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Genetic Diversity and Population Structure of *Boehmeria nivea* var. *tenacissima* (Gaudich.) Miq. on Island and Coastal Regions of Korea Revealed by Genotyping-by-sequencing (GBS)

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[Introduction]

Boehmeria nivea var. *tenacissima* (Gaudich.) Miq. is a fiber crop with immense economic and environmental importance. Understanding the genetic diversity and population structure of *B. nivea* var. *tenacissima* populations is essential for breeding programs and conservation efforts. This study aims to explore the genetic diversity and population structure of *B. nivea* var. *tenacissima* populations in 13 regions located on islands and coasts using genotyping by sequencing (GBS) technology.

[Materials and Methods]

In this study, we genotyped 192 *B. nivea* individuals collected from 13 regions using the GBS approach. After quality control, we obtained 13,563 single nucleotide polymorphism (SNP) markers for further analysis. We used various statistical methods, including discriminant analysis of principal components (DAPC), STRUCTURE, and phylogenetic analysis, to investigate the genetic diversity, population structure, and relationships among populations.

[Results and Discussion]

The results revealed high levels of genetic diversity among the studied populations. The DAPC analysis showed that the first three principal components accounted for 80.8% of the total variation, with clear differentiation among the populations. STRUCTURE analysis identified twelve subpopulations, and phylogenetic analysis showed that the populations clustered according to geographic origin. The results suggest that geographic isolation and environmental factors have played a significant role in shaping the genetic diversity and population structure of *B. nivea* var. *tenacissima* populations in the studied regions. Our findings provide valuable insights into the genetic diversity and population structure of *B. nivea* var. *tenacissima* populations and could guide breeding programs of *B. nivea* and conservation efforts for this important crop.

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