Triticum aestivum* and *Cinnamomum tamala* have considerable effect on amelioration of type 2 diabetes in streptozotocin induced diabetes in rats. The compounds isolated from the leaves of the plants exerted a considerable effect on the diabetic status. The extract of *Coriandrum sativum* did not exert much effect on the diabetic status, which may be either due to the low concentration of the isolated flavonoids (Quercetin and 2-Quercetin 3-O-α-L-arabinopyranoside) or this might have been inactivated by the cells.

Novel findings in this work includes the following:

- Amelioration of type 2 diabetes by modulation of insulin receptor and leptin levels by the isolated compounds.
- Concerted effect on Nrf2, GPx, GST and hyperglycaemia by the compounds isolated from *Anethum graveolens*, *Triticum aestivum* and *Cinnamomum tamala*.
- The compounds isolated from *Anethum graveolens* includes 2, 5, dihydroxy-6, 7-dimethoxy flavone and 3, 7, 3’, 5’-tetramethoxy-4-hydroxy flavone and compounds from *Triticum aestivum* namely Rutin and Quercetin-3-O-α-L-rhamnopyranoside respectively, proved to have a collective effect on normalising the glucose levels and also in increasing the antioxidant mechanism in diabetic rats. Compounds isolated from *Cinnamomum tamala* namely Kaempferol-3,7-O-α-L-dirhamnoside and Kaempferol 3-O-β-D-glucopyranosyl-(1 4)-α-L-rhamnopyranosyl-7O-α-L-rhamnopyranoside also had ameliorative potential in the diabetic status of streptozotocin induced diabetic rats.
- Our study has proved that these compounds do have an effect at the molecular level on the production and action on leptin, Nrf2 translocation to nucleus and concomitant activation of ARE and quantitative upregulation of insulin receptors.
The compounds isolated from *Anethum graveolens*, *Triticum aestivum* and *Cinnamomum tamala* have antidiabetic and antioxidant effects and they exert their action through Nrf-2 and also quantitatively increasing leptin and insulin receptors. Thereby providing a mechanism of cross talk between antioxidant response element (ARE) and sugar metabolism.

Diabetes is a multifactorial metabolic disorder which requires a multifaceted approach in treating it. Our study provides ample scope for the development of novel therapeutic drugs which not only can target hyperglycaemia but also the associated complications of type 2 diabetes.

**Limitations and future prospective of this study**

Although our study provides evidence for the ameliorative effect of *Anethum graveolens*, *Triticum aestivum* and *Cinnamomum tamala*, the effectiveness on humans and clinical trials has to be conducted.

Further studies have to be conducted to evaluate the absorption and metabolism of the isolated compounds in this study.

Molecular docking studies will provide insights into the action of the isolated compounds on the various enzymes implicated in Type2 diabetes and free radical scavenging enzymes. This will help in further understanding of microvascular complications associated with type2 diabetes and develop a drug which not only ameliorates diabetic status but also will reduce the complications associated with type 2 diabetes.