9.0. SUMMARY AND CONCLUSION

Hepatic diseases stand as one of the foremost health trouble worldwide. Liver cirrhosis and drug induced liver injury accounting ninth leading cause of death in western and developing countries. Therapeutics developed along the principles of western medicine are often limited in efficacy, carry the risk of adverse effects and are often too costly, especially for the developing world. Therefore, treating liver diseases with plant derived compounds which are accessible and do not require laborious pharmaceutical synthesis seems highly attractive. In view of this, an attempt has been made to find out the hepatoprotective activity of mangrove plants in the management of liver damages. The salient features of the present study are listed as below:

1. A total of six mangrove species (Bruguiera cylindrica, Ceriops decandra, Lumintzera recemosa, Rhizophora apiculata, Avicennia marina, Rhizophora mucronata) with eighteen different parts (Leaf, collar, hypocotyl, bark, stilt root, stem and flowers) were tested for the hepatoprotective activity

2. Among the eighteen different mangrove extracts, Bruguiera cylindrica leaf extract showed maximum percentage of hepatoprotective activity (72.20%) followed by Rhizophora mucronata stilt root (71.00%). Does
dependant analysis reveals that, the level of SGOT, SGPT, ALP, bilirubin, cholesterol, sugar and lactate dehydrogenase were significantly \( p<0.05 \) reduced in all the doses (75, 150 and 300 mg.kg\(^{-1}\) bw) of the *B. cylindrica* leaf extract treated rats when compared with hepatotoxin group rats. The overall percentage of hepatoprotective activity (73.54%) was observed with high dose (300 mg.kg\(^{-1}\).bw) of *B. cylindrica* leaf extract and not showing any sign of histopathological changes when compared with the control group.

3. The bioactive constituents such as reducing sugars, proteins, phenolic groups and tannins were reported in *Bruguiera cylindrica* leaf extract. The total phenolic content of ethanolic extract of *Bruguiera cylindrica* is 14.08±0.97 mg.g\(^{-1}\).

4. The *in vitro* antioxidant activity of DPPH assay (51.70±1.09 \( \mu \)g.ml\(^{-1}\)), hydroxyl radical scavenging (49.21±1.32 \( \mu \)g.ml\(^{-1}\)), nitric oxide radical scavenging (69.14±0.94 \( \mu \)g.ml\(^{-1}\)), lipid peroxide radical scavenging (268.38±0.81 \( \mu \)g.ml\(^{-1}\)), total antioxidant assay (O.D 2.45), reducing capacity (O. D 1.15), FRAP radical scavenging (54.20±0.93 \( \mu \)g.ml\(^{-1}\)), superoxide radical scavenging (39.25±0.93 \( \mu \)g.ml\(^{-1}\)) revealed the potential of therapeutic property of *B. cylindrica* leaf extract.
5. The correlation analysis of the total phenolic content showed strong and positive correlation (p<0.05) with DPPH (0.982), FRAP (0.985), hydroxyl radical scavenging (0.936), lipid peroxide (0.982), nitric oxide (0.959) and superoxide radical scavenging (0.989) activities.

6. The physical properties such as ash values and organoleptic parameters such as colour, taste, odour and consistency are found within the acceptable limits as per the WHO guidelines.

7. The most effective leaf extract of *Bruguiera cylindrica* is reported to have variety of heavy metals *viz.*, Fe, Cu, Zn, Cr, Mn, Ni, Pb, Cd and As. But, the levels are within the permissible limits as per the WHO guidelines.

8. The microbial counts of *Bruguiera cylindrica* leaf extract reveals that, the counts of THB, *E. coli*, *Salmonella sp.* and *Enterobacter sp.* were found within the acceptable limits of WHO guidelines.

9. In histopathological assay, hepatic necrosis, fatty changes and congestion in central vein were displayed in CCl₄ intoxicated rats. But, pre-treatment of *Bruguiera cylindrica* leaf extract treated rats have significantly reduced the destruction of parenchymal cells and architecture.
10. The HPTLC fingerprinting showed several compounds with different Rf values which could be further used for checking the adulteration in the finished products.

It is concluded from the present study that, the *Bruguiera cylindrica* leaf extract collected from Pichavaram mangrove forest has potential hepatoprotective activity against carbon tetrachloride induced hepatotoxicity in rat because of the maximum antioxidant property of the plant extract and hence it opens a new way for the development of potential hepatoprotective drugs. The purification and structural elucidation of unique chemical classes present in the most effective crude extracts are highly warranted for the successful completion of clinical trials.