GC-MS And IR Analysis Of Ethylacetate Roots Extracts Of Anogeissus leiocarpus.

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ABSTRACTS: Anogeissus leiocarpus is locally known as 'Marke' among the Hausa's of Northern Nigeria. Their roots and stem bark have been used in the treatment and prevention of human ailments such as Respiratory tracts infections, typhoid fever,Syphilis,Liver cirrhosis,Gonorrhea and diabetes. The phytochemical screening of the extracts also showed the presence of some secondary metabolites at various degrees. The antimicrobial activities of the extracts were found to be against clinical isolates of Staphylococcus aureus, Escheria coli Aspergillus niger and Candida albicans. Though at varied degrees with 20.0mm zone of inhibition by water stem of Anogeissus leiocarpus W(S)B 10μg/cm3against Eschericia coli being the highest while Acetone roots of Anogeissus leiocarpus A(R)A showed 0.00 mm 10μg/cm3 being the least.Infrared spectroscopy (IR) and Gas chromatography Mass spectroscopy (GC-MS) of the extracts were also determined.

KEY WORDS: Staphyloccocus aureus, Eschericia aspergillus niger, Candida albicans, Infrared spectroscopy and Gas chromatography mass spectroscopy.

INTRODUCTION

Herbal medicine is a natures gift for treating many different ailments. Since creation man has been dependent on plants for food, shelter and drugs. This brought about the need for search for more herbal drugs that may be used as antibiotics as advocated by world health organization (Sofowora, 1999).Plants derived compound are major area of interest to source for safer and more effective antibacterial agents (Baladrin *et-al,* 1985) The use of medicinal plants constitutes a rich source of more substances capable of enriching therapeutics.(Hostettman *et-al* (1996).As part of our search for bioactive material products we considered as a good phytochemical source the plants Anogeissus leiocarpus which has indigenous use in part of Nigeria. In the present study we have isolated a related compound1, 2, 3 trimethyl benzene. Their structures were established by the infrared spectroscopy (IR) and Gas chromatography mass spectroscopy (GC-MS) is here by reported for the first time.

MATERIALS AND METHODS.

2.1 PLANTS MATERIALS

Anogeissus leiocerpus roots was collected in October 2014 at Botanical garden of Biological sciences, ATBU Bauchi, North east Nigeria. Its identity was established by a specialist at Botany unit of Biological sciences Department, ATBU Bauchi. The stem and the roots were air dried under shade and ground into powder using mortar and pestle and stored in a sterile plastic Jugs for further use.

2.2 GENERAL EXPERIMENTAL PROCEDURE

Spectras were recorded with infra red spectroscopy (IR) using Nujol and potassium Bromide (KBr) and Gas chromatography mass spectroscopy (GC-MS). Identification of the separated compound were performed by comparism with a library search of the mass spectra of authentic compounds.

2.3 EXTRACTION AND ISOLATION OF CHEMICAL CONSTITUENTS

Dried powdered roots of (100g) was exhaustively extracted with redistilled Hexane, Ethylacetate, Acetone, Methanol and water in order of their polarity using soxhlet extractor at the temperature of (60-80^{0}C).The residue weighing 0.500g was chromatography on Silica gel (60-120 mesh) column with elution using the solvent ratio of chloroform, hexane and methanol (4:3:1). The polarity was gradually increased up to 100% methanol and finally washed in hexane. Similar fractions were matched together on the bases of their retention factor (R_f) values. Each of the combined fractions were further fractionated using a preparative thin layer chromatography and developed in chloroform, hexane and methanol in the ratio of (4:3:1) three components were isolated X(10.5mg R_f = 0.942 M.pt 45- 48 ^{0}C).

Y(13.6mg R_f = 0.52 M.pt 97-100 ^{0}C) and Z (7.50mg R_f = 0.463 M.pt 109-112 ^{0}C).

RESULT AND DISCUSSION

TABLE 1: PERCENTAGE YIELD OF THE PLANTS EXTRACTS

LIST OF EXTRACTS	RECOVERY IN (g)	PERCENTAGE YIELD	COLOUR	TEXTURE
E(R)B	1.50	1.87	Brown	Solid
E(S)B	5.00	6.25	Pale	Solid
E(R)A	4.00	5.00	Orange	Solid
E(S)A	1.20	1.52	Orange	Solid

TABLE 2: (IR–SPECTRAL RESULT OF ETHYL ACETATE ROOTS OF (*Anogeissus Leiocarpus*)

FREQUENCY (CM^{-1})	FUNCTIONAL GROUP
2800	>C - H Stretching of CH_3
1600	>C=C< Stretching of Aromatic
1400	>C-H Bending of alkane (CH_2)
2823	>C-N Bending out of plane (mono substituted aromatic).

