

## CHEMICAL COMPOSITION OF THE ESSENTIAL OIL FROM LEAVES OF *Callicarpa nudiflora*

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UDC 547.913

*Callicarpa nudiflora* Thunb. (Verbenaceae) are deciduous shrubs or small trees reaching a height of up to 3–4 m, native to Guangdong, Guangxi, Hainan of China.

Previous studies on this species focused on the clinical curative effect and pharmacology. Xie Bin studied the cytological mechanism of *C. nudiflora* in 1995 [1]. The results suggest that *C. nudiflora* inhibit the proliferation and promote the synthesis and release of protein in human embryo fibroblasts; Zeng xiang-zhou studied the acute and long-term toxicity of *C. nudiflora* tablet in animals in 2002 [2]. The conclusion is that it is safe to take *C. nudiflora* tablet for clinical oral administration; Fu Jian investigated the efficiency of *C. nudiflora* tablets on antibiosis, antiphlogosis, and hemostasis in 2002 [3]. The results indicated that *C. nudiflora* is a kind of antimicrobial and antiphlogistic drug that has wide pharmacological effects. Other researchers have reported that *C. nudiflora* has anti-inflammation and hemostasis properties [4]. Mozaina Kobaisy analyzed the composition of the essential oil of *Callicarpa japonica* [5] and *Callicarpa americana* [6]. In this work the essential oil from the leaves of *Callicarpa nudiflora* was analyzed by GC–MS, and 34 compounds were identified. To our knowledge, this is the first study on the composition of the essential oil from the leaves of *C. nudiflora*.

A light yellow essential oil of *C. nudiflora* was obtained in a yield of 0.1% dry weight. Results of the GC/MS analysis of the oil are shown in Table 1, where the components are listed in order of their elution from the DB-5 column. Thirty-four constituents, accounting for more than 87% of the total oil composition, were identified. The main components of the essential oil from *C. nudiflora* were humulene epoxide (17.28%),  $\alpha$ -bisabolene epoxide (10.51%), (+)-2-carene (9.24%), terpinolene (8.70%), farnesol (6.65%), longipinene epoxide (4.24%), *o*-cymene (3.93%), sabinene (3.62%),  $\beta$ -terpineol (2.95%), and linalool (2.05%). Five unknown compounds in *C. nudiflora* accounted for >0.5% of the total area (RA). The essential oil constituents of *C. nudiflora* were significantly different from *C. americana* and *C. japonica*, which are related species of *C. nudiflora*. Our results showed that only three components were common for this three species, while eight components of *C. americana* and *C. nudiflora* were identical; five among the eight components exceeded 1% in *C. nudiflora*.

TABLE 1. Constituents of the Essential Oil of *Callicarpa nudiflor*

Compound	%	Compound	%	Compound	%
$\alpha$ -Thujene	0.14	Dihydrocarvyl acetate	0.47	Calarene	0.26
$\alpha$ -Pinene	0.11	(–)- <i>trans</i> -Pinocarveol	2.86	Longipinene	0.27
Sabinene	3.62	4-Terpineol	0.41	$\alpha$ -Bisabolene epoxide	10.51
Terpinolene	8.70	( $\pm$ )- $\alpha$ -Terpineol	0.92	Humulene monoepoxide	0.48
(+)-2-Carene	9.24	$\alpha$ -Cubebene	0.19	Isoaromadendrene epoxide	0.20
<i>o</i> -Cymene	3.93	Germacone	0.17	$\beta$ -Pinene	1.59
6,6-Dimethyl-2-(3-oxobutyl)bicyclo- [3.1.1]heptan-3-one	0.97	Farnesol	6.65	$\alpha$ -Bisabolol	0.78
$\gamma$ -Terpinene	1.89	$\alpha$ -Ocimene	0.97	Longipinene epoxide	4.24
$\beta$ -Terpineol	2.95	Humulene	0.23	Nerolidol	1.26
Isothujol	2.01	Isocaryophyllene	0.12	Manoyl oxide	0.34
Linalool	2.05	Junipen	0.45	Humulene epoxide	17.28
		$\gamma$ -Cadinene	1.02		

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## ACKNOWLEDGMENT

We are grateful to Sun baohui for the identification of the species and other anonymous referees for their helpful comments.

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