Physiological and Biochemical Effects of *Herbaspirillum seropedicae* on Wheat Grown in Poor Soil Under Water Restriction

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Plant growth promoting bacteria (PGPB) are known by several mechanisms which contribute to the development and growth of the plant. Of these, the most relevant is the potential to reduce the effects of stress. *Herbaspirillum seropedicae* is known as a PGPB that colonizes wheat endophitically. The aim of this work is to study the biochemical and physiological responses of wheat (Triticum aestivum L., CD120) in association with *H. seropedicae* SMR1 under water restriction and in poor soil. In a greenhouse wheat were inoculated with10^6 *H. seropedicae* cells by seed at planting. Reaching one month some treatments received urea. To control, non-inoculated plants were not fertilized. To some plants were applied water restriction in the booting stage (t0) until 15 days (t15). After this time the plants returned to normal water regime. Leaves were sampled to analyze the relative water content (RWC), proline content, malondialdehyde content (MDA) and activity of phenylalanine ammonia lyase (FAL). After 15 days was not noticed the effect of drought on plants by RWC, however the inoculated treatment had a decrease in relative water content. The proline content decreased to the group that suffered water restriction, although when comparing the stressed group and not subjected to water restriction with control t0 non-stressed plants had an increase in proline content. After the period of water restriction MDA contents increased for both groups and it was observed that the bacteria caused a significant increase of MDA effect. The activity of FAL increased in fertilized plants after 15 days in the non-irrigated plants and decreased in the inoculated, while irrigated plants had no decrease in the FAL comparing control to the other treatments. The plants suffered in the poor soil and bacterium effects seemed not to be helping the plants. There is need for further research on these interactions.

Keywords: PGPB, poor soil, water restriction