The present study is mainly focused on the following aspects of the ethnomedicinal plant, *Hugonia mystax* L. (Linaceae).

- Pharmaco-chemical characterization of leaf and bark of *H. mystax*.
- HPTLC profiles of leaf and bark, ethanol extracts of *H. mystax*.
- GC-MS analysis of leaf and bark, ethanol extracts of the above plant.
- LC-MS analysis of leaf and bark, ethanol extracts of *H. mystax*.
- *In vitro* antioxidant activity of different solvent extracts of leaf and bark of *H. mystax*.
- Pharmacological studies using the leaf and bark ethanol extracts of *H. mystax* to find out their anticancer, antidiabetic, hepatoprotective, antifertility and antiinflammatory activities through animal model.

The ash analysis carried out revealed that the total ash content of the powdered leaf and bark extracts of *H. mystax* are 9.34% and 10.21% respectively. The leaf powder of *H. mystax* fluoresced green under day light and short UV light (254 nm) and dark green under long UV light (365 nm). The bark powder of *H. mystax* fluoresced green in day light and short UV light and dark green in long UV light. Both the powders, when treated with different reagents, emitted the characteristic fluorescent green colour under short UV light.

The results of the qualitative phytochemical study exhibited the occurrence of alkaloid, anthraquinone, catechin, coumarin, flavonoid, phenol, quinone, saponin, tannin, terpenoid, sugar, glycosides and xanthoproteins in the methanol and ethanol extracts of

**SUMMARY**
leaf and bark of the plant. HPTLC profiles have also confirmed the presence of alkaloids, flavonoids, glycosides, saponins and steroids. The GC-MS analysis of the leaf and bark ethanol extracts of *H. mystax* confirmed the presence of 13 and 14 compounds respectively. 21 and 19 compounds and their molecular mass were detected in the leaf and the bark of *H. mystax* respectively by LC-MS analysis.

Pharmacological investigations carried out, using animal models, revealed that the leaf and bark of the plant could be used as potent anticancer, antidiabetic, hepatoprotective, antifertility and antiinflammatory agents. Antidiabetic studies using the ethanol extracts of leaf and bark of *H. mystax* showed that these plants possessed a significant antihyperglycemic activity. Studies under taken in the treatment of CCl₄ induced liver dysfunction proved that various serum biochemical parameters, after the treatment with ethanol extracts of leaf and bark of *H. mystax*, were recovered to near normal. Hence they could be used as hepatoprotective agents.

Antifertility experiments carried out on rats revealed that the treated rats showed decreased sperm motility, decreased sperm density and abnormality in sperm nature. The leaf and bark extracts of *H. mystax*, at the dose of 500 mg/Kg body weight, showed significant antiinflammatory activity as compared to that of indomethacin, a standard drug to treat inflammation.

The anticancer, antidiabetic, hepatoprotective, antifertility and antiinflammatory activities of *H. mystax* need further detailed studies in path of isolation of active principles responsible for the above potentialities of these herbal drugs.