

## Gas Chromatography-Mass Spectrometry Analysis Of Petroleum Ether Extract Of *Piper Guineese* Seeds (Schum And Thonn)

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**ABSTRACT:** *Piper guineese* is herbal recipe ingredient widely used in African Traditional Medicine (ATM). The essential oil of *piper guineese* seeds was analysed by using GC-MS, which led to the identifications of many constituents present in the medicinal plant. The essential oil consist mainly alcohol, ether saturated and unsaturated hydrocarbon. The major compounds of the essential oil were 1,3-benzodioxole, 4,7-dimethoxy,5-(2-propenyl), 1,3-Benzodioxole, 4-methoxy-6-(2-propenyl) and 1,3-Benzodioxole, 5-(1-propenyl).

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**KEY WORDS:** *Piper guineese*, essential oil, constituent, hydrocarbon and Gc-Ms

### INTRODUCTION

*Piper guineese* belong to the family of *pipeceareae*. Members of this family are known to be herbs or shrubs which have erect, scandent or climbing. The medicinal plant is distributed throughout Nigeria and other West African Countries including Ghana, Cameroun and Senegal (Olorode 2011). *Piper guineese* is known as Oduka among the Efik people of Cross River and Uziza among the people of South East of Nigeria. They can also be used in the management of ailment such as rheumatism, antipyretic, anti-emetic, mental illness, impotence and microbial, diabetic and hypertension.

The plant also played a roles in many of the industries and are used in perfumery soap, incense as dyes in histology and various acts. (Onyeson and Okoh 2006). The study of various seed extract of the plants have shown that the plant has contains substance that interfere with conception in mice (Ekanem et al 2010). Several active compounds previously identified and isolated from the seed of *piper guineese* includes, piperanine, N-isobutyl (E,E)-2,4,4-decandienamide and  $\alpha\beta$ -dihydro wasamin (Ekanem 2010). The aim of the work is to investigate and identify other phyto chemical constituents present in the seed of *piper guineese*.

### MATERIAL AND METHODS

The seeds of *piper guineese* (schum and thonn) were purchased from a local market in Uyo Akwa-Ibom State Nigeria. Plant identification and authentication has been done earlier (Ekanem 2010) and voucher specimen had been deposited at

herbarium unit of Department of Botany University of Abuja.

### EXTRACTION PROCEDURE

30g of the powdered seed of *piper guineese* was exhaustively extracted in 400ml pet Ether (60-80) using percolation method and then concentrated to dry mass using rotary vacuum evaporator. The weight of the dry extract was stored in airtight container until required.

### Gas Chromatography-mass spectrometry analysis

The Gc-Ms analysis was carried out using thermo scientific trace Gas chromatography model (ultra As 3000 series). The Gc was

equipped with an As 3000 auto sample and split/splitless injector. The column was (30×0.25mm with film thickness of 0.25 $\mu$ m

coated with 5% diphenyl 95% poly dimethyl siloxane. The column oven was programmed from 50°C to 250°C at 20°C/mm under the following condition carrier gas Helium, split ratio 30:1 flame ionization detector (FID) 250°C.

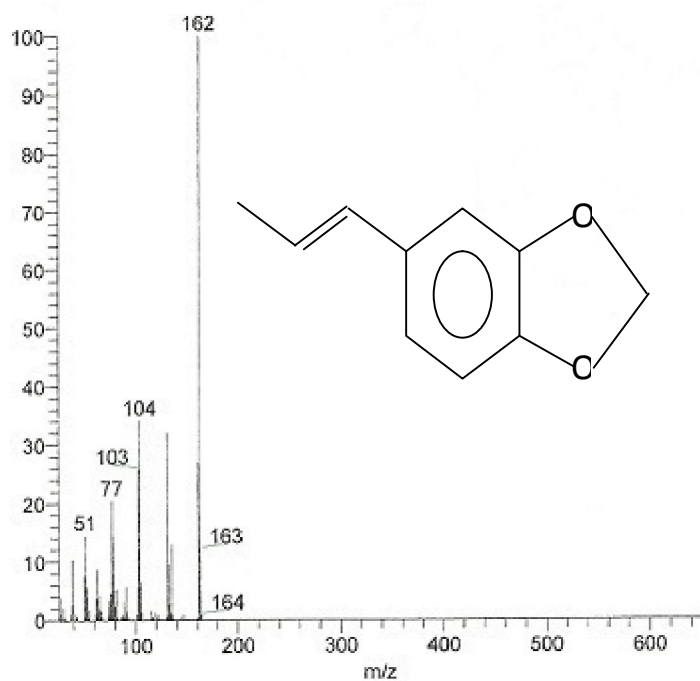
Identification of compounds in the *piper guineese* seeds was conducted using data base of the library search. The mass Spectrum of the identify compounds stored in the soft ware data base library.

