

Title The relationship between water loss, lipid content, membrane integrity and LOX activity in ripe pepper fruit after storage

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Abstract

Ten pepper genotypes with wide variation in rate of water loss after storage were examined in relationship to their membrane lipid content, loss of membrane integrity (electrolyte leakage) and lipoxygenase activity. Pepper genotypes susceptible to high rates of water loss, membrane ion leakage and lipoxygenase activity were found to have correspondingly low amounts of total lipids, total phospholipids and phospholipids classes. The fatty acids determined were also low in amounts except linoleic acid which was high in genotypes susceptible to high rates of water loss. Genotypes with low water loss rates had high amounts of all lipids with the exception of linoleic acid. The high amount of linoleic acid in high water loss genotypes suggests either a rapid biosynthesis of this fatty acid or a slower rate of its catabolism. Correlations between total membrane lipids and rate of water loss (-0.79), electrolyte leakage (-0.89), lipoxygenase (-0.87) were negative and significant. The total phospholipids, phospholipids classes and the fatty acids followed similar trends to total lipids in relation to the other parameters. The high negative correlation between membrane lipids and lipoxygenase activity strengthened the suggestion of the involvement of lipoxygenase activity in lipid peroxidation. Lipoxygenase-catalyzed oxidation of membrane lipids can cause membrane damage, loss of membrane integrity, and interaction of membrane components with highly reactive oxidation products resulting in membrane ion leakage and accelerated water loss in stored peppers.