

**TITLE: TOLERANCE TO WATER STRESS by *Burkholderia* spp. PLANT GROWTH PROMOTING**

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**Abstract:**

Agriculture has undergone several modernization processes in order to meet the growing demand for food. Were made large investment to enhance the productivity. In the Brazilian Northeast region the food production based on family farmers has an important economic role. The geographic location of this region presents large periods of dry weather. So, the familiar farmers do not have resource to face these difficult periods. An alternative is the use of plant growth promoting bacteria, which solubilize phosphate, biologically fix nitrogen and synthesize indole acetic acid (AIA), and other features of bioprospecting as production of osmotic controllers (exopolysaccharides), that favor the plant under conditions of low water activity in the soil, contributing in this way to the development of plants. Based on this context, the aim of this study was to evaluate the *Burkholderia* strains ability to grow under different conditions of water stress *in vitro*. Were evaluated in this experiment two *Burkholderia* strains (G29 and UAGC739), submitted to the following treatments: liquid medium added the following concentrations of polyethylene glycol (PEG), 0; 119.6; 178.3; 223.6; 261.9; 295.7 gL<sup>-1</sup>, corresponding respectively to the following potential -2 water; -4; -6; -8; -10 Mpa, and incubated in shaker table for 24h. The optical density (O.D) was evaluates in the spectrophotometer (600 nm). The results showed that both the bacteria grow in different water potentials, the control treatment excelled statistically of the other tests, followed by the -2 potential MPa, regressing the bacterial growth from the -4 MPa treatment, there is no statistical difference between these treatments. Thus, it was concluded that the bacteria exhibit tolerance to water stress, showing potential for the field experiment on soils with low water availability.

**Keywords:** bioprospecting, exopolysaccharides, polyethylene glycol (PEG).

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