

Effect of water stress and plant growth promoting rhizobacteria (PGPR) on ecophysiological traits in sweet basil

Abstract

This research was done to find out the effect of plant growth promoting rhizobacteria (PGPR) in three levels of drought stress on ecophysiological traits in sweet basil. Experiment was in the form of split plot and randomized complete block design with three replications in Zabol University agricultural research farm (farming year: 1389-1390). the main factor was in three levels of drought stress treatment, control or 90% field capacity, Mild stress or 75% of field capacity and severe stress or 55 percent of field capacity and useage of plant growth promoting rhizobacteria (PGPR) in five levels, non-inoculated (control), inoculated with the *Pseudomonas* bacteria, *Bacillus* bacteria, *Azospirillum* bacteria and inoculated with a combination of three bacteria was considered as sub-factor. The results showed that the drought treatment decreased the efficiency of essence, chlorophyll and chlorophyll fluorescence in all three levels significantly But the amount of antioxidant enzymes, carbohydrates and proline increased. So that the highest and lowest yield of essential oil, chlorophyll and chlorophyll fluorescence were in the treatment of mild stress and severe stress respectively and The highest amount of anti-oxidants enzymes, carbohydrates and proline were in the treatment of severe stress. Drought stress influenced the amount of obsorption of element on the seed and plant tissue, so that the drought stress reduced the obsorption of sodium, phosphorus and nitrogen respectively and increased the obsorption of potassium. inoculation with plant growth promoting rhizobacteria (PGPR) did not influence the amount of antioxidant enzymes, chlorophyll, chlorophyll fluorescence significantly, but increased the efficiency of essence, rate of uptake of nitrogen, phosphorus and potassium. Also inoculation the seed with the bacteria reduced carbohydrates and proline in plant tissue of basil.

Key words: Drought stress, Plant growth promoting rhizobacteria (PGPR), Basil.



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