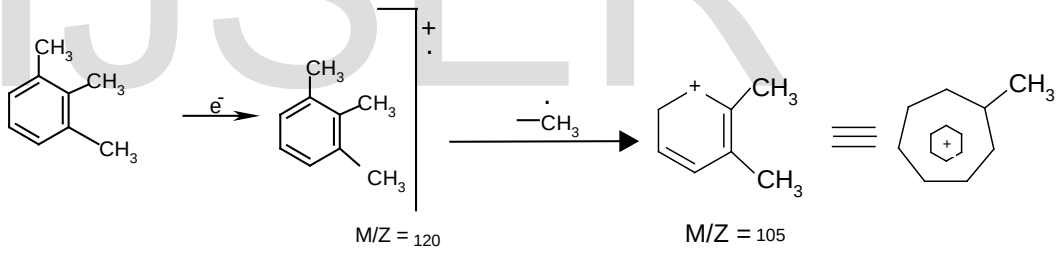
**TABLE 3: (GC/MS Analysis of ETHYL ACETATE ROOTS EXTRACTS OF (*Anogeissus Leiocarpus).*

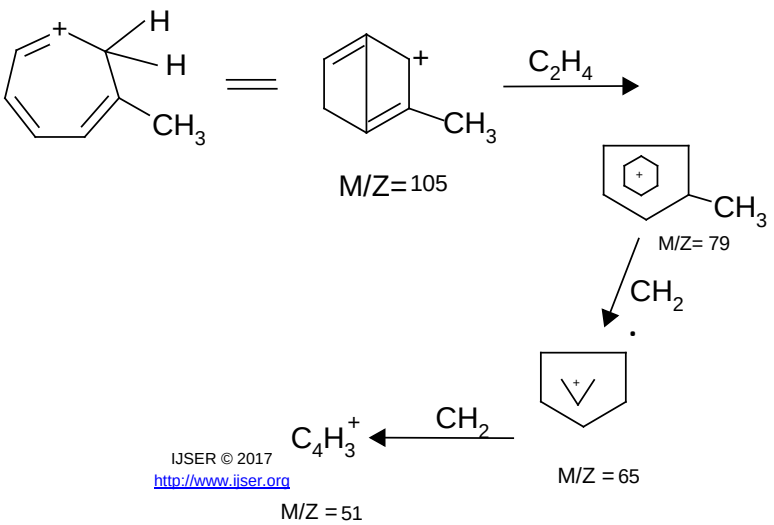
RETENTION TIME (RT).	MASS FRACGMENTS
4.895 Min	124,(105 base peak) 77,58,39
7.383	144,127,105,(85 base peak),67
8.428	138, (119 base peak), 91, 65
9.191	135,(119 base peak),91,77,60
20.626	165,(149 base peak),121,91,65
27.796	246.1,(226.1 base peak),204,183

DISCUSSION

The three components (X, Y and Z) obtained by column chromatography and were analysed using the various spectroscopic methods. The IR results confirms to the structures of the 1, 2, 3 trimethlyl benzene with the C – H stretching of alkane absorption at 2800cm^{-1}and the –C=C- of the aromatic at 1600cm^{-1} (see table 1). The GC/MS of the most abundant peak at the retention time (t_R = 4.895 min). showed by the library matching that it is 1,2,3 trimethlyl benzene. This is a white semi solid hydrocarbons which is insoluble in water, methanol but soluble in hexane, ether etc (see table III). The most abundant peak was further analysed by MS the fragmentation pattern of the compound was indicative of a hydrocarbons with a molecular ion peak M/Z= 120 which correspond to the molecular formular (C_9H_{12}).

SCHEME 1.





SCHEME 1: 1,2,3 Trimethyl benzene.

Hydrocarbons are widely distributed in nature and have been isolated from the plants source and petroleum products.

CONCLUSION

The isolation and identification of 1,2,3 trimethyl benzene from the roots of Angogeissus leiocorpus ethylacetate extracts is hereby reported for the first time. The work was carried out by the series of chromatographic analysis.

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