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Differential expression of anthocyanin biosynthesis genes and transcription factors determines coloration patterns in gerbera flowers

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Diverse flower colors exist in different gerbera cultivars. To elucidate the different coloration patterns in two commercial cultivars 'Nathasha and Rosalin', expressions of anthocyanin biosynthesis genes and transcription factors associated with varying anthocyanin contents during different developmental stages (S1 to S5) were investigated. In addition, role of different temperatures in anthocyanin biosynthesis were also investigated by detecting anthocyanin content and gene expression levels. Accumulation of anthocyanin in both cultivars started at S1 and reached a maximum at both of S2 and S3 or only S3 depending on the cultivars. Enhancement of anthocyanin in cv. Nathasha was associated with up-regulation of *ANS* and *MYB10,* while *CHS1* and MYC were likely to be responsible for this in cv. Rosalin. Low temperature (6 °C) could enhance the anthocyanin contents than 22 °C by stronger up-regulation of *CHS1* and MYB10 in cv. Nathasha or of *CHS1* and MYC in cv. Rosalin, regardless of the flower stages. However, the difference of contents between the two cultivars was found to be influenced by expression levels of all biosynthesis genes and TFs, regardless of flower stages and temperature conditions. Hence, it was suggested that the expression patterns of biosynthesis genes and TFs are involved in the differential regulation mechanisms of anthocyanin biosynthesis and coloration pattern between the two cultivars, although further functional studies of the key genes still need to be explored.

Biography

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