GENETIC DIVERSITY ANALYSIS OF SOYBEAN GERMPLASM COLLECTION BASED ON CHARACTERIZATION AND DNA MARKERS

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Objectives

In general, to improve the genetic gain, breeders need the existing genetic diversity. Therefore, the objectives of this research was to evaluate genetic diversity of soybean local varieties collected in Korea, Viet Nam, China, and Japan; and also to study the genetic relationships based on morphological and agronomic traits. In addition, information technology was applied to analyse database.

Materials and Methods

One hundred and sixty soybean local varieties collected from different countries were sown in Suwon, 2003. Each variety was planted in a two-meter long row without replication. The spacing was 60 x 15cm. Two seeds were sown per hole. Twenty agronomic, morphological traits, yield and components of yield were recorded. The average from five representative plants of each variety random was used. Morphological traits were used for calculating genetic diversity indexes, and analyzing cluster. Besides, morphological traits were photographed by digital camera for analyzing pod shape.

Results

There is a wide variation in agronomic traits: maturity, days to flowering, pod number, especially the ratio between one-seeded + two-seeded pod and three-seeded pod (presented in Fig.1; and Table 1). The analysis of eight qualitative traits indicated that variety groups were abundant in genetic diversity, with Shannon index being 0.81 (VietNam), 0.83 (Korea), 0.76 (China), and 0.79 (Japan) (presented in Fig.2). Cluster analysis revealed that Viet Nam group belongs to one group and quite different with others; meanwhile Korea and China groups are closely related.

In order to understand the genetic diversity, distribution of genetic diversity and information of genetic diversity of different groups, the data for morphological characters integrated with molecular data should be analyzed in future. It can provide a whole picture of genetic diversity from different ecological regions. It can also provide plenty of information for further utilization of local varieties in soybean improvement.

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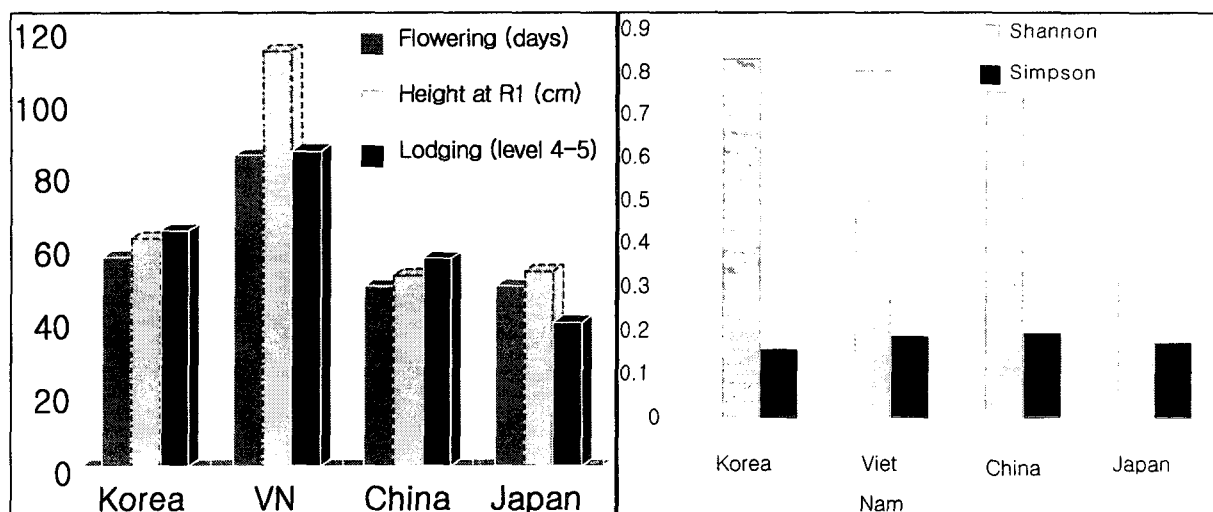sukhalee@snu.ac.kr

Fig. 1. Flowering date, height, lodging

Fig. 2. Biodiversity in germplasm collecti

Table 1. Some agronomic traits of 20 Korea varieties.

| Codes	Days to flowering (days)	Maturity (days)	Branch number	Pod (1+2) seed	Pod (3) seed	Ratio Pod (1+2)/Pod (3) seed
G1	60	140	7 ± 1.3	138	8	17:1
G2	53	133	5 ± 0.5	57	2	29:1
G3	55	136	8 ± 1.7	221	6	37:1
G4	70	150	5 ± 1.1	100	4	25:1
G5	56	135	6 ± 0.8	87	1	87:1
G6	56	134	6 ± 0.8	40	3	13:1
G7	53	131	6 ± 0.8	38	0	38:1
G8	69	144	4 ± 1.0	75	4	19:1
G9	70	147	7 ± 0.8	123	4	31:1
G10	78	156	8 ± 1.1	127	7	18:1
G11	69	143	7 ± 1.7	127	9	14:1
G12	70	157	4 ± 1.1	44	10	4:1
G13	71	159	4 ± 1.7	51	12	4:1
G14	51	148	7 ± 0.8	67	3	22:1
G15	59	149	8 ± 0.8	86	23	4:1
G16	68	146	7 ± 1.1	58	12	5:1
G17	67	147	8 ± 1.9	73	9	8:1
G18	53	131	8 ± 1.1	78	5	16:1
G19	58	151	5 ± 0.7	30	1	30:1
G20	49	140	5 ± 0.7	50	22	2:1
Mean	62	144	6	84	7	
Range	49-78	131-159	4-8	30-221	0-23	2:1 – 87:1
CV%	13.75	6.02	23.14	54.89	87.11	
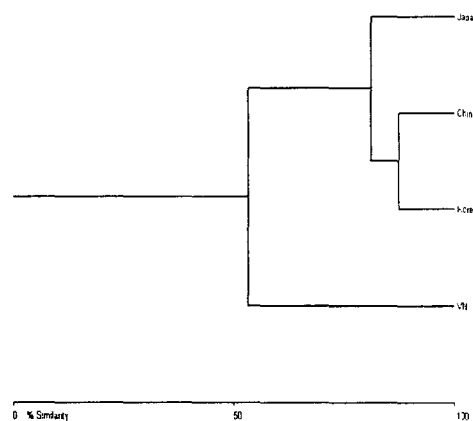
Fig. 3. Cluster Analysis of germplasm

Remark: G: Glycine