Poster Presentation

Abiotic Stress: The Effects of High Temperature on Bacteria Inoculated Maize

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Corn production plays a huge role in agriculture. It is one of the leading crops in the United States. One of the many factors that affect the growth and yield of corn plants are abiotic factors such as heat, cold, drought, salinity, and nutrient stress. Among all of these components of the environment, the constantly rising ambient temperature is considered one of the most detrimental abiotic stresses. The use of beneficial plant growth promoting bacteria may help reduce some of the effects of these abiotic stresses. Corn and some of the beneficial bacteria have evolved to have multiple processes to adapt to these stresses, but very little focus has been put on the genetic mechanisms to which this is done on bacteria inoculated corn plants. In this research sterilized corn seeds were inoculated with MicroAZ and MicroAF. The seedlings were then germinated in soil at room temperature of 25°C and were given a heat shock at 35°C in the dark for 16 hours. The soil was washed off the roots. The leaves and roots are separated and frozen at 80°C. The tissues were ground in liquid nitrogen, followed by RNA extraction and realtime quantitative to evaluate gene expression. We examined the gene expression of several heatshock proteins by observing what genes are turned on or off in response to heat stress. This research allowed us to determine the effects of bioinoculated maize defense response under heat stress and what genes and specifically what proteins are activated to carry out this response.