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Effect of different vase solution on post-harvest life of tuberose flower (*Polianthes tuberosa* L.)

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Abstract

The current investigation entitled "Effect of different vase solution on post harvest life of tuberose flower was carried out to analyse the best vase solution for tuberose cv. Vaibhav. The whole experiment was laid out in completely randomized design with 12 treatment and 3 replication. (2% Sucrose+Limejuice (30 ml)+Coconutwater (30 ml)+Teaextract (30 ml)+DisprinTablet (T₁₀) significantly increases the vase life of tuberose cv. Vaibhav as compared to all treatment combination and found significant in almost all the parameters in cut spikes of tuberose.

Keywords: Tuberose, vase life, floral preservative, parameters, cut spikes

Introduction

The Tuberose (*Polianthes tuberosa* L.) is one of the most important perennial bulbous flowering plants. It is popularly known as Rajnigandha or Nishigandha. It belongs to the family Amaryllidaceae and is native to Mexico. The name Polianthes has been derived from two Greek words: Polios, meaning sparkling or white, and Anthos, meaning flower, in reference to a regular tuberose and spiced tuberosa blossoms. It includes Polianthes spices apart from *Polianthes tuberosa*, all of which have been found growing wild. Tuberoses are divided into three categories based on the number of rows and petals. They appear in single, semi-double and double varieties, along with variegated cultivars. The flower is very popular for its strong fragrance and its essential oil is an important component of high-grade perfumes. Tuberose can successfully be grown in pots, borders, beds and commercially cultivated for its various uses, viz., floral ornamental, bouquets, buttonholes, gajras and extraction of essential oil. The fresh flower seems to have a concrete yield of 0.08 to 0.11% alcohol soluble absolute. Only the greatest possible perfumes contain all the necessary oil. The oil also includes candy, beverages and baked goods. Tuberose flowers are in high demand.

Material and Methods

Tuberose cv. Vaibhav corm obtained from Pt. Kishori Lal Shukla College of Horticulture and Research Station Rajnandgaon, Department of Floriculture and Landscape Architecture. These bulbs were planted at Horticultural Farm using regular packages and techniques in order to provide a decent crop. Cut spikes were gathered early in the morning with a secateur, when the basal two florets started emerging and placed in a bucket holding water and brought to the laboratory for vase life studies of different types of tuberose. The stem lengths of all the spikes were kept uniformly. The entire spike collection was randomly selected and separated into 180 experimental units. Each spike was placed in a glass bottle containing preservative solutions of each preservative acting as an individual there by after recording the fresh weight. During the laboratory experiment, each treatment was reproduced five times.

The whole experiment was laid out in completely randomized design (CRD) with 12 treatments and 3 replication. The treatment used were T₀ Distilled water (Control), T₁ 2% Sucrose+Lime juice (30 ml), T₂ 2% Sucrose+Coconut water (30 ml), T₃ 2% Sucrose+Teaextract (30 ml), T₄ 2% Sucrose+Lime juice(30 ml)+Disprin Tablet, T₅ 2% Sucrose+Coconutwater(30 ml)+Disprin Tablet, T₆ 2 % Sucrose+Teaextract (30 ml)+DisprinTablet, T₇ 2% Sucrose+Limejuice(30 ml)+AmpicillinTablet, T₈ 2%Sucrose+Coconutwater (30 ml)+Ampicillin Tablet, T₉ 2% Sucrose++Teaextract (30 ml)+Ampicillin Tablet, T₁₀ 2% Sucrose+Limejuice (30 ml)+Coconutwater (30 ml)+Teaextract(30 ml)+Disprin Tablet, T₁₁ 2% Sucrose+Limejuice(30 ml)+Coconutwater(30

ml)+Teaextract(30 ml)+Ampicillin tablet and the observations were recorded on Initial weight of spike, Final weight of spike, Loss in weight percentage, Unopened bud per spike, Percentage of half opened bud, Number of flower in spike, Number of opened flower, Flower opening percentage, Flower diameter, Days of 1st flower wilting, Days of fading of last flower, Days of 1st flower dropping, Vase life (Days) of spike.

Result and Discussion

The vase solution mixed with antibiotics(Disprin, Ampicillin) natural acids (Tea extract and lime juice) and natural substances (coconut water) were found to be very effective in boosting most of the tuberose spike's post harvest attributes when compared to controls (distilled water).

Tuberose spikes with the lowest physiological weight loss percent (10.7%) were found in spikes treated with 2% Sucrose+Lime juice (30 ml)+Coconut water (30 ml)+Tea extract (30 ml)+Disprin tablet under the treatment 10 of the experiment, which was clearly superior to all other treatments. While in distilled water (T0), the highest losses of physiological weight (18.7%).

