THE ACTIVE COMPOUND OF ETHYL ACETATE EXTRACTS OF *Ceiba Pentandra*

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ABSTRACTS: The active compound of ethylacetate extracts of Ceiba pentandra was purified using the thin layer chromatography (TLC) and the column chromatography using a silica gel of 60-120mm mesh size. The results was subjected to the infra red spectroscopy and the following spectras were obtained 1200cm-1, 1450 cm-1, 1600 cm-1,1710 cm-1and 2830 cm-1respectively. The gas chromatography (GC-MS) revealed the presence of phenol-2-methoxy acetate and phenol 2, 5 dimethyl acetate.

KEY WORDS: Chromatography, Methoxy, Column, Spectroscopy, acetate.

INTRODUCTION

Humans have frequently used plants to treat common infectious diseases. The practice of the use of medicinal plants for health care purpose dates back to the prehistoric period (Akande et al., 2011). The potentials of higher plants as a source of new drugs is still largely unexpected as among the estimated 250, 000-500, 000 plants species, only a small percentage has been investigated for their phytochemical constituents and the fractions subjected to biological or pharmacological screening is even smaller (Edeoga, 2005; Goyal, 2013; Iwu, 1994; Mishra, 2007)

It is observed that certain diseases do not have drugs that can be used for routine management antifungal drugs is rather limited. There is therefore the need for continuous search for new drugs and medicinal plants are one of the useful areas of search in this regard (Olukoya *et al.,* 1993)

2.0 CHROMATOGRAPHIC SEPARATION

Fractions obtained from extraction was further separated with the aid of column chromatography technique using suitable solvent mixtures (mobile phase) and adsorbent (stationary phase) to be determined from the thin layer chromatography

2.1 THIN LAYER CHROATOGRAPHY

The portion of the extracts was dissolved in few drops of hexane and spotted on pre-coated silica gel (TLC plate). The chromatogram was developed using methanol and hexane methanol mixtures. The plate was then dried spread with Wagner's reagent and the retention factor (R_f) values of the spot was taken. A preliminary quantitative examination of the mixtures by TLC was carried out. A solvent mixture of chloroform and methanol (1:4) was used to develop the extracts spots of ethyl acetate; while acetone and chloroform (1:4) was used for the development of methanol extracts this method described by (Vogel.,1989) was adopted.

2.2 COLUMN CHROMATOGRAPHY

The portion of the ethyl acetate extract was mixed with a silica gel and loaded on 500g silica gel (60-120mm Mesh size). The column was then sequentially eluded with a solvent. After the sample has been added the column was eluded with the solvent mixture ratio.When the level of the liquid in the column was low the eluting solvent were added continuously to avoid disturbing the top of the bed of the absorbent.

Approximately equal volumes of successive fractions were collected in a test tube. The thin layer chromatography was used to determine the R_f values for each fractions that were similar and combined and evaporated to dryness.

2.3 MELTING POINT DETERMINATION

The melting point of the extracts was also determined using the capillary tube and the melting point apparatus. The main aim of carrying out the melting point was to ascertain the purity of the isolates.

2.4 SPECTROSCOPIC DETERMINATION

The pure isolates of all the extracts was subjected to the infrared spectroscopy and Gas chromatography mass spectroscopy GC-MS test.

RESULTS

Table 1; The results of the melting point of the extracts.

Fractions	Appearance	Melting point (^{0}C)
Ethyl acetate (roots)	White solid	45-48
Ethyl acetate (stem)	White solid	97-100
Methanol (roots)	Dark brown	109-112
Methanol (stem)	Dark brown	205-208

Table 2: The results of the infra red spectroscopy of ethylacaetate (roots)

Frequency (cm^{-1})	Functional groups
2840	>C – H Stretching alkyl (CH_3 –, - CH_2 -)
1710	>C = O Stretching due to Carbonyl
1600	>C = C - Stretching due to aromatics
1200	> C – O - Stretching due to Esters

Table 3: Molecular weight and important ions in the mass spectra of ethyl acetate roots of *Ceiba Pentandra.*

