101. ISOZYME POLYMORPHISM 에 의한 우리나라 수도품종의 분류

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VARIETAL CLASSIFICATION OF KOREAN CULTIVATED RICE (*ORYZA SATIVA* L.) BASED ON ISOZYME POLYMORPHISM

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Enzyme variation detected by starch gel electrophoresis was used to investigate genetic structure of Korean rice varieties. Fifteen polymorphic loci coding for 8 enzymes were surveyed among 50 rice varieties recommended in 1987. The fifty Korean varieties analyzed showed ten different genotypes. Multivariate analysis of the data resulted in identificantion of main varietal groups, Indica and Japonica type (group I and group VI). All of the Indica type varieties showed positive phenol reaction in hulled grain, whereas most of the Japonica types showed negative except 7 varieties.

Table 1. Number of alleles surveyed among 50 Korean varieties.

Enzyme	Locus	No. of alleles
Catalase	Cat-1	2
Shikimate dehydrogenase	Sdh-1	2
Phosphoglucose isomerase	Pgi-1	2
	Pgi-2	2
Aminopeptidase	Amp-1	1
	Amp-2	2
	Amp-3	2
	Amp-4	1
Alcohol dehydrogenase	Adh-1	1
Esterase	Est-1	2*
	Est-2	3*
	Est-5	1
	Est-9	2
Isocitrate dehydrogenase	Icd-1	1
Acid phosphatase	Acp-1	2

* Including a silent allele.

Table 3. Phenol reaction of Korean cultivated rice varieties.

Degree	Varieties
++ (19)	Baegyang, Baegunchal, Shinhwaeg, Wonpoong, Jangseong, Gaya, Tongeoon, Hanpoong, Hangangchal, Tongju, Taebaek, Sameang, Seokwang, Pungsan, Chilseong, Nawyeong, Cheongcheong, Semjin, Honglima.
+ (3)	Shinseonchal, Daecheong, Yeongsan, Palgong, Yeongdeok.
0 (26)	Sobaek, Dobong, Bogkwang, Unbong, Seolak, Daeseong, Chisk, Hongbaek, Baegam, Daekyan, Kwanak, Cheoma, Hwaseong, Giho, Chucheong, Dongjin, Hwacheong, Odae, Songchoon, Bongkwang, Daechang, Namyang, Kwangyeong, Nagdong, Seonam, Palgum.

( ): Number of varieties.
++ : Dark; + : Slightly dark; 0: none.

Table 2. Ten groups with various allelic combinations observed for Korean varieties.

Group	CAT 1	SDH 1	PGI 1	PGI 2	AMP 3	AMP 4	AMP 2	AMP 1	AMP 1	EST 5	EST 9	EST 3	EST 2	ACP 1	ICD 1	Varieties
A	2	2	2	1	1	1	1	1	1	1	1	1	0	2	1	Sobaek, Bogkwang, Unbong, Seolak, Daeseong, Chisk, Hongbaek, Baegam, Daekyan, Kwanak, Cheoma, Hwaseong, Giho, Chucheong, Dongjin, Daecheong, Yeongsan, Odae, Songchoon, Palgong, Bongkwang, Daechang, Kwangyeong, Nagdong, Yeongdeok, Seonam, Semjin, Palgum (29)
B	2	2	2	2	1	1	1	1	1	1	1	1	2	2	1	Unbong (1)
C	2	1	2	1	1	1	1	1	1	1	1	1	0	2	1	Daecheong (1)
D	2	2	2	1	1	1	1	1	1	1	1	1	0	1	1	Namyang (1)
E	1	2	2	1	1	1	1	1	1	1	1	1	0	2	1	Honglima (1)
F	1	1	1	1	2	1	2	1	1	1	2	1	1	1	1	Baegyang, Baegunchal, Shinhwaeg, Wonpoong, Jangseong, Gaya, Tongeoon, Hanpoong, Hangangchal, Yongju (10)
G	1	1	1	1	2	1	2	1	1	1	2	0	1	1	1	Taebaek, Sangang (2)
H	1	2	1	1	2	1	2	1	1	1	2	1	1	1	1	Seokwang, Pungsan (2)
I	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	Chilseong, Nawyeong (2)
J	1	2	1	1	2	1	2	1	1	1	1	1	1	1	1	Cheongcheong (1)

( ): Number of variety.

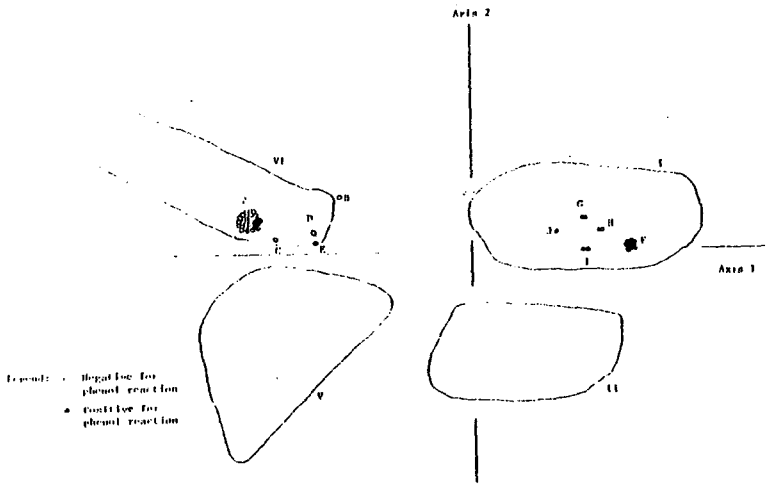

Figure 1. Distribution of 50 Korean rice varieties in varietal group through factor analysis of correspondence (FAC) based on isozyme variation at 15 loci.