Obesity is a growing problem, resulting in significant morbidity and mortality as well as reduced quality of life. Daily cholesterol production rate has been directly and significantly correlated with excess body weight. It is therefore important to study the cholesterol metabolism.

In the present study, methanolic extracts of five selected medicinal plants viz., *Amorphophallus campanulatus*, *Foeniculum vulgare*, *Hisbiscus rosa sinensis*, *Luffa cylindrica* and *Trichosanthes anguina* were screened for their potential for lowering of serum total cholesterol levels in Triton WR 1339 induced hyperlipidemic mice model. Methanolic extracts of *H. rosa sinensis* leaf (MEHR) and *T. anguina* fruit (META) showed maximum percentage reduction in total serum cholesterol levels and hence were selected for further evaluation.

The preliminary phytochemical screening showed presence of phytoconstituents such as flavonoids, sterols and saponins in both the extracts which was confirmed with high performance thin layer chromatography.

Studies on high fat diet (HFD) induced obese rat model showed that both MEHR and META exhibited significant anti-obesity and anti-hyperlipidemic activities at 500 mg/kg body weight dose in rats fed with high fat diet for 28 days.

Acute toxicity studies showed that both MEHR and META were safe for short term use as no deaths were observed at the dose of 2000 mg/kg body weight in case of both the extracts.

Repeated dose oral toxicity test was carried out for META as significant elevation in serum AST and ALT levels were observed in animals treated with the extract. META was orally administered daily for a period of 28 days. Satellite groups were maintained for 14 days post treatment for observation of reversibility, persistence, or delayed occurrence of toxic effects. Significant elevation in serum AST, ALT and alkaline phosphatases (ALP) levels were observed in the 500 and 1000 mg/kg dose groups, but were significantly restored after 14 days recovery period in the satellite groups. The effect of MEHR and META on lipid metabolic enzymes was evaluated to determine the possible mechanism of action of these extracts. The results showed that both MEHR and META resulted in significant inhibitory activity on pancreatic lipase *in vitro*, whereas only MEHR showed a significant reduction in HMG CoA reductase
activity in both *in vitro* and *ex vivo* assays. The present investigation indicates that both, *H. rosa sinensis* and *T. anguina* possess antihyperlipidemic and anti-obesity activities.