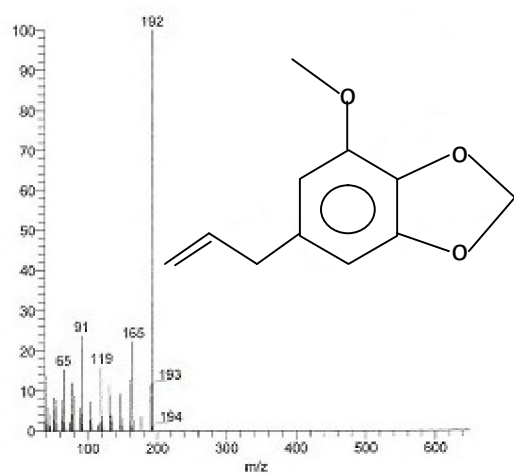
### RESULTS

The results are shown in Table 1 and Figures 1, 2.

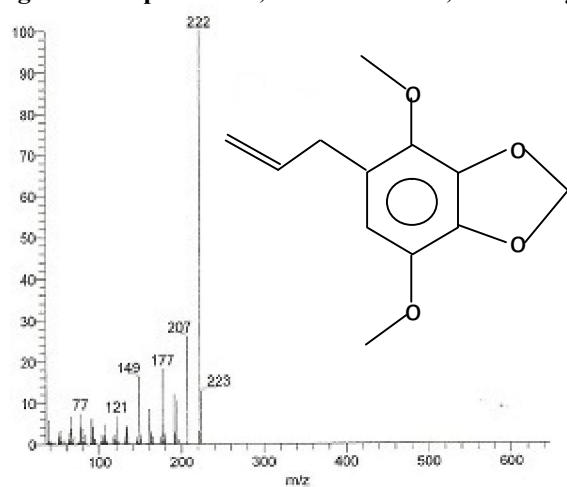
**Table 1:** Result of GC/MS analysis of the essential oil of *piper guineese* showing their RT, Intensity and % composition

Peak	RT	Composition	% composition
1	3.79	1,6-Octadien-3-ol-3,7-dimethyl	4.07
2	6.17	1,3-Benzodioxide, 5-(1-propenyl)	3.59
3	7.23	Tricyclo(4.4.0.02,7) dec-3-ene 1,3-dimethy-8-(1-methylethyl)	6.69
4	7.35	Naphthalene 1, 2, 3, 4, 4a, 5, 6, 8a-octahydro-7-Methyl-4-methylene-1-(1-methylethyl)	5.22
5	7.92	Bicyclo (7, 2, undec-4-ene 4, 11, 11-trimethyl-8-methylene)	13.05
6	8.09	1, 6, 10-Dodecatriene, 7, 11-dimethyl-3-Methylene (E)	2.45
7	8.49	1, 4, 8 Cycloundecatriene 2,6,6,9-tetramethyl (E,E,E)	4.89
8	8.82	1,6 Cyclodecadiene-1-methyl-5-methylene-8-(1-methylethyl) (s(EE))	16.31
9	9.02	Cyclohexane, 1-methyl-4-(5-methyl-1-Methylene-4-hexenyl, (s)	2.34
10	9.27	Cedr-8(15)-ene	10.60
11	9.47	1,3-Benzodioxole,4,methoxy-6-(2-propenyl)	12.24
12	10.90	1,3-Benzodioxole,4,7-dimethoxy-5-(2-propenyl)	17.94

