

Introduction

In this study bacterial strains obtained in the rhizosphere, phyllosphere or endophytic, from coffee and other hosts, were evaluated for their effect on the growth promotion of coffee seedlings. Moreover, eight isolates were evaluated for the biological control of coffee leaf rust (CLR), caused by *Hemileia vastatrix*, and dieback, caused by *Boeremia coffea*, previously described as *Phoma tarda*, an important disease in plantations located at high altitudes.



Materials/Methods

Nineteen bacterial strains from the Microorganism Collection of Instituto Agronômico were tested for the growth promoting of cv. Catuai Vermelho IAC 144 seedlings. Of these, eight were tested for the control of rust and dieback in cv. Catuai Amarelo IAC-62 coffee seedlings. The bacterial strains, grown in LB medium for 72 hours, were applied to the seedlings in 10^7 and 10^8 cfu/mL suspensions. After two weekly applications, the pathogens were inoculated, receiving another application seven days after inoculation. For CLR inoculation, a solution containing 10^5 urediniospores/mL was used. For the inoculation of dieback, four mycelium disks were placed on the four upper leaves of the seedlings. The severity, estimated by the leaf area affected by each of the diseases, was evaluated 40 days after inoculation for CLR and 10 days for dieback.

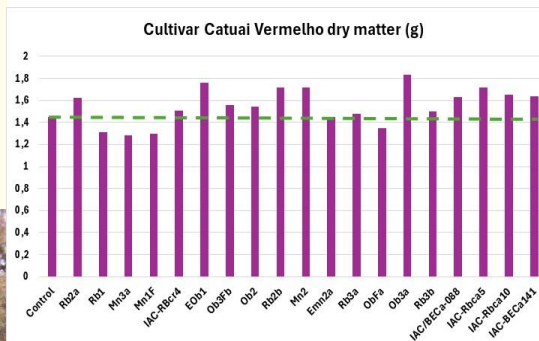


Figure 1: Coffee seedlings growth

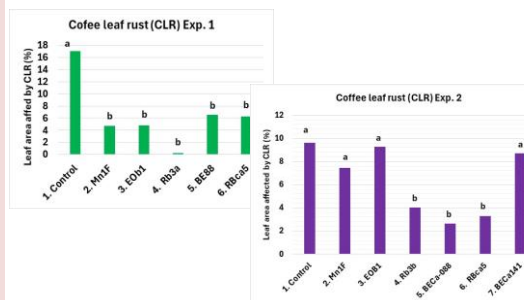


Figure 2: Severity of coffee leaf rust (*Hemileia vastatrix*)

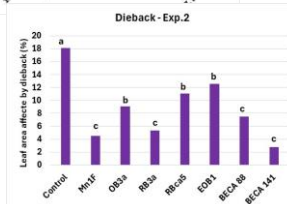
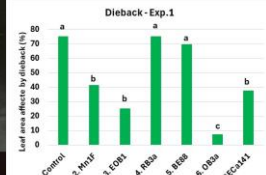
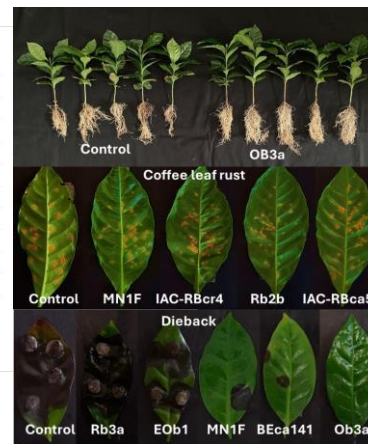


Figure 3: Severity of dieback (*Boeremia coffea*)

Results/Discussion

Nine isolates (RB2a, EOb1, Rb2b, Mn2, OB3a, Beca88, RBca5, RBca10 and Beca141) promoted increases in the dry weight and nutrient accumulation of coffee seedlings. The isolates Mn 1F (*Pseudomonas gozinkensis*), EOb1 (*Enterobacter homaechei*), Rb3a (*Pseudomonas koreensis*) Rb3b (*Pseudomonas* sp.), BEca88 (*Paraburkholderia caribensis*) and RBca5 (*Pseudomonas* sp.) reduced the severity of CLR by 98.6 to 58%. The isolates Mn1F, EOb1, 14. Ob3a (*Bacillus safensis*), BEca88, RBca5 and Beca141 (*Pseudomonas fluorescens*) reduced the severity of dieback by between 90 and 30%, as assessed by the leaf area affected by the disease

Conclusion/Perspectives

Bacterial strains, especially the endophytic Mn 1F (*Pseudomonas gozinkensis*) and BEca88 (*Paraburkholderia caribensis*) and the rhizospheric RBca5 (*Pseudomonas* sp.), obtained in different habitats of coffee plants or other crops, promote biological control of CLR and dieback, and increased the growth of coffee seedlings.