Anthocyanin Levels in Red Pigmented Germplasm Collections of Lettuce (Lactuca sativa L.)

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Leaf samples of 110 germplasm collections and 15 commercial cultivars with red color cultivated at the experimental field of the National Agrobiodiversity Center, Jeonju, South Korea, were subjected to UPLC/MS analysis of anthocyanin concentrations and their relationship with some selected morphological characters (shape of cotyledon, plant growth type, intensity of red color, leaf attitude, leaf shape, leaf length and width) were evaluated. Anthocyanins content showed a wide variation between samples ranging from 1.87 to 42.29, 0.46 to 20.13, and 0.47 to 501.36mg/100g DW of cyanidin-3-O-B-D-glucopyranoside (CG), cyanidin-3-O-(3"-malonyl)-B-D-glucopyranoside (C3"MG), and cyanidin-3-O-(6"-malonyl) B-D-glucopyranoside (C6"MG), respectively in germplasm collections. C6"MG content in commercial cultivars ranged between 3.36 and 272.15mg/100g DW. CG and C3"MG were detected in a quantifiable amount in only two commercial cultivars named "Power red romaine" and "Ghadal sangchu". C6"MG was the major anthocyanin across the entire samples. A significant association between intensity of red color and anthocyanin content was recorded. The highest content of total anthocyanins was recorded in accession IT301289 (563.78mg/100g DW) followed by IT302033 (423.89mg/100g DW) and IT228749 (422.78mg/100g DW). These accession could be utilized for further breeding experiment to develop new cultivars with high content of anthocyanins.

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