Int.J.Curr.Microbiol.App.Sci (2023) *12*(04): 220-229

EXCELLENT PUBLISHERS

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 12 Number 4 (2023)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2023.1204.025

Role of Coconut Water, Gibberelic Acid in Vase Life of Existing Lotus (*Nelumbo nucifera* Gaertn) Genotypes in Chhattisgarh Plains

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Keywords

Lotus, coconut water, Gibberelic acid, vase life, *Nelumbo nucifera* Gaertn

Article Info

Received:
06 March 2023
Accepted:
04 April 2023
Available Online:
10 April 2023

ABSTRACT

In order to improve the vase life of closed bud of indigenous sacred lotus cut flowers (*Nelumbo nucifera* Gaertn.) collected from different village ponds, swamps and reservoirs from seven districts of Chhattisgarh Plains *viz.* Dhamtari, Balod, Durg, Gariyaband, Mahasamund, Kabirdham, Raipur districts of zone of Chhattisgarh plains, during the year 2017-18 and 2018-19.The experiment was performed based on completely randomized design with five treatments including tap water, 25 % coconut water, 50% coconut water,0.12 mM Gibberelic acid, 0.15 mM Gibberelic acid in three replication. In this study, characteristics such as fresh weight, dry weight, and water uptake and vase life were evaluated. The result showed that 50% coconut water has the maximum vase life (5.67 days) followed by 25 % coconut, 0.12 mM & 0.15 mM Gibberelic acid does not show significant difference. Fresh weight and dry weight of flower was maximum recorded under treatment tap water and water uptake is highest in 0.15 mM Gibberelic acid. Phenotypic coefficient of vase life of all the treatment was higher than the genotypic coefficient of variation. The highest genotypic coefficient of variation was found under treatment (T1) in fresh weight of flower i.e.38.38, phenotypic coefficient of variation was ranged between 3.90 to 40.46. The highest phenotypic coefficient of variation was found under treatment T1 (Tap water) fresh weight is 40.46, the highest heritability was recorded for fresh weight of flower under T3 (97.90%) and highest amount of genetic advance as percent of mean was observed for fresh weight of flower under T1 (75.00%), followed by fresh weight of T3 (74.09%). High heritability accompanied with high genetic advance has been recorded for fresh weight of flower in T3 (97.90, 74.09), water uptake in T3 (89.60, 42.77) which indicates that the heritability for these characters is due to additive gene effect.

Introduction

Lotus (*Nelumbo nucifera* Gaertn.) is a symbol of Indian cultural heritage, deeply related to Hindu mythology, art and culture and has so been accorded the status of the national flower of India. It is one of the ancient plant species in our country occurring from Kashmir to Kanyakumari exhibiting thermo plasticity and phenotypic diversity with racial variants with different color of the bloom starting from white to dark pink and having 16-160 petals. The plants being extremely decorative and exploited for landscaping lakes and ponds. Solitary, large, 10-25 cm in diameter, white pink or pink white musky peduncles arising from the nodes of the rhizomes, over layer at the bottom, 1-2 cm long, inexperienced or achromatic inexperienced, enormous and stout, smooth or rough because of the presence of diverse tiny scattered prickles, sepals, petals and stamens and spirally organized passing one into another.

The flowers are used for ornament and as offerings in temples; they are used as a supply of fragrance. Garlands made up of the attractive, white or pink flower of lotus are used for adornment and within the worship of immortal Hindu deity, the image of wealth. Lotus flower beholds a secret that means and significance that produces it a sacred beauty.

In contrast to the other flowering plants, lotus life cycle is completely different. With its roots padlock within the mud, the flower gets submerged into the water in the night and re-blooms ensuring morning, sparkling clean. Therefore in several cultures, lotus significance is of re-birth, reemergence, and religious enlightenment that attributable to the lotus flower that means of purity, grace, fertility, self-regeneration, serenity, and everything divine, it's usually placed aboard god figures.

The lotus plant encompass rootstock, leaf, stalk, flower and pod, the leaves float on the water surface and also the stem contains flower develop from the rootstock. Flowering stem bear no leaves. Every genotype of lotus flowers treated with 25% coconut milk, 50% coconut milk, 0.12 mM Gibberelic acid, 0.15 mM Gibberelic acid and Tap water, to increase its vase life. Fresh weight, dry weight, water uptake rate and vase life of flowers was principally investigated beneath laboratory experiments. The experiment was conducted within the month of October-November. The water temperature throughout the experimental amount averaged 29.5°C with a most variation between day temperatures of concerning 0.7°C. The distinction in day and night water temperature was concerning 1.3°C. The air temperature showed a diurnal cycle between a median of 27.5°C and 32.7°C. Lotus flower never shows floral leaf change of color once it connected to the plants, until that absolutely opened.