Vase solution containing 2% Sucrose+Lime juice (30 ml)+Coconut water (30 ml)+Tea extract (30 ml)+Disprin tablet (T10) treatment produced the minimum unopened bud of tuberose spike (0.4), which was clearly superior to all other treatments. While the highest number of unopened spike buds (2.4) significantly in distilled water (T0).

Table 1: Effect of different floral preservative on vase life of tuberose flower

Treatment	Weight loss %	Unopened bud per spike	% of half opened bud	Flower opening %
T ₀	18.6	2.4	21.4	78.6
T ₁	13.9	1.5	12.13	84.5
T ₂	13.6	1.4	10.3	89.9
T ₃	14.4	2.1	18.7	81.9
T ₄	12.7	1.0	7.2	92.1
T ₅	12.4	0.8	5.2	94.8
T ₆	13.6	1.0	7.5	92.4
T ₇	12.9	1.1	8.4	91.8
T ₈	12.6	0.9	6.6	93.4
T ₉	14.0	1.1	8.6	91.9
T ₁₀	10.7	0.4	2.4	97.5
T ₁₁	11.4	0.6	3.9	96.1
CD _{at5%}	1.0404	1.432	1.0588	1.5499
S.Em _±	0.356	0.049	0.363	0.531

Minimum percentage of half-opened buds of tuberose spike (2.4) was found in spikes treated with the following treatment 2% Sucrose+Lime juice (30 ml)+Coconut water (30 ml)+Tea extract (30 ml)+Disprin tablet (T10). Notably, the highest percentage of half-opened spike buds (3.9) in distilled water (T0). Among the different vase solution treatments have a substantial impact on the post-harvest quality of tuberose spikes. The treatment 2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet (T10), had the highest flower opening percentage (97.5%). Significantly, the lowest flower opening percentage (78.6%) was obtained under distilled water (T0).

Treatment 2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet (T10) had the highest total number of florets opened at one time (5.2 florets). While the smallest total number of florets opening at

a time (1.9 florets) was observed in distilled water (T0). Different vase solutions had a substantial impact on the post-harvest quality of tuberose spikes. The highest flower diameter (5.3cm) was recorded under treatment i.e., 2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet (T10) which was significantly superior to the other treatments, while the smallest flower diameter (3.4cm) was recorded under distilled water (T0).

The influence of various preservatives on the initial flower wilting of cut tuberose spikes revealed substantial results. Vase solution 2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet (T10) showed delayed initial flower wilting at 3.8 days. While, distilled water (T0) showed early flower wilting at 1.3 days.

Table 2: Effect of different floral preservative on vase life of tuberose flower

Treatment	Flower diameter	Days of 1 st flower wilting	Days of 1 st flower dropping	Days of fading of last flower	Vsae life days
T ₀	3.4	1.3	1.8	3.9	2.9
T ₁	3.7	2.0	2.3	5.5	3.5
T ₂	3.8	2.3	2.5	6.0	4.1
T ₃	3.5	1.6	2.1	4.9	3.2
T ₄	4.4	3.1	3.4	7.5	5.9
T ₅	4.8	3.3	3.9	9.1	7.2
T ₆	4.2	2.7	3.0	6.9	5.1
T ₇	4.3	2.8	3.1	7.3	5.2
T ₈	4.6	3.0	3.5	8.1	6.5
T ₉	4.1	2.7	3.0	6.7	5.6
T ₁₀	5.3	3.8	4.5	11.4	9.5
T ₁₁	5.2	3.6	4.1	10.9	8.8
CD _{at5%}	0.4154	0.2999	0.4166	0.3694	0.4624
S.Em _±	0.142	0.103	0.143	0.1790	0.158

Treatment, 2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet (T10), showed delayed first flower dropping at 4.5 days. while distilled water (T0) recorded the first flower dropping in 1.8 days. In all treatment, the influence of different vase solution on the days of fading of the last bloom of cut tuberose spikes showed substantial effects. Vase solution of 2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet (T10) had the most 11.4 days of fading of the last bloom with 3.9 days, recorded under treatment (T0) distilled water.

Treatment 2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea Extract (30 ml)+Disprin Tablet (T10), had the longest vase life (9.5 days), while 2.9 days in distilled water (T0), had the shortest vase life.

Conclusions

The data from the present findings concluded that the treatment T₁₀ (2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet) had a superior performance in almost all considerable aspects under study. The result revealed that the treatment T₁₀ (2% Sucrose+Lime Juice (30 ml)+Coconut Water (30 ml)+Tea extract (30 ml)+Disprin Tablet) was found significant on almost all the parameters and showed maximum percentage of bud opening with maximum longevity and vase life.

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