

Title Physiological and biochemical response of harvested plum fruit to oxalic acid during ripening or shelf-life

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Abstract

The effect of oxalic acid application on plum fruit (*Prunus salicina* cv. 'Damili') ripening properties during storage or shelf-life was determined. The fruits were dipped for 3 min in solutions containing 5 mmol/L oxalic acid and then were packed into polyethylene bags and stored at 25 °C for 12 days, or at 2 °C for 20 days and subsequently at 25 °C for 12 days. Ethylene production, fruit firmness, contents of pectin and anthocyanin, specific activities of polygalacturonase (PG), pectin methylesterase (PME) and phenylalanine ammonia lyase (PAL), and chlorophyll fluorescence (Fv/Fm) were measured. The application of oxalic acid reduced ethylene production and delayed softening of plum fruit. The inhibition of softening was associated with decreased PG and PME activities; that is, the retardation of pectin solubilization/degradation. During storage or shelf-life, flesh reddening and anthocyanin synthesis were significantly inhibited in oxalic acid-treated plum fruit, accompanied with decreased PAL activity. Furthermore, it was found that variable: maximal chlorophyll fluorescence (Fv/Fm), an indicator of ripening, senescence or stress injury of fruit and vegetable, decreased much more slowly in oxalic-treated plum fruits than in control fruits. Thus, oxalic acid treatment can be an effective means to extend the shelf life of plum fruit.