

Exogenous calcium chloride (CaCl₂) promotes γ -aminobutyric acid (GABA) accumulation in fresh-cut pears

Zongyu Chi, Yuqin Dai, Shifeng Cao, Yingying Wei, Xingfeng Shao, Xiaosan Huang, Feng Xu and Hongfei Wang

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Abstract

Effect of calcium chloride (CaCl₂) on γ -aminobutyric acid (GABA) accumulation pathways in fresh-cut pears was investigated. The metabolites, enzyme activity and gene expression associated with GABA shunt and polyamine degradation were measured. Results demonstrated that CaCl₂ treatment promoted GABA accumulation and reduced the glutamate (Glu) content in fresh-cut pears. Ca²⁺ fluorescence in pear cell, glutamate decarboxylase (GAD) activity and its gene expression increased significantly under CaCl₂ treatment correspondingly. Meanwhile, the Ca²⁺ channel blockers lanthanum chloride (LaCl₃) treatment not only significantly inhibited the activities of GAD, GABA transaminase (GABA-T), diamine oxidase (DAO), polyamine oxidase (PAO) and aminoaldehyde dehydrogenase (AMADH), but also down-regulated the transcripts of *PbGAD*, *PbGABA-T*, *PbPAO1* and *PbPAO2*. Taken together, it can be concluded that CaCl₂ seems to be more effective to GABA shunt, while LaCl₃ treatment mightily stimulate GABA shunt and polyamine degradation pathway.