Preface

This thesis includes some of the thrmo-physical, chromatographic and crystallography properties of certain medicinal plant leaves and fruits that are readily available and used as remedy in North East India. While studying the thermo-physical, chromatographic and crystallography properties, attempts have been made to forecast the future application in manufacturing plant base drugs for curing different ailments and chronic diseases.

The work is divided broadly into three parts, each part contains four chapters. The references are compiled after each chapter.

In the **part-I**, the chapter-1 includes introduction of selected medicinal plants and review of the thermophysical properties of different kinds of fibres.

In the chapter 2 contains a theoretical part and experimental section is presented in the chapter-3.

The discussions of the results of different thermophysical properties of the medicinal plant samples are given in the chapter-4.

In the **part-II**, the chapter-1 contains brief introduction about chromatography, Mass spectrogram, NMR & IR spectroscopy.

In chapter-2 & 3, chromatographic separation and isolation of the compounds from the fruits of medicinal plants have been discussed.

In the chapter-4, a brief description about HPLC techniques, as used extensively for fruits extract is included.

In the **part-III**, deals with the elucidation of the structure and conformation of molecules exhibiting interesting stereochemical features have been shown.

Preliminary investigation of crystals are carried out by means of oscillation and Weissenberg photographs taken at the X-ray diffraction laboratory of the Department of physics, Gauhati University,Guwahati Assam,India.

Three dimentional X-ray diffraction intensity data from single crystal samples are collected in a Bruker 3-circle diffractometer (Bruker Nonius SMART APEX 2) equipped with CCD area detector, and using graphite monochromated Mo-K_α radiation (λ = 0.71073 Å) from 60W microfocus Siemens Microsource with glass polycapillary optics in Chemistry Department, Indian Institute of Technology Guwahati (IITG) India. Bruker SMART software is used for data collection and also for indexing the reflections and the unit cell parameters. The collected data are integrated using SAINT software. The structures are solved by direct method and refined by full-matrix least squares calculation using SHELXTL software.

Three compounds of medicinal plants fruits are chosen for this part of work in which are reported to have medicinal use. The structure determination of these compounds assumes importance in view of the fact that any changes made in the structure and conformation of these molecules, due to different substituents can lead to better biological activities. Hence, each structure has been studied and discussed with related other compounds of the same class, to understand properly the mechanism of activities.

In the chapter-1, the basic principles involved and methods used in the determination of crystal structure, particularly those employed in the present work, together with the computer programs used, have been described.

Chapter -2 describes the determination of crystal and molecular structure of 6α-acetoxy azadirone - $[C_{30}H_{38}O_6]$ (MK-001) " isolated from the plant *Chisocheton peniculatus*.

Chapter-3 is concerned with the crystal and molecular structure of "5, 7, 4'-trihydroxy-6, 3'-diprenylisoflavone- $[C_{25} H_{26} O_5]$(MN-02) " obtain from *Cudrania javanensis*.

Chapter - 4 contains determination of the crystal and molecular structure of "{ 5-hydroxy-3-(3-hydroxyphenyl)-8,8-dimethyl-6-(3-methylbut-2-enyl)-4H.8H-pyrano [2,3-h]chromen-4-one],}(MN-01) - $[C_{25}H_{24}O_4]$(MN-01)" obtain from *Cudrania javanensis*.

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