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NOTE

Volatile Components of the Leaves of *Vitex simplicifolia* Oliv.

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The composition of the essential oil from the leaves of *Vitex simplicifolia* Oliv. were studied by capillary gas chromatography. The analysis using a combination of retention indices and combined GC/MS led to the identification of 52 components. The essential oil contains mainly mono terpenoids (71.02 %) out of which 64.70 % are monoterpene hydrocarbons and some sesquiterpene hydrocarbons (22.03 %). The major constituent was myrcene (53.50 %).

Key Words: *Vitex simplicifolia*, Verbenaceae, Essential oil, GC/MS, Myrcene.

Within the context of the study of aromatic plants commonly used as remedies or spices in Western and Central Africa, we have taken interest in the study of the species *Vitex simplicifolia* Oliv. Only this species of *Vitex* has been recorded to date in Burkina Faso[1]. *Vitex simplicifolia* Oliv. (Verbenaceae) is a perennial small tree which grows to a height of *ca.* 8 m in the tropical climate. It is distributed from tropical Africa to Egypt. In Western Africa and Burkina Faso, The leaves and its edible fruits are used in traditional medicine for the treatment of malaria, skin diseases, toothache, dermatitis[2,3]. To the best of our knowledge no study concerning the non-volatile components of this plant and the chemical composition of the essential oil of *Vitex simplicifolia* has been done before. The present work reports results of a detailed analysis of the composition of the leaf oil of *Vitex simplicifolia*.

The leaves of *V. simplicifolia* were collected in January 2007 from the Kadiogo region, city of Balgui, 10 km near Ouagadougou, Burkina Faso. A voucher specimen has been identified by Dr. Jeanne Millogo, botanist (University of Ouagadougou) and deposited at the herbarium of IRSS of Ouagadougou.

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Extraction and analyses: The air dried leaves (200 g) were subjected to hydro-distillation for 4 h with a clavenger-type apparatus. The essential oil was collected and dried, after decantation, over anhydrous sodium sulphate, then analyzed by GC and GC/MS.

GC analysis was performed on a Hewlett-Packard HP 6890 equipped with a split/splitless injector (280 °C), a split ratio 1:10, using a HP-5 capillary column (25 m × 0.25 mm, film thickness 0.25 m). The oven temperature was programmed from 50 to 300 °C at a rate of 5 °C/min. Helium was used as the carrier gas at a flow rate of 1.1 mL/min. The injection of each sample consisted of 1.0 L of oil diluted to 10 % (v/v) with acetone.

GC/MS analysis was carried out on a Hewlett-Packard 5973/6890 system operating in EI mode (70 eV) using two different columns: a fused silica HP-5 MS capillary column (25 m × 0.25 mm, film thickness 0.25 m), and a HP-Innowax capillary column (60 m × 0.25 mm, film thickness 0.25 m). The temperature program for HP-5 MS column was 50 °C (5 min) rising to 300 °C at a rate of 5 °C /min and for

TABLE-1
CHEMICAL COMPOSITION OF THE LEAF ESSENTIAL OIL OF *Vitex simplicifolia* Oliv.

RI	Constituents	Percentage (%)	RI	Constituents	Percentage (%)
926	Tricyclene	0.07	1384	β-Bourbonene	0.31
930	α-Thujene	0.17	1390	β-Cubebene	0.26
939	α-Pinene	5.13	1394	*cis*-Jamone	0.11
953	Camphene	0.10	1418	β-Caryophyllene	3.47
976	Sabinene	0.35	1432	β-Copaene	0.13
980	β-Pinene	2.48	1455	α-Humulene	7.70
991	Myrcene	53.50	1477	γ-Muurolene	0.15
1005	α-Phellandrene	0.10	1480	Germacrene-D	6.52
1031	Limonene	0.91	1499	δ-Amorphene	0.13
1032	β-Phellandrene	1.38	1502	Epizonarene	0.15
1050	(E)-β-Ocimene	0.16	1510	α-Bulnesene	0.06
1062	γ-Terpinene	0.07	1514	γ-Cadinene	0.06
1068	*cis*-Sabinene hydrate	0.05	1523	δ-Cadinene	0.33
1088	Terpinolene	0.12	1549	Elemol	0.56
1093	6,7-Epoxymyrcene	0.07	1559	epi-Torilenol	0.12
1096	Linalool	4.70	1562	Germacrene-B	0.24
1102	Nonanal	0.13	1564	E-Nerolidol	0.28
1145	Ipsdienol	0.10	1581	Caryophyllene oxide	0.89
1148	*trans*-Verbenol	0.09	1597	Salvia-4(14)-en-1-one	0.07
1159	β-Pinene oxide	0.75	1606	Humulene-1,2-epoxide	1.15
1177	Terpinene-4-ol	0.18	1620	Torrilenol	0.19
1195	α-Terpineol	0.20	1632	Isospathulenol	0.49
1253	Piperitone	0.05	1638	γ-Eudesmol	0.55
1338	δ-Elemene	0.19	1658	7-epi-α-Eudesmol	0.95
1351	α-Cubebene	0.24	1688	Eudesma-4(15),7-dien-1-β-ol	0.20
1379	α-Copaene	1.21	1780	14-Hydroxy-α-muurolene	0.13

RI = Retention indices.

the HP-Innowax column, 50-250 °C at a rate of 5 °C/min. Helium was use as the carrier gas at a flow rate of 1.1 mL/mn. The oil components were identified by comparison of their mass spectra and their retention indices with those of reference compounds or with literature data[4-7].

The hydrodistillation of the air-dried leaves of *V. simplicifolia* gave a limpid mobile oil in 0.8 % yield (w/w). The compounds identified in the oil are listed in Table-1 according to their order of elution on HP5. A total of 52 components were identified (98.63 %). The oil contains mainly terpenoid compounds, with monoterpenoids (71.02 %) being predominant. The hydrocarbons and the oxygenated compounds accounted for 92.31 and 27.61 % of the constituents of the oil, respectively. Among the monoterpene hydrocarbon, myrcene (53.50 %) had been found as the major component and four components were detected as predominant: 3.47 %: α-pinene (5.13 %), β-pinene (2.48 %) and β-phellandrene (1.38 %). We also reported that myrcene have been found as a major constituent of the oil of *Daniella klainei* Pierre ex. A. Chev., Cesalpiniaceae[8]. Seventeen sesquiterpenes were detected of which β-caryophyllene (3.47 %), α-humulene (7.70 %) and germacrene-D (6.52 %) were the main constituents.

In the oxygenated fraction, 10 monoterpenoids (6.32 %) and 12 sesquiterpenoids (5.58 %) were present, with linalool (4.70 %) and humulene-1,2-epoxyde (1.15 %) as the major compounds. Finally, no phenolic compound has been detected in this essential oil.

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