Pretreatment of Brassica rapa with Pyrabactin Increases Tolerance to Drought Conditions

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Recently, drought conditions in South Asia have resulted in the starvation and suicides of over 500,000 individuals due to crop yield drastically decreasing. Plants are severely affected by the current drought in this region. The Abscisic Acid (ABA) signaling pathway regulates abiotic stress tolerance, such as drought tolerance, in plants. The activation of the ABA signaling pathways results in the slowing down of cellular processes in order to conserve energy Realistically, ABA is too expensive for farmers to utilize. Pyrabactin (PYR) is a cheaper synthetic alternative that may act as an agonist or an antagonist for PYR/PYL/RCAR receptors. Previous studies have not identified the effects of pretreatment of PYR on abiotic stress tolerance. Brassica rapa is a plant that is susceptible to drought. This study sought to identify the effects of a pretreatment of PYR in order to fortify brassica rapa against abiotic stress. It was identified that PYR does in fact attach to ABA receptors and result in the ABA response. It was also determined that a pretreatment before drought conditions was necessary in order to fortify the brassica rapa against the abiotic stress. Through bioinformatics, it was identified that Bra000184 (PYL 6b) and Bra017012 (PYL 6c) are likely the receptors that are expressed during drought, as they are the only two which are activated during abiotic stress.

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