

Publication

A widespread plant-fungal-bacterial symbiosis promotes plant biodiversity, plant nutrition and seedling recruitment

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 4605520

Author(s) van der Heijden, Marcel G. A.; de Bruin, Susanne; Luckerhoff, Ludo; van Logtestijn, Richard S. P.; Schlaeppli, Klaus

Author(s) at UniBasel [Schläppi, Klaus](#) ;

Year 2016

Title A widespread plant-fungal-bacterial symbiosis promotes plant biodiversity, plant nutrition and seedling recruitment

Journal ISME Journal

Volume 10

Number 2

Pages / Article-Number 389-399

Mesh terms Bacteria, growth & development; Bacterial Physiological Phenomena; Biodiversity; Fabaceae, growth & development, microbiology; Fungi, growth & development, physiology; Mycorrhizae, growth & development, physiology; Nitrogen, metabolism; Plant Roots, growth & development, microbiology; Seedlings, growth & development, microbiology; Symbiosis

Highly diverse microbial assemblages colonize plant roots. It is still poorly understood whether different members of this root microbiome act synergistically by supplying different services (for example, different limiting nutrients) to plants and plant communities. In order to test this, we manipulated the presence of two widespread plant root symbionts, arbuscular mycorrhizal fungi and nitrogen-fixing rhizobia bacteria in model grassland communities established in axenic microcosms. Here, we demonstrate that both symbionts complement each other resulting in increased plant diversity, enhanced seedling recruitment and improved nutrient acquisition compared with a single symbiont situation. Legume seedlings obtained up to 15-fold higher productivity if they formed an association with both symbionts, opposed to productivity they reached with only one symbiont. Our results reveal the importance of functional diversity of symbionts and demonstrate that different members of the root microbiome can complement each other in acquiring different limiting nutrients and in driving important ecosystem functions.

Publisher Nature Publishing Group

ISSN/ISBN 1751-7362 ; 1751-7370

edoc-URL <https://edoc.unibas.ch/79056/>

Full Text on edoc No;

Digital Object Identifier DOI 10.1038/ismej.2015.120

PubMed ID <http://www.ncbi.nlm.nih.gov/pubmed/26172208>