Streptomycetes as biocontrol agents against *Fusarium oxysporum* f.sp *lycopersici* and *Fusarium graminearum* in tomato and wheat crops

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Streptomycetes have emerged as promising biocontrol and growth-promoting agents, with demonstrated efficacy in supporting plants under biotic and abiotic stresses.

In this study, we present two experiments that use proteomics and metabolomics to characterize two streptomycetes with effective positive interactions with wheat and tomato plants, respectively.

In the first experiment, an *in vitro* system coupled with a 1D GeLC-MS/MS approach identified over 300 proteins (90% of which were from wheat). These proteins were involved in the wheat response to *Fusarium graminearum* infection, either with or without a streptomycete on the seed, and in the presence or absence of mild drought stress. The fungal infection produced a significant shift in protein abundance, affecting primary and redox metabolism, transport, and defense-related proteins. Notably, seed inoculation also influenced plant responses, suggesting that *Streptomyces* sp. DEF39 modulates plant defense mechanisms against various stresses, offering insight into its mode of action.

The second experiment investigated the ability of *Streptomyces* sp. DEF17 to modulate tomato plant responses to *Fusarium oxysporum* f.sp *lycopersici*. When applied to tomato seeds, the species modulated root exudates, decreasing the attractiveness of the roots to the germinating conidia. A metabolomics study identified potential molecular players.

By integrating proteomic and metabolomic approaches, this work highlights how streptomycetes influence plant responses to biotic stresses, contributing to a deeper understanding of their functional role in plant health.