

Total and Soluble mixed-linked(1,3),(1,4)- β -D-Glucan Content in Korean Barley

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Objectives

It is important to distinguish the two types of β -glucans and examine their ratios in various barley varieties, because of the very different physiological effects of soluble and insoluble dietary fiber. In this study, we analyzed the content of total and soluble β -glucan in various barley varieties and investigate the ratios of soluble β -glucan to total β -glucan.

Materials and Methods

○ Materials

- 27 naked barley and 25 covered barley varieties

○ Methods

- o Total and soluble β -glucan analysis : McCLEARY method(Megazyme kit)
- o Extract soluble β -glucan : 0.5g grind sample /5ml H₂O, 38°C, 2hr

Results

○ Extraction of soluble β -glucan according to extraction time increased rapidly in the first 0~0.5 hr and then slowly to 1.5 hr.

○ Total β -glucan in waxy line showed higher value than non-waxy and abraded grain had higher content than whole grain. Soluble β -glucan was higher in waxy line and it was higher in abraded grain of non-waxy. But in waxy line, it was lower in abraded grain than whole grain.

○ Total β -glucan content among examined 27 naked barley was the highest, 9.72 in No.25, Doowonchapssalbory. Range was 3.86~9.72. Soluble β -glucan ranged 2.36~5.56. Soluble % of total β -glucan ranged 48.3~72.12 %. Total β -glucan content among 25 covered barley was the highest, 7.39 in No.3, Seodunchal and range was 4.13~7.39. Soluble β -glucan ranged 2.68~5.20. Soluble % of total ranged 64.63~79.39 %.

○ The correlation coefficient between the total and soluble β -glucan in non-waxy and waxy was $r^2=0.859$, 0.817 respectively, and in covered and naked barley, the correlation coefficient was $r^2=0.941$, 0.871 respectively.

Table 1. Variation in content of total, insoluble, and soluble β -glucan(%) and in soluble β -glucan as percent of total β -glucan of whole and abraded barley varieties.

Division		Total	Soluble	Insoluble	Soluble, % of total
Olbori	Whole	5.37	3.62	1.75	67.36
	Abraded	5.86	3.63	2.23	61.90
Seodunchal	Whole	6.97	4.56	2.41	61.90
	Abraded	8.73	5.24	3.49	60.01
Saessal	Whole	5.45	3.33	2.12	61.09
	Abraded	5.76	2.75	3.01	47.69
Saechalssal	Whole	6.54	4.02	2.52	61.54
	Abraded	7.20	3.73	3.47	51.82
LSD(5%)		0.51**	ns	0.41*	

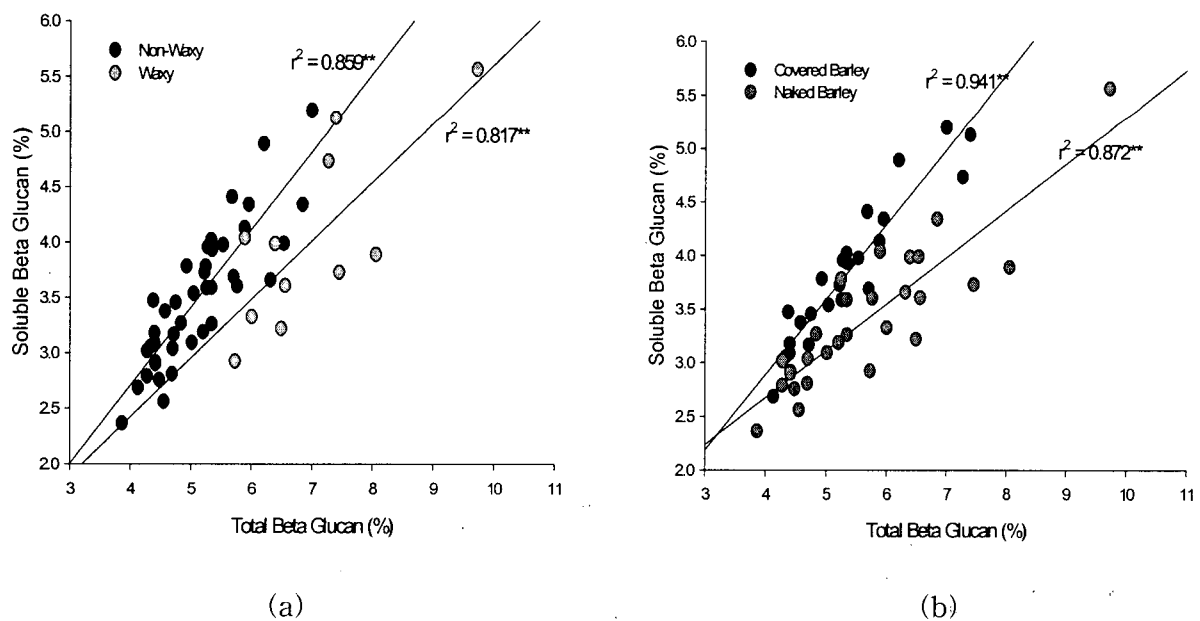


Fig. 2. Correlation of total β -glucan and soluble β -glucan (a) in non-waxy and waxy and (b) covered and naked barley