

R. 543.3
PAT

Cey. Room.

STUDIES ON THE SYNTHESIS OF
SESQUITERPENES AND THE STRUCTURES
OF TWO POLYSACCHARIDES FROM
Aegle marmelos

A Thesis submitted

by

SAROJA KAHANDAWA PATHIRANA

in partial fulfilment of the requirements

for the degree of

MASTER OF PHILOSOPHY

of the

University of Peradeniya

Sri Lanka

PERMANENT REFERENCE
FOR USE IN THE
LIBRARY ONLY

September 1992

Research Laboratory

Department of Chemistry

446811 0



ABSTRACT

This thesis consists of two parts.

Part 1 describes the investigation of a new synthetic route to sesquiterpenes.

A new synthetic route to zingiberene was projected. This could be extended to the synthesis of the potent juvenile hormone, juvabione using the same synthon, 8,9-dihydro-9-(toluene *p*-sulphonyl)carvone. Attempts were made to use this synthon as well as a related synthon in elimination reactions leading to the formation of an intermediate with the system of conjugated double bonds as in zingiberene. These attempts were unsuccessful. The conjugated diene unit obtained in all cases had a position different from that in zingiberene.

In order to obtain the conjugated diene unit as in zingiberene, the Shapiro reaction was carried out. This reaction was successful with carvone itself. With the synthon indicated, a compound with the required position of the diene unit was obtained in low yield. This was however unstable and could not be used for further reactions.

The second part of this thesis discusses the isolation and structural investigation of some alkali soluble

polysaccharides from *Aegle marmelos* (Rutaceae). The glycosyl composition and glycosyl linkage composition analyses were carried out using g.l.c, g.l.c-m.s, high resolution ^1H -n.m.r and ^{13}C -n.m.r spectroscopy. Polysaccharide P_1 isolated from the 10% KOH extract of *A. marmelos* was composed mainly of glucose. Arabinose and xylose were present in trace amounts while uronic acids were absent. Methylation studies showed a 1 \rightarrow 4 linked glucopyranosyl backbone with short side chains of arabinosyl and xylosyl residues. ^1H -n.m.r data showed that the glucosyl residues were α -linked.

The other polysaccharide (P_2) contained equimolar amounts of arabinose and glucose. Fractionation of P_2 gave two polysaccharide fractions. ($P_2\text{PS-1}$ and $P_2\text{PS-2}$).

Methylation studies suggested that $P_2\text{PS-1}$ consists of arabinosyl residues, while $P_2\text{PS-2}$ contained more of glucopyranosyl residues. Both polysaccharides were found to have highly branched structure. ^{13}C -n.m.r data indicated that both arabinosyl and glucosyl residues were α -linked.

PERMANENT REFERENCE
FOR USE IN THE
LIBRARY ONLY