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RESEARCH ARTICLE

CHEMICAL COMPOSITIONOF METHANOLIC EXTRACTS OF *OCIMUM CANUM* SIMS (LAMIACEAE) LEAVES

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Abstract

The methanolic extract of Ocimum canum leaves was studied for its phytochemical constituents and essential oils. The phytochemical screening was done using standard procedures while the essential oils present were estimated using the gas chromatography and gas chromatography coupled with mass spectroscopy (GC/GC-MS. The result of the phytochemical screening showed the presence of alkaloids, glycosides, saponins, flavonoids and terpenoids. The GC/GC-MS analysis showed that the leaves was characterised by a high percentage of monoterpenes (36.5%) with linalool as the major component (29.4%).

Key words: Ocimum canum, phytochemical ,monoterpenes, linalool

INTRODUCTION

Ocimum canum Sim (Lamiaceae) is native to tropical Africa and finds a very useful application in folk medicine [5]. *O. canum* shows a pungent aromatic flavour and it is commonly cultivated for culinary purposes due to the minted scent [5,7].. The leaves are used for the treatment of fever, headaches, parasitic infections and inflammation of joints [7]. Essential oils from the leaves possess anti-bacterial and anti-insecticide properties [2]. The leaves have been reported to lower blood glucose and facilitate insulin release by isolated pancreatic β-islet cells [5].

MATERIALS AND METHODS

Plant Collection

The plant *Ocinum Canum* was collected at Oluwo, Abeokuta, Ogun State at about 10:00am. The experimental protocols were conducted with the identification and approval of the FORESTRY INSTITUTE RESEARCH OF NIGERIA at Jericho, Ibadan Oyo State. Voucher number – FHI – 109699.

EXTRACTION

The leaves of *Ocimum Canum* (OC) were air dried for one month under room temperature to prevent the loss of it volatile oils. The dried leaves were grinded using a blender of model Mc-9980B (Master chef). The total weight of the blended sample was 112.27g. The powder was extracted by maceration with methanol of 1250mls in a transparent jar left for 24 hours, corked and taken away from direct sunlight. The filtrate was collected into a volumetric flask to separate the extracts from the residues. After the filtration, the filtrate was concentrated in a water bath at temperature of 45^{o}C.

PHYTOCHEMICAL ANALYSIS

Ocimum canum aqueous leaf extracts was tested for it various phytochemical constituents according to the methods reported by Adiguzel *et al* 2005 [1].

Gas Chromatography Mass Spectrometry (GCMS)

The Methanolic extract of the plant *(Ocimum canum)* was taken to the University of Lagos; Department of Chemistry Laboratory for the GC-MS analysis. The model of the instrument is GCMS Agilent technologies. The GC Model was 7890A and MS Model was 5975C.
The column used is HPSMS, the length of the column is 30m, internal diameter 0.32mm and film (thickness) is 0.25Nm. The injection volume is (N/L, pressure is 12.936 Psi, Septum flow 5ml (Min, mode Spotlers). Initial temperature was 60^{o}C to hold for 2 minutes at the rate of 40c/mins to the final temperature 240^{o}C to hold for 2 minutes.

GC-MS Spectrum Analysis

The spectrum obtained from the GCMS analysis were computer matched using NATIONAL INSTITUTE OF STANDARD AND TECHNOLOGY web book.

RESULT AND DISCUSSION

Phytochemical Screening

The phytochemical screening (table 1) of the methanol extract of *O. canum* leaves showed the presence of alkaloids, cardiac glycosides, saponins, flavonoids and terpenoids

Table 1: The result of the phytochemical constituents of *Ocimum canum*

Chemical Constituents	Extract
Saponins	+
Tannins	-
Alkaloid	+
Flavonoids	+
Reducing Sugar	-
Protein	-
Triterpenoids	+
Phenolic compounds	-
Cardiac Glycosides	+
Anthocyanides	-

+: Present
-: Absent

Similar study was reported by Behera *et al*., (2012) of ethanol and water extracts of leaves of *O. canum* in India.Flavonoids, reducing sugars and terpenoids were present in both water and ethanolic extract while tannins were present in the ethanol extract but absent in the water extract. Tannins and reducing sugars were not detected in our study. Thisdiscrepancy could result from difference in the location of the plant and solvents of extraction.The phytochemical screening of *O. camum* suggests that the scented leaves possess bioactive compounds with therapeutic potentials. Further studies need to be carried out to isolate all bioactive compounds with therapeutic activities.

Table 2: Result of the chemical constituents present in *Ocimum canum*.

