CONCLUSION

□ The plants, *T. cordifolia* and *P. amarus*, were distributed throughout the Northwest region of India including the three climatic zones.

□ The wildly collected individual accessions showed the morphological variations including differences in leaf margin, colour, branching pattern etc. all the distinguishing phenotypic characters.

□ The accessions from different climatic zones were placed in separate groups indicating the presence of genetic diversity in the plant i.e. plants from different climatic zone were more genetically diverse as compared to the plants from the same climatic zone.

□ The EST-SSR marker system proved to be more efficient than ISSR marker system based on the UPGMA and PCA results as it directly correlates with the different accessions collected from the different climatic zones.

□ The plants grown and harvested under environmental conditions of temperature (24.5-33.5°C), rainfall (400-800 mm) and soil moisture conditions of Rohtak found to be most suitable among three different climatic zone sites due to the presence of significant detectable berberine and phyllanthin content.

□ The silver nanoparticles from *T. cordifolia* & *P. amarus* were successfully synthesized and possess good antimicrobial activity, even at very small concentration (in μg/ml), which makes them a potent source of antimicrobial agent against reference strains.

□ As infection of *P. aeruginosa* always remains one of the most challenging concerns in burn units and the synthesized AgNPs from *T. cordifolia* & *P. amarus* were highly effective antibacterial agent against the MDR burn isolates of *P. aeruginosa*.
SIGNIFICANCE OF WORK

- The study was helpful in separating the different accessions of both plants according to their respective climatic zones with the help of molecular markers and may helpful in advance molecular analysis.

- The study may helpful in the development of agronomic practices of both the plant mitigating the adverse affect of climate change for sustainable, effective and profitable cultivation and better pharmaceutical results.

- The study also gives insight of the potential applicability of silver nanoparticles from *T. cordifolia* and *P. amarus* as an alternative antimicrobial in the health care system, may also reduce the burden of multidrug resistance and thereby justify the folklore claim of both the plants used in the traditional system of Indian medicine.
FUTURE PROSPECTS

- The transferability of EST-SSR markers of both *T. cordifolia* and *P. amarus* needs to be checked in other plant species. Also the advanced marker detection system needs to be developed for molecular characterization in both medicinal plants.

- The better strategies for agronomic practices to be developed for sustainable, profitable cultivation and better pharmaceutical results.

- The toxicity level of silver nanoparticles of *T. cordifolia* and *P. amarus* to be checked against human cell lines to use them as an alternative antimicrobial in the health care system. The different activities also to be checked for find out the other potential efficacies of nanoparticles.