

# Lipidomics reveals the difference of membrane lipid catabolism between chilling injury sensitive and non-sensitive green bell pepper in response to chilling

Dongying Xu, Sin Man Lam, Jinhua Zuo, Shuzhi Yuan, Jiayu Lv, Junyan Shi, Lipu Gao, Bin Chen, Yuan Sui, Guanghou Shui, Sansheng Geng and Qing Wang

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## Abstract

Changes in membrane lipid composition play multiple roles in the response of pepper to chilling injury (CI). A membrane lipidomic approach was used to elucidate the response of a harvested peppers of a chilling-sensitive (CS) cultivar, '129' and a chilling-tolerant (CT) cultivar, '130' to chilling temperatures during storage. Changes in the lipid composition of CT fruit were proportionally smaller relative to the changes in CS fruit. Lipidomic analysis revealed that CI in CS fruit is associated with a decrease in lysophosphatidic acid, and an increase in phosphatidic acid, triacylglycerols, and steryl esters. Furthermore, a lower level of electrolyte leakage, malondialdehyde, lipoxygenase and phospholipases D activity was observed in CT fruit, indicating that CT fruit were able to maintain membrane function despite exposure to the low temperature. Overall, results indicate that CI in pepper is associated with extensive alterations in membrane lipid metabolism and that CT fruit can avoid CI by maintaining membrane lipid homeostasis.