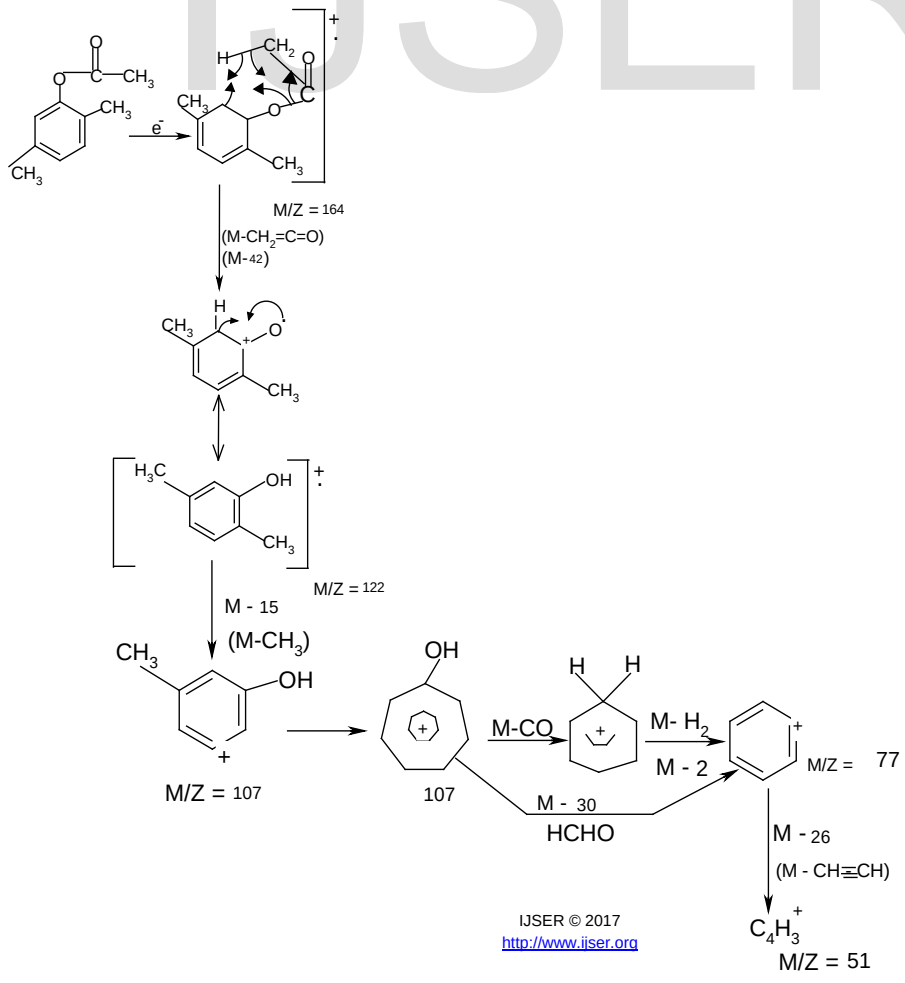
Names of isolates	Retention time	Fragment ions and their percentage
Phenol -2-methoxy acetate	19.501	166(10%), 124(100% base peak), 95(3%), 69(2%)
Phenol 2, 5 dimethyl acetate	12.124	164(15%),142(10%),122(100%base peak),107(50%),77(18%), 51(8%)

Table 4. Molecular weight and important ions in the mass spectra of ethyl acetate roots of *Ceiba pentandra*

RETENTION TIME	MOLECULAR WEIGHT	PROPOSED IDENTITY	MASS OF FRAGMENTS ION M/Z (%ABUNDANCE)
8.346	164	Phenol ,2 5 dimethyl acetate	(164,122 (basepeak)107,77,51,39,15.

