Plants and humans have unique relationship since time immemorial. For centuries human being have relied on nature for their basic needs like food, clothing and cures for various ailments. Natural product medicines have come from various sources like plants, micro-organisms, marine organisms, vertebrates and invertebrates. Ancients records like the Charaka Samhita and the Sushruta Samhita, which are the pillars of Ayurvedic System of medicine stores huge information of medicinal utilities of plants in curing ailments. The importance of natural products, especially plants derived natural products have originated from human curiosity for taste, odour, colour and cures for human diseases and since than hundreds of natural products have been isolated and characterized. Historically, the pharmaceutical industries have used plant extracts to produce relatively crude therapeutic formulations, but with the advancement of antibiotics in the mid 20th Century, fairly purified drug formulations came into existence. Natural products have been the major source of chemical diversity. Many natural products have been synthetically modified and their derivatives were successfully used in curing human diseases.

With continuous advancement in the science of natural products and drug discovery, many major pharmaceutical companies have either terminated or considerably reduced their natural product operations. Biotechnology companies working in the field of combinatorial biosynthesis, genetic engineering and metagenomic approaches to identify novel lead natural products have met with limited success. However, with wide diversity of plants in our planet, one can expect the diversity of natural products and their importance in curing various diseases. This potential has not been fully exploited.
“Ethnobotany” as a branch of botany has contributed significantly in drug discovery efforts. About 80% of all the natural products used in treatment of human diseases have same or related ethnobotanical significance. Taking into account the importance of natural products in human health care, the aim of this work was settled down to search potential therapeutics from *Pajanelia longifolia*, an ethnomedicinal plant from Southern Assam part of North East India.

The thesis has been divided in three major parts, viz., bioactivity evaluation (anti-microbial activity and hepatoprotective activity), isolation and characterization of natural products and *in silico* approach to study drug-receptor interaction.

Date: 22.03.09
Place: Silchar, Assam

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