SUMMARY
SUMMARY

CHAPTER 1

The introduction begins with a brief account of the liver, its essential functions and common disorders associated therewith. This is followed by a general account of the various hepatotoxins encountered, experimental models for the evaluation of antihepatotoxic activity and the physiological and biochemical parameters employed for the detection of hepatic injury. Special stress has been given to CCl₄ (the model chosen for our study) as a hepatotoxin and as a model for hepatic injury. Plants and phytoconstituents have been suggested as good alternative hepatoprotectants to the corticosteroids and immunosuppressive agents, which in spite of their alarming side effects, remain the only drugs of choice in modern medicine.

CHAPTER 2

The study aims to evaluate the hepatoprotective activity and to isolate and characterise the active components of four plants namely *Thespesia populnea*, *Lagenaria siceraria*, *Capparis spinosa* and *Solanum nigrum* which are frequently used either alone or in combination in the indigenous system of medicine.

CHAPTER 3

This chapter is a review of the literature of plants with hepatoprotective activity. While the first part reviews hepatoprotective plants in general, the latter part deals with the plants that have been undertaken in this study.

CHAPTER 4

The experimental section has been broadly divided into 2 sections, (A) Chemistry
and (B) Pharmacology.

The collection of plant materials, methods of extraction and isolation of chemical components have been described. Further chemical tests, derivatisation and spectral data such as U.V., I.R., \(^1\)H-NMR, \(^{13}\)C-NMR and EIMS of the isolated pure compounds have been recorded in section A.

Section B deals with the pharmacological investigations such as acute toxicity studies, selection of dose, treatment protocol, biochemical, histopathological and statistical methods employed.

**CHAPTER 5**

The results and discussions pertaining to sections 4A and 4B have been elaborated separately under the corresponding sections 5A and 5B.

Under the chemistry section 5A, all the compounds isolated have been characterised. From *Thespesia populnea* in addition to the known compound lupeol and stigmastanol, and rare/new compounds viz 5,8-dihydroxy-7-methoxyflavone, 7-hydroxyisoflavone, kaempferol-7-O-\(\beta\)-D-rutinoside, tamarixetin-7-O-\(\beta\)-D-glucoside and quercetin-7-O-\(\beta\)-D-rutinoside have been isolated and characterised.

Two steroids were isolated from the PE fraction of *Lagenaria siceraria*, one of which was characterised as fucosterol while the other was identified as campesterol.

The petroleum ether fraction of *Capparis spinosa* yielded two common sterols, \(\beta\)-sitosterol and stigmasterol. The flavonol glycoside quercetin-3-O-\(\beta\)-D-glucoside was isolated from the ethyl acetate fraction.

A sterol was isolated from the PE fraction of *Solanum nigrum*, the structure of which has been proposed as 4-dimethyl ergost-9(11) en-3-ol. The ether extract yielded
the aglycone quercetin while the two known steroidal sapogenins solasodine and tigogenin were isolated from the saponified ethyl acetate fraction.

Section B of this chapter deals with the results and discussions pertaining to the pharmacological investigations.

All the four plants screened exhibited significant hepatoprotective activity. The ethyl acetate fraction of *Thespesia populnea* was found to possess maximum activity followed by the ether and the petroleum ether fractions. Similarly all the three fractions of *Lagenaria siceraria* especially the PE extract showed significant hepatoprotective activity.

In investigations on *Capparis spinosa* however, the CCl$_4$ induced elevated ALT, AST and alkaline phosphatase levels declined significantly only in the group treated with the petroleum ether extract. The groups treated with the ether and ethyl acetate extracts, however, exhibited a significant decline only in the ALT levels. The plant *Solanum nigrum* was also endowed with hepatoprotective activity, especially in the petroleum ether extract.

Histopathological evidence supported the biochemical findings in all the extracts studied.

**CHAPTER 6**

From the studies carried out, this chapter concludes that *Thespesia populnea, Lagenaria siceraria, Capparis spinosa* and *Solanum nigrum* are endowed with significant hepatoprotective activity, against CCl$_4$ induced hepatic injury, thereby justifying their use in the indigenous system of medicine.