VOLATILE CONSTITUENTS OF THE FLOWERS AND LEAVES OF *Eucalyptus oleosa* CULTIVATED IN CENTRAL IRAN

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Eucalyptus oleosa, which belonges to the Myrtaceae family, is native to Australia. *Eucalyptus* leaves contain essential oil and this oil gives the leaves their characteristic fragrance. From the time of European settlement, there has been considerable interest in the properties of essential oils of indigenous Australian plants, in particular *Eucalyptus*. In 1788, this genus was named *Eucalyptus* by L′Heriter. The word is derived from the Greek words *eu* (well) and *kalypto* (I cover) and is alladed to the observation that the flower-bud covers the stamens until they are fully developed. Medicinally, *Eucalyptus* oil is used for the treatment of bronchial ailments, where it works by stimulating mucous secretion, and as an antiseptic agent [1].

Eucalyptus contains many chemical compounds that play several roles in the plant. These include defense against insect and vertebrate herbivores and protection against uv radiation and against cold stress. The best known compounds are the terpenoids, which form most of the essential oil, giving *Eucalyptus* foliage its characteristic smell. However, *Eucalyptus* is also a rich source of phenolic constituents such as tannins and simpler phenolics. Some of these have formed the basis of industries in the past. For example, tannins were extracted from *E. astringens* and rutin from *E. macrorhyncha* [2]. *Eucalyptus* species are widely planted throughout the world; they yield oils as by products with considerable economic value. Although about 300 species of *Eucalyptus* have been shown to contain volatile oils in their leaves, only a few are important as far as commercial production of essential oils is concerned. The oils of these species are classified for trade in three broad types according to their composition and main end-use: medicinal (cineole-rich), perfumery (citronella), and industrial (rich in phellandrene and piperitone) [3].

TABLE 1. The Percentage Composition of the Leaf and Flower Oils of *Eucalyptus oleaosa* from Kashan Area

Compound[a]	RI[b]	% in flower[c]	% in leaf[c]	Compound[a]	RI[b]	% in flower[c]	% in leaf[c]
α-Pinene	924	6.01	11.19	*cis*-*p*-mentha,1(7),8-dien-2-ol	1219	-	0.16
β-Pinene	964	2.01	1.62	Cuminal	1233	3.45	0.91
α-Phellandrene	994	3.18	-	Carvotanacetone	1242	0.5	-
p-Cymene	1015	-	5.86	Piperitone	1248	0.68	-
1,8-Cineole	1025	36.55	57.89	Phellandral	1270	4.05	0.27
γ-Terpinene	1050	1.20	-	2-Caren-10-al	1277	0.36	-
Terpinolene	1080	1.38	-	*p*-Cymen-7-ol	1287	1.31	-
Isopentyl isovalerate	1100	0.8	1.3	Carvacrol	1298	0.7	-
endo-Fenchol	1105	-	0.81	Nerolic acid	1319	1.26	-
α-Campholene aldehyde	1117	-	0.33	*exo*-2-Hydroxycineole acetate	1336	1.09	0.16
trans-Pinocarveol	1131	1.28	7.79	Aromadendrene	1424	-	0.34
Camphor	1135	-	0.48	Spathulenol	1569	2.01	0.34
Pinocarvone	1153	-	3.18	Globulol	1575	1.65	0.27
Terpinen-4-ol	1176	8.05	1.68	γ-Eudesmol	1624	2.31	-
Cryptone	1182	5.53	2.60	β-Eudesmol	1651	1.62	0.44
α-Terpineol	1185	9.16	1.17	α-Eudesmol	1654	1.39	-
Myrtenal	1187	-	0.85	Total		97.53	99.64

[a]Compounds listed in order of their RI. [b]RI (retention index) measured relative to *n*-alkanes (C_6-C_{24}) on the non-polar DB-1 column. [c]%, Relative percentage obtained from peak area.

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In previouse research, the essential oils of five cultivated *Eucalyptus*, namly *E. intertexta, E. platyptus, E. leucoxylon, E. sargentii*, and *E. camaldulensis*, collected from Kashan area were analyzed [4–11]. Our literature surveys revealed that the essential oils of leaves and flowers of *Eucalyptus oleosa* from Kashan area have not been studied to date; therefore this article deals with the detailed quantity and composition of the oil analyzed by GC/MS (Table 1).

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