

## ABSTRACT

### Characterization of Cassane Diterpenes of

*Caesalpinia bonducella* Flem.

(Caesalpinaceae)

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The objective of this dissertation is two-fold .

- (i) To review the family Caesalpinaceae for the genera/species distribution of diterpenes.
- (ii) To report on the phytochemical investigation of the plant *Caesalpinia bonducella* for the isolation and structure elucidation of diterpenes.

Chapter one outlines the classes of diterpenes isolated from various genera. The biogenesis of diterpenes in this family yields a variety of bicyclic, tricyclic and tetracyclic natural products belonging to the structural classes of labdanes, clerodanes and cassanes. These are widely

distributed throughout many genera including *Cassia*, *Chamaecrista*, *Eperua*, and *Hardwickiia*.

Chapter two describes the isolation and structure elucidation of cassane diterpenes from the root extract of *C. bonducella* collected from the parish of St. Andrew in Barbados. This exploration led to the discovery of twelve new cassane diterpenes and the isolation of three known furanoditerpenes,  $\alpha$ -caesalpin, caesalpin F and caesaldekarin C. Two-dimensional nuclear magnetic resonance (2D NMR) spectroscopy was fundamental in the structure elucidation of these secondary metabolites.

The results of this research will boost the study of the biogenesis of diterpenes by leguminous plants. It can also be beneficial in establishing substituent effects on the chemical shifts of the carbons and associated protons of diterpenes with a cassane skeleton. Closer examination could probably reveal chemotaxonomic features for the *Caesalpinia* genus. Ultimately, these isolated compounds can prove beneficial if significant biological activity is observed.