

TREATMENTS FOR INCREASING THE LIFE OF CUT CAMELLIA FLOWERS

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The preservation of the camellia flower after it has been removed from the plant is a matter of great interest and some importance to the camellia grower. In ordinary practice, camellia flowers are displayed at room temperature by floating them on water; alternatively they may be placed on a moist surface. Under these conditions the symptoms of degeneration of the camellia flower include discoloration of the flower petals close to the floral axis. This is followed by wilting of the petals. Secondly the petals become discolored at the tips and edges. Camellia flowers which are not kept floating on water or on a moist surface wilt rapidly and show this particular symptom even earlier than flowers kept under moist conditions. A treatment for extension of the life of the cut camellia flower to be successful must then prevent discoloration of the petals, prevent loss of petals and prevent wilting or loss of turgor in the flower. It is well-known that life of the cut flower can be extended by low temperature treatments. Although low temperatures are used for the preservation of cut camellia flowers in storage by commercial growers, this method is not well-adapted to the individual camellia fancier and is not well-adapted to the display of camellia flowers.

Two general approaches have been used in the present work. In the first method, camellia flowers were floated on water at a temperature of 26° F. The water was then supplemented with various substances in an effort to find materials which might act effectively in prolonging the life of the flower. A second general approach consisted in placing flowers in an atmosphere saturated with water vapor. Other treatments were then superimposed upon this basic treatment. In both types of experiments the flowers were examined from time to time and evaluation of the results of treatment made in comparison with the standard treatment in which flowers were merely floated on water.

Results

The most significant results from the standpoint of extension of effective life of the cut flower were obtained when flowers were stored in a saturated water atmosphere. Under these conditions, flowers maintained a fresh appearance for as long as 28 days. Table I gives a summary of certain of the treatments in which a saturated water atmosphere was used. In the first two treatments of Table I, the freshly cut flowers were placed upon a support in a closed container in such a way that the flowers were not resting in liquid water, but were maintained in a saturated atmosphere. In the first treatment, the excised flower alone was used, while in the second treatment the flower was excised so as to include one leaf. This was done because it was thought possible that the leaf might contribute to the extension of the life of the flower. In both treatments the flowers maintained a wholly turgid and fresh appearance up to approximately two weeks, or approximately double the life of similar flowers floated on water in the standard way. If the flowers were floated on water and also enclosed in a saturated water atmosphere, life of the flowers was almost as

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long, but after a period of two weeks, small amounts of discoloration appeared at the base of the petals about the floral axis. Still further increases in the life of the cut flower under saturated atmosphere conditions were apparently obtained by treating the flowers with naphthaleneacetic acid, a substance known to prevent abscission or separation of petals and leaves from the floral axis. In these experiments, naphthaleneacetic acid was dissolved in acetone and a small volume of acetone applied at the center of the flower. The application of 0.1 cc. of naphthaleneacetic acid, 10 mg./cc., appeared to increase the life of the cut flowers substantially.

TABLE I

The Storage of Camellia Flowers in an Atmosphere Saturated with Water Vapor. All Trials Recorded in this Table Carried Out With Var. Pink Perfection. Flowers Floated on Water in an Open Atmosphere (Not Saturated) Lasted Less than 6 Days in All Instances.

Type of Material	Treatment	Number of Days of Fresh Healthy Appearance	Final Appearance Comments
Flower Alone	Saturated Atm., Flower not in Contact with Liquid Water	13	Fresh Turgid
Flower + 1 Leaf	Saturated Atm., Flower not in Contact with Liquid Water	13	Fresh Turgid
Flower Alone	Saturated Atm., Flower Floating on Water Surface	14	Turgid but Slightly Discolored
Flower Alone	Saturated Atm., 1 mg. NAA Applied to Center of Flower	28	Fresh Turgid
Flower + 1 Leaf	Saturated Atm., 1 mg. NAA Applied to Center of Flower	28	Fresh Turgid

The addition of certain substances to the water on which camellia flowers were floated exerted measurable effects prolonging the life of such flowers. No treatment, however, resulted in prolonging the life as much as did a saturated water atmosphere. Increased life as a result of treatments in solution was at most only 1 to 2 days; an increase of roughly one fourth as compared with doubling or quadrupling storage life in the saturated atmosphere treatments. After 7 days of treatment the flowers were examined and the treatments evaluated as compared to the controls, flowers on water alone. At this time the control flowers were invariably wilted and discolored. Table II gives the results of these experiments.

Inorganic phosphate and naphthaleneacetic acid (NAA) give consistently increased life over the control flowers. The combinations of sodium fluoride, KH_2PO_4 , NAA, and succinate also seemed to give prolonged life. It was originally suspected that a part of the deterioration of the cut flower might be due to microorganisms attacking the petals close to the submerged floral axis. Sulfanilamide was used in an effort to decrease such bacterial growth but no encouraging results were obtained.

Summary

1. Camellia flowers when stored in a saturated water atmosphere, the flowers themselves not touching water, retained their freshness and turgidity up to 2 weeks. Application of naphthaleneacetic acid, NAA, dissolved in acetone, near the floral axis, increased the life span of these flowers up to 28 days.

2. Camellia flowers stored floating on water deteriorated within 7 days. Addition to the water of inorganic phosphate, NAA, and combinations of the same, increased the life span by not more than 2 days. Other treatments were even less successful.

TABLE II

Effect of Various Chemical Treatments on the Storage Life of Cut Camellia Flowers. All Flowers Floated on Water or on Water Solutions, Maintained in Dark at 25° C.

Treatment	Concentration	No. of Experiments	Appearance Relative to Control (Water Alone) After 7 Days ¹
KH_2PO_4	30-10,000 mg/l	13	++
NAA	1-100 mg/l	28	++
Naphthalene acetamide	10-100 mg/l	3	+
NaF	10-1000 mg/l	17	—
Dinitrophenol	1-10 mg/l	7	—
Malonate	1-10 mg/l	2	0
Succinate	10-10,000 mg/l	8	0
2, 4D	10-1000 mg/l	7	+
Adenylic Acid	10-100 mg/l	3	0
Adenylic Acid	100 mg/l	3	0
Sulfanilamide	10-1000 mg/l	3	+
Sulfanilamide	10-200 mg/l	8	0
Sucrose	1-4%	4	—
Arginine	100 mg/l	1	0
Glutamic Acid	100 mg/l	1	0

¹Symbols. ++ = much better than control. + = better than control. 0 = same as control. — = worse than control.