

## **Phytic Acid and Mineral Composition of Rice Cultivars Grown at Southern Part of Korea**

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### **Objectives**

- ◆ To elucidate the contents of phytic acid and minerals in rice grown at the Southern part of Korea.
- ◆ To study simple correlation coefficients, determined in all Combinations among phytic acid, minerals, protein, and head rice.

### **Materials & Methods**

- ◆ Rice variety : Taebongbyeo , Odaebyeo, Hawyoungbyeo, Illpumbyeo, and Junambyeo.
- ◆ Sowing date(Transplanting date) : April 30(May 30).
- ◆ Analysis of phytic acid : Derived by combining and modifying of Haug & Lantzsch's method(1983).
- ◆ Analysis of minerals : Inductively coupled plasma-optical emission spectroscopy courtesy of Charles B.Boss and Kenneth J, Fredeen
- ◆ Rice analysis : classified into 4 types (Head rice, broken, chalky, damaged, colored) by using Foss Infratec applications.

### **Results**

- ◆ Brown rice contained phytic acid in the range of 61.4 to 82.5  $\mu\text{g/ml}$ (Av. $\pm$ S.E.,70.2  $\pm$  8 $\mu\text{g/ml}$ ). Although there were differences among rice varieties, Taebongbyeo and Odaebyeo showed higher content of phytic acid than the others.
- ◆ Significant correlations were observed between magnesium, phosphorus, protein, and head rice in rice kernel. In rice bran, Potassium was significantly and negatively correlated with phytic acid, iron, and phosphorus. One significant point was evident that phytic acid was significantly and positively related to phosphorus and protein in kernel and bran.
- ◆ Pericarp of Odaebyeo was thicker than that of Illpumbyeo and the shape of starch granules was no difference of the tow.

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Table 1. The contents of phytic acid and minerals in brown rice.

Variety	Phytic acid ( $\mu\text{g/ml}$ )	Ca ( $\text{mg/l}$ )	Fe ( $\text{mg/l}$ )	Mg ( $\text{mg/l}$ )	Zn ( $\text{mg/l}$ )	P ( $\text{mg/l}$ )	K ( $\text{mg/l}$ )
Taebong	81.2a	112.7b	27.6b	1217a	24.3a	2910a	2640bc
Odae	82.5a	96.5c	14.4b	1273c	17.3a	2985a	2355c
Hwayoung	62.4b	115.1ab	58.5b	1137b	16.4a	2447b	2805ab
ILLpum	63.7b	108.6bc	113.4a	1067c	17.0a	2535b	2755b
Junam	61.4b	123.9a	16.4b	1094bc	16.5a	2425b	2895a
Av. $\pm$ S.E.	70.2 $\pm$ 4.8	111.4 $\pm$ 4.5	46.1 $\pm$ 18.6	1157 $\pm$ 38.4	18.3 $\pm$ 1.5	2660 $\pm$ 119.2	2690 $\pm$ 93.3
C.V.(%)	15.2	9.0	90.3	7.4	18.4	10.0	7.8

Table 2. The contents of protein, amylose and head rice in milled rice.

Variety	Protein (%)	Amylose (%)	Head rice (%)	Broken (%)	Chalky (%)	Damaged (%)	Colored (%)
Taebong	7.5a	18.0a	72.9b	4.7a	21.5a	0.8b	0.0b
Odae	7.7a	17.4a	71.9b	5.6a	20.5a	1.6a	0.4a
Hwayoung	7.2b	18.5a	91.8a	2.1b	4.1b	1.4a	0.5a
ILLpum	7.1b	17.0a	93.3a	2.1b	3.4b	1.1ab	0.1b
Junam	7.1b	18.1a	90.1a	4.8a	4.3b	0.6b	0.2b
Av. $\pm$ S.E.	7.3 $\pm$ 0.1	17.8 $\pm$ 0.3	84.0 $\pm$ 4.8	3.9 $\pm$ 0.7	10.8 $\pm$ 4.2	1.1 $\pm$ 0.1	0.2 $\pm$ 0.1
C.V.(%)	3.7	3.4	12.7	42.6	87.0	37.5	86.4

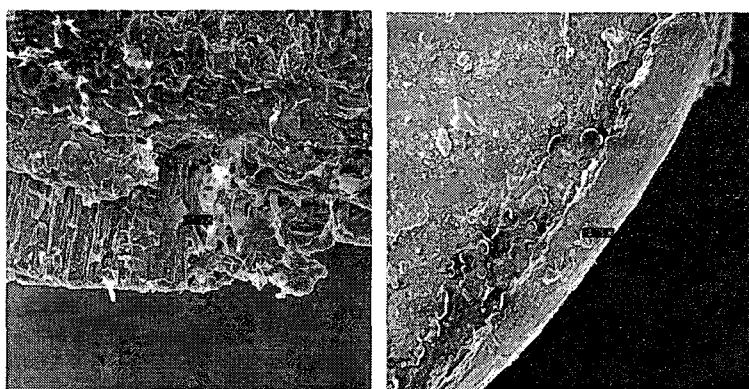


Fig. 1. Transverse section of the outer seed coat of brown rice, showing the contour of the exterior surface(bottom), aleurone layers(AL) and pericarp(PE).