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STUDIES ON WET REFRIGERATED STORAGE OF GLADIOLUS SPIKES IN RELATION TO PRE- AND POST-STORAGE TREATMENTS

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ABSTRACT

Studies were conducted on the effect of pre-storage pulsing treatment and post-storage vase solution on wet refrigerated storage of gladiolus spikes in cv. Jacksonville Gold. Pre-storage pulsing with sucrose (20 percent) + $Al_2(SO_4)_3.16H_2O$ (400 mg l^{-1}) and post-storage vase solution treatment with sucrose (4%) + $Al_2(SO_4)_3.16H_2O$ (mg l^{-1}) hastened opening of the basal floret, increased vase life, floret size, number of florets opened at one time, percent opening of florets as well as absorption of water/solution over the water-treated control spikes. Post-storage treatment with vase solution was, however, more effective than the pre-storage pulsing treatment, apparently due to continuous uptake of sucrose by the spikes. Spikes subjected to pre-storage pulsing treatment exhibited higher percent gain in fresh weight during storage due to more expansion of florets than those held in water. The utility of wet refrigerated storage of spikes for day to day handling has been discussed.

Key words : Gladiolus, Pulsing, storage, Vase solution.

Gladiolus is an important floral crop that is being grown commercially all over the country, under varying climatic conditions. Gladiolus spikes possess good vase life with variously-coloured elegant florets of varying sizes which open in an acropetal succession. Gladiolus spikes comprise a significant market share in the cut flower trade of the country. However, absence of regulated marketing system, overproduction and lack of regular demand for cut flowers in the domestic market leads to frequent gluts and hence, crash in prices. Refrigerated storage offers a suitable alternative for an orderly and sustained marketing of flowers.

Wet refrigerated storage which implies storage in water or preservative solution is the most practiced method for day to day handling of cut flowers (Goszcznska and Rudnicki, 1988). It has earlier been reported that the florets of gladiolus lose the ability to open with advancement in the duration of storage (Arora *et al.*, 2001). Kofranek and Halevy (1976) have reported that pre-storage pulsing with sucrose and $AgNO_3$ improved vase life and opening of florets in dry-stored gladiolus spikes. It has earlier been reported that pulsing treatment with 20 percent sucrose as well as vase solution containing 4 percent sucrose significantly improved vase life of cut gladiolus spikes (Arora *et al.*, 2001; Singh *et al.*, 2001). Sucrose is reported to promote microbial growth in vase solution but when applied in combination with $Al_2(SO_4)_3.16H_2O$ (400 mg l^{-1}), it significantly improved vase life and opening of florets in gladiolus due to inhibition of microbial contamination of vase solution (Singh *et al.*, 2000).

Present studies report the effect of pre-storage pulsing treatment as well as post-storage treatment with vase solution containing sucrose and $Al_2(SO_4)_3.16H_2O$ on post-storage keeping quality of cut gladiolus spikes.

MATERIALS AND METHODS

Spikes of gladiolus cv. Jacksonville Gold (85-90 cm long) were harvested from the field-grown crop, at tight bud stage (when colour was visible in basal 1-2 florets) and stored under wet refrigerated conditions (3.5-4^{O}C temperature; 85-90% R.H.) for 3, 6, 9, 12, 15 and 18 days. The spikes were subjected to three treatments. In treatment 1 (T_1) the spikes were subjected to pre-storage treatment with pulsing solution containing sucrose (20 percent) + $Al_2(SO_4)_3.16H_2O$ (400 mg l^{-1}) for 20 hours at 23±2^{O}C temperature, 60-70 percent relative humidity and 16 h illumination (1000 lux intensity) provided by white fluorescent tubes, in an air-conditioned laboratory, held in water during storage and their post-storage keeping quality was also evaluated in water. In treatment 2, the spikes were held in water during storage and their post-storage vase life was evaluated in vase solution containing sucrose (4 percent) + Al2(SO4)3.16H2O (400 mg l^{-1}). The treatments were given by dipping basal 5-7 cm portions of the spikes in the respective solution. In the third