7. SUMMARY, CONCLUSION AND RECOMMENDATIONS

In this research work we observed the several biological activities of *Meyna spinosa* and *Leea asiatica* for the first time and few biologically active chemical constituents isolated from the leaves of the plants. The present studies also validated the claim made by the several folk medicinal systems regarding the use of these plants in treatment of several diseases.

7.1. SUMMARY OF THE STUDY

- An ethnomedicinal survey conducted in state of Tripura, India and reported 113 medicinal plants.
- Two ethnomedicinal plants (*Meyna spinosa* and *Leea asiatica*) were selected from the state of Tripura based on a literature search and survey.
- Identification, extraction, phytochemical studies carried out accordingly.
- *In vitro* and *ex vivo* antioxidant study revealed methanol extract of leaves of *M. spinosa* and *L. asiatica* was more effective than ethyl acetate and petroleum ether extract.
- More effective methanol extract of both plant fractionated using petroleum ether, ethyl acetate and methanol.
- Methanol fraction of *M. spinosa* and ethyl acetate fraction of *L. asiatica* found more effective against paracetamol (3 gm/kg, *p.o.*) induced hepatotoxicity and cisplatin (20 mg/kg, *i.p.*) induced nephrotoxicity. Fractions at a dose of 150 mg/kg produced better activity.
- Both fractions also demonstrated significant *in vitro* and *in vivo* antioxidant effect.
Twenty one days treatment with methanol fraction of *M. spinosa* produced significant antidiabetic activity against high fat diet-alloxan type 2 diabetes in rats. Fraction showed significant effect on glucose tolerance test and decreased elevated lipid profile to normal. But no effect was observed on normal animals.

Methanol and ethyl acetate fraction of *L. asiatica* demonstrated potent anthelmintic activity tested against Indian earthworm *Pheretima posthuma*.

A fatty alcohol was isolated from *L. asiatica* and a flavonoid was isolated from *M. spinosa* which showed potent showed potent DPPH and nitric oxide radical scavenging effect.

### 7.2. CONCLUSION OF THE STUDY

Present work justifies the folk medicinal uses of the plants by the tribes of Tripura, India. Ethyl acetate fraction of *L. asiatica* and methanol fraction of *M. spinosa* showed potent hepatoprotective and nephroprotective activity, thus these fractions and their chemical constituents may be considered as a lead of future that could prevent the drug induced toxicity in liver and kidney by their concurrent uses.

EFLA and MFLA also proved their effectiveness against Indian earth worm. On the basis of the results of the present study, it is concluded that this plant can viewed as a potential source of natural anthelmintic compound against gastrointestinal infection. Further studies may necessary to establish the mechanism(s) of action of the fractions.

MFMS found effective against experimentally induced type 2 diabetes by reducing the elevated blood glucose level, α-amylase activity and lipid profile of
diabetic rats. This effect of fraction may be due to the increase in insulin secretion or ameliorating insulin sensitivity or due to the inhibition of α-amylase activity. Therefore the fraction could be further investigated to add in the list of medicinal preparations that beneficial in type 2 diabetes mellitus and to reduce the risk of diabetic complications.

Methanol extract of both plants also demonstrated strong antioxidant activity and showed the presence of high concentration of phenolic and flavonoid content, which may be responsible for their observed biological activity. Fraction of these extracts especially EFLA, MFMS showed very potent antioxidant activity which is comparable or better than the standard drugs ascorbic acid, rutin and α-Tocopherol. Therefore the inherent antioxidant and free radical scavenging activity of the fractions may be responsible for their beneficial effect in those disease conditions.

The isolated compounds a fatty alcohol from *L. asiatica* and a flavonoid from *M. spinosa* showed potent antioxidant activities which could be a future drug molecule in the treatment of various oxidative stress related diseases or can be used as antioxidant supplements.

### 7.3. RECOMMENDATIONS

- Ethyl acetate fraction from *Leea asiatica* and methanol fraction from *Meyna spinosa* showed significant protective effect against paracetamol induced hepatotoxicity and cisplatin induced nephrotoxicity, which was evident by the restoration of different serum biochemical parameter and antioxidant level near to normal.

Therefore, further investigation of the fractions of *Leea asiatica* especially EFLA and fractions of *Meyna spinosa* especially MFMS could be
helpful to find a better and less toxic hepatoprotective/nephroprotective molecule, concurrent administration of which could helpful to prevent the toxicity induced by allopathic drugs.

- MFMS and EFMS confer antidiabetic effect against experimentally induced type 2 diabetes and these fractions also highly helpful to bring the lipid profile in normal level.

  Thus these fractions of *M. spinosa* could a lead to find antidiabetic molecule which could replace current synthetic drug molecules which are also responsible for various toxicities.

- Anthelmintic activity of the fractions of *L. asiatica* leaves (MFLA, EFLA) on the *Pheretima posthuma* was evaluated. The dose-dependent anthelmintic efficacy of the fractions was quite similar to that of piperazine citrate.

  Thus advanced and future investigation of these fractions of *L. asiatica* could be a source of effective phyto anthelmintic agent against different gastrointestinal infections.

- A fatty alcohol from *L. asiatica* and a flavonoid from *M. spinosa* was isolated which showed potent antioxidant activity, therefore further study will help to incorporate this molecules in modern treatment therapy or to use it in antioxidant supplements.

- Both the plants can be further investigated as they proved to possess nephroprotective, hepatoprotective and anthelmintic/antidiabetic activities and can be made in to suitable formulation to treat such ailments.