



Scholars Research Library

J. Nat. Prod. Plant Resour., 2013, 3 (2):127-130

(<http://scholarsresearchlibrary.com/archive.html>)



Scholars Research

Library

ISSN : 2231 – 3184

CODEN (USA): JNPPB7

Analysis of fatty acids composition of *Cissampelos Owariensis* root using gas chromatography and mass spectrometry method

Efiom, O.O

Department of Chemistry, University of Abuja, Nigeria

ABSTRACT

The root Cissampelos Owariensis, a medicinal plant, was extracted using n-hexane. The filtrate was analysed for fatty acid using high spectrometer. The fatty acid composition profile of the root showed the presence of unsaturated fatty acids such as Oleic acid, 7-octadecenoic acid, 10-octa decenoic acid, 11-octadecenoic acid, saturated fatty acid, pentadecanoic acid, and dodecanoic acid. The result suggests that the phytochemical properties of roots for curing various ailment.

Key words: *Cissampelos Owariensis*, filtrate, fatty acids, phytochemical, gas chromatography and mass spectrometer.

INTRODUCTION

Cissampelos Owariensis, known as kilo -mpape among the Efik people in Cross river state of Nigeria, belongs to the family of Menispermaceae,^{1&4} a short shrub of small tree from Africa. Its growth habit is regulated by its care and environment . It has twinning spindly hairy leaves and bears small flower with green colour.

The plant is known among the traditional healers for its medicinal efficacy². The powdered root is usually blended with pap or dispersed in tea and drunk to treat sweet breast in nursing mothers and stomach trouble². Literature review has failed to reveal any study on the analysis of fatty acids of the root despite high potential pharmaceutical application of the fatty acids as an ointment, suppository base and other uses.⁶ It is therefore the aim of the study to verify the fatty acid composition of the root of *Cissampelos Owariensis*, using high resolution gas chromatography, a method which is considered superior to many other methods for analysis of fatty acids.

MATERIALS AND METHODS

Sample Collection

The plant material (root) was collected from Suleja, a town situated North of FCT, Abuja Nigeria, in September 2005 through the assistance of traditional healers and local dealers. Identification of the plant was done by Mallam Muazu, Herbarium unit of National Institute of Pharmaceutical Research and Development (NIPRD), Abuja, Nigeria where Voucher Specimen was deposited.

Extraction

Powdered root 400g was soaked in 800ml of n-hexane for 24 hours. It was then passed through a white-man filter paper N01. The filtrate was evaporated using rotary evaporator and yield 10g. The oily extract was kept in a sterile container.

Transmutation of fatty acid

The oil sample (400mg) was dissolved in mixture of diethyl ether (5ml) and methyl acetate (5ml). 1:1 of 0.5N sodium Methoxide was then added to the mixture. The flask was agitated briefly to ensure thorough mixing. The solution became cloudy as the sodium glycerol derivative was precipitated. The reaction was stopped after 5mins by adding a saturated solution of oxalic acid. The mixture was centrifuged to precipitate sodium oxalate. Fresh diethyl ether (5ml) was added and aliquot from the ether phase was dried and used for GC-MS.

Gas chromatography-mass spectrometry analysis

The Gc-ms analysis of the fatty acid methyl ester of the root of *Cissampelos Owarienesis*, was carried out on a computerized Shimadzu Gc-17A interfaced with a quadrupole mass spectrometer QP 5000 machine.

The GC was equipped with a DB-1 column (30m 0.32mm film thickness 0.25 μ). The column oven temperature was programmed from 80 $^{\circ}$ C to 250 $^{\circ}$ C at 10 $^{\circ}$ C/min, the interface temperature was 230 $^{\circ}$ C and detected temperature at 250 $^{\circ}$ C. Carrier gas Helium (1.6ml/min). Mass spectra were taken with ionization voltage of 70eV. Identification of the fatty acid component was based on retention time of the standard in the computer library obtained from the mass spectra of reference samples.

RESULTS

Table 1: Retention time and scan number of methylated fatty acid of the root of *Cissampelos Owarienesis*,

Peak No	Retention time	Scan No	Methylated fatty acid
1.	4.247	301	Dodecanoic acid, methyl ester
2.	4.257	302	Pentadecanoic acid, methyl ester
3.	19.005	2600	11-Octadecenoic acid, methyl ester
4.	19.012	2607	7-Octadecenoic acid methyl ester
5.	19.215	2631	Oleic acid
6.	19.269	2639	10-Octadecenoic acid methyl ester

