7. SUMMARY

- Based on the information on traditional usage and the literature survey, 28 medicinal plants were chosen and collected from Virudhunagar district area for antimycobacterial screening.

- Methanol and hexane extracts of selected medicinal plants were screened against *M. tuberculosis* H$_{37}$Rv along with two clinical isolates of *M. tuberculosis* by luciferase reporter phage (LRP) assay at concentrations of 250 and 500µg/ml.

- Four plants *A. paniculata*, *Acalypha indica*, *Tragia procumbens* and *Cissus quadrangularis* showed maximum antimycobacterial activity followed by *G. superba* and *A. sativum* at 500µg/ml.

- *A. paniculata*, showed maximum antimycobacterial activity even at lower concentration against all three strains of *M. tuberculosis* in comparison with the other plants tested. Hence methanolic extract of *A. paniculata* was selected for further studies.

- The preliminary phytochemical screening revealed that methanolic extract of *A. paniculata* indicated the presence of alkaloids, phenols, saponins, terpenoids and carbohydrates.

- Based on bioassay guided fractionation, fraction four (FR-4) of methanol extract of *A. paniculata* was identified as potent fraction for antimycobacterial activity.
- Based on the different spectral data (UV, FT-IR and NMR) the active compound was determined as Andrographolide

- Estimation of MIC by the LRP assay revealed that concentrations ranging from 100 to 200µg/ml were active against all the strains irrespective of their resistance pattern to the conventional anti-TB drugs. All the strains sensitive to the conventional drugs exhibited MIC value of less than 400µg/ml by absolute concentration method

- The study reiterates the suitability of LRP assay for rapid screening of plant extracts and their compounds for antimycobacterial activity

- Cytotoxicity evaluation using cell line model demonstrates that Andrographolide showed minimal toxic effect against Vero cell lines

- Docking studies carried out for Andrographolide identified the possible drug targets of tuberculosis and results showed that Andrographolide docked with Aminoglycoside 2'-N-acetyltransferase (AAC) and Isocitrate Dehydrogenase-1 (ICDH) protein.