

## Preface

Flowering plants or angiosperms are widely explored for isolating active components, while lower group of plants especially pteridophytes are under explored in this aspect. Pteridophyte plants have feather-like leaves and ferns and fern-allies together form the pteridophytes. Pteridophyte plants have medicinal values. Medicinal ferns of India were studied different ethnobotanists. Crude preparations from pteridophytes are ethno-medicinally important, and some of them are used against various bacterial diseases. Due to the indiscriminate use of antibiotics a large number of pathogenic bacteria became resistant to antibiotics. Most of the allopathic medicines are not plant based and have lot of side effects; while plant based drugs have a little side effect when compared with others. Therefore it is the obligation of the phytochemists to explore the potential of our indigenous medicinal plants and isolate active compounds to fight against pathogenic organisms. In the present study, an attempt has been done to isolate an antibacterial principle against multidrug resistant bacteria.

The work is an interdisciplinary one. The contents of this thesis are distributed in six chapters highlighting the medicinal potential of ferns. In the initial phase of the study forty-four locally available ferns were screened for antibacterial activity. In the next step fourteen plants that showed good result in preliminary study were evaluated further in different solvents of increasing polarity and *Drynaria quercifolia* was selected for isolating antibacterial principle. The structure of the active compound was clearly established by various spectroscopic techniques like UV, IR, MS,  $^1\text{H}$  and  $^{13}\text{C}$  NMR and Elemental analysis. The structure of the compound was established as (1E, 4E)-1,5-bis (4-hydroxy-3,5-dipropyl phenyl) penta-1,4-dien-3-one. Its molecular formula is  $\text{C}_{29}\text{H}_{38}\text{O}_3$  (MW: 434). Minimum inhibitory concentration of the compound was also established. Structure of the compound was compared with known compounds and certain conclusions were made. From the present investigation it has been concluded that the fern *Drynaria quercifolia* can yield an antibacterial principle and is found to be potent against a multidrug resistant strain of *Pseudomonas aeruginosa*.