

Title Studies on fragrance, vase life and ethylene regulation of volatile production in rose flowers

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Abstract

This research determined the amounts of the main volatile compounds produced by fragrant and non-fragrant cut rose cultivars during vase life together with flower ethylene production, sensitivity respiration rate, weight loss and opening. No relationship was observed between the amount of volatile compounds produced and the longevity of the flower. Short vase life of fragrant rose cultivars was directly related with endogenous ethylene production, external ethylene sensitivity and quick fresh weight loss during vase life. Alternatively, fragrant roses with ethylene production below detection levels, insensitivity to external ethylene and slow fresh weight loss during vase life had acceptable vase lives. Respiration rate was not directly related with vase life of the flowers. Ethylene did not play a role on the regulation of volatile emission of the main biosynthetic pathways in rose flowers. Endogenous ethylene was very low in most of the cultivars and it was not autocatalytic. Ethylene had differential effect within flower petals since it regulated petal abscission and had no effect on volatile emission of fragrant rose flowers. Specific volatile compounds were produced in different amounts by each cut rose cultivar resulting in variable types of fragrance intensities on each flower. This research studied production of volatiles in relation to human detection and rose fragrance preferences. Human panelists detected different rose fragrance intensities that corresponded to the total amount of volatiles produced by each cultivar. Panelists gave the highest rank to a rose fragrance constituted mainly by 2-phenylethanol, 3,5 dimethoxytoluene, (-) transcaryophyllene, geranyl acetate and neryl acetate. The ability of human subjects to detect different fragrance intensities between flowers from the same cultivars at different stages of development depended on the type of volatile, its amount and the composition given by the specific volatile compounds emitted. The results of the volatile compounds emitted by rose flowers together with the ethylene production and sensitivity that lead to short vase life and the human ability to detect fragrance intensities and preferences can be used by rose breeders and flower producers to select long lasting fragrant roses.