

**TITLE:** EFFECT OF INOCULATED VEGETABLE GROWTH PROMOTING BACTERIA IN *Brachiaria* sp. AND SUBMITTED TO THE *IN VITRO* WATER DEFICIT

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**ABSTRACT:**

The genus *Brachiaria* (Poaceae) originates from the African continent and is widely used as a forage plant mainly in tropical regions. *Brachiaria ruziziensis* presents high quality of forage, is quite palatable and of high food value, in contrast is not tolerant to drought. The objective of this study was to evaluate the effect of plant growth promoting bacteria on plants submitted to *in vitro* water stress. *Brachiaria ruziziensis* and the bacteria *Azospirillum brasilense* and *Burkholderia ambifaria* were used in this study. The experiment was completely random, with 6 treatments (control, stress control, inoculated stressed and inoculated with *A. brasilense* and *B. ambifaria*). Seed asepsis was performed with acidified hypochlorite and after asepsis the seeds were transferred to agar/water medium and incubated for 48 h at 32 ° C in the dark. The pre-germinated seeds were placed in test tubes containing 25 mL of MS medium with polyethylene glycol (PEG-6000 at -0.3 MPa concentration) and inoculated with 10<sup>6</sup> CFU.seed<sup>-1</sup> from each of the strains. After 13 days of cultivation, the length, fresh and dry weight of shoot and root biomass, microbial (epiphytic and endophytic) counts, relative water content (RWC) and membrane stability index (MSI) and root morphology, by staining with 1% methylene blue, were evaluated. Polymerase chain reaction (PCR) was performed to confirm the presence of epi and endophytically adhered bacteria. The data were submitted to ANOVA and compared by the Tukey test (p> 5%). As results obtained, the weight of fresh and dry biomass of aerial part of plants inoculated with *B. ambifaria* are highlighted, since they presented significant difference in relation to the other treatments. Stressed and inoculated plants with both strains had different results in relation to the control. However, the plants inoculated with *B. ambifaria* presented higher results than the other treatments in the dry weight of root biomass and MSI variables. The epiphytic microbial count was higher for *A. brasilense*, and *B. ambifaria* was found to be empirically and endophytically adhered. Visually, stressed plants inoculated with *B. ambifaria* presented greater lateral root development, suggesting a beneficial interaction between *B. ambifaria* and *B. ruziziensis* with potential for the development of biofertilizers.

**Keywords:** Water stress; Bacteria Plant Interaction; Pasture.