A36 Varietal Difference of Lignan Glycoside Content in Sesame

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참깨 리그난 배당체 함량의 품종간 차이

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☐ OBJECTIVES

○ The primary objectives of sesame breeding are both to increase the contents of seed oil and minor lignan components in order to improve the quality of the seed and the oil.

○ The goal of this study was to investigate the variation of minor components in sesame germplasm, and the relationship between the oil content and minor components in order to improve the quality to the sesame oil.

☐ MATERIALS AND METHODS

○ Samples : 224 Sesame Varieties ,

These varieties, all being the dehiscent type were obtained from the gene bank of RDA, Korea. Those from the latter include varieties that had originated in Korea, China, Mexico, India and Venejuela.

○ Extraction, Separation and Identification

Sesame seed (250g) was ground and defatted with hexane and extracted with 80% ethanol. The ethanol extract was dissolved in 50 mM acetate buffer pH 5.4 and hydrolyzed overnight with β-glucosidase. The reaction mixture was extracted with ethyl acetate and the extract purified by preparative HPLC to give six compounds (compounds 1-6). Compound 7 was isolated from the 80% ethanol extract of sesame seed using a XAD-2 column and preparative HPLC.

A Varian Model VIST 5000 LC equipped with a stainless - steel column (20mm i.d. X 250mm) packed with Develosil ODS (Nomura Chemical Co., Ltd., Japan) was used. The chromatography was performed in a mobile phase (methanol : water = 2 : 3) at a flow rate of 4.0 mL/min. Their purities were confirmed by mass spectrometry and proton nuclear magnetic resonsnce (H-NMR)

☐ RESULTS AND DISCUSSION

○ The most abundant lignan glucosides in sesame seed were sesaminol triglucoside. The content of sesaminol triglucoside in 100g seed ranged from 14.1 to 91.3 mg with an average value of 68.4mg ; that of sesaminol diglucoside from 8.2 to 18.3mg with an average value of 11.6mg ; and that of sesaminol monoglucoside from 5.4 to 19.5mg with an average value of 8.3mg.

○ The mean content of sesaminol glucoside was 88.3mg in 100g of sesame seeds. Also, the sesamolinol content in 100g sesame seed ranged from 5.6 to 28.5mg, the average being 19.8mg. Within varieties, sesaminol glucoside contents of black sesame seed were greater than those of white sesame seed. Higher correlation (ranged from 0.695 to 0.917) was observed between the sesaminol contents and the amounts of sesamolinol in these cultivars.

Table 2. The Contents of Sesaminol Glucosides and Sesamolinol from Sesame Seed by Hydrolysis of Cellulase and β-Glucosidase (mg/100g Sesame Seed)

	Sesaminol[a]				Sesamolinol
	Tri	Di	Mono	Total	
Mean	68.4	11.6	8.3	88.3	19.8
Range	14.1-91.3	8.2-18.3	5.4-19.5	32.5-134.5	5.6-28.5
SD[b]	11.4	4.2	2.8	4.4	9.6
CVc	39.3	16.5	9.3	30.4	31.1

[a]Tri: sesaminol triglucoside; Di: sesaminol diglucoside; Mono: sesaminol glucoside
[b]standard deviation; [c]coefficient of variation

Table 4. Simple Correlation among the Contents of Lignan Glucosides and Seed Characteristics of *Sesamum indicum* L.

Correlation Between	Calculated r		
	White(10)[a]	Brown(5)	Black(10)
Seed weight and oil content	-0.578[b]	0.124	0.684[b]
Oil content and sesaminol content	0.613[b]	0.251	0.648[b]
Oil content and sesamolinol content	-0.123	-0.254	-0.397
Oil content and sesamin content	0.594[b]	-0.197	0.385
Oil content and sesamolin content	-1.109	-0.258	0.135
Sesamin content and sesamolin content	0.615[b]	0.894[c]	0.869[c]
Sesamin content and sesaminol content	-0.432	-0.382	-0.149
Sesamin content and sesamolinol content	0.297	0.249	-0.138
Sesamolin content and sesaminol content	0.438	0.514	0.364
Sesamolin content and sesamolinol content	0.297	-0.147	-0.259
Sesaminol content and sesamolinol content	0.735[b]	0.695[b]	0.917[c]

[a]number of sample analyzed given in parentheses
[b]significant at the 5% level / [c]signigicant at the 1% level

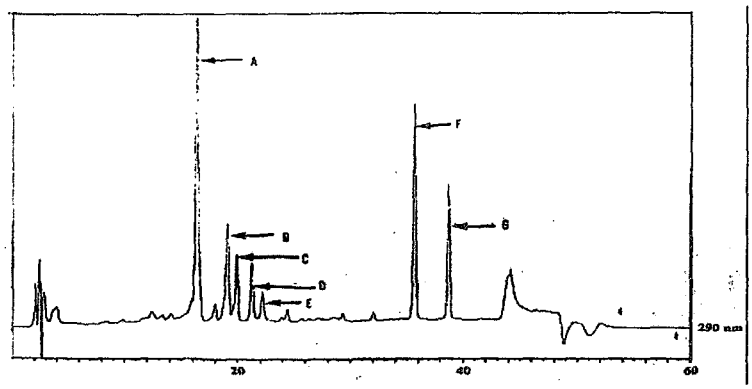

Fig1. High performance liquid chromatogram of sesaminol glucosides, sesamolinol, sesamin and sesamolin extracted from sesame seed of PI 200100 sesame variety
Peak A, sesaminol triglucoside; B, Sesaminol diglucoside; C, sesaminol monoglucoside; D, Sesamolinol; E, nonidentification; F, sesamin; G, sesamolin.