

Title Identification and characterization of ethylene receptor homologs expressed during fruit development and ripening in persimmon (*Diospyros kaki* Thumb.)

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Citation Postharvest Biology and Technology, Volume 44, Issue 3, June 2007, Pages 195-203

Keywords Ethylene receptor; Fruit ripening; Gene cloning; Persimmon

Abstract

Persimmon (*Diospyros kaki* Thumb.) is an atypical climacteric fruit that produces a small amount of ethylene during ripening, whereas it exhibits a climacteric-like increase in ethylene production in detached young fruit. To better understand the regulatory role of ethylene in fruit ripening, we isolated three full-length persimmon cDNAs homologous to *Arabidopsis* ethylene receptor genes *ERS1*, *ETR1*, and *ETR2*, designated as *DkERS1*, *DkETR1*, and *DkETR2*, respectively, and examined their expression during fruit development and ripening. *DkETR1* mRNA expression remained at a basal level throughout all stages examined and was not affected by ethylene treatment. In contrast, expression of *DkERS1* and *DkETR2* mRNAs was correlated with ethylene production during fruit development and ripening and was enhanced after ethylene treatment. Because the abundance of the *DkERS1* transcript was far higher than those of the other two genes, we further examined *DkERS1* expression at the protein level. Western blot analysis using anti-*DkERS1* antibody showed that expression of *DkERS1* protein decreased gradually towards maturation and reached the lowest level at the ripening stage. Possible roles of the ethylene receptors in regulating fruit development and ripening are discussed.