7 SUMMARY AND CONCLUSIONS

An attempt was made in the present studies to investigate the antioxidant and anti ulcer activities of the various leaf extractives of *Rhodomyrtus tomentosa* and *Mallotus philippensis* at dose levels of 100, 200 and 400 mg/kg.

The *in vitro* antioxidant activity of the extractives showed good activity against DPPH, H$_2$O$_2$, Nitric oxide and ABTS radical scavenging methods. Methanolic extractives of *Mallotus philippensis* and aqueous alcoholic extractives of *Rhodomyrtus tomentosa* exhibited potent antioxidant activity in comparison to the other extractives.

The safety profile of the extractives was evaluated by 14-day acute toxicity studies and the results did not indicate clinical signs and symptoms of toxicity or mortality. The gastric anti ulcer activity of the all extractives were carried out at a dose of 100 mg/kg and 200 mg/kg by ethanol induced gastric ulcer model. Methanolic extractives of *Mallotus philippensis* and aqueous alcoholic extractives of *Rhodomyrtus tomentosa* exhibited significant anti ulcer activity when compared to the other extractives. Hence, these extractives were selected for further evaluation of anti ulcer activity using modified pylorus ligated (shay) rat model and acetic acid induced chronic gastric ulcer model in rats. In modified pylorus ligated (shay)
rat model both the extractives exhibited significant changes in the antisecretory parameters like ulcer index, % ulcer protection, volume, pH, free acidity, total acidity, total proteins and carbohydrate content (p<0.01). However, there was no significant alteration in free acidity, total acidity and fucose content with 100 mg/kg b.w of animals.

In the chronic model the extractives exerted moderate healing rate and was comparable to the standard Omeprazole. Extractives significantly increased enzymatic antioxidants levels (SOD and CAT) and decreased the LPO level in the stomach tissue. It also increased the mucous levels, which are of primary significance in gastroprotection.

A short-term toxicity study was carried out on the chronic ulcer-healing model in animals by means of change in food and water consumption, differences in body weight and effect on RBC and WBC count. The extractives did not produce any toxicity or behavioural change on repeated dosing. The histopathological study of the glandular part of the stomach revealed the protection of mucous epithelium only with mild congestion with minute oedema at 400 mg/kg.

Antiulcerogenic activity of MEMP and RTLE was also assessed by Forced swimming Stress induced gastric ulceration in rats at dose levels of 100 and 200 mg/kg. RTLE, at both the doses and MEMP at 100 mg/kg exhibited ulcer protective effect which was indicated by a
decrease in ulcerative index. Further the *in vivo* antioxidant effect of the extractives was assessed by forced swimming stress induced changes in the antioxidant markers SOD, Catalase and Thiobarbituric acid reactive species in blood and gastric tissue samples. RTLE at 100 and 200 mg/kg induced a dose related reversal of the stress induced effects by causing a decrease in the levels of thiobarbituric acid reactive species in the blood and gastric tissues in comparison to the stress control group. Antioxidant markers, Superoxide dismutase and catalase were found to be significantly increased at 200 mg/kg. However at a dose of 100 mg/kg, MEMP did not cause reversal of the stress induced changes.

The aqueous alcoholic extractives of *Rhodomyrtus tomentosa* exhibited significant anti ulcer activity when compared to the other extractives and hence the constituents were separated by column chromatography. Spectral characterisation of the isolated compounds was carried out using UV, FT IR, LC-MS, $^1$H-NMR and $^{13}$C- NMR spectra. The compounds isolated were characterised as 7- hydroxy coumarin (umbelliferone), Psoralene and 8-hydroxy-psoralene (xanthotoxin). Coumarins are reported to possess strong antioxidant activity and recent reports suggest inhibitory activity of xanthotoxin against *Helicobacter pylori*. GC-MS studies of RTLE revealed the presence of important volatile phytoconstituents like phytol, hexadecanoic acid and squalene.
From the above finding it can be concluded that the the methanolic extractives of *Mallotus philippensis* and the Aqueous alcoholic extractives of *Rhodomyrtus tomentosa* exhibited moderate Anti ulcer and antioxidant activity in all the models studied.

Oxygen handling cells have antioxidant enzymes such as Catalase and Superoxide dismutase are known to decrease the gastric mucosal damage induced by ulcerogens, as they are the first line of cellular defence against injury induced by oxidative stress. Antioxidants play a significant role in protecting the stomach against mucosal injury by inhibiting the progression of gastric ulcers. Hence the anti ulcer activity of the extractives is attributed to the potent antioxidant activity of the extractives under study.

Hence, it can be concluded that the extractives studied may partly protect the gastric mucosa against acute and chronic gastric mucosal injury and promotes healing by their free radical scavenging activity. Further studies on the isolated compounds would probably establish the exact mechanism by which the selected plants exert their antioxidant and anti ulcer effects. The results of the present study also indicate that extracts under study can be used as easily available and cost effective source of natural antioxidants.