Title Mango fruit ripening - An overview on plant hormones

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Abstract

Mango fruit ripen quickly and is highly perishable consequently limits its transportation to distant markets. We investigated the role of plant hormones in modulating 'Kensington Pride' mango fruit ripening. The endogenous levels of brassinosteroids (BRs), abscisic acid (ABA), indole-3-acetic acid (IAA) and ethylene as well as the respiration rate, pulp firmness and skin colour were determined at 2-d intervals during an 8-d ripening period at ambient temperature (21 ± 1°C). We also investigated the effects of exogenously applied epibrassinolide (Epi-BL), S-(+)-*cis, trans*-abscisic acid and an inhibitor of ABA biosynthesis, nordihydroguaiaretic acid (NDOA) on fruit-ripening parameters. Climacteric ethylene production and the respiration peak occurred on the 4th-d of ripening. While, catasterone and brassinolide were present in only trace amounts in fruit pulp throughout the ripening period. However, the exogenous application of Epi-BL (45 and 60 ng g^{-1} FW) advanced the onset of the climacteric peaks of ethylene production and respiration rate by 2- and 1-d, respectively, and accelerated fruit colour development and softening during the fruit ripening period. The endogenous level of ABA rose during the climacteric rise stage on the 2nd-d of ripening and peaked on 4th -d of ripening. Postharvest application of ABA (1.0 mM) increased the climacteric peak of ethylene production through promoting the activities of l-aminocyclopropane-1-carboxylic acid (ACC) synthase (ACS), ACC oxidase (A CO) enzymes, and ACC content, decreased the fruit firmness with increased *exo*-polygalacturonase *(exo*-PG), *endo*-PG and *endo*-1,4-β-D-glucanase (EGase) activities, decreased pectinesterase (PE) activity in the pulp, higher total sugars and sucrose, advanced degradation of total organic acids, citric and fumaric acid. The application of 0.2 mM NDGA showed reverse trends for these ripening indicator parameters. The endogenous IAA level in the fruit pulp was higher during the pre-climacteric minimum stage and declined during the climacteric and post-climacteric stages. The higher levels of endogenous IAA in fruit pulp during the pre-climacteric stage and the accumulation of ABA prior to the climacteric stage might switch on ethylene production that triggers fruit ripening.