STANDING CYPRESS: A POTENTIAL NEW SPECIALTY CUT FLOWER CROP

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ABSTRACT

Standing cypress (*Ipomopsis rubra* (L.) Wherry), a member of phlox family, is native to North America and grows up to West Texas. It produces a thyrse-like attractive panicle consisting of 1-3 flowered cymose inflorescences with scarlet–yellow-red flowers on a long axis with dark green pinnately parted leaves. Herein, we report our preliminary observations relating to postharvest performance of cut flowering stems of this plant. The flowers were found to be relatively more tolerant to ethylene than phlox and pretreatment with 1-MCP or STS prevented corolla abscission and slightly delayed flower senescence. Incorporation of sucrose in the vase solution dramatically promoted opening of new flower buds, delayed flower abscission and senescence, and greatly improved vase life and longevity. Plants grown from seeds collected from a wild population exhibited variation in their vigor, branching, length of flowering axis, flower size and color. Selection and breeding efforts are underway to further improve plant growth, flower quality and display life of cut flowering axis.

INTRODUCTION

The cut flower market is highly competitive both domestically and internationally. In recent years, the share of "novel specialty cut flower crops" has registered a distinct increase in the overall cut flower market due to insatiable consumer demand for "new crops" (2). Introduction of new crops begins with the search for alternative crops, follows with selection and improvement, standardizing rapid propagation protocols and postharvest performance, test marketing the crop, and finally concludes by introducing the crop commercially (2).

In the last several years, we have been evaluating a number of new cut flower crops for Texas (3, 4, 5). Based on several years of evaluation, development, test marketing and limited commercial production, Big Bend bluebonnet (*Lupinus havardii*) has been introduced as a new specialty cut flower crop (3). In this report, we intend to summarize our preliminary results relating to post harvest performance and longevity of cut flowering axis of standing cypress (*Ipomopsis rubra* (L.) Wherry), a member of phlox family (*Polemoniaceae*), having potential as a new specialty cut flower crop.

MATERIALS AND METHODS

Standing cypress (*Ipomopsis rubra*) plants were grown from the seeds in the Texas A & M University trial garden at Dallas. Freshly cut flowering stems were taken to the postharvest laboratory and processed for studies within one hour of cutting. Cut flowering stems were placed in glass vases containing 400 ml water or an equivalent amount of test solution containing sucrose (1– 8%) or 2-chloroethylphosphoic acid (CEPA; 10–500 µM). A batch of flowering stems was also pretreated with either STS or 1-MCP for 4–8 hours. The vases were kept at 22–24°C under cool-white fluorescent lamps (30 $\mu mol \cdot m^{-2} \cdot sec^{-1}$). Observations on flower abscission and senescence were recorded regularly.

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RESULTS AND DISCUSSION

In North America the genus *Ipomopsis* is represented by about 24 species which grow from South Carolina through Florida to West Texas (1). Standing cypress (*I. rubra*) produces thyrse-like attractive panicles consisting of 1–3 flowered cymose inflorescences with scarlet-yellow-red flowers on long flowering axes having dark green pinnately parted leaves. In the flowering axis, the top 8–10 nodes generally develop only solitary flowers which open in a basipetal succession. The middle part of the axis produces cymes with three flowers in which the terminal bigger flower opens first. At this time, the lower nodes have inflorescences consisting mainly of solitary cymes which are still in varying stages of development.

Incorporation of sugar in the holding solution greatly enhanced flower opening, increased flower size, and improved flower color resulting in improvement of the postharvest display life. The cut flowers in control exhibited a vase life of about 6–8 days which was extended to 12–15 days in the presence of sucrose. Beneficial effects of sucrose on postharves life of flowers have been reported for several flowers (1, 6, 7).

Members of *Polemoniaceae*, such as phlox and several other flowers, indicate high ethylene sensitivity of flower abscission (4, 5). Therefore, we included CEPA in the test solution to evaluate the responses of *Ipomopsis* flowers. As expected, incorporation of CEPA in the holding medium resulted in abscission of flowers. However, a significant effect of CEPA on flower abscission was observed only in the presence of relatively high concentrations (>100 µM). This indicates that as compared to phlox (5), *Ipomopsis* is relatively more tolerant to the presence of ethylene. Earlier, we observed that a unique feature of flower abscission in phlox is that the abscission is limited to the shedding of turgid sympetalous corolla with epipetalous stamen (5). Other parts of the flower, such as calyx and gynoecium, are not shed. In *Ipomopsis* also the abscission was confined to corolla and the epipetalous stamen only.

It was also observed that pretreatment of flowering axis with either STS or 1-MCP, inhibitors of ethylene action, almost completely prevented abscission of flowers caused by CEPA. Furthermore, when added simultaneously with low concentrations of CEPA, sucrose also partially counteracted the abscission-accelerating effect of the former chemical. Since sucrose is known to reduce ethylene production/or sensitivity (6, 7), the reversal of ethylene-induced effects by sucrose in *Ipomopsis* may be via its effect on ethylene metabolism.

Overall, these results indicate that due to its relatively high insensitivity to ethylene and positive response to ethylene inhibitors and sucrose during postharvest life, *Ipomopsis* merits further development as a potential new specialty cut flower crop. However, we observed that plants grown from seeds collected from a wild population exhibited variation in their vigor, branching, length of flowering axis, flower size, color and number. Therefore, selection and breeding efforts are necessary to further improve growth characteristics including flower quality and extended display life of cut flowers.

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