mosseae mitigates *Striga* damage to sorghum, mainly, through reduction of parasitism, achieved, possibly, through down regulation of production of germination stimulant(s) by sorghum roots.

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Morpho-anatomical and biochemical changes in the roots of rice plants induced by plant growth-promoting microorganisms

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Upland rice is planted in few regions worldwide. However, it presents advantages compared to floodland rice due to its lower production costs and water consumption. However, the average productivity of upland rice has been under 3 ton.ha^{-1}, the low productivity is attributed to water stress, which causes low initial vigor of the seedling root, deficiency in the uptake of nitrogen in the form of nitrate (NO_3^-) at early stages of rice plant development, lack of plant response to inputs under successive planting, and the occurrence of rice blast. The goal of the present study was to characterize anatomical and biochemical changes in rice plant roots in response to seed treatment with rhizobacteria [*Burkholderia pyrrocinia* (R-46) + *Pseudomonas fluorescens* (R-55)] and *Trichoderma asperellum* (Ta: mixture of strains T-06, T-09, T-12, and T-52). The experimental design was completely randomized, with six treatments (R-46*,* R-55, R-46 + R-55, Ta*+* R-46 + R-55, Ta, and control) and ten replicates. Treatments Ta and R-46 + R-55 increased the root length and diameter as well as the cortex expansion and induced a 2% expansion of the aerenchymal space. Treatments Ta and R-46 increased the vascular cylinder diameter. The number of protoxylem poles and metaxylem vessel elements was increased by R-46 and R-55(Figure 1). The total phenol content increased with treatments Ta, R-46 + R-55, R-46, and R-55, and all the treatments increased the flavonoid content. The lignin content increased with the Ta and R-55 treatments (Table 1). All the root architecture modifications resulting from the interaction between seedlings and bioagents (rhizobacteria and *Trichoderma* spp.) observed in the present study favored the root plasticity of rice seedlings, resulting in greater plant growth due to a better water uptake, resistance to water stress and mechanical impedance. The tested biogents showed to be potential biofertilizer to be inserted in upland rice management, with the goal of minimizing the disadvantages of this system, besides increasing defense response and increasing the productivity levels of genetically improved rice cultivars, without increasing the application of chemicals for fertilization and plant protection.