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Morphological diversity in kidney bean(*Phaseolus vulgaris* L.) germplasm

Sea-Hee Han, Yu-Mi Choi, Gi-An Lee, Yang-Hee Cho and Kyung-Ho Ma, Jung-Ro Lee*

National Agrobiodiversity Center, National Institute of Agricultural Sciences, RDA, 370 Nonsaengmyeong-Ro, Wansan-Gu, Jeonju-Si, Jeollabuk-Do, 54874, Republic of Korea

Abstract

The National Agrobiodiversity Center (NAS, RDA, Republic of Korea) has continually collected new valuable genetic resources. In this study, we regenerated conserved kidney bean (*Phaseolus vulgaris* L.) germplasm which couldn't be available because of seed quantity and quality, and we also surveyed their morphological characters for the sustainable utilization. A total of 431 kidney bean accessions were regenerated and 18 morphological traits were surveyed according to the characterization guideline of RDA Genebank. Among the surveyed traits, flowering time ranged from May 23 to September 4 and 73.8% of tested accessions were mainly flowering in June. The maturity time ranged from July 1 to October 15 and main flowering time was July (91.4%). For plant type, 270 accs (62.6%) were climbing type followed by medium type of 86 accs (20.0%) and dwarf type of 65 accs (15.1%). The seed coat colors were various; yellow (34.6%), white (22.3%), brown (17.9%), red (10.7%), black (5.8%), violet (11%), pink (1.4%), navy (0.9%). Principal component analysis indicated that five principal components (PCs) with Eigen values >1 accounted for more than 65.8% variability. The first PC was more related to growth habits such as growth type, flowering time, and plant type. The second and third PCs showed higher values of the pigment characters such as seed coat color, flower color, and pod color. In fourth and fifth PCs, there were the higher positive values of the pod shapes. Our results provided insight into the characteristics kidney beans, thus the utilization basis of kidney beans might be elevated for bio-industry.

Keywords: Kidney bean, Morphological diversity, Principal component analysis (PCA)

Corresponding author*

Jung-Ro Lee

Address: National Agrobiodiversity Center, National Institute of Agricultural Sciences, RDA, 370 Nonsaengmyeong-Ro, Wansan-Gu, Jeonju-Si, Jeollabuk-Do, 54874, Republic of Korea

Tel and Fax: +82-63-238-4880/+82-63-238-4859

E-mail: jrmail@korea.kr