

Publication

Sugar exchanges in arbuscular mycorrhiza: RiMST5 and RiMST6, two novel *Rhizophagus irregularis* monosaccharide transporters, are involved in both sugar uptake from the soil and from the plant partner

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 3693965

Author(s) Ait Lahmidi, Nassima; Courty, Pierre-Emmanuel; Brulé, Daphnée; Chatagnier, Odile; Arnould, Christine; Doidy, Joan; Berta, Graziella; Lingua, Guido; Wipf, Daniel; Bonneau, Laurent

Author(s) at UniBasel [Courty, Pierre-Emmanuel](#) ; [Brulé, Daphnée](#) ;

Year 2016

Title Sugar exchanges in arbuscular mycorrhiza: RiMST5 and RiMST6, two novel *Rhizophagus irregularis* monosaccharide transporters, are involved in both sugar uptake from the soil and from the plant partner

Journal Plant Physiology and Biochemistry

Volume 107

Pages / Article-Number 354-363

Arbuscular mycorrhizal (AM) fungi are associated with about 80% of land plants. AM fungi provide inorganic nutrients to plants and in return up to 20% of the plant-fixed CO₂ is transferred to the fungal symbionts. Since AM fungi are obligate biotrophs, unraveling how sugars are provided to the fungus partner is a key for understanding the functioning of the symbiosis. In this study, we identified two new monosaccharide transporters from *Rhizophagus irregularis* (RiMST5 and RiMST6) that we characterized as functional high affinity monosaccharide transporters. RiMST6 was characterized as a glucose specific, high affinity H(+) co-transporter. We provide experimental support for a primary role of both RiMST5 and RiMST6 in sugar uptake directly from the soil. The expression patterns of RiMSTs in response to partial light deprivation and to interaction with different host plants were investigated. Expression of genes coding for RiMSTs was transiently enhanced after 48h of shading and was unambiguously dependent on the host plant species. These results cast doubt on the 'fair trade' principle under carbon-limiting conditions. Therefore, in light of these findings, the possible mechanisms involved in the modulation between mutualism and parasitism in plant-AM fungus interactions are discussed.

Publisher Elsevier

ISSN/ISBN 1873-2690

edoc-URL <http://edoc.unibas.ch/51894/>

Full Text on edoc No;

Digital Object Identifier DOI 10.1016/j.plaphy.2016.06.023

PubMed ID <http://www.ncbi.nlm.nih.gov/pubmed/27362299>

ISI-Number WOS:000382341600036

Document type (ISI) Journal Article