Summary & Conclusions
SUMMARY AND CONCLUSIONS:

1. *Ficus bengalensis* and *Hemidesmus indicus* were identified and authenticated with the help of a botanist and standard specimens has been deposited in the herbarium. The identification was done by carrying out morphological, microscopical studies of aerial parts and bark of *F. bengalensis* and root of *H. indicus*.

2. Proximate analysis of bark of *F. bengalensis* and phytochemical analysis of its crude extract and fraction has been carried out for the first time. It showed foreign matter 2% and ash values like total ash and acid insoluble ash were found to be 4.5% and 1.5%, respectively. High content of water-soluble extractive value was found (22.35%) while ethanol soluble extractive value was found to be 14.5%.

3. TLC studies of crude extract and their fractions were performed. The most suitable solvent system for methanolic extract of *H. indicus* was found to be butanol: acetic acid: water: methanol: ethyl acetate (4:1:5:2:4) and for its toluene fraction, it was found to be chloroform: methanol (7:3). While for methanolic extract of *F. bengalensis* most suitable solvent system was found to be butanol: acetic acid: water (4:1:5) and and for its fraction ethyl acetate: Toluene (4:6).

4. Flavonoids, saponins, coumarinolignans and tannins were found to be the major constituents of methanolic extract of bark of *F. bengalensis* and root of *H. indicus*.

5. Methanolic extract of both the plants exhibited significant free radical scavenging activity in different *in vitro* and *ex vivo* models. Aqueous and methanolic extracts showed significant dose dependent hepatoprotective activity in paracetamol and CCl₄ induced hepatic damage. The methanolic extract was found to be more potent and effective than that of aqueous extract.

6. Ethyl acetate fraction of methanolic extract of *F. bengalensis* and toluene fraction of methanolic extract of *H. indicus* were found to be the most active as an antioxidant whereas chloroform, petroleum ether and butanol fractions were failed to produce any significant antioxidant activity.

7. These active fractions along with methanolic extract also showed *in vitro* (isolated hepatocytes) hepatoprotective activity against CCl₄ induced hepatotoxicity.
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8. Methanolic extract of both these plants was also found to demonstrate in vivo preventive and curative effect in CCl₄ and paracetamol induced hepatic damages. Methanolic extract of *F. bengalensis* at the dose of 250mg/kg and methanolic extract of *H. indicus* at the dose of 500mg/kg was found to produce maximum preventive and curative effect. Our studies also demonstrated that *F. bengalensis* was found to be more potent than that of *H. indicus* with respect to its reversal effect in hepatotoxicity and antioxidant activities.

9. In addition to antioxidant and hepatoprotective activity, methanolic extract of both these plants was also found to possess anti-inflammatory activity.

10. In conclusion our study supports the folklore use of *F. bengalensis* and *H. indicus* as herbal liver protective remedy. The mechanism of hepatoprotective activity of *F. bengalensis* and *H. indicus* appears to be free radical scavenging action, prevention of peroxidation of membrane lipids and regeneration and/or stabilization of membrane of hepatocytes.