Abstract

The role of 1-aminocyclopropane-1-carboxylic acid (ACC) synthase and ACC oxidase in ethylene biosynthesis in persimmon fruit (*Diospyros kaki* Thunb. cv. Hiratanenashi), both intact and wounded, was characterized. In young intact fruit, ethylene production was detected 2 days after harvest, and peaked at 4 days. Little ACC content was detected at 1 day, rapidly increasing 4 days after harvest, and peaking at 7 days. *DK-ACS2* was strongly expressed during almost all periods after it commenced at 3 days, followed by a rapid increase in ACC synthase activity at 4 days and a peak at 5 days. *DK-ACO1* mRNA accumulation was initiated at harvest time, dramatically increased at 2 days; as a result, high ACC oxidase activity was detected at the beginning of harvest, and peaked at 3 days. *DK-ACO1* mRNA accumulation continued during the subsequent days, whereas ACC oxidase activity decreased to a low level. Wounding treatment induced ethylene biosynthesis and ACC accumulation. The strongest *DK-ACS2* expression was induced 1 day after wounding, followed by the highest ACC synthase activity, which paralleled ACC accumulation. Abundant *DK-ACO1* mRNA accumulation and high ACC oxidase activity were observed at the initiation of wounding and remained at high levels during the days that followed.