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Role of homobrassinolide, abscisic acid, and 6-benzylamino purine on delaying flower senescence in *Gladiolus grandiflora*

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Abstract

A study was conducted to investigate the effects of homobrassinolide (HBL), abscisic acid (ABA) and 6-benzylamino purine (BAP) on the post-harvest life of two *Gladiolus grandiflora* cultivars, snow princess and nova lux. Different HBL, ABA and BAP concentrations were applied to cut flowers. The experimental results showed that ABA and BAP treatments significantly increased post-harvest life in snow princess and nova lux cultivars compared to untreated flowers. However, HBL treatment was unsuccessful in delaying senescence in gladiolus. Furthermore, ABA and BAP treatments were more effective in delaying senescence in the nova lux cultivar than in the snow princess cultivar. Vase solutions containing BAP (500 µM) and ABA (10 µM) were the most efficient in extending the life of the cut floral spike of the nova lux variety (10 and 9 days, respectively) followed by the snow princess variety (8 and 7 days respectively). Increased fresh weight of flowers, vase solution uptake and membrane integrity along with decreased pH, malondialdehyde content, and lipoxygenase (LOX) activity prolonged flowers' post-harvest life. In terms of the post-harvest life of *G. grandiflora*, BAP outperformed ABA in improving the flower longevity of Gladiolus by maintaining higher physiological and biochemical stability in petals.

Keywords

Membrane integrity, nova lux, snow princess, lipoxygenase, malondialdehyde, phytohormone

Introduction

The rapid and predictable nature of the senescence process makes flowers an excellent model for revealing physiological and biochemical processes. The deterioration of plants with age, which leads to death, is called senescence (1). A plant's tissues, cells, or whole body die as a result of the down-regulation of several physiological and biochemical processes during senescence (2). During plant development, senescence is genetically determined as well as controlled by various plant hormones and environmental factors. Senescence causes numerous changes, including decreased fresh weight, reduced vase solution uptake, membrane degradation and an increase in lipid peroxidation (3-5).

Flowers' commercial value is determined by the life expectancy and quality of the cut flower (6). Understanding physiological and biochemical processes associated with petal senescence is essential to increasing the life span of flowers (7). Both ethene-sensitive and ethene-insensitive flowers extend their lives by responding to phytohormones (1, 8). Phytohormones