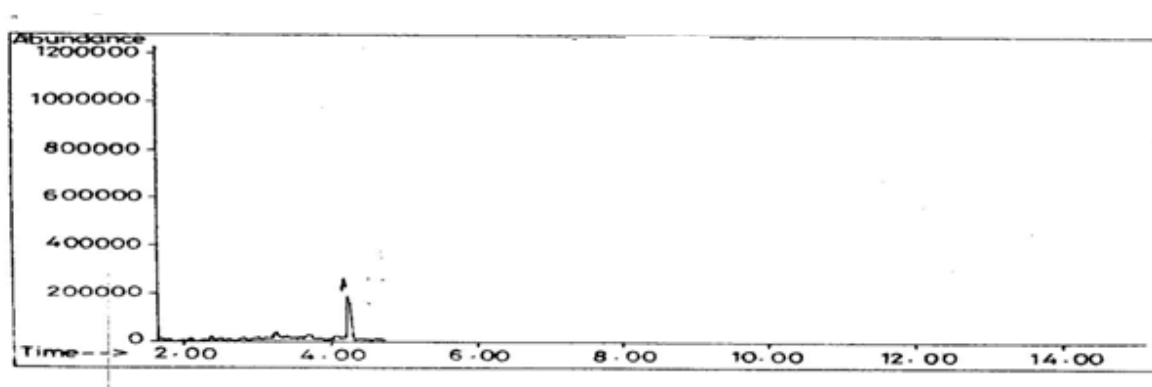


Fig1: Histogram of Dodecanoic acid

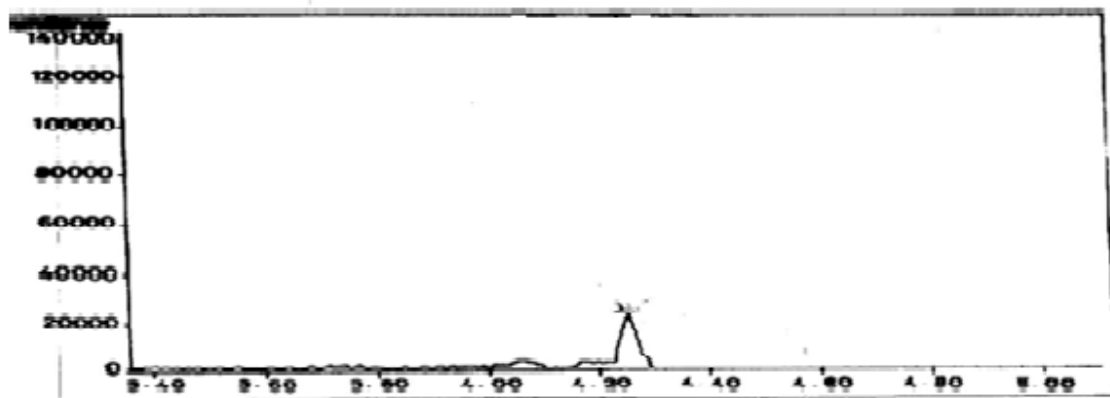


Fig2: Histogram of pentadecanoic acid

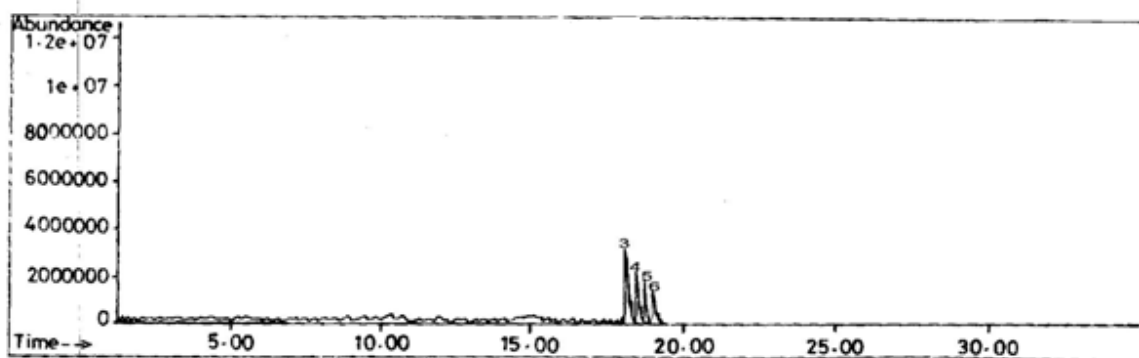


Fig3: Histogram of 11-octadecanoic, 7-octadecanoic, oleic and 10-octadecanoic acids

DISCUSSION

Six fatty acids were identified in the sample. The retention(min) scan No recorded for these were; Dodecanoic acid 4.247(301); Pentadecanoic acid 4.257(302); 11-Octadecanoic acid 19.005(2600); 7-Octadecanoic acid 19.012(2607); Oleic acid 19.215(2631); 10-Octadecanoic acid 19.269(2639). The histogram of the fatty acid obtained by summation of the peak area are listed on the figures 1, 2, 3. The root fat was found to be very rich in unsaturated fatty acid and saturated fatty acid, which is also reflected in the physical and chemical properties of the root fat(liquid at room temperature and high iodine volume).³ From the analysis it was found that unsaturated fatty acid was very high compared to saturated fatty acid. From the results of the work we can say that oleic, 7, 10 and 11 octadecanoic acids contents of the root like any other plant fat of this nature may be sourced for industrial and pharmaceutical purposes.⁵

The results obtained by using high resolution gas chromatography appear more accurate and related to the physical and chemical character of the plant fatty acids

REFERENCES

- [1] Dalziel, I.M, (!989) The useful plants of west tropical Africa. Crown agent for oversea Government and Administration London, 126
- [2] Akinniyi, J.A, Ogunbuaga, V.O Agurawu V C(1997) Elemental Analysis of Medicinal Plant (University of Maiduguri Pulisher) 33-38
- [3] Ayodele J.T and Okpapi, S.(2000) *Nigerian food journal* 18, 66-69
- [4] Irvine, F.R (1961) Woody plant of Ghana. Oxford University press London 135-140
- [5] Ayodele, J.T Dandaso, R and Olagbemiro, T.O (2004) *Nigerian Food Journal* 22, 22-32

[6] Abdurahman, E.M, Rai, P.P. shok, M and Laakso LL (1996) *Journal of pharmaceutical Research and Development* 1(1), 49-51

[7] Allen, M.H & Slwisliam B.I (1993) Atmospheric Pressure Ionization mass spectrometry detection for liquid Chromatography and capillary for liquid chromatography and capillary electrophoresis *LLGC Publisher* 11(2), 112-126.