

研究论文

渗透胁迫下ABA及Ca²⁺/CaM信使系统对玉米幼苗根系63.5 kD热稳定蛋白的调控作用

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摘要 以玉米(*Zea mays*)鲁单50幼苗为实验材料, 采用等渗的离子胁迫(0.8% NaCl -0.6 MPa)和非离子胁迫(20% PEG)模拟渗透胁迫处理, 从受胁迫的玉米幼苗根系中分离出63.5 kD热稳定蛋白。用ABA、Ca²⁺、Ca²⁺螯合剂EGTA、CaM抑制剂TFP处理幼苗, 96 h后取材进行SDS-PAGE电泳。结果表明, 该蛋白既可由渗透胁迫也可由ABA诱导产生, 且二者同时处理时, 该蛋白的表达量更大; Ca²⁺促进该蛋白的表达; Ca²⁺螯合剂EGTA对该蛋白的表达有抑制作用; CaM抑制剂TFP对该蛋白的表达也有抑制作用, 且高浓度TFP对非离子胁迫下的作用比离子胁迫时明显。说明63.5kD热稳定蛋白受Ca²⁺/CaM信号传导途径的调控。

关键词 [玉米](#) [渗透胁迫](#) [热稳定蛋白](#) [信号物质](#)

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Regulation of 63.5 kD Heat-stable Protein in Maize Seedling Roots by ABA and Calcium/Calmodulin under Osmotic Stress

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Abstract The maize(*Zea mays*) seedlings were cultivated by Hoagland solution with simulated isotonic ionic and nonionic osmotic stress by NaCl(0.8%) and PEG(20%), respectively. A 63.5 kD heat-stable protein was separated from the roots. Under different treatments, the analysis of heat-stable proteins by SDS-PAGE showed that the 63.5kD protein was induced by osmotic stress or ABA. Moreover, the protein subunit content induced by combination of osmotic and ABA was more than that by individual of them. The expression of the induced protein was enhanced by Ca²⁺ and inhibited by EGTA and TFP. The regulation by high-concentration TFP was more obvious under nonionic stress than under ionic stress. The results suggest that the expression of the 63.5 kD heat-stable protein is regulated by Ca²⁺/CaM messenger system.

Key words [Maize](#) [Osmotic stress](#) [Heat-stable protein](#) [Signal substances](#)

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