

STUDIES ON POSTHARVEST APPLICATION OF MINERAL SALTS ON SCAPE BENDING, PEROXIDASE ACTIVITY AND BIOCHEMICAL COMPONENTS OF CUT GERBERA

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ABSTRACT

The postharvest vase life of cut gerbera is limited by bending of flower stalk, called scape bending. Cut gerberas held in AgNO₃ 20 ppm (18.014 degrees) recorded lowest scape bending curvature and highest vase life (8.09 days), whereas highest scape bending (76.666 degrees) and lowest vase life (4.58 days) was registered in control. The highest POD activity was registered in flowers held in distilled water (0.034 Units/g f wt) and Al₂(SO₄)₃ 100 ppm (0.032 Units/g f wt) and lowest POD activity (0.028 Units/g f wt) was observed in AgNO₃ 20 and 40 ppm. The maximum total sugars and reducing sugar content were observed in AgNO₃ 20 ppm (3.155 mg/g f wt) and AgNO₃ 40 ppm (1.786 mg/g f wt) respectively. The treatment KCl 100 ppm (2.802 mg/g f wt) and AgNO₃ 20 ppm (17.225 mg/g f wt) recorded maximum total phenols and protein contents in flower scapes respectively resulting in longest vase life.

Key words: Gerbera, Mineral salts, Postharvest, Peroxidase activity, Scape bending.

The postharvest longevity of gerbera has been extended by postharvest treatments but the extent to which these treatments can improve vase life may be limited by the plant genome. Floral senescence is regulated by genetic mechanisms, hormonal balance and environmental conditions (Borochoy and Woodson, 1989). The vase life of gerbera is normally limited by petal wilting, called normal senescence and stem bending, which is premature senescence. Lipid peroxidation, due to an increased production of highly toxic oxygen free radicals appears to be responsible for membrane destabilization and ethylene may facilitate the peroxidative pathway (Meir *et al.*, 1992) stimulating the activity of peroxidase. This enhanced activity of enzymes involved in oxygen detoxification (catalase and peroxidase) may be considered as circumstantial evidence for the production of oxygen-free radicals, which in turn may stimulate the conversion of ACC to ethylene (Weckx *et al.*, 1992) and induce senescence. Amariutei *et al.* (1995) reported that, the peroxidase activity generally decreased during vase life in preservative solutions and distilled water in cut gerbera flowers cv. Red Marleen. Mencarelli *et al.* (1995) in his observations revealed that the basal portions of the gerbera scapes exhibited high POD (peroxidase) and PAL (phenylalanine ammonialyase) activities as a result of cutting, moreover, POD activity was stimulated in bent

scapes. Cut flowers treated with mineral salts can partially substitute for metabolic sugars in extending cut flower longevity, which indicate some metabolic roles for the applied sugar. Hence, with a view to study the effect of mineral salts in postharvest vase life of cut gerbera the present investigation has been conducted.

MATERIALS AND METHODS

The present study was carried in Department of Horticulture, College of Agriculture, Acharya N. G. Ranga Agricultural University, Rajendranagar, Hyderabad, during December 2004 to February 2006.

Procurement of flowers :

Flowers of cut gerbera cultivar 'Yanara' used in the experiment were obtained from a commercial polyhouse located 50 km away from the University. The flowers were harvested from one year old mother plants at the commercial harvest stage (ray florets 3/4th opened) in the morning hours between 6.30 to 7.30 am by pulling the scapes of 50 to 60 cm from the crowns. Immediately after harvest 5 – 10 cm of basal woody portion was cut under deionized water, packed, then placed in water (deionized) and transported through truck (for about 1 h) to the laboratory. The flowers were precooled at 4±2°C for about 4 h and then immediately unpacked, sorted to uniform length and quality of capitulum, in order to maintain uniformity within the replications. Flower scapes were trimmed under water to 40 cm.