

## ABSTRACT

In Part I of this thesis a composite theory is presented of the proposals for the biogenetic development of the tetranor-triterpenoids isolated from Meliaceae and Rutaceae. These are shown to develop from squalene via tetracarbo-cyclic triterpenes of the euphol type, in which four carbon atoms of the side chain have been lost and C-20 to C-23 modified to a furan. Parallel in vitro experiments are also discussed and the taxonomic value of limonoids evaluated.

In Part II the structure of photogedunin, a metabolite of a Jamaican specimen of Cedrela odorata L. is presented. This structure is supported by chemical and spectral evidence, and is directly interrelated to the limonoid gedunin. The status of this butenolide as a natural product is also discussed.

Part III presents the structure and stereochemistry of a new limonoid spathelin from Spathelia sorbifolia L. The absolute stereochemistry is based on correlation with obacunone. The use of nuclear magnetic resonance spectroscopy in determining the C-1 stereochemistry of an isoobacunoic acid type compound and also the stereochemistry of an epoxide is also discussed. The discovery of the compound spathelin has defined the family to which the genus Spathelia belongs.

Part IV discusses biogenetic, spectral and chemical evidence for the structure and stereochemistry of hirtin. Also discussed are the anomalies which stem from the chemistry of hirtin, in particular a novel rearrangement product from a derivative of hirtin.