SUMMARY AND CONCLUSION

Plants play a significant role in maintaining human health and improving the quality of human life. They serve human, as valuable components of food such as seasonings and beverages and also as in cosmetics, dyes and medicine. Phytochemical constituents of plants with varied phytochemical, physiological and biochemical activity has received attention to use them as food, medicine, cosmetics etc. In fact many plants extracts have been shown to exert biological activity *invitro* and *invivo* which justified the healing potential of ethnomedicine. Hence it is essential to study the traditional health care systems.

It is expected that plant compounds showing target sites other than those currently used by antibiotics will be active against drug-resistant microbial pathogens. On the other hand, a large number of plants have been screened as a valuable source of natural antioxidants including tocopherols, vitamin-C, carotenoids and phenolic compounds which are responsible for the maintenance of health, to help the human body to reduce oxidative damage and protection from coronary heart diseases, cancer and (Kilani *et al.*, 2008). Realizing the importance of plant compounds in recent years much attention is focused to explore the medicinal potential of all plant. Further there is a deep search for safe and effective natural antioxidants from edible plants especially spices and herbs. Plant derived polyphenolic compounds possess antimicrobial, antioxidant, anticancer and apoptosis including properties. The role of plant derived
polyphenols in chemoprevention of cancer has emerged as an interesting area of research (Kilani, 2008).

In this direction a lot of research is in progress on a medicinal plant *Cyperus rotundus* Linn. *Cyperus rotundus* is sedge of the *Cyperaceae* family. It grows naturally in tropical, subtropical and in temperate regions. It is one of the earliest known and most important edible herbs and has been reported to exhibit wide spectrum activity in biological systems, including antimicrobial, antioxidant and anti-inflammatory effects.

In the present study an indepth research was carried out on the medicinal properties of the rhizome of *Cyperus rotundus* Linn. Antimicrobial antioxidant and immunomodulating potential of *Cyperus rotundus* was tested. To identify the bioactive compounds in *Cyperus rotundus*, methanol, ethyl acetate and methanol and DCM extractions were used. The crude extracts of *Cyperus rotundus* and column separated fractions were subjected to various biological tastings. The major bioactive compounds present in Indian *Cyperus rotundus* was screened and identified.

Using phytochemical analysis, UV-visible spectrum and GC-MS studies, the active compound that are rich in rhizomes were tested. From the investigation it was found that phenolic compounds and tannin are rich in rhizomes. An important compound that formed a dominant peak was identified to be $3, 3, 3, \text{trifluoro-N-}(-4\text{-fluorophenyl}) - \text{bicyclo (4.1.0) heptane.}$
Antimicrobial study of the crude extract was tested, using pathogens. The pathogenic fungi and bacteria were isolated locally and tested. Also standard strains were used. The methanolic and ethyl acetate extracts of *Cyperus rotundus* *L.* rhizome and DCM and methanolic fraction (30:70) were used. The extracts of *Cyperus rotundus* posses a good antimicrobial activity.

The effect of *Cyperus rotundus* for antioxidant potential was studied. Both *Invitro* and *Invivo* testing were done. For *invivo* testing wistar rats were used. The rats were pretreated with drugs that induced ROS production. After ROS production the various indicators of ROS were estimated (CAT, LPO, SOD GPX TRG). A higher level of ROS production was noticed when paracetamol was given. Hence to the oxidative stress induced rat extracts of *Cyperus rotundus* (Methanol, Ethyl acetate and DCM: Methanol) were given and again ROS level was estimated. The treatment of rats with the extract of *Cyperus rotundus* had significantly reduced the oxidative stress and this antioxidant potential was because of the bioactive potential compound present in *Cyperus rotundus*. The liver and kidney of rat that were under oxidative stress were examined for histopathological changes and marked histopathological damages were observed. Hence, whether the extracts of *Cyperus rotundus* were able to repair the damaged liver and kidney was tested. To the surprise it was found that the kidney and liver that were damaged by oxidative stress got recovered after the treatment with *Cyperus rotundus*.
*Invitro* study was also made find out the scavenging ability of the extracts of *Cyperus rotundus* on free radicals. The results indicated that the bioactive compounds of *Cyperus rotundus* have significant scavenging activity on free radicals like DPPH, Hydroxyl, Super oxide and Nitric oxide.

From the study it was quite evident that the extracts of *Cyperus rotundus* possess a good antioxidant activity. Phytochemical investigation revealed the presence of flavanoid, tannins and phenolic compounds. These compounds had been reported to have good antioxidant properties.

The effect of the extracts of *Cyperus rotundus* on Haematological parameters and immunological parameters was studied. For this study wistar rats were used. The immunity of the rat was suppressed by the suppressive drug pyrogallol. After suppression, the rats were treated with *Cyperus rotundus* extract and challenged with antigen, SRBC, after antigenic challenge DTH level, T-cell count and Antibody titer value were estimated.

Delayed Type Hypersensitivity (DTH) reaction an indicator for cell mediated immunity was studied in normal, immune suppressant treated and *Cyperus rotundus* extract administered rats were estimated. The extracts of *Cyperus rotundus* was found to reduce the inflammation caused by antigen in the paw. The paw edema was reduced after the treatment with *Cyperus rotundus* extract.
Further the effect of *Cyperus rotundus* on T-cell count and Antibody formation in rats that were immunologically induced was studied. The drug pyrogallol suppressed T-cell count and antibody production significantly also damaged liver and kidney. Hence the affected rats were treated with the extracts of *Cyperus rotundus* and the indicators of immunity were again estimated. It was found that in the extracts treated rats both T-cell count and Antibody formation were significantly improved from immune suppressed state. Histological examination of the pyrogalol treated rat’s in liver and kidney showed damaged. But such damages were repaired on treatment with the extracts of *Cyperus rotundus*.

Phytochemical study was made on the extracts of *Cyperus rotundus*. In the extract Triterperoids, Reducing sugar, alkaloids, phenolic compounds, saponin, xanthoprotien, tannins, Flavanoids and phytosterols are present. Total phenolics, Flavanoid and total tannins were estimated. As per GC MS library, the major compound that formed the peak was identified to be 3,3,3, trifluoro–N-(4-fluorophenyl)- bicyclo (4.1.0) heptane.

For the future research pharmacological studies has been planned with the identified compounds and efforts will be taken to synthesize these compounds in a large scale to carry out antitumour studies in cell lines and animals.