The mass spectral data recorded an even number of base peak at (122) M/Z for a compound whose molecular weight was observed to be at 164. The identity of this compound was proposed to be Phenol ,2 5 dimethyl acetate. and this confirm with the results of the infra red spectroscopy, results as there is the peaks at 1200 cm^{-1}, 2800cm^{-1},1700cm^{-1} and 1600 cm^{-1} for (SP^3hybrid) alkanes, esters, stretching of carbonyls and bending due to carbon carbon double bonds aromatics respectively.

The proposed fragmentation of the compound is presented as below;



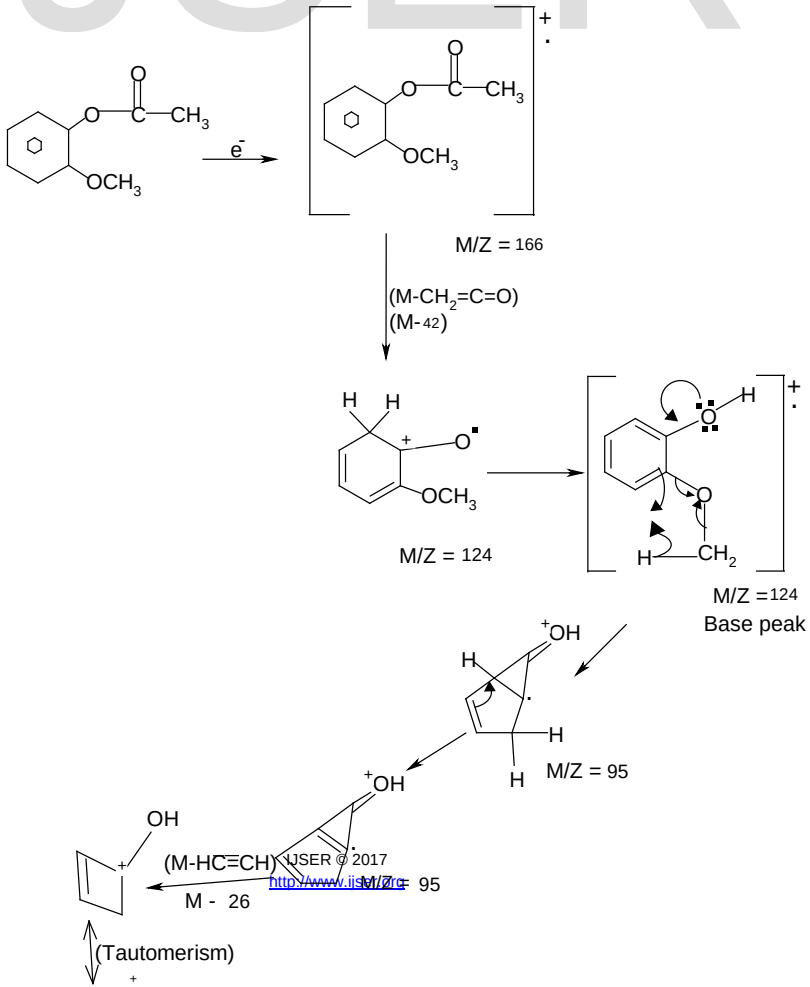
SCHEME 1: Fragmentation pattern of the isolated compound (Phenol, 2,5 dimethyl acetate)

Table 5. Molecular weight and important ions in the mass spectra of ethyl acetate stem of *Ceiba pentandra.*

RETENTION TIME	MOLECULAR WEIGHT	PROPOSED IDENTITY	MASS OF FRAGMENTS ION M/Z (%ABUNDANCE)
19.501	166	Phenol,2-Methoxy acetate	(166, 124 (base peak) 95, 69

The mass spectra data was for recorded for the compound to have an even peak base at 124 for a compound whose molecular weight was observed at 166. The identity of the compound was proposed to be Phenol 2 methoxy acetate and this confirms with the results of the infra red spectroscopy. The results as there in the peaks at 1200cm^{-1}, 2800cm^{-1} for alkanes Esters and bending due to aromatics respectively at 1596.4 cm^{-1}.

The proposed fragmentation of the compound is presented below.



SCHEME 1: Fragmentation pattern of the isolated compound (Phenol,2 methoxy acetate)

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