Postharvest responses of six cut Mokara spp. hybrids to exogenous ethylene

ABSTRACT

Ethylene-sensitive cut flowers despite having good shape and colour, display short vase life and usually after shipment, their ethylene injury would be very high, which is a negative point for exportation. The objectives of the study were first, evaluation of level of ethylene sensitivity and second, categorizing of six cut Mokara hybrids based on ethylene sensitivity: Mokara óChak Kuan Blueô, M. óChao Praya Classicô, M. óCalypso Jumboô, M. óBoy Blueô, M. óRedô and M. óChitty Goldô. The inflorescences were treated with 10 µL/L ethylene gas for 24 hours before placing them in bottles containing standard solution [distilled water + 250 mg/L 8- hydroxyquinoline citrate (8-HQC) + 150 mg/L citric acid + 4% sucrose, pH=3.5]. Water loss, vase life, anthocyanin contents and ethylene production were determined after treatments. Expressions of 1-aminocyclopropane-1-carboxylic acid synthase (ACS) and oxidase genes (ACO), before and after exposure to ethylene in the lips of third florets were also determined using semi-quantitative RT-PCR method. Ethylene caused tremendous reduction of vase life with an average of 59%, indicating ethylene sensitivity in studied Mokara cut hybrids. This was displayed by florets and buds wilted and dropped in all tested hybrids. Weight loss and anthocyanin degradation increased when the flowers were exposed to ethylene 11.5 and 16%, respectively. Both genes were expressed in fully open florets, but after exposure to ethylene, the levels of expressions were higher in all hybrids. However, different hybrids showed distinct variances in ethylene sensitivities and degrees of deterioration. M. óCalypso Jumboô and M. óRedô exhibited the utmost anthocyanin degradation in sepals and petals and declined in the length of vase life. Thus, these two hybrids were categorized as the very sensitive group. M. óChak Kuan Blueô, M. óChao Praya Classicô, M. óBoy Blueô and M. óChitty Goldô categorized as less sensitive group.

Keyword: Ethylene sensitivity; Vase life; Anthocyanin content; ACC synthase; ACC oxidase