TYPE COMPOSITION OF TRIGLYCERIDE SEED OILS. III. TRIGLYCERIDES FROM CERTAIN PLANTS OF THE RANUNCULACEAE FAMILY

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Quantitative determination of triglycerides from plant oils using reversed-phase HPLC [1] is an alternative to the usual method of converting the oil components to the methyl esters with subsequent GC analysis. We used the same conditions in our research that were used previously [2].

Table 1 presents results for seed oils from plants collected in Belgorod region in 2003 (*Aquilegia hybrida* hort., *Delphinium consolida* L., *Delphinium* sp., *Ranunculus acris* L., *Clematis integrifolia* L., *Nigella sativa* L.) and acquired in commerce (*Adonis aestivalis* L., *Trollius chinensis* L., *Pulsatilla vulgaris* Mill., *Helleborus* sp.). Triglycerides from the majority of plants are formed mainly from α-linolenic, linoleic, and oleic acids (from unsaturated acids). However, trienoic acids of seed oil from *Clematis* contain only γ-linolenic (11.0 ± 2.0 mol %); in oil from *Aquilegia*, ranunculenic (57.9 ± 2.0 mol %). The ratio of acid increments in *Aquilegia* oil is so favorable that "problem" triglycerides are practically not seen in the chromatogram. Oils from *Delphinium* seeds are clearly distinguished by the presence of triglycerides formed from *cis*-11-eicosenoic acid (**1**) (10-20 mol %), which are well separated from other triglycerides. The chromatogram of seed oil from *N. sativa* shows triglycerides formed from *cis*-11,*cis*-14-eicosadienoic acid (**2**) (3.5 ± 0.5 mol %). Our data agree with those in the literature [3, 4]. However, owing to the approximately equal increments corresponding to transitions from linoleic acid to **2** and oleic acid to **1**, it is practically impossible to determine separately triglycerides formed from **2** and **1** (except pure triglyceride L_2**2**). The fatty-acid composition should be established by traditional methods for reliability.

TABLE 1. Triglycerides from Seed Oils of Certain Ranunculaceae Plants

Acid radical	*Adonis vernalis* L.	*Trollius chinensis* L.	*Pulsatilla vulgaris* Mill.	*Clematis integrifolia* L.**	*Helleborus* sp.	*Ranunculus acris* L.	*Delphinium* sp.	*Delfinium consolida* L.	*Nigella sativa* L.	*Aquilegia hybrida* hort***
Ot_3	0	0	0	0	11.7	15.6	0	0	0	2.9
Ot_2L	0	2	1.2	1.8	13	23.8	0	0.3	0	35.6
OtL_2+Ot_2O	0.8	8.6	1.2	12.3	13.9	20.9	1.8	1.0	0.4	10.6
		7:1*	1:1*	40:1*	2:1*	2:3*	9:1*	9:1*	20:1*	7.0
Ot_2P	0	0.4	0.6	0.3	7.8	3.8	0.1	0.1	0	21.0
Ot_3+OtLO	45.3	47.1	46.5	30.5	15.3	12.1	11.4	16.2	8.6	0
	150:1	15:1	90:1	5:1	1:9	1:2:5	30:1	30:1	80:1	5.1
OtLP+Ot_2S	0.3	1.6	0.9	6.2	9.8	7.6	0.4	0.2	0.1	5.5
										5.2
Ot_2 **2**							0	0	2.8	0
Ot_2O	12	21.7	20	14	8.7	3.6	19	7.2	13	0

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TABLE 1. (Continued)

Acid radical	*Adonis vernalis* L.	*Trollius chinensis* L.	*Pulsatilla vulgaris* Mill.	*Clematis integrifolia* L.**	*Helleborus* sp.	*Ranunculus acris* L.	*Delphinium* sp.	*Delfinium consolida* L.	*Nigella sativa* L.	*Aquilegia hybrida* hort***
OtO_2+Ot_2P+ OtLS+OtOP	15.6	8.90	15	15.9	9.0	8.1	2.5	1.1	11.0	1.8 0 1.6
$Ot\mathbf{2}_2$							0	0	1	1.0 0
$OtO\mathbf{2}$+$Ot_2\mathbf{1}$					2.5		6.4	1.9	3.0 ?	 0
OtO_2	4.6	5.4	6.3	5.3	0.2	2.1	22	15	13	0.6
Ot_2S+OtOP+ OtOS	10.7	4.4	6.4	9.8	4.1	2.1	3.7	3.9	11.2	0 0.6 0.7
OtP_2	0.9		0	0	1		0	0	0	0
$O_2\mathbf{2}$							0	0	2.1	0
$OtO\mathbf{1}$					1.2		10	8.7		0
O_3	0		0.8	0.8	0		10	14	7.1	0
OtOS+O_2P	0	0	1.4	3.1	1.6	0	2.7	4.1	7.0	0 0
$O_2\mathbf{1}$							5.1	7.5		0
$Ot\mathbf{1}_2$							0.6	9		0
$O\mathbf{1}_2$							1.4	6.7		0
$\mathbf{1}_2$							0	1.5		0
Res.	0	0	0	0	0	0	1.8	1.5	1.2	0.8

*Ratios of amounts of pure triglycerides in problem pairs were obtained in eluent containing 25 vol % CH_3CN in $(CH_3)_2CO$. Acid radicals: Ot, octadecatrienoic (*cis*-9,*cis*-12,*cis*-15, ***cis*-6,*cis*-9,*cis*-12, ****trans*-5,*cis*-9,*cis*-12); L, linoleic; O, oleic; P, palmitic; S, stearic; **1**, *cis*-11-eicosenoic; **2**, *cis*-11,*cis*-14-eicosadienoic.

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