Title Effects of Promoters and Inhibitors of Ethylene and ABA on Flower Senescence of *Hibiscus rosa-sinensis* L.

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Abstract

Hibiscus rosa-sinensis L. flowers (cv La France) senesce and die over a 12-h period after opening. The aim of this study was to examine the physiological mechanisms regulating the senescence process of ephemeral hibiscus flowers. Different flower stages and floral organs were used to determine whether any interaction existed during flower senescence between endogenous abscisic acid (ABA) and the predisposition of the tissue to ethylene synthesis. This was carried out on whole flowers treated with promoters and inhibitors of ethylene and ABA synthesis or a combination of them. Treatments with 1-aminocyclopropane-1-carboxylic acid (ACC), a precursor of ethylene biosynthesis, enhanced flower senescence, whereas amino-oxyacetic acid (AOA) and fluridone, an ethylene and an ABA inhibitor, respectively, extended flower longevity. These effects were more significant when applied before anthesis. Ethylene evolution was substantially reduced in all organs from open and senescent flowers treated with fluridone and AOA. Similarly, endogenous ABA accumulation was negatively affected by AOA and fluridone treatments. Application of fluridone plus ACC reduced ethylene evolution and increased ABA content in a tissue-specific manner but did not overcome the inhibitor effect on flower longevity. AOA plus fluridone treatment slightly accelerated flower longevity compared to AOA-treated flowers. Application of ABA alone promoted senescence, suppressed ethylene production, and, when applied with fluridone, countered the fluridone-induced increase in flower longevity. Taken together, these results suggest that the senescence of hibiscus flowers is an endogenously regulated ethylene- and ABA-dependent process.

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