

The effect of *Pseudomonas jessenii* RU47 and *Bacillus amyloliquefaciens* FZB42 on the rhizosphere microbial community and plant growth of tomato and maize

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Bio-effectors (BEs) affect plant performance directly and indirectly based on biological mechanisms interfering with soil-plant-microbe interactions. One example for BEs are plant growth promoting rhizobacteria, mostly *Pseudomonas* and *Bacillus* spp., which are applied to a wide range of agricultural crops to enhance growth by promoting seedling emergence, plant biomass and disease control.

In this study, the effect of *Pseudomonas jessenii* RU47 (RU47) and *Bacillus amyloliquefaciens* FZB42 (FB01) on plant growth and on indigenous bacterial and fungal communities in the rhizosphere as well as bulk soil of tomato and maize plants was investigated, with an aim to screen for promising and effective BEs. This work is embedded in the framework of the EU-project "BIOFEKTOR", which aims at increasing the field efficiency of the most promising BEs, with the final goal to contribute to the ecological intensification of agriculture by developing a viable alternative to mineral fertilizers.

A greenhouse experiment with two different plant species (tomato and maize), three application modes (control, RU47 and FB01) and four replicates was performed. The plant growth pa-

rameters were assessed. The effect of inoculant strains RU47 and FB01 on the relative abundances of dominant bacterial, fungal and *Pseudomonas* populations in the rhizosphere and bulk soil of tomato and maize plants was investigated using denaturing gradient gel electrophoresis (DGGE) analysis of 16S rRNA gene and ITS fragments amplified from total community-DNA.

RU47 increased the growth of tomato plants compared to the control while FB01 increased the growth of maize plants. The DGGE fingerprint revealed that the application of RU47 and FB01 clearly affected the bacterial community composition in rhizosphere and bulk soil of tomato while for maize effects were only observed in the bulk soil. Furthermore, significant effects of RU47 and FB01 application on fungal communities were observed in the bulk soil of tomato but not in the rhizospheres of tomato and maize. The communities of *Pseudomonas* in rhizosphere and bulk soil were affected only by RU47.

In conclusion, RU47 and FB01 promoted the growth of tomato and maize, which might be related to significant effects on the plant-associated microbial communities.