

ESSENTIAL OIL COMPOSITION OF *Centratherum punctatum* FROM NIGERIA

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The Brazilian bachelor botton, *Centratherum punctatum* Cass. (*Asteraceae*), is a fragrant bushy perennial plant and attains up to 45–60 cm [1]. It is well-branched with refreshing resinous pineapple-scented foliage. The purple flowers seem to close up at night. A related species, *C. anthelminticum*, has been reported to possess antimicrobial [2] and antifilarial [3] activities. *C. punctatum* of Brazilian origin has been investigated for its essential oil constituents [4, 5].

In this work we report on the essential oil composition of *C. punctatum* herb growing in Nigeria. To date, there is one literature report of the essential oils from *C. punctatum* leaves [6].

The results of chemical analysis of *Centratherum punctatum* essential oil are presented in Table 1. Fifty-nine compounds, which represent 99.31% of total oil, were identified. The essential oil was characterized by the sesquiterpenes (96.63%), categorized as hydrocarbons (83.11%) and oxygenated compounds (13.52%). The predominant constituent was β -caryophyllene (27.4%) (Table 1). Minor sesquiterpene hydrocarbons in 3.01–6.59% yield like cycloisosativene, α -copaene, *trans*- α -bergamotene, β -farnesene, germacrene D, bicyclogermacrene, α -humulene, and δ -cadinene occurred in *C. punctatum* oil. Among the oxygenated sesquiterpenes, spathulenol (1.26%), viridiflorol (2.12%), and caryophyllene oxide (2.42%) formed the notable constituents. The monoterpene class (2.29%), which formed an unimpressive group of constituents, is represented mainly by trace amounts ($\leq 0.46\%$) of its compounds. Previous reports by Mancini et al. [4] and Craveiro et al. [5] on the Brazilian varieties indicated β -caryophyllene as the principal oil constituent.

Ogunwande et al. [6] found β -caryophyllene as the dominant compound in essential oil from leaves of *C. punctatum*. Both Nigerian and Brazilian oils also bear some qualitative and quantitative properties with the oil analyzed in this work, and this indicates that oils of different origin belonged to the same chemotype.

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TABLE 1. Composition of *Centratherum punctatum* Herb Essential Oil (expressed as %)

Compound	KI*	%	Compound	KI*	%
<i>trans</i> -2-Hexenal	8.6593094e+124	0.16	Germacrene D	1.485149e+103	5.93
α -Thujene		0.07	β -Selinene		1.98
α -Pinene		0.46	Bicyclogermacrene		4.63
Verbenene		0.05	α -Muurolene		1.26
Sabinene		0.26	β -Curcumene		1.03
β -Pinene		0.33	δ -Cadinene		6.59
β -Myrcene		0.22	<i>trans</i> -Cadina-1(2),4-diene		0.28
α -Terpinene		0.04	α -Cadinene		0.51
<i>p</i> -Cymene		0.11	α -Calacorene		0.91
Sylvestrane		0.08	Elemol		0.44
1,8-Cineole		0.03	Germacrene B		0.36
<i>cis</i> - β -Ocimene		0.36	Palustrol		0.34
γ -Terpinene		0.09	Spathulenol		1.26
α -Terpinolene		0.04	Caryophyllene oxide		2.42
Linalool		0.11	Viridiflorol		2.12
<i>cis</i> -3-Hexenyl isobutanoate		0.11	Guaial		0.58
Terpinen-4-ol		0.10	Ledol		0.86
<i>cis</i> -3-Hexenyl- α -methyl butyrate		0.15	Humulene epoxide II		0.58
δ -Elemene		1.68	1-epi-Cubenol		1.76
α -Cubebene		0.23	Caryophylla-3(15),7(14)-dien-6-ol		0.97
Cycloisosativene		3.01	τ -Muurolol		0.47
α -Copaene		5.03	Cubenol		0.91
β -Bourbonene		1.28	α -Cadinol		0.27
β -Elemene		1.32	Himachalol		0.22
Cyperene		0.21	α -Santalol		0.14
9,10-Dihydroisolongifolene		0.28	Cedr-8-en-13-ol		0.18
α -Gurjunene		0.97	Grouped constituents		
β-Caryophyllene		27.40	Monoterpene hydrocarbons		2.05
<i>trans</i> - α -Bergamotene		3.87	Oxygenated monoterpenes		0.24
β -Farnesene		3.90	Sesquiterpene hydrocarbons		83.11
α -Humulene		6.95	Oxygenated sesquiterpenes		13.52
Alloaromadendrene		1.22	Others		0.42
γ -Muurolene		2.20	Total identified		99.34

*KI: kovats index on DB-5 column.

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REFERENCES

1. C. A. Backer and R. C. B. van den Brink Jr, *Flora of Java*, Wolters-Noordhoff NV, Groningen, Vol. 2, 370 (1965).
2. Sharma and B. K. Mehta, *J. Hyg. Epidemiol. Microbiol. Immunol.*, **35**, 2, 157 (1991).
3. K. C. Singhal, S. Sharma, and B. K. Mehta, *Indian J. Exp. Biol.*, **30**, 546 (1992).
4. B. Mancini, A. C. Bernardi, and J. Jorge-Neto, *Rev. Cienc. Farm.*, **5**, 1 (1983).
5. A. A. Craveiro, C. H. S. Andrade, F. J. A. Matos, J. W. Alencar, and M. I. L. Machado, *J. Nat. Prod.*, **47**, 743 (1984).
6. I. A. Ogunwande, N. O. Olawore, and L. Usman, *J. Essent. Oil Res.*, **17**, 496 (2005).