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Construction of a DNA database and development of highly informative SNP markers for Persimmon (*Diospyros kaki* L.) identification using NGS technology

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[Introduction]

Diospyros kaki is the most widely cultivated species of the genus Diospyros. The kaki is among the oldest plants in cultivation, known for its use in China for more than 2000 years. In Korea, the persimmon is called gam and it is usually eaten as a dessert or when there are guests at home and they are very popular amongst children. But there are no reliable identification method for its variety even though SSR marker are developed.

[Materials and Methods]

The construction of a DNA database for identify the Persimmon (*Diospyros L.*) has been made possible by the development of novel single nucleotide polymorphism(SNP) markers using next generation sequencing(NGS) technology. For the development of highly informative SNP marker, next generation sequencing was performed with four key varieties cultivated in Korea; Sancheong Go-Jong-Si, Sancheong Dan-Sung-Si, Haman Su-si, Yeongdong wheol ha-shi, and Sangju doong-shi was used as reference sample for performed the de-nove assamply of persimmon genomes. And 48 Koran cultivated persimmon used for validation of SNP marker developed in this study.

[Results and Discussions]

The 1,640,067 SNPs loci were discovered by re-sequencing of each persimmo. Out of total 126,529 SNPs have common in all sample were selected and then 34 SNP loci that indicated most high read depth were initially applied to select SNP markers for identification of persimmon varieties. Finally 19 SNP markers were developed for identification of 48 persimmons varieties and constructed of a DNA database. Average polymorphism information content(shannon's information index) was 0.533, ranging from 0.268 to 0.693. Genetic distance of clusters ranged from 0.0714 to 1.000 by unweighted pair-group method with arithmetical average based on Jaccard's distance coefficients. These novel SNP markers will useful for persimmon variety identification related to seed dispute and distinctness, uniformity and stability (DUS) test for persimmon.

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