

Publication

The family of ammonium transporters (AMT) in *Sorghum bicolor* : two AMT members are induced locally, but not systemically in roots colonized by arbuscular mycorrhizal fungi

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 1939134

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Year 2013

Title The family of ammonium transporters (AMT) in *Sorghum bicolor* : two AMT members are induced locally, but not systemically in roots colonized by arbuscular mycorrhizal fungi

Journal The new phytologist

Volume 198

Number 3

Pages / Article-Number 853-65

Keywords ammonium and phosphate transporters, arbuscular mycorrhiza, immunolocalization, microdissection, nitrogen, sorghum (*Sorghum bicolor*)

Arbuscular mycorrhizal (AM) fungi contribute to plant nitrogen (N) acquisition. Recent studies demonstrated the transport of N in the form of ammonium during AM symbiosis. Here, we hypothesize that induction of specific ammonium transporter (AMT) genes in *Sorghum bicolor* during AM colonization might play a key role in the functionality of the symbiosis. For the first time, combining a split-root experiment and microdissection technology, we were able to assess the precise expression pattern of two AM-inducible AMTs, SbAMT3;1 and SbAMT4. Immunolocalization was used to localize the protein of SbAMT3;1. The expression of SbAMT3;1 and SbAMT4 was greatly induced locally in root cells containing arbuscules and in adjacent cells. However, a split-root experiment revealed that this induction was not systemic. By contrast, a strictly AM-induced phosphate transporter (SbPt11) was expressed systemically in the split-root experiment. However, a gradient of expression was apparent. Immunolocalization analyses demonstrated that SbAMT3;1 was present only in cells containing developing arbuscules. Our results show that the SbAMT3;1 and SbAMT4 genes are expressed in root cortical cells, which makes them ready to accommodate arbuscules, a process of considerable importance in view of the short life span of arbuscules. Additionally, SbAMT3;1 might play an important role in N transfer during AM symbiosis.

Publisher Blackwell Science

ISSN/ISBN 0028-646X

edoc-URL <http://edoc.unibas.ch/dok/A6164895>

Full Text on edoc No;

Digital Object Identifier DOI 10.1111/nph.12199

PubMed ID <http://www.ncbi.nlm.nih.gov/pubmed/23461653>

ISI-Number WOS:000317682900021

Document type (ISI) Journal Article