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CONSTITUENT COMPOSITION OF ESSENTIAL OIL FROM *Cornus mas* FLOWERS

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Cornus mas L. (Cornaceae Dumort) is a widely distributed but rather unstudied plant that grows wild in the countries of Central, Southern, and Eastern Europe in addition to the Caucases and Asia Minor, the Crimea in Ukraine, the western forest-steppe, the Transcarpathian and Carpathian regions, and the southeastern right-bank forest-steppe. Fruit of *C. mas* contains carbohydrates, phenolic compounds, organic acids, vitamins, and macro and trace elements; exhibits astringent, tonic, diuretic, anti-inflammatory, and antioxidant activity; and improves metabolism [1–3]. We determined previously using GC–MS the volatile compounds in leaves of this plant [4].

The goal of the present work was to study essential oil from *C. mas* male flowers collected in April 2009 from plants cultivated in Kharkov and Simferopol Oblasts of Ukraine. The raw material was identified botanically based on voucher specimens stored at the herbarium of the Pharmacognosy Department, NPU. Samples for analysis were obtained from freshly collected raw material by steam distillation and subsequent work up of the distillate with hexane [4]. The yield of essential oil was 0.03%. The analysis used an Agilent Technology 6890N chromatograph with a 5973N mass-spectrometric detector. The analytical conditions included an HP-5MS (30 m × 0.25 mm) quartz capillary chromatography column, He carrier gas, flow rate 1 mL/min, sample volume 0.1–0.5 μL, sample injection with 1/50 flow division, 50°C thermostat temperature programmed at 4°C/min to 220°C, and 250°C detector and vaporizer temperature. Constituents of the essential oil were identified by comparing mass spectra of the products with data in the NIST02 mass-spectra library. Table 1 presents the results.

A total of 47 constituents was detected in essential oil from *C. mas* flowers collected in Kharkov Oblast; 65, from those in Simferopol Oblast. Of these, 74 and 62%, respectively, of the constituents were identified. Monoterpenoids dominated essential oil from both samples. These included camphor, verbenone, borneol, α-terpineol, β-thujone, carvone, and 1,8-cineol. Aromatic compounds were represented by carvacrol and 2-methoxy-4-vinylphenol. Alkanes were also found. The composition and content of the oil constituents varied as a function of habitat.

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TABLE 1. Constituent Composition of Essential Oil from *Cornus mas* Flowers, %

Compound	Retention index	Collection site		Compound	Retention index	Collection site	
		1	*2*			*1*	*2*
Hexanone-3	857	0.17	–	Borneol	1168	3.75	6.71
Hexanone-2	859	0.31	–	Terpinen-4-ol	1180	–	1.04
trans-2-Hexenal	890	0.63	0.55	α-Terpineol	1193	2.07	2.89
cis-3-Hexen-1-ol	892	0.21	–	Dodecane	1200	3.64	2.67
Nonane	919	0.39	0.24	Verbenone	1213	14.79	5.69
Heptanal	920	0.09	–	Carveol	1223	–	0.67
α-Pinene	945	0.22	–	Carvone	1248	1.68	2.68
Camphene	957	0.1	–	Geraniol	1259	–	0.88
1-Octen-3-ol	984	–	0.37	Tridecane	1300	2.10	1.35
Decane	1000	1.27	0.81	Carvacrol	1311	4.37	5.6
2,6-Dimetylheptane	1010	0.20	–	2-Methoxy-4-vinylphenol	1325	3.54	1.16
4-Methyldecane	1022	–	0,38	Piperitenone	1364	0.47	0.44
Limonene	1029	1.34	1.18	Pentadecene-1	1495	–	0.31
1,8-Cineol	1031	1.62	2.58	Pentadecane	1500	3.74	3.38
Phenylacetaldehyde	1044	–	0.84	Hexadecane	1600	1.09	0.44
3-Methylnonane	1051	1.69	–	3-Methylhexadecane	1671	–	0.40
5-Methyldecane	1056	1.32	0.73	Heptadecene-1	1693	–	0.35
3-Methyldecane	1059	0.45		Viridiflorol	1697	–	0.34
2-Methyldecane	1062	1.39	0.83	Heptadecane	1700	2.13	1.23
Undecane	1100	4.09	2.00	Nonadecane	1900	–	0.32
Linalool	1103	–	0.89	Neophytadiene	1944	–	0.34
β-Thujone	1107	1.15	2.7	Heneicosane	2100	1.83	1.78
Chrysanthenone	1126	1.9	–	Tricosane	2300	3.38	1.91
Camphor	1146	9.13	16.23	Pentacosane	2500	1.44	0.91
4-Methylundecane	1159	1.06	–	Heptacosane	2700	1.04	0.46
Benzylacetate	1168	–	3.8	Squalene	2795	0.53	0.41

1 - Kharkov Oblast; *2* - Simferopol Oblast.

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