



## Quantitative trait loci analysis reveals a correlation between the ratio of sucrose/raffinose family oligosaccharides and seed vigour in *Medicago truncatula*

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Titre	Quantitative trait loci analysis reveals a correlation between the ratio of sucrose/raffinose family oligosaccharides and seed vigour in <i>Medicago truncatula</i>
Type de publication	Article de revue
Auteur	Vandecasteele, Céline [1], Teulat, Béatrice [2], Morère-Le Paven, Marie-Christine [3], Leprince, Olivier [4], Ly Vu, Benoit [5], Viau, Laure [6], Ledroit, Lydie [7], Pelletier, Sandra [8], Payet, Nicole [9], Satour, Pascale [10], Lebras, Camille [11], Gallardo, Karine [12], Huguët, Thierry [13], Limami, Anis M. [14], Prosperi, Jean-Marie [15], Buitink, Julia [16]
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Résumé en anglais	Seed vigour is important for successful establishment and high yield, especially under suboptimal environmental conditions. In legumes, raffinose oligosaccharide family (RFO) sugars have been proposed as an easily available energy reserve for seedling establishment. In this study, we investigated whether the composition or amount of soluble sugars (sucrose and RFO) is part of the genetic determinants of seed vigour of <i>Medicago truncatula</i> using two recombinant inbred line (RIL) populations. Quantitative trait loci (QTL) mapping for germination rate, hypocotyl and radicle growth under water deficit and nutritional stress, seed weight and soluble sugar content was performed using RIL populations LR1 and LR4. Seven of the 12 chromosomal regions containing QTL for germination rate or post-germinative radicle growth under optimal or stress conditions co-located with Suc/RFO QTL. A significant negative correlation was also found between seed vigour traits and Suc/RFO. In addition, one QTL that explained 80% of the variation in the ratio stachyose/verbascose co-located with a stachyose synthase gene whose expression profile in the parental lines could explain the variation in oligosaccharide composition. The correlation and co-location of Suc/RFO ratio with germination and radicle growth QTL suggest that an increased Suc/RFO ratio in seeds of <i>M. truncatula</i> might negatively affect seed vigour.

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