SUMMARY

The present investigation was mainly focused on the following aspects of an important ethnomedicinal plant, *Cynoglossum zeylanicum* (Vahl ex Hornem.) Thunb. ex Lehm. (Boraginaceae).

- Pharmacochemochemical characterization and qualitative photochemical analysis of whole plant of *Cynoglossum zeylanicum*.
- To examine the HPTLC profile of whole plant ethanol extract of *C. zeylanicum*.
- GC-MS analysis of whole plant ethanol extract of *C. zeylanicum*.
- LC-MS analysis of the selected plant.
- To isolate and characterize the phytocompounds using spectral studies.
- To assess *in vitro* antioxidant activity of different solvent extracts of *C. zeylanicum*.
- To evaluate the anticancer, antidiabetic, hepatoprotective, antifertility, antiinflammatory activities of whole plant ethanol extract of *C. zeylanicum*, using animal models.

The ash analysis carried out revealed that the total ash content of the powdered plant drug was 10.84%. The whole plant powder of *C. zeylanicum*, as such, fluoresced green under day light and short UV light (254 nm) and dark green under long UV light (365 nm). The powdered plant drug emitted the characteristic fluorescent green colour when treated with certain chemical agents.

The results of the preliminary phytochemical study showed the presence of alkaloids, anthraquinones, catechins, coumarins, flavonoids, phenols, quinones, saponins, steroids, tannins, terpenoids, sugars and glycosides in the methanol and ethanol extracts of the selected plant. In addition to the above compounds, the presence of xanthoprotein was noticed in the ethanol extract of experimental plant. The HPTLC profiles confirmed the presence of coumarin, glycoside, phenol, steroid and alkaloid. The GC-MS analysis of ethanol extract of *C. zeylanicum* helped...
to confirm the presence of twenty compounds. The major phytocompouds observed in
the selected plant were 9,12-Octadecadienoic acid (Z-Z)- (44.18%), n-Hexadecanoic
acid (15.46%) and Borazine2,4,6-trimethyl (9.39%). LC-MS analysis of the plant
powder aided to detect twenty one compounds, their chemical names and their
molecular mass.

Pharmacological studies carried out, using animal models, revealed that the
whole plant of *C. zeylanicum* could be used as potent antioxidant, anticancer,
antidiabetic, hepatoprotective, antifertility and anti-inflammatory agents. Antidiabetic studies
carried out confirmed that the plant possessed a significant anti-hyperglycemic activity.
Studies under taken in the treatment of CCl₄ induced liver dysfunction proved that various
serum biochemical parameters, after treatment with the plant extract, were recovered to near
normal. Hence, it could be used as a hepatoprotective agent.

Anticancer studies carried out clearly confirmed its antitumour potentials by
inhibiting the tumour volume, packed cell volume, tumour cell count and also bringing back
the haematological parameters to near normal. Antifertility experiments conducted on rats
revealed that the male rats treated with the plant extract showed decreased sperm motility,
decreased sperm density and abnormality in sperm nature. The selected plant also showed a
significant anti-inflammatory activity, at the dose of 150 mg/kg body weight, as compared to
that of indomethacin, the standard drug to treat inflammation.

The antioxidant, anticancer, antidiabetic, hepatoprotective, antifertility and
anti-inflammatory potentials of *C. zeylanicum* need further detailed study in the path of
isolation and characterization of active principles responsible for the above abilities of
this herbal drug.