Fatty Acid Composition of Morning Glory Seed Oil

RECENT INVESTIGATIONS (1) carried out in our laboratories on the alkaloids of morning glory seed (*Convolvulaceae*) showed that lipid values were relatively high in samples which had a high content of lysergic acid-alkaloids. This paper reports the fatty acid composition of 17 horticultural varieties of morning glory seed oil. Morning glory seeds were obtained from commercial sources and include American, African and European varieties (1).

Seeds were ground to pass a 30 mesh sieve and extracted with petroleum ether (bp 30–60C) in a Soxhlet apparatus for 4 hr. The oils were transesterified with HCl-Methanol and the fatty acid composition was determined by gas chromatography. A Perkin-Elmer model 800 dual column gas chromatograph equipped with hydrogen flame detector was used. Six-foot 1/8 in. stainless steel columns were packed with 6% butane-diol succinate on Chromosorb W and programmed from 120C to 190C at 4C per minute.

The samples used in this study belonged to the genera *Ipomoea, Convolvulus* and *Rivea*. The fatty acid distribution is presented in Table I. The oils contain predominantly C18 unsaturated acids (64–70%) of which linoleic acid constitutes a major part. Palmitic acid is the major saturated acid (14.6–26.3%). It was noted that the linolenic and stearic acid contents of *Ipomoea violacea* were higher than in all other species, while the short chain fatty acids (C 8:0–C 12:0) occurred in seeds of species which do not produce any significant amounts of alkaloids (1). Studies on the significance of these qualitative differences in relation to the chemotaxonomy and the alkaloidal content are in progress and will be reported later.

Earlier reports (2,3) on seven samples of *Convolvulaceae* from three genera indicate that the seed oils contain 11–30% stearic, 24–60% oleic, 15–52% linoleic and up to 11% linolenic acid.

Ergot, the dried sclerotia of the fungus *Claviceps purpurea* contains alkaloids similar to those found in some Ipomoea seeds (1,6). Bharucha and Gunstone (4) and Thiele (5) reported significant amounts of hydroxy-fatty acids (20–30%) in ergot oil. Our analysis based on retention times does not indicate any appreciable quantities of hydroxy acids in the seed oil.

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TABLE I

Fatty Acid Composition of Seed Oils (% by weight)

Fatty acid in seed	*Ipomoea Nil* (L.) Roth				*Ipomoea violacea* L.					*Convolvulus tricolor* L.		*Ipomoea alba* L.	*Ipomoea purpurea* (L.) Roth				*Rivea corymbosa* (L.) Hall. f.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	5.7[a]	11.3	12.5	12.9	16.3	15.2	15.6	15.2	14.7	11.6	6.1	11.1	10.8	13.4	8.9	13.2	8.0
8:0	2.2										0.4					1.5	
10:0	1.3										0.8					0.8	
12:0	3.0										1.2					0.9	
Unknown	t	t					0.1									1.1	
14:0	1.9	t	0.2	0.1	0.1	t	0.2	0.1	t	0.4	1.8	0.3	t	t	0.1	1.9	0.1
15:0	0.4						t				0.3					0.3	
16:0	23.2	20.4	18.4	14.6	23.7	19.9	21.0	18.3	18.3	23.8	18.4	26.3	24.7	20.7	22.0	17.8	20.4
16:1	0.4	0.7	0.2	1.0	0.4	0.6		1.8	0.5	0.5	0.4		0.1	0.9	0.3	0.9	0.4
																0.1	
17:0		t	0.1		0.2	0.1	0.2	0.1	t	t	0.3	0.2	0.1	0.1	0.1	0.6	0.1
Unknown											0.1						
18:0	1.5	8.9	7.4	6.8	9.6	11.5	9.2	9.2	10.5	8.0	2.0	6.4	7.4	8.4	8.3	2.0	8.0
18:1	13.5	20.2	24.1	22.7	16.0	13.2	13.2	13.4	15.9	16.8	20.1	17.0	15.1	18.3	17.3	17.9	13.5
18:2	49.2	42.3	43.2	49.5	42.2	48.9	48.4	45.5	47.3	46.8	48.7	40.0	50.0	47.2	47.7	48.4	50.4
18:3	1.7	4.7	3.3	2.8	4.9	7.9	5.7	7.8	6.0	1.3	1.2	6.7	0.9	2.0	1.5	1.7	2.3
19:0	0.6	0.4	0.7	0.4	0.7	0.5	0.4	1.3	0.2	1.1	2.1	0.7	0.5	0.7	0.5	1.5	1.6
20:0	0.2	1.3	0.7	1.1	0.6	1.1	0.5	1.3	1.2	0.8	1.4	1.7	1.0	0.7	1.0	1.5	1.6
20:1					0.5					0.1			0.2			0.2	
22:0	0.6	0.4	0.4	0.2	0.1	0.8	1.2	0.4	0.1	0.3	0.7	0.7		0.4	0.3	0.7	1.7
20:4				0.6	0.8		0.1										
24:0		0.5	1.4			0.4	t	0.8	0.1		0.2			0.6	0.8		1.0

1. Royal Marine; 2. Darling; 3. Scarlet O'Hara; 4. Candy Pink; 5. Major (+ I. purpurea); 6. Heavenly Blue; 7. Flying Saucers 8. Wedding Bells; 9. Pearly Gates; 10. Everblooming; 11. Fine Mix; 12. Moonflower; 13. Crimson Rambler; 14. Tall Choice Mix; 15. Tall Mix; 16. Double Rose Marie; 17. Ololuqui.

t—Trace.

[a] Figures under sample numbers represent % fat in seed.