

CHARACTERISTICS OF THE GENE ENCODING PYRROLINE-5-CARBOXYLATE SYNTHASE (P5CS) IN VIETNAM SOYBEAN CULTIVARS (GLYCINE MAX L. MERRILL).

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TÓM TẮT:

This research evaluates the ability of six soybean local cultivars and a control cultivar (DT84) to tolerate severe drought. In this research, SL5 and SL6 have the most stress tolerance while DT84 and SL1 have the least stress tolerance. We have isolated P5CS gene as it relates to stress tolerance by using PCR with primers. The results show that the size of the P5CS gene of the studied cultivars is 2,148 bp, which encodes for 715 amino acids. When these proteins are compared with the P5CS proteins of the other species, the result shows that the isolated P5CS proteins have a higher identity than other bean species. They are located on the same branch of the phylogenetic tree. Proline (Pro) is one of the most accumulated osmolytes in salinity and water deficit conditions in plants. P5CS is a key regulatory enzyme involved in proline biosynthesis in plants and is subject to feedback inhibition by proline. The conserved aspartate residue at 126 and the phenylalanine at 129 are involved in the feedback inhibition by Pro binding. A gene encoding a feedback insensitive P5CS enzyme was obtained by mutating the P5CS gene. The mutation was due to a change of an aspartate at position 125 to alanine in the P5CS. This mutated gene was cloned in pBT vector and sequenced. This gene will be transferred to plants to increase the level of proline overproduction and to enhance the drought tolerance ability.