Chapter 5

CONCLUSIONS
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The present thesis entitled “Phytochemical and cytotoxic studies of Careya arborea” deals with pharmacognostical uniqueness, phytochemical contour, and pharmacological prospective of traditionally used medicinal plant of genus Careya. A perusal of literature declares that only fragmentary information are available on Careya arborea but this study was designed for the evaluation of pharmacognosy, phytochemistry and pharmacology in order to establish its folklore claims. The work carried out comprises the following aspects of the Careya arborea:

- Pharmacognostic evaluation of the stem bark.
- Preparation of the different extracts of Careya arborea stem bark (alcohol, hydroalcoholic and aqueous).
- Preliminary phytochemical screening of all the prepared extracts was carried out.
- Screening of various extracts for biological activities (anti-oxidant, cytotoxic and antimicrobial).
- Biologically active extract was underwent fractionation using different solvents (petroleum ether, ethyl acetate, ethanol, water).
- Each fraction was further screened for biological activity.
- Isolation of active phytoconstituents from bioactive fraction by column chromatography.
- The isolated constituents were elucidated using various spectroscopic techniques such as UV spectroscopy, IR spectroscopy, NMR and mass spectrometry etc.
- Isolated compounds were screened for biological activities.

Plants are the fountain head for accomplishment of modern medicine. The relative few adverse consequences of plant preparations in contrast to allopathic pharmaceuticals, in association with low cost and high acceptance by public, consider plant medicines as replacement to synthetic drugs.

It is documented in the literature that oxidative stress is involved in the pathogenesis of cancer. The plants with antioxidant potential have been reported
to have cytotoxic activity. Research also depicts that several tri-terpenoids possess antitumor properties. Based upon earlier reported data like pharmacological activities, phytochemical composition and availability, and ethno medical uses, the given plant was selected.

The selected plant for the present study was initially authenticated by a botanist Dr. K.Madhava Chetty, faculty of botany at Sri Venkateswara University, Tripuri, Andhra Pradesh, India. In the next phase, standardization of elected part of plant was performed by conducting its macroscopic, microscopic research along with physical parameters. The study was further progressed by the extraction of stem bark powder with solvents of increasing polarity using Soxhlet extraction technique. The prepared extracts were subjected for preliminary phytochemical evaluation followed by biological screening.

Different activities (anti oxidant, anti cancer and antimicrobial) were corroborated by employing suitable in-vitro models. The anti-oxidant activity was checked by DPPH and ABTS assays and the cytotoxic activity was appraised by using cell lines like MCF-7 and HepG2. Furthermore, antimicrobial activity was analysed by micro dilution method. Remarkable results for anti oxidant and anticancer activity were obtained on the prepared extracts especially the hydroalcoholic and ethanol extracts. Additionally both these extract also possess masterly antimicrobial activity whereas aqueous extract did not show any antimicrobial effect.

The hydroalcoholic extract showed biological action in a trend, and further fractionation was implemented on this extract. Biological screening in vitro was again carried out on the fractions prepared. Petroleum ether (PECA) fraction manifested healthy results. In the eventual level, auspicious results from in vitro studies for the candidate plants revitalize for the isolation of phytoconstituents from petroleum ether fraction of hydroalcoholic extract of Careya arborea.

The nominated fraction was then subjected to column chromatography for isolation and purification. The column was eluted with solvents of varying polarity. The column fractions were monitored with TLC and similar fractions were combined and further processed to yield the isolation of compounds. These
isolated compounds were characterized by using suitable spectral techniques like UV, NMR, IR and mass spectrometry. PECA (Petroleum ether fraction of *Careya arborea*) escorts to be isomers of each other. In conclusion, the results of the present investigation infer that plant extracts possess good antioxidant anti-cancer and anti-microbial properties, the antioxidant being apparently responsible for the anti-cytotoxicity. Thus, the extracts can be beneficial in treating cancer as well as microbial infections. The present investigation also leads to the conclusion that the anticancer potential of different extracts of stem bark of is due to the antioxidant nature of the plant.

5.1. **Future prospects**

The findings suggest that the plant *Careya arborea* possess anti oxidant, anti cancer and antimicrobial activities. However further studies are required to explore the exact mechanism of action for the bioactive constituents. Further, the pharmacological evaluation can be carried out using suitable animal models followed by clinical trials in human volunteers are proposed.