

D1. Test of Antioxidative Activity on Rice Varieties by Nitrogen and Piggery Manure Application Level

Konkuk Univ. : I.M. Chung* · K.H. Kim · J.K. Ahn · J.O. Lee · S.J. Lee · S.H. Kim

질소시비 및 돈분발효처리에 대한 벼 (*Oryza sativa* L.)의 항산화 활성검정

건국대학교 : 정일만* · 김광호 · 안종국 · 이진옥 · 이선주 · 김승현

OBJECTIVES

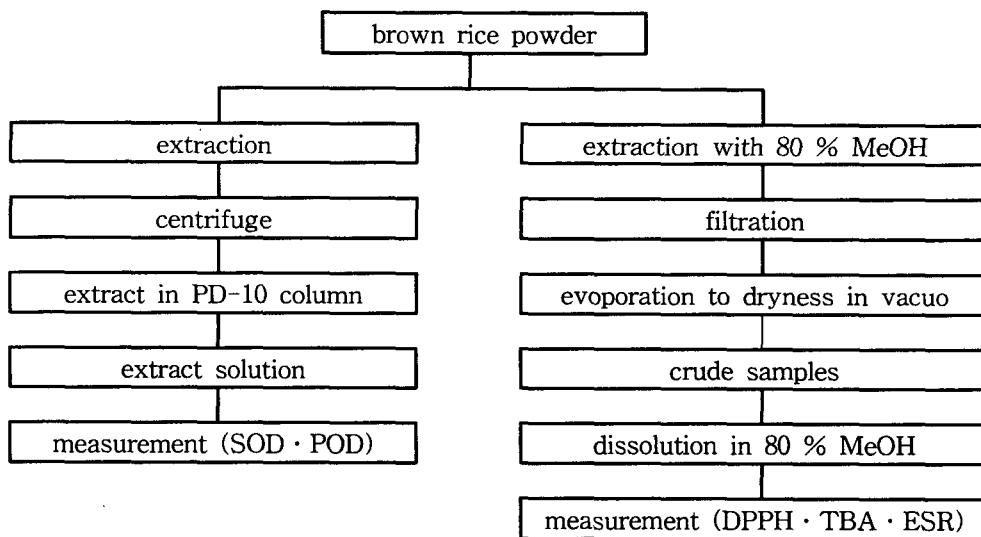
To test antioxidative activity with five like SOD, POD, DPPH, TBA, ESR methods at N, and piggery manure and nitrogen mixture application levels on high antioxidative activity rice varieties.

MATERIALS AND METHODS

MATERIALS: Daeanbyeo and seventeen rice varieties including Hwei Ju showed high antioxidative activity was studied. Nitrogen application level was 150%, 100%, 50%, and piggery manure application level was 0.5ton/10a, 0.5ton/10a plus N 30%, 0.5ton/10a plus N 60%, 0.5ton/10a plus N 90%, 1.0./10a, 1.0ton/10a plus N 30%, 1.0ton/10a plus N 60%, 1.0ton/10a plus N 90%,

METHODS

- Antioxidative Activity Test



RESULT AND DISCUSSION

The antioxidative activity exhibited 50% > 100% > 150% at nitrogen application level. Siga-Chata-Mochi indicated the highest activity in DPPH method showed 59%, 36% and 33% at 50%, 100% and 150% nitrogen application level. SOD, POD, DPPH and TBA activity in Daeanbyeo exhibited 16%, 89%, 55%, 45% and 13%, 86% 60%, 45% in 0.5ton/10a and 0.5ton/10a plus N 30% application, respectively. These results were similar to those of ESR data.

Table 1. SOD activity of high antioxidative rice varieties at N application levels

Varieties	Treatment	50 %	100 %	150 %	LSD (0.05)
----- Activity (%) -----					
Hwei Ju		10.3	12.5	7.7	5.8
Pungujo		8.1	9.4	10.8	5.2
Hongcheongdo		7.1	9.2	7.1	5.4
Joseokjo		4.5	3.5	4.3	2.6
CV (%)		38.0	46.4	47.6	
LSD (0.05)		4.1	4.9	4.9	

Table 2. DPPH inhibitory percentage of high antioxidative rice varieties at N application levels

Varieties	Treatment	50 %	100 %	150 %	LSD (0.05)
----- Activity (%) -----					
Hwei Ju		82.0	81.7	76.3	4.3
Pungujo		56.3	56.0	60.1	7.8
Hongcheongdo		54.6	54.7	63.9	7.5
Joseokjo		53.5	51.5	70.7	11.9
CV (%)		11.5	8.2	7.8	
LSD (0.05)		8.2	6.0	5.8	

Table 3. TBA inhibitory percentage of high antioxidative rice varieties at N application levels

Varieties	Treatment	50 %	100 %	150 %	LSD (0.05)
----- Activity (%) -----					
Hwei Ju		54.7	42.1	24.4	14.4
Pungujo		55.4	38.3	30.8	11.9
Hongcheongdo		58.8	37.9	29.9	20.0
Joseokjo		42.3	16.8	27.8	18.5
CV (%)		22.3	30.5	47.8	
LSD (0.05)		12.8	12.8	13.5	

Table 4. Antioxidative activities as pig waste fertility application treatments

Treatment	SOD	POD	DPPH	TBA
--- Activity (%) --- --- Inhibition (%) ---				
Standard application *	6.7	67.9	54.7	43.5
None	14.1	86.6	64.4	31.7
PM** 0.5ton/10a+N 60%	16.7	45.7	54.1	47.1
PM 1.0ton/10a	7.9	59.3	50.2	48.8
PM 1.0ton/10a+N 60%	8.8	75.6	61.4	39.8
CV (%)	83.4	11.6	5.5	18.0
LSD (0.05)	15.5	13.2	5.4	11.8

* : N-P₂O₅-K₂O=11-4.5-5.7 kg/10a + rice residue 1ton/10a, ** : piggery manure