6.0 SUMMARY

The patients with liver diseases have found a steady increase in the recent years, but the treatment strategies they undergo is relatively poor. Herbal medicine has become a major contributor to the treatment of liver diseases from the ancient times. *Caesalpinia bonduc* is one among them. However there is a dire need to understand the chemical constituent and their mode of action on the liver biology. Therefore in the present study, *Caesalpinia bonduc*, a well-known folk medicine was evaluated for its hepatoprotective nature detail by using both *in vitro* and *in vivo* models to provide scientific cellular and molecular evidences thereby affirming its benefits.

The three different leaf extracts of CB i.e., aqueous, alcoholic and petroleum ether were tested for its efficacy in this study. The aqueous extract of CB strongly inhibited the toxic effect of PCM on HepG2 cell lines, the same effect was observed in all the experimental models i.e., preventive, curative and prophylactic. But the preventive cytoprotective effect of aqueous CB extract was the most evident against PCM induced toxicity and was almost similar to the cytoprotection offered by silymarin. This was further reaffirmed by colongenic assay.

The aqueous leaf extract of CB when further evaluated by using acute and chronic *in vivo* toxicity models and tested its preventive, curative and prophylactic efficacies. The toxic effect of CCl4 was successfully circumvented by the aqueous extract of the CB in preventive group when compared to CCl4 control. The results were evaluated on the basis of histological and biochemical analysis. Further, the one of the mode of action of this plant extract, the antioxidant property was confirmed by the DPPH free radical scavenging assay.
Summary

The aqueous leaf extract of CB was further subjected to column chromatography obtain nine different fractions which and was then subjected to HPTLC fingerprinting. These fractions of CB was assessed for the bio-activity against PCM induced *invitro* toxicity. Results showed minimum or no cytoprotection against PCM induced toxicity. This effect was further more justified by the estimation of flavonoid content in the extract/ fraction which showed a low quantity of the total flavonoids in these fractions.

To understand the mechanism of hepatoprotection, the aqueous extract of CB was then subjected to anti-apoptotic assay against PCM induced toxicity on HepG2 cell lines. The intracellular antioxidant levels (GSH and MDA) and the regulation of GCLC and GSR genes were assessed against PCM intoxication on HepG2 cell lines. The results of the study supported and justified antioxidant property of aqueous extract of CB against PCM induced toxicity.

Thus the aqueous extract of CB scientifically proved to be protective against PCM/CCl4 induced liver toxicity. The protection against liver damage by the aqueous extract of CB was found to be comparable and even better to the standard drug, silymarin in many instances. Thus, from the foregoing findings, it was observed that aqueous CB extract is a promising hepatoprotective agent and this activity of CB may be due to the antioxidant chemicals present in it. This glorifies the use of traditional Indian medicines in the treatment of different liver disorders with fewer side effects and could be beneficial to the society. Therefore the result of the present study is promising for further extensive research for formulation of new drug series which can be used as adjunct or supplement to the current treatment plans for liver diseases.