LICHEN DIVERSITY OF ULTAPANI FOREST RANGE, MANAS BIOSPHERE RESERVE, ASSAM AND BIOLOGICAL ACTIVITY OF SELECTED SPECIES

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CHAPTER 8

CONCLUSION

The present study made a comprehensive documentation on lichen biota of Ultapani Forest Range under Manas Biosphere Reserve, Assam for the first time. This work will definitely help in the identification of lichen taxa, their conservation and management of endemic species of the entire region and the forest in particular. This exploration will not only add more taxa to the existing list but also acts as a baseline data for carrying out future survey, related to biomonitoring and bioprospection studies in the field of lichenology.

Lichens play a major role in maintaining the ecological balance of an ecosystem, and contributes significantly to the oxygen cycle by fixing carbon dioxide from the atmosphere. Among the substratum, lichens grow, trees act as an important habitat for their survival. However, most of the areas under the forest range have been cleared for human settlement which is an important threat to lichen diversity of the region. During the survey, it is painful to observe large number of trees being burned down. So, along with the loss of vegetation, large number of lichen species are forced to disappear from the region by these actions. Therefore, it necessitates conservation of the region so as to protect the lichen biota along with other flora and fauna.

In addition to their ecological relevance, lichens have been acknowledged for their pharmacological potential, providing a rich source of bioactive chemicals. The evaluation of *Anzia ornatoides* for medicinal purposes offers a fascinating point of convergence between contemporary science and traditional ecological knowledge. The richness of antioxidants found in lichens and their historical usage in traditional medicine have sparked much research into the potential health advantages of lichens for people.

The comprehensive investigations conducted in this study provide compelling evidence of the remarkable potential of the lichen extracts under examination as a promising candidate for antioxidant, anticancer, and antimicrobial activity. Through a series of meticulously designed experiments, including Phosphomolybdenum, FRAP, DPPH, ABTS and Lipid peroxidation assays, cell proliferation assay, apoptosis assay,

toxicological assessment, disc and well diffusion assay, MIC, MBC and MFC, the multifaceted properties of this extract have been unveiled. This is the first ever report of antioxidant, anticancer and antimicrobial activities of *A. ornatoides* and there is promising scope for preclinical research on the anticancer potential of this species. It is essential to note that the transition from laboratory studies to effective clinical therapies is a complex process. To evaluate the safety and effectiveness of substances obtained from lichens in humans, clinical trials are required.

Rigorous experiments involving varying organic solvents and extraction methods to identify the most potential signature compounds having such activities need to be done. Purification of the specific compounds having the potential anticancer, and antimicrobial properties is another challenging task. The assessment of other biological properties of this lichen are beyond the scope of this thesis.

In light of these findings, the present study highlights the need of investigating *A. ornatoides* extracts as useful resources in the development of innovative therapeutics. However, more investigation is necessary to clarify the underlying mechanisms and optimise dosages for clinical applications. The promising outcomes of this investigation warrant continued exploration of this lichen and extract's potential in the fields of cancer treatment. This research serves as a foundation for future studies aimed at harnessing the full therapeutic potential of this natural compound for the benefit of human health.