

SUMMARY

The thesis entitled “**Pharmacognostical, Phytochemical, Pharmacological and Antimicrobial Studies on *Carmona retusa* (Vahl) Masam,**” impacts on pharmacognostical, phytochemical standardisation and screening of pharmacological and antimicrobial activities.

- The plant with the sandy paper texture on the upper surface of the leaf is one of the striking features of the family Boraginaceae.
- The pharmacognostical studies deals with the macroscopic and microscopic features of the plant. The results show some of the unique distinguish features viz.
 - numerous unicellular covering trichomes with cystoliths (Calcium carbonate crystals) in the leaf surface;
 - epicuticularised crystals in the surface of the trichomes;
 - Calcium oxalate crystals in the form of druses in the leaf;
 - Prismatic crystals in the bark and secondary phloem region;
 - styloid (scale) crystals present in the axile parenchyma of the root bark
- Lastly on the basis of the present study of the microscopical characters of various parts of *C. retusa* we are able to conclude that certain microscopical characters are highly reliable for the botanical diagnosis of Boraginaceae in general and *C. retusa* in particular.
- The qualitative chemical analysis of the alcohol extracts showed the presence of alkaloid, amino acid, coumarin, flavone, glycoside, phenol, tannin and saponin in alcohol extract of root, stem and leaves.

- The physico-chemical parameters of the plant shows the presence of inorganic content found to be higher in leaf followed by root and stem from the water soluble ash. The alcohol soluble extractive value indicated the presence of polar and non polar secondary metabolites where as the water soluble extractive value indicated the presence of sugar, acids and inorganic components.
- The quality control parameters analysed for microbial load were within the WHO permissible limit whereas the total fungal count, *Enterobacteriaceae* spp, *Salmonella* spp, *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas* spp were not found in the samples. The heavy metal analysis shows only negligible amount of lead which indicate within the permissible limits where as arsenic, cadmium and mercury were not detected. The aflatoxin and pesticidal analysis were not detected in the plant. All these quality control parameters results disclose the plant to be non-toxic and may be eco-friendly.
- Each plant has a distinguished finger print chromatogram. The TLC and HPTLC finger print profile will provide identification and purity of the plant and distinguishes from the adulterants and substituents of the species. TLC and HPTLC finger print profile of alcohol extracts of root, stem and leaves were analysed by viewing at UV-254 nm, UV-366 nm and vanillin sulphuric acid reagent and the R_f values were obtained.
- The cytotoxicity studies showed there was no morphological changes were observed in the Vero cell lines at the minimum concentration.

- The acute toxicity study revealed that there was no mortality in the entire group treated with various extracts of root, stem and leaves is safe up to 2000mg/kg body weight.
- The alcoholic extract of the plant showed significant analgesic activity, anti-inflammatory and wound healing activity in experimental model and the result were comparable with standards.
- The antimicrobial study revealed that the alcohol extract of root of *C. retusa* possess more activity than stem and leaf extract.

The present study has provided a scientific evaluation for *Carmona retusa* (Vahl) Masam, on pharmacognostic features, physico-chemical standards and phyto-chemical studies. The TLC and HPTLC finger print profiles have been useful for identity, purity and fixing standards of the plant materials. The studies on acute toxicity, pharmacological and anti-microbiological activities may be the proofs for the therapeutic efficacy of the plant.