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COMPARATIVE FATTY ACID ANALYSIS OF *Telekia speciosa*

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Fatty acids in petroleum-ether extracts prepared from the flower, stem, and leaf of Telekia speciosa *(Schreb.) Baung. were studied by capillary gas chromatography-mass spectrometry (GC-MS). The flower and leaf extracts were found to contain similar fatty acids, namely palmitic, linoleic, and oleic acids, whereas the stem extract contained only caproic acid.*

Key words: *Telekia speciosa,* Asteraceae, *Buphthalmum,* fatty acid, GC-MS.

Telekia speciosa (Schreb.) Baung. (syn. *Buphthalmum speciosum*), a member of the Asteraceae family, is widely distributed in Europe and the Balkan peninsula. In Anatolia peninsula, this genus is represented only by *T. speciosa* growing at the northeast part [1]. To date, little phytochemical work has been performed on *T. speciosa*, known as "yellow oxeye" in English [2–4].

On the other hand, fatty acids, particularly essential fatty acids (EFAs), are of vital significance for human beings. Since EFAs are not synthesized by the body itself, their dietary consumption through certain plants and various oils (evening primrose oil, borage oil, etc.) are a must [5, 6]. In our search to find new sources of EFAs [7-12], we have investigated the petroleum-ether extracts of the flower, leaf, and stem of *T. speciosa* by capillary GC-MS. Through the methylation of the extracts according to Morrison's method [13], fatty acids were converted to their methyl derivatives. The methyl esters of fatty acids were dissolved in CH_2Cl_2 (Merck) and injected into the GC-MS apparatus.

The fatty acids were identified by comparison of their retention times with those of standards and by using the Wiley database search. The injections for each extract were triplicated, and relative percentages are given in Table 1. According to the results obtained by GC-MS, the flower, leaf, and stem extracts of the plant differed in terms of fatty acid content and their percentages (Table 1). The flower and leaf extracts showed similar fatty acid profiles, containing palmitic acid (hexadecanoic acid, C16:0) as a saturated fatty acid as well as linoleic acid (*cis*-9,12-octadecadienoic acid, C18:2) and oleic acid (*cis*-9-octadecenoic acid, C18:1) as the unsaturated fatty acids. In addition, the leaf extract also contained arachidic acid (eicosanoic acid, C20:0) and the flower extract possessed the peak of heneicosanoic acid (C21:0). Moreover, the linoleic acid percentage (67.140±0.08%) in the flower extract was found to be approximately two times richer than that of the leaf extract (37.126±1.33%). However, the leaf extract was richer in palmitic acid than the flower extract. As to the stem extract, it only had one saturated fatty acid, caproic acid (hexanoic acid, C6:0), 11.427±0.95%) and no unsaturated fatty acid at all.

In conclusion, these results suggest that flower and leaf extracts of *T. speciosa* could be considered new alternative sources of fatty acids, especially linoleic acid, which plays a critical role in the onset of chronic and degenerative diseases including circulatory disorders, arthritis cancer, and inflammatory disorders [14, 15]. To the best of our knowledge, this is the first study on the fatty acid content of *Telekia speciosa*.

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TABLE 1. Fatty Acids Detected in the Flower, Leaf and Stem Extracts of *Telekia speciosa*

Fatty acids	Retention times (Rt, min)	Relative percentages of the fatty acids detected in petroleum-ether extracts of *Telekia speciosa*		
		flower	leaf	stem
Caproic	30.84	-	-	11.427±0.95
Palmitic	30.86	17.193±0.41	20.340±1.33	-
Linoleic	34.21	67.140±0.08	37.126±1.33	-
Oleic	34.32	10.584±0.55	25.923±0.86	-
Heneicosanoic	34.87	3.280±0.32	-	-
Arachidic	34.88	-	6.540±0.62	-

EXPERIMENTAL

Dried plant materials (flower, leaf, and stem) were extracted separately with petroleum-ether at room temperature and concentrated under vacuum to dryness. The extracts were weighed accurately and methylated with boron trifluoride (BF_3)-methanol complex reagent (20%, Sigma Co.) Capillary GC-MS analysis was performed on a Hewlett Packard HP 6890 series equipped with a capillary column of HP-5MS (5% phenyl methyl siloxane, model No. HP 190915-433, 30.1 mm × 250 mm × 0.25 mm). The experiment was developed under the following conditions. Carrier gas helium (1 ml/min), flow rate 0.5 ml/min, detector temperature 250°C, split ratio 100:1, split flow 50 ml/min, injection volume 0.2 ml, pressure 9.7 psi, average velocity 36 cm/s, injection temperature 280°C, run time 38 min, initial temperature 80°C, hold time 5 min, ramp 1 5°C/min at 220°C for 5 min.

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