RT	Compound name	% total
5.962	Eucalyptol	1.882
7.100	cis-β-Terpineol	0.319
7.541	L-Fenchone	1.064
8.050	β–Linalool	29.433

8.264	Acetamide, N-methyl-N-(2-propynyl)	0.616
9.747	Terpinen-4-ol	2.984
10.227	2,6-Dimethyl-3,7-octadiene-2,6-diol	0.795
10.809	Acetylproline	0.851
13.288	Eugenol	8.423
13.475	β-cubebene	0.493
13.776	β-Elemene	1.437
14.072	Methyl eugenol	0.930
14.496	(Z-E)-α-Farnesene	8.180
14.848	β -(Z)-Farnesene	0.170
15.214	Germacrene D	0.961
15.267	β -(E)-Farnesene	0.720
15.742	α – Muurolene	1.503
15.891	β-Sesquiphellandrene	0.473
16.745	Spathulenol	0.420
17.264	Cubenene	0.589
17.661	2-Isopropyl-5-methyl-9-methylenebicyclo[4.4.0]dec-1-ene	2.958
20.250	Isophytol	0.388
21.357	Methyl palmitate	2.206
21.965	Palmitic acid	5.799
23.329	Methyl linoleate	0.729
23.405	9-Octadecenoic acid, methyl ester	4.546
23.555	Phytol	2.466
23.709	Methyl isostearate	0.878

24.000	9,17-Octadecadienal, (Z)-	15.549
24.231	Linoleic acid	1.940
27.340	2-Methyl-Z,Z-3,13-octadecadienol	0.153
30.148	2-Heptadecenal	0.144
	Total identified	99.999

Instrumental analysis

The GC and GC/MS analysis revealed that the oxygenated monoterpenes had the highest percentage (36.5%) followed by long chain unsaturated aldehydes (9, 17-Octadecadienal, 2-heptadecenal, 15.7%), sesquiterpenes (14.9%), phenylpropanoids (eugenol and methyl derivative, 9.3%), saturated fatty acids (8.9%), unsaturated fatty acids (7.2%) and diterpenoid (2.9%). The result also showed that linalool (29.4%) was the major essential oil in the plant. This is in agreement with the Ngassoum *et al*., 2004 who reported that linalool was the highest essential oil (44.9%) from a variety of O. canum grown in Cameroun [4].

Linalool is a monoterpene alcohol and a major volatile component of essential oils of several aromatic plant species. It is one of the most important compounds to the perfume and flavour industries 9[3,6]. Linalool has been reported to be a component of *O. canum[2].*, however, we could not lay hold on any literature of the study of essential oil components of *O. canum* in Nigeria

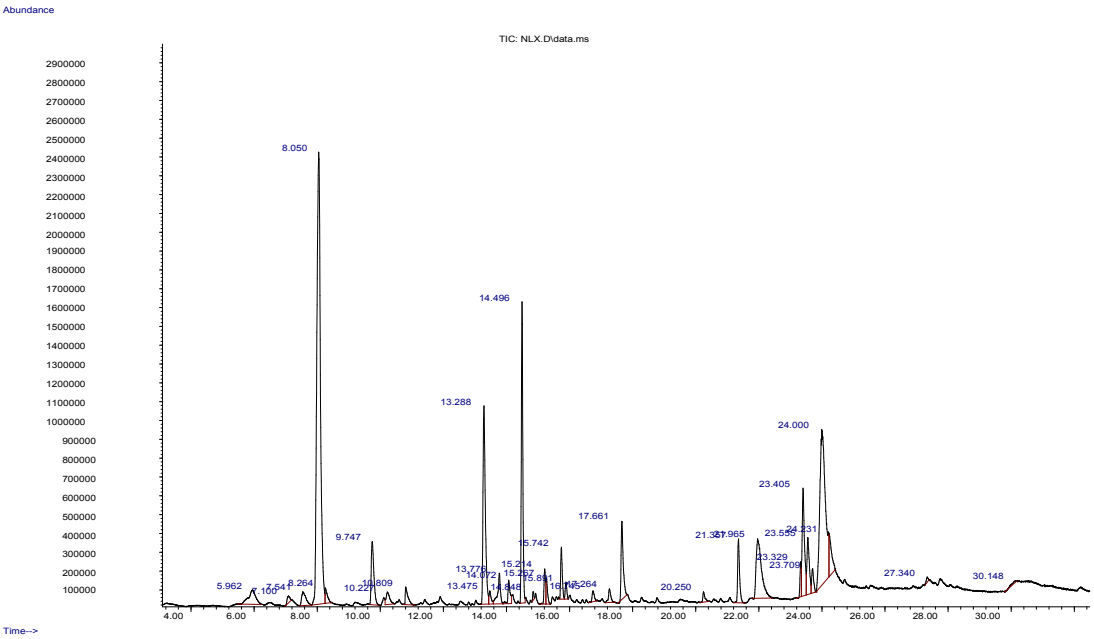

Fig.1: Mass Spectra of the *O. canum* extract

CONCLUSION

Plant derived drugs remains important resource especially in developing countries, to combat serious diseases. Therefore, natural products play on important role in drug development programmes in the pharmaceutical industry (Baker *et al*., 1995). The presence of alkaloids, glycosides, saponins, flavonoids and terpenoids in this plant extract verified the traditional uses of the plant for human ailments. Further researches to isolate, characterize and elucidate the structures of the bioactive compounds in the plant will be useful for industrial drug formulation and for new useful drug molecules discovery.

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