

Qualitative Analysis and Characterization of Bioactive Compounds in Mauby Bark (*Colubrina arborescens*) via Gas Chromatography – Electron Ionization – Mass Spectrometry (GC-EI-MS)

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Figure 1. *Colubrina arborescens* (Mauby tree)

Introduction

- Mauby tree (*Colubrina arborescens*) bark extract (Figure 1,2,3):
 - Used in ethnomedicine in Barbados and the greater Caribbean
 - Ingredient in tonic used for diabetes and lowering cholesterol
 - Contains bioactive plant metabolites called phytonutrients that are associated with various health effects
 - Possible application as functional food ingredient for management of hypokinetic disease (primarily caused by physical inactivity)
 - Research is limited



Figure 2. Dried commercial Mauby tree bark



Figure 3. Traditional Mauby bark beverage with common ingredients

Research Objectives

- Identify tentatively the predominant volatile bioactive compounds
- Categorize the health benefits of the predominant bioactive compounds

Methods

- Qualitative Analysis was performed via Gas Chromatography – Electron Ionization – Mass Spectrometry (Figure 4) was conducted at the Mass Spectrometry Research and Education Center (University of Florida)
 - XCALIBUR software, v2.2 SPI.48
 - National Institute of Standardization and Technology (NIST) Spectral Library, v2.3
- Literature review was conducted
 - Potential health benefits categorized as anti-oxidative, anti-inflammatory, anti-glycemic, anti-lipidemic and anti-carcinogenic

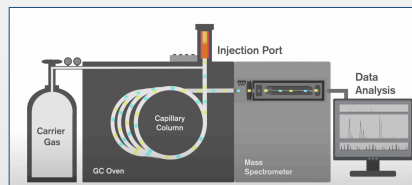


Figure 4. Gas Chromatography-Electron Ionization-Mass Spectrometry (GC-EI-MS) Diagram

Results

- 164 peaks were detected in the spectra
- 36 compounds were tentatively identified with the NIST Library
- 10 predominant bioactive compounds with a Total Ion Concentration (TIC) greater than 1% and associated health benefits tentatively identified

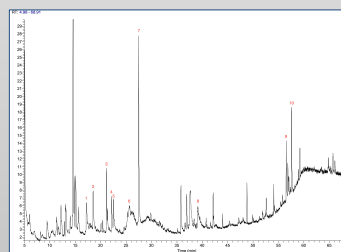


Figure 5. Chromatographic profile of *C. arborescens* generated by XCALIBUR, v2.2

Table 1. Summary of potential health benefits associated with predominant volatile bioactive compounds in *C. arborescens*

Compound	Antioxidant	Anti-inflammatory	Anti-lipidemic	Anti-glycemic	Anti-carcinogenic	Other
Canolol	x	x			x	Anti-mutagenic
Lupeol	x	x	x	x	x	Wound healing potential in hyperglycemic conditions Anti-microbial
Caprylic acid	x	x	x			Anti-microbial
Coumaran	x	x				Biofumigant
Bufotenine		x				Anti-rabies Analgesic
MVP	x	x			x	Antimicrobial
Capric Acid	x	x				Anti-bacterial
Syringol	x	x				Plant metabolite
B-sitosterol	x	x	x	x	x	Anti-microbial Anxiolytic
Methyl vanillate	x					Anti-bacterial

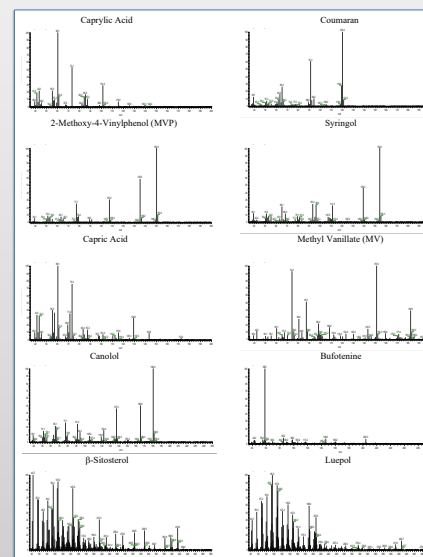


Figure 6. Chromatograms of 10 predominant volatile bioactive compounds in *C. arborescens* generated by XCALIBUR, v2.2

Discussion

- Combined, all of the bioactive compounds had anti-oxidative, anti-inflammatory, anti-glycemic, anti-lipidemic and anti-carcinogenic properties, as summarized in Table 1.
- Health benefits overlap with common symptoms of hypokinetic disease indicating potential application of Mauby bark extract in treatment and management of these diseases.

Conclusion

- This study aligns with current research on Mauby bark extract and promotes the need for more focuses research on the mechanisms of action and magnitude of potential health benefits.

Limitations

- Only assessed predominant volatile bioactive compounds
- No quantitative data collected
- Focus on compounds with health benefits
- No clinical application

Acknowledgements

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For more Information & Reference List

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