

Abstract

Mature olive fruit that produced barely detectable levels of ethylene produced much greater quantities when they were briefly dipped in a solution containing 2 mM 1-aminocyclopropane-1-carboxylic acid (ACC), the immediate precursor of ethylene. A single 10 s dip resulted in a transient increase in ethylene production that peaked 1 day after the application. When the fruits were dipped daily, their ethylene production remained elevated and their attachment to their pedicels weakened after 3 days.

As a first step towards producing mature olive fruit with elevated levels of ACC leading to weakened abscission zone tissue, we examined the expression of genes whose promoters might be potential candidates for driving maturation-specific expression of an ACC synthase construct in the olive. We examined the accumulation of three distinct transcripts (chalcone synthase, OE-CHS1; anthocyanidin synthase, OE-ANS1; expansin, OE-EXP1) at five stages of olive fruit development. Northern analysis showed that all three gene transcripts accumulated during ripening. Transcript abundance was lowest in green fruit, higher as the pericarp began to darken and highest at the stage where the exocarp was completely purple and the mesocarp beginning to color. None of the transcripts were detected in either young or aged leaves suggesting that they may be specific to the fruit and useful candidates for promoter isolation.