C4 Test of Antioxidative Activity on Rice Varieties

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벼 (*Oryza sativa* L.) 품종의 항산화 활성검정

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OBJECTIVES

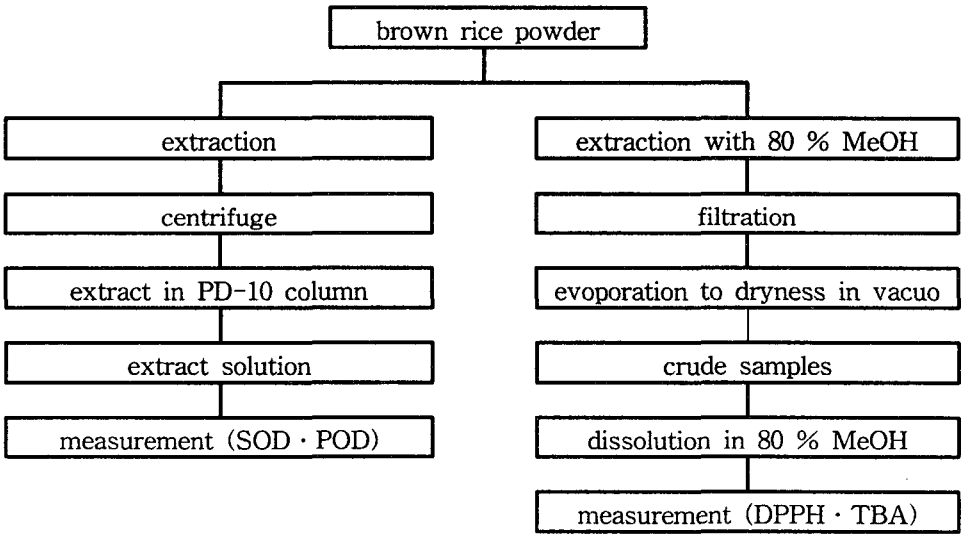
To test antioxidative activity by the four methods of antioxidative activity and germination test on traditional and foreign rice varieties.

MATERIALS AND METHODS

MATERIALS: traditional rice varieties (fifty-eight) and foreign rice varieties (twenty-nine).

METHODS

- **Antioxidative Activity Test**



- **Germination Speed Index**: $GSI=5\times D_1+4\times D_2+3\times D_3+2\times D_4+1\times D_5$

RESULT AND DISCUSSION

- B1293B-PN-24-2-1, IET 60 and AUS 196 showed high inhibitiory activity in antioxidative test and Che-shau-nan-bir represented high GSI on germination test (Table 1 and Fig. 1). In correlation coefficient among antioxidative activity characters, TBA inhibition had significantly negative correlation between GSI ($r=-0.2345^{**}$) and POD ($r=-0.2125^{**}$) respectively (Table 2).

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Table 1. Antioxidative activity and germination speed index of foreign rice varieties.

Varieties	Antioxidative Activity				GSI	Varieties	Antioxidative Activity				GSI
	SOD	POD	DPPH	TBA			SOD	POD	DPPH	TBA	
	---- Inhibition (%) ----						---- Inhibition (%) ----				
AC 1423	1.36	6.17	86.28	53.10	181.7	Mon-z-wuan	6.07	6.72	54.54	37.55	193.7
AUS 196	6.07	13.13	87.38	57.87	162.3	Philippine 2	2.05	22.90	86.61	40.82	169.7
B1293B-PN-24-2-1	18.98	3.96	31.48	54.48	185.0	Red khosha cerma	3.43	6.75	56.10	56.16	189.7
Che-shau-nan-bir	5.46	8.10	56.40	44.75	196.7	San chiao tswen	4.86	21.31	85.99	51.62	165.3
Gin shun	15.23	3.23	9.81	36.18	187.0	Shuang chiang-30-21	5.33	3.53	53.04	53.95	193.0
GPNO 12856	16.43	5.32	28.17	36.50	179.7	Taichung native i	6.34	19.60	55.88	41.85	175.7
GPNO 3005	15.58	16.07	63.19	46.31	194.0	Tsai yuan chon	3.90	19.18	60.77	49.06	194.7
IARI 10560	10.18	16.75	87.20	44.30	179.0	Woo co chin yu	13.62	20.89	52.31	51.33	191.3
IET 60	13.60	35.46	54.90	37.13	170.3						
IR 644-1-63-1-1	11.47	18.05	37.40	51.05	178.0	CV (%)	33.71	28.42	8.09	13.06	10.8
Mamoriaka	8.75	23.67	30.19	35.19	186.7	LSD (0.05)	4.70	6.37	7.38	9.87	31.6

GSI ; Germination Speed Index

Table 2. Correlation coefficient among antioxidative activity characters and chroma values of traditional rice varieties.

	SOD	POD	DPPH	TBA	GSI	L	a
POD	0.1289	-					
DPPH	0.0366	0.0117	-				
TBA	-0.0967	**-0.2125****	-0.1242	-			
GSI	0.0473	0.0626	-0.1087	**-0.2345****	-		
L	-0.0648	-0.1416	-0.0835	**0.1639***	0.0040	-	
a	0.1340	-0.0375	**0.2952****	-0.1358	-0.0632	**-0.3112****	-
b	0.1249	**-0.1910***	**-0.1937***	**0.1558***	0.1010	**0.5606****	**-0.3176****

L; lightness, a; yellowness, b; redness

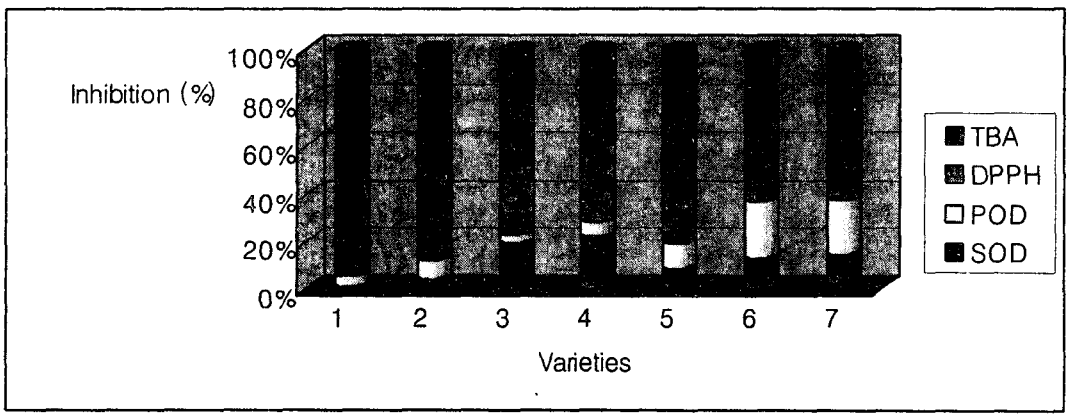

Fig. 1. Distribution of antioxidative activity in seven foreign rice varieties.
(1; AC 1432, 2; AUS 196, 3; B1293B-PN-24-2-1, 4; GPNO 12856, 5; IARI 10560, 6; IET 60, *7; MAMORIAKA)