C43 Test of Antioxidative Activity and Isoflavones Analysis on Native Soybean (*Glycine max* (L.) Merrill)

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재래콩에서의 항산화 활성 검정과 Isoflavones 분석

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Objectives

To test antioxidative activity and analyze isoflavones on native soybean cultivated in 1998 and 1999.

Materials and Methods

- Seven native soybean cultivated in 1998 and 1999.

- Test of Antioxidative Activity
  SOD (superoxide dismutase)
  DPPH (1,1-diphenyl-2-picrylhydrazyl)
  TBA (thiobarbituric acid)

- Isoflavones Analysis
  Solvent A : 0.1% glacial acetic acid in distilled water
  Solvent B : 0.1% glacial acetic acid in acetonitrile
  Mobile phase : solvent B was increased from 15% to 35% over 50 min and then held at 35% for 10 min
  Colum : YMC-AM 303 (ODS 4.5×250 mm)
  UV detector : 254 nm

Results and Discussion

- In SOD, soybean of Kangjin and Seochun were 7.56 and 36.97%, in 1998 and 1999, respcectively. In DPPH, soybean of Changsung were 40.0 and 59.08%, in 1998 and 1999, respcectively. In TBA, soybean of Kangjin and Kwangju were 66.13 and 44.45%, in 1998 and 1999, respcectively.
- In isoflavone anlysis, soybean of Kwangju and Yesan were 12.96 and 16.34 mg/g, in 1998 and 1999, respectively.

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Table 1. The antioxidative activities(%) of native soybean cultivated in 1998 and 1999.

Collected location	1998			1999			LSD		
	SOD	DPPH	TBA	SOD	DPPH	TBA	SOD	DPPH	TBA
Haenam	61.37	28.86	65.34	27.77	52.07	26.88	5.80	6.99	16.72
Kwangju	57.02	16.10	51.41	36.91	21.15	44.45	14.5	10.98	8.66
Kongiu	0.00	35.87	51.11	34.10	49.01	37.23	7.78	8.92	13.18
Yesan	56.73	12.96	54.63	7.43	19.02	30.85	6.38	2.67	7.74
Seochun	66.42	36.04	61.80	36.97	50.54	29.63	9.78	8.46	5.44
Kangjin	70.56	37.69	66.13	34.76	50.60	29.25	9.10	8.53	9.89
Changsung	69.90	40.02	25.66	26.47	59.08	33.45	17.60	5.14	14.65
LSD(0.05)	9.57	4.75	5.68	7.11	7.09	11.24			

Table 2. Isoflavone contents(mg/g) of native soybean cultivated in 1998 and 1999.

Collected locations	1998				1999				LSD			
	Din†	Gin↓	Glein#	Total	Din	Gin	Glein	Total	Din	Gin	Glein	Total
Haenam	2.79	4.70	0.61	8.10	2.20	8.92	1.60	12.72	0.25	0.36	0.42	0.83
Kwangju	4.46	8.37	0.14	12.96	2.77	10.04	0.23	13.03	0.18	0.58	0.09	0.76
Kongiu	2.05	5.65	0.07	7.77	2.68	8.86	0.21	11.75	0.14	1.36	0.01	1.23
Yesan	3.53	4.74	0.10	8.37	3.41	12.74	0.18	16.34	0.30	0.43	0.11	0.43
Seochun	3.13	6.63	0.17	9.92	2.61	10.64	0.25	13.49	0.16	0.85	0.04	1.01
Kangjin	3.36	6.70	0.19	10.25	3.51	11.80	0.18	15.49	0.05	0.11	0.20	0.18
Changsung	4.69	8.43	1.68	14.80	4.69	10.45	1.01	16.14	0.26	0.35	0.04	0.64
LSD(0.05)	0.14	0.32	0.20	0.54	0.18	0.68	0.04	0.69				

† ; Daidzin and Daidzein, ↓ ; Geinstin and Genistein, # ; Glycitein

Table 3. Correlation coefficient among isoflavone contens and antioxidative activities.

1998 \ 1999	Din†	Gin↓	Glein#	Total isofl.	SOD	DPPH	TBA
Din		0.4517*	-0.0276	0.7959**	-0.2953	0.1719	-0.0089
Gin	0.7569**		-0.4693*	0.8476**	-0.4963*	-0.3973	-0.1248
Glein	0.5289*	0.4296		-0.0795	-0.0921	0.4636*	-0.3035
Total isofl.	0.9014**	0.9372**	0.6533		-0.5507**	-0.0953	-0.1938
SOD	0.6337**	0.2991	0.3608	0.4720*		0.3767	0.2129
DPPH	-0.2116	0.2178	0.4259	0.1481	-0.0199		-0.3012
TBA	-0.5713**	-0.5719**	-0.7214**	-0.6889	0.0499	-0.1420	

† ; Daidzin and Daidzein, ↓ ; Geinstin and Genistein, # ; Glycitein