SUMMARY AND CONCLUSIONS

The present work was undertaken to study the effect of industrial pollution on selected medicinal plants showing healthy robust growth and the analysis is compared with the same plants grown under unpolluted sites.

The following work carried on different phases given below fulfills the aims and objectives.


2. The soil samples at two sites and the plants collected at the respective areas were subjected to metal analysis to study the abiotic stress.

3. The phytochemicals were analysed qualitatively and quantitatively in response to the pollutant stress.

4. The effect of these phytochemicals extracted from the five plant species, for Antimicrobial activity was carried out using eight pathogens.
5. Therapeutic activity of two plant species namely *Ocimum sanctum* and *Azadirachta indica* was studied by analyzing anticancer activity on HepG2 cell lines.

The salient findings of the present study are furnished below.

1. The metal analysis of soil in the industrial site of eastern ghats and unpolluted site of eastern ghats revealed that the concentration of some of the metals are more in industrially polluted area. Yet the metal concentration is below the regulatory limits of soil adopted from USEPA 1993.

2. The studied plants collected in industrially polluted area accumulated a few metals in high concentration. The accumulated metal concentration is falling below the permissible levels WHO/FAO.

3. Elements found in higher concentration in plants are only few of all the 25 elements studied.

4. The results highlight accumulation of metal contaminants in low quantity below the permissible levels.

5. The studied metal contents in all the plants are within the limits, with those proposed by FAO/WHO (1984). Therefore prolonged ingestion of these medicinal plants may not lead to chronic accumulation of these elements causing various health problems.
6. As these medicinal plants do not exhibit exceptional metal accumulating capacity, they cannot be known as hyperaccumulator plants, though Ba is more in polluted soils and Rb is more in unpolluted soils.

7. Abiotic stress enhanced phytochemicals in certain plants.
   - Antimicrobial activity is enhanced in *Ocimum sanctum* and decreased in *Azadirachta indica*.
   - Cytotoxicity is enhanced in *Ocimum sanctum* decreased in *Azadirachta indica*.

8. Abiotic stress to which these plants are exposed, enhanced the anticancer activity of *Ocimum sanctum* only and not of *Azadirachta indica*.

9. *Ocimum sanctum* grown under polluted soils showed higher anticancer activity.

Robust anticancer activity is exhibited by extracts of *Ocimum sanctum* and *Azadirachta indica* when used in combination of unpolluted soil.

10. These observations clearly indicate *Ocimum sanctum* extracts possess anticancer activity.

11. As these plants have excellent safety profiles, they may be ideal candidates for a prospective trial for different cancer cell lines and cancer patients as well.

From the above summary following conclusions are drawn.

i. Of all the five plant species, *Ocimum sanctum* subjected to abiotic stress exhibited promising antimicrobial and anticancer activity paving a definite way for drug formulation.
ii. It is recommended to check the metal content in plants before using the phytochemical as therapeutic agent. As all the heavy metal concentration is below the permissible limits of WHO/FAO, the bioactive compound may be recommended for further therapeutic studies.

iii. The anticancer findings suggested methanol extracts of *Ocimum sanctum* collected from polluted site reduced the number of viable cells. The percentage of cytotoxicity by the crude extract is close to the action of standard drug cis platin used on HepG2 cell lines. Therefore it could be further proposed to test its efficacy as anticancer drug.