**Fig 1:** Mass spectrum of 1,3-benzodioxole,5-(1-propenyl)



**Fig 1: Mass spectrum 1, 3-Benzodioxole, 4-methoxy-6-(2-propenyl)**



**Fig 3: Mass spectrum of 1, 3-Benzodioxole, 4,7-dimethoxy-5-(2-propenyl)**

## DISCUSSION

The result of the GC-MS analysis of the essential oil of *piper guineese* identified the various compounds present in the plant. From the gas chromatogram of the extract which shows 12 distinct peaks identified by GC-MS while the compound identified through computer data library search are listed in table 1. The major compounds present in the essential oil of *piper guineese* as identified by GC-MS were 1,3-Benzodioxole, 5-(1-propenyl) (RT:6.17), 1,3-Benzodioxole,4-methoxy-6-(2-propenyl)12 $\alpha$  $\beta$  and (RT: 9.47) and 1,3-Benzodioxole, 4,7-dimethoxy-5-(2-propenyl) (RT: 12.90). The GC-MS spectrum gives the structure of the compounds figure 1,2and3

molecular formula as C<sub>10</sub>H<sub>10</sub>O<sub>2</sub>, C<sub>11</sub>H<sub>12</sub>O<sub>3</sub> and C<sub>12</sub>H<sub>14</sub>O<sub>4</sub> respectively.

Other component also identified in the oil of *piper guineese* are 1,6-octadien-3-ol, 3,7-dimethy(3.79:RT), Tricyclo (4,4,0.02), dec-3-ene (RT: 7.23), Naphthalene. 1,2,3,4, 4a,5,6,8-octahydro-7-methyl-4-methylene-(1-methylethyl) (RT: 7.35), B.cyclo(7.20) undec-4-ene, 4,11,11-trimethy(-8-methylene (RT:7.92), 1,6,10-Dodecatriene, 7,11-dimethyl-3-methylene (RT: 8.09), 1,4,8-cycloundecatriene,2,6,6,9-tetramethyl (RT:8.49), 16-cyclodecadiene, 1-methylene-8-(1-methylethyl) (RT: 8.82), Cyclohexane, 1-methy-5-methylene-4-hexenyl (RT:9.02) and Cedra-8-(15)-ene(RT: 9.27).

It has been reported that many medicinal plants are rich varieties of secondary metabolite such as essential oil and have been used for many thousand years in food preservative medicine and natural therapies (Onyeson and Okoh 2006). Apart from the essential oil providing energy, it can also contain modest but useful amount of the compounds on important component of membrane phospholipid or precursor to number of critical compounds once found in virtually all tissue membrane of human (Cley et al 2004). Earlier studies carried out using the seed of *piper guineese* revealed that the seeds are found to be a potential source of anti oxidants due to the present of polyphenonic compound (Otshudi 2005). Essential oils are rich source of biologically active compound. In looking at anti-microbial properties extract from the plant is particularly essential. Essential oil has been reported to be immune enhancing, anti-bacterial, antifungal, antiviral, and antiseptic, wound healing anti-inflammatory and anti-cancer properties (Ali 2011). The present study aimed at identifying wide range of the nature of compounds of the plant which might play role as reported in African traditional medicine.

## REFERENCE

1. Tolu, Odugbemi (2008) A text book of medicinal plants from Nigeria University of Lagos Press Lagos Nigeria Page 594.
2. Onyeson, I. and Okoh, P.N (2006) Quantitative analysis of Nitrate and Nitrite Contents in vegetable commonly consumed in Delta State Nigeria. *Br.J.Nutr* 96(5)2-905.
3. Ekanem, AP, Udoh EV, and Oku, EE. (2010) Effects of Ethanol extract of Piper guineese seeds (schum and Thonn) on conception of mice (Musulus) *journal of Pharmacy and Pharmacology* 4(6) 362-367.
4. Friday, OU Emaka E.J.I and Ijeoma K (2011) studies on the chemical and antinutritional content of some spices. *Journal of Nitriton and metabolism* 3(6) 72-76.
5. Olorode, A (2011) Taxonomy of West African Flowering Plants, 2<sup>nd</sup> Edition Ile-Ife,- Nigeria 25-26.
6. Glew, Rs Vandan Jagt DJ, Huang YS chauang Li Glew, RH (2004) Nutritional Analysis of the edible pit of Sclerocarya birrea *J food comp Anal* 17(1) 99-111.
7. Otshudi AL, Aperss Pieter L Clacys M VannZeebroeck, A (2005) *Journal of Ethnopharmacology* 102(89).
8. Ali, A.S (2011) Evaluation of antibacterial activity of essential oil of annamomum Sp. *Journal of Basral Researches (sciences)* 37(5A).

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