CHAPTER I

INTRODUCTION

Dalbergia cochinchinnesis, Pierre, is a tree in the family Leguminosae, species Dalbergia, genus cochinchinnesis. It is a typical tropical tree. Cochinchinnesis can be found in the northern and north-eastern parts of Thailand, and is known as Siamese rosewood. It is a hardwood which ranks among the finest woods for furniture, cabinet-making, house building, etc. Besides beeing a hardwood, it is also strong and has insecticidal properties. It is therefore of interest to the chemist because of these active insecticidal ingredients. In the present, only a single compound, Latifolin ($C_{17} H_{18} O_4$), was found by extraction from Dalbergia cochinchinnesis[1]
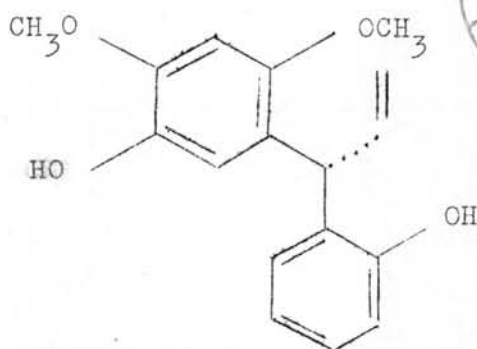
Latifolin ($C_{17}H_{18}O_4$)

m.p. 125°C.

---

[1] Kasensri Vajaraskunee, Termite-Resisting Compound in Thai Hardwood (Thesis Graduate School, Chulalongkorn University, 1970.)

At present we do not know which compound really acts as insecticide. The study of Latifolin by the x-ray diffraction method may help the chemist to deduce this insecticidal property from its crystal structure.

X-rays may be used to explore the nature of crystal patterns through the phenomenon of diffraction by the crystal pattern which has two aspects[2]:

(1) the study of the spatial distribution of atoms

(2) the study of the geometry of the repeating pattern.

The size and shape of the unit cell of a crystal determine the positions of the diffracted beams, where as the distribution of atoms within the unit cell determines the intensities of the diffracted beams.

A study of crystal structure starts with the determination of the geometry of the repeating pattern. It is with this first step that the present research laid with this first analytical step by the determination of the unit cell dimensions, the crystal system, the space group, the observed and calculated densities, the number of molecules per unit cell, and the refinement of the unit cell dimensions of the Latifolin ($C_{17} H_{18} O_4$), extracted from Dalbergin cochinchinnesis, given to us by Mrs. Kasemsri Vajaraskunee of the Chemistry Department of Chulalongkorn

[2] M.J. Buerger, X-Ray Crystallography (New York : John Wiley & Son, Inc.,1953), pp. 1 - 2.

University.

Chapter two describes the principles of x-ray diffraction and the techinques used in the present research. Chapter three deals with the preliminary intensity in an attempt to determine the distribution of atoms for future research. Chapter four describes the procedures for the experiments and the data as well as the calculations for the desired values. The final chapter consists of conclusions from the experimental results and discussion of the experiments.