



Isolation and identification of compounds in the leaf *Ficus sycomorus* Linn Moraceae by Gas Chromatography-Mass Spectrometry, Infra-red and Ultraviolet Spectroscopy

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ABSTRACT

This study was aimed at evaluating phytochemical constituents and characterization of the active principles using UV, FTIR and GC-MS spectroscopic techniques. The leaves of *Ficus sycomorus* were collected from Alau-Dam, Jere Local Government Area of Borno State, Nigeria. Seven hundred grams (700 g) of dry pulverized *Ficus sycomorus* leaves were extracted with 95% methanol using soxhlet extractor and a gummy dark green mass of 124.8 g crude extract was obtained, given a percentage yield of 17.83% w/w. Eighty grams (80 g) of crude methanol extract was fractionated through column chromatography and twenty-two (22) eluents of 100 mL aliquot were obtained. Similar fractions were then pooled on the basis of their R_f values on thin layer chromatography (TLC) and four (4) pooled fractions were obtained, coded as F_A, F_B, F_C and F_D. The preliminary phytochemical evaluation investigations revealed the presence of alkaloids, carbohydrates, tannins, cardiac glycoside, cardenolides, saponins, terpenoids and flavonoids. Anthraquinones and combine anthraquinones were absent. Preparative thin layer chromatography (PTLC) of column fraction F_C yielded four sub-fractions (coded C₁, C₂, C₃ and C₄). The interpretation of the UV spectra of sub-fraction C₁ revealed that, fraction C₁ consist of absorption λ_{max} at 650.60 nm and 503.00 nm which are similar to λ_{max} of alkaloids. Also, the UV spectra of sub-fraction C₃ revealed absorption λ_{max} at 657.20 nm, 602.80 nm and 503.20 nm which are also similar to λ_{max} of alkaloids. These observations were supported by the major functional groups present in their FTIR spectra, having bands at 3333.1 cm⁻¹ which corresponds to N-H stretch in secondary amine, 1790 cm⁻¹ corresponding to C=O stretch of ring carbonyl, 1427.37 cm⁻¹ corresponding to C=C stretch of aromatic compounds and 2962.76 cm⁻¹ corresponding to C-H stretch methyl group. These sub-fractions were also subjected to Gas Chromatography-Mass Spectrometry (GC-MS) and the analysis of the result compared with NIST library revealed similar compounds. The compounds were, 2-Acetyl-3-methylaminocyclopentenone, 9-anthracenyltrimethylsilane, 6,13-bis(2,5-dimethylphenyl)-Dibenzo[C,H]diazecine, 4'-dimethylamino-2'-(trimethylsilyl)acetanilide, 5-Methyl-4-hydroxybenzoylhydrazonofurfurole, 4-(3,4-dimethoxyphenyl)-5-methyl-2-thiazolamine and Cyclobarbitol.

Keywords:

Phytochemical, chromatography. structure, plants, extraction

1. Introduction

Medicinal plants are plants that possess some natural constituents that produce a definite physiological action

on human or animal systems. Plant base natural constituents can be derived from any part of the plant like barks, leaves, flowers, roots, fruits and seeds [1]. (Collectively, plants produce diverse arrays, of low

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