

Fruit Morphology, Citrulline, and Arginine Levels in Diverse Watermelon (*Citrullus lanatus*) Germplasm Collections

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Watermelon (*Citrullus lanatus*) is a non-seasonal, economically important, cucurbit cultivated throughout the world with Asia as a continent contributing the most. As part of the effort in diversifying watermelon genetic resources in the already cultivated group, this study was devoted to providing baseline data on morphological quality traits and health-beneficial phytonutrients of watermelon germplasm collections, thereby promoting watermelon research and cultivation programs. To this end, we reported morphological traits, citrulline, and arginine levels of watermelon genetic resources obtained from the gene bank of Agrobiodiversity Center, Republic of Korea, and discussed the relationship between each other. Diverse characteristics were observed among many of the traits. But, most of the genetic resources (>90%) were either red or pink-fleshed. Korean origin fruits contained intermediate levels of soluble solid content (SSC) while The USA, Russian, Tajikistan, Turkmenistan, Taiwan, and Uruguay originated had generally the highest levels of soluble solids. The citrulline and arginine contents using HPLC method were ranged from 6.9 to 52.1 mg/g (average, 27.3 mg/g) and 1.8 to 21.3 mg/g (average, 9.8 mg/g), respectively. The citrulline content determined using Citrulline Assay Kit was ranged from 6.5 to 42.8 mg/g (average, 27.0 mg/g). Resources with high citrulline and arginine levels contained low SSC. Whereas, red- and pink-colored flesh samples had less citrulline compared to yellow and orange. In addition to the profiling of morphological characters and phytonutrients, molecular marker characterization and identification of sources of resistance to diseases and pests are recommended for a more complete diversity analysis of watermelon genetic resources.

Key words: Genetic resources, Fruit morphological characterization, Flesh color, Principal component analysis, Citrulline Assay Kit, HPLC

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