



## Differential Pigment Accumulation in Carrot Leaves and Roots during Two Growing Periods

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Auteur	Perrin, Florent [1], Brahem, Marwa [2], Dubois-Laurent, Cécile [3], Huet, Sébastien [4], Jourdan, Matthieu [5], Geoffriau, Emmanuel [6], Peltier, Didier [7], Gagné, Séverine [8]
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Mots-clés	carotenoid [9], chlorophyll [10], <i>Daucus carota</i> L. [11], environmental factors [12], growing conditions [13], transcriptional regulation [14]
Résumé en anglais	<p>Carotenoids are important secondary metabolites involved in plant growth and nutritional quality of vegetable crops. These pigments are highly accumulated in carrot root but the knowledge about the environmental factors on their accumulation is limited. The purpose of this work was to investigate the impact of environmental variations on carotenoid accumulation in carrot leaves and roots. In this work, carrots were grown during two contrasted periods to maximize bioclimatic differences. In leaves, carotenoid and chlorophyll contents were lower in the less favorable growing condition while relative contents were well conserved for all genotypes suggesting a common regulatory mechanism. The down-regulation of all genes under environmental constraints demonstrates that carotenoid accumulation is regulated at transcriptional level. In roots, the decrease in <math>\alpha</math>-carotene and lutein contents was accompanied by an increase of <math>\beta</math>-carotene relative content. At transcriptional level, LCYB and ZEP expression increased while LCYE expression decreased in the less favorable condition, suggesting that carotenoid biosynthesis is switched toward the <math>\beta</math>-branch.</p>
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