# EXTRACTION AND ISOLATION STUDY OF PROPOSED ANTI-VIRAL COMPOUND(S) FROM *GARCINIA KOLA* USING SUPERCRITICAL FLUID EXTRACTION

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## INTRODUCTION

*Garcinia kola* is a native plant which is grown in tropical climates of Western Africa, Asia, and Australia. It is reported that compounds isolated from the seed of this plant has anti-oxidant, anti-bacterial, anti-inflammatory and anti-viral properties. These methods were aimed at isolating and identifying garcinol, a known antiviral compound isolated from *Garcinia sapp*. The purpose of this research study was to apply fractional extraction, chromatography and analytical chemistry techniques in order to isolate and identify one or more compounds with potential anti-viral activity from the seed of *Garcinia kola* and confirm previous reports. Additionally, comparisons will be made to determine the percent overlap and distinguishing features between the various extraction techniques.

## MATERIALS AND METHODS

*Garcinia kola* nuts were peeled, dried, ground using a rotary mill and was subject to solvent-solvent extraction using methanol, hexane and compared to Supercritical Fluid Extraction (SFE) using carbon dioxide ($CO_2$) and three different modifiers: methanol, ethanol and IPA using various extraction percentages. Samples were further examined by HPLC, NMR, and UltraPerformance Convergence Chromatography (UPC²) coupled to Q-Tof MS. The UPC² instrumentation used a UPC² BEH column with dimensions 3.0 x 100mm; 1.7um. MS data acquisition was performed using alternating high and low collision energy during a single injection; known as $MS^E$.

## RESULTS

Compounds with photo diode array (PDA) fingerprints characteristic of garcinol were not detected in the supercritical fluid extraction (SFE) analysis nor solvent-solvent extracts of the

*Gacinia kola* plant. The supercritical fluid chromatography analysis of the SFE extracts yielded many of the same masses found in the different solvent-solvent extracts. Statistical analysis of the supercritical fluid extraction results identified only an overlap of 26% of the chemical features were found by the four other solvent-solvent procedures.

## CONCLUSION

Garcinol was not observed in the chromatographic analysis of the various extracts. Although the desired objective was not achieved, many positive conclusions resulted from these experiments. The extraction specificity provided by SFE provides insight to streamlining an extraction approach that would eliminate the need for the various and tedious solvent-solvent extractions typically used in the field of natural product profiling. The workflow which resulted from this investigation demonstrates a simplified protocol consisting of a design matrix that covers sample preparation, chromatographic analysis and data interpretation. The workflow can easily be adopted for profiling of not just natural products, but easily feasible for metabolomics, lipidomics, food analysis, and medicinal plants.

## REFERENCES

[1] FULLER, R. W., et al, Journal of Natural Products, Vol. 62, No. 1, **1999**, p. 130