CHEMICAL COMPOSITION OF THE ESSENTIAL OIL OF *Caragana sinica* FLOWERS

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The genus *Caragana* (Leguminosae) is represented in the flora of China by more than 60 species [1]. Among them, some are medicinal plants used to treat hypertension, irregular menstruation, and fatigue [2]. A literature survey shows that extracts and compounds from the genus have antitumor, antivirus, antiinflammation, hypertensive, sedative, acetylcholinesterase inhibitory, and immunosuppressant activities [3–7].

Extracts and compounds from *C. sinica* were reported to possess significant anti-HSV, antitumor, and protein kinase C inhibitory activities [3, 5], but there are no references on the oil content and chemical composition of its flower, which is also known to be a delicious and healthy vegetable in China for frying or distillation with eggs. We report here the results of our studies on the composition of oil from the fresh flowers of *C. sinica.*

The fresh flowers were collected in Kunming, Yunnan of China and identified by Dr. Hong Yu, Biological Department of Yunnan University, Kunming, Yunnan of China. A voucher specimen is kept in the Herbarium of Department of Chemistry, Yunnan Normal University, Kunming, China.

The fresh flowers of *C. sinica* yielded 0.1% of a yellowish oil. Sixteen components were detected in the oil. The identified components and their percentages are given in Table 1, where the components are listed in the order of their elution on the HP-5 column. As can be seen, the major components of the essential oil are torreyol (35.8%), germacrone (9.0%), 1,10-di-*epi*-cubenol (7.2%), viridiflorol (7.2%), and three unknown oxygenated sesquiterpenes (10%, 9, and 6.7%, respectively). The terpenes were the dominant group in the oil (98.3%), whereas aldehydes accounted for only 1.6%.

TABLE 1. Composition of the Essential Oil from the Fresh Flowers of *Caragana sinica*

Compound	RI	%	Compound	RI	%
α-Pinene	942	2.2	δ-Cadinene	1524	2.4
β-Pinene	979	3.6	Unknown[a]	1575	6.7
Nonanal	1106	1.2	Viridiflorol	1590	7.2
Decanal	1207	0.4	Unknown[b]	1598	9.0
β-Caryophyllene	1418	0.7	1,10-di-*epi*-Cubenol	1615	7.2
α-Humulene	1452	0.5	Torreyol	1646	35.8
trans-β-Ionone	1488	1.8	Unknown[c]	1691	10.0
Bicyclogermacrene	1495	2.2	Germacrone	1695	9.0

[a] $C_{15}H_{24}O$, MS *m/z* (rel. int.): 220 $[M]^+$ (6), 204 (40), 189 (10), 161 (100), 145 (5), 133 (25), 119 (38), 105 (50), 91 (30), 81 (26), 65 (4), 55 (2).

[b] $C_{15}H_{26}O$, MS *m/z* (rel. int.): 222 $[M]^+$ (5), 204 (50), 189 (40), 161 (100), 147 (42), 133 (35), 119 (40), 105 (70), 97 (75), 81 (35), 67 (18), 55 (32).

[c] $C_{15}H_{26}O$, MS *m/z* (rel. int.): 222 $[M]^+$ (1), 204 (37), 189 (13), 161 (100), 147 (5), 133 (14), 119 (38), 105 (46), 91 (29), 81 (6), 65 (5).

RI: retention indices on HP-5 capillary column.

%: calculated from TIC data.

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