ABSTRACT

Medicinal plants and other plant based food products are reported to be good source of natural antioxidants. The secondary metabolites such as phenolic compounds (phenolic acids and flavonoids etc) and other biomolecules such as amines, pigments, vitamins, steroids and alkaloids are the important antioxidants present in the plant based foods. *Merremia emarginata* (Burm. f.) synonym *Ipomoea reniformis* belongs to family Convolvulaceae is prevalent throughout India. This is uncultivated food crop used by poor people in India as green leaf vegetable. In Indian traditional medicine system, *M. emarginata* is used as deobstruent, diuretic, for rheumatism, neuralgia, cough and headache. Though, this plant has been used for treating many ailments for decades in Siddha and Ayurveda, but study of their pharmacological effects and the compounds responsible for their therapeutic property are yet to be identified.

This thesis describes analytical methods for identification of the main constituents in the leaves of *M. emarginata* and its pharmacological uses. The preliminary phytochemical screening of aqueous leaf extract of *M. emarginata* indicates the presence of alkaloids, steroids, saponin, phenolics, flavonoids, reducing sugars and terpenoids. The *in vitro* antioxidant activity of *M. emarginata* leaf extract indicates the plant has potential to act as significant source of antioxidants. The antimicrobial activity of *M. emarginata* with quantum dots (QDs) was successfully studied and could be used for the pathogen reduction and detection. The phenolic compounds present in the *M. emarginata* were identified using UPLC MS/MS analysis. Phenolic compounds profiling shows 26 known and 19 unknown compounds in *M. emarginata*. Further, the diuretic property of *M. emarginata* was analysed in female Wistar rats. The polyphenolics (Chlorogenic acid) byproduct hippuric acid was successfully analysed in urine sample using RP-HPLC, it may act as polyphenolics induced diuretic marker.