Some floral leaf change of color of connected flower is seen when three days of flower gap. Once flower did not absolutely open, it showed floral leaf change of color when 1-2 days. Abscission was seen clearly when four days of floral leaf gap. Aside from use as a contemporary flower, dry flowers are also used for decoration, some cut buds are used for decorative functions. Once closed bud flowers are, control in water within the temperature controlled area at concerning 25°C, floral leaf change of color started by the tip of the day one. By day two the change of color was clearly visible.

All petals, stigma, reproductive structures were uniformly black by 4-5 days. The length of vase life of lotus flower is three - four days. Lotus flowers are unremarkably harvested at the cut bud stage, once such cut flowers were placed in water at concerning 25°C, the primary floral leaf change of color symptoms were ascertained when 1 day of vase life and change of color symptoms were ascertained when 1 day of vase life, and change of color was terribly clear by 2 days of vase life. All visible petals were uniformly black by concerning 4-5 days of vase life, thus completely different treatment are set to increase the vase lifetime of lotus.

Materials and Methods

Plant

Fifty one indigenous genotypes of sacred lotus (*Nelumbo nucifera* Gaertn.) Flower buds were collected from seven districts of Chhattisgarh *viz.* Dhamtari, Gariyaband, Balod, Durg, Raipur, Kabirdham, and Mahasamund. The flower buds were picked from plant with fully closed bud condition but about to open. Workers walked under the lotus pond either by walking, swimming or with the help of boat to harvest the flower from plants.

From each genotypes 15 flowers were harvested at stem length of 60-70 cm. Direct after harvesting, the flowers was wrapped under jute bags for 7-8 hrs, thereafter the stems are again re cut at the length of 40-60 cm and placed individually at different treatments.

Coconut water

Fresh coconut water from 6-8 month old nuts collected hygienically was used in this study. Coconut water was sieved with cotton cloth to remove the suspended particles before use. A series of solution containing 25% and 50% coconut water were prepared.

Gibberelic acid

GA_3 included in the vase water at two different concentration *viz*. 0.12 mM and 0.15 mM was carried out at experiment, to delay the petal blackening of lotus.

Tap water

Tap water was used in the experiment to test the vase life of lotus.

Vase life and flower opening

Petal blackening was assessed daily, at the end of the day. The length of the vase life was defined as the period until half of the visible petal showed black patches. Flower opening was determined visually. The flower was defined to have started opening if the petals at the tip left an opening.

Statistical analysis

Experiment for vase life of the lotus flower was set in five treatments and three replication under completely randomized design. Statistical differences were calculated using t-test when comparing two datasets. All experiments were repeated at least once at a later date, with very similar results.

Results and Discussion

Analysis of Variance

Analysis of variance for vase life of lotus flower under different treatment have been given in Table 3.1 which exhibit the mean sum of squares due to variability was found to be significant for all the traits.

Mean performance of treatments

Tap water

Tap water is taken as treatment, 100 ml of tap water is taken at flask, to see the effect of tap water on vase life of water, the flowers harvested at closed bud stage are dip in the tap water vessel then following observations are taken at different genotypes. The length of flower stalk is kept 50 cm.

Fresh weight (g)

Fresh weight is ranged between 10.45 in CGL-17-39 to 49.73 in CGL-17-12 under tap water treatment. The mean value for fresh weight is 22.57, C.V.is 12.80 and standard error is 1.67.

Dry Weight (g)

Dry weight is ranged between 6.17 in CGL-17-38 to 22.40 in CGL-17-22.The mean value for dry weight is 11.21, C.V. is 14.56 and standard error is 0.94.

Water uptake (ml)

Water uptake range under tap water is ranged between 9.47 in CGL-17-1to 25.03 in CGL-17-12. The mean value for water uptake is 17.31, C.V. is 8.33 and standard error is 0.83.

Vase life (Days)

Vase life ranged between 3.50 days in CGL-17-13 to 5.00 days in CGL-17-24 under tap water condition. The mean value for vase life is 4.07, C.V. is 2.98 and standard error is 0.07.

25% Coconut Water

Fresh weight (g)

Fresh weight is ranged between 11.87 in CGL-17-38 to 45.80 in CGL-17-31 under 25 % Coconut water. The mean value for fresh weight is 22.27, C.V.is 10.33 and standard error is 1.33.

Dry Weight (g)

Dry weight is ranged between 6.97 in CGL-17-29 to 17.32 in CGL-17-10 under 25 % coconut water. The mean value for dry weight is 11.03, C.V. is 14.41 and standard error is 0.92.

Water uptake (ml)

Water uptake range under 25 % Coconut water is ranged between 6.50 in CGL-17-23 to 18.13 in CGL-17-12. The mean value for water uptake is 13.94, C.V. is 7.80 and standard error is 0.63.

Vase life (Days)

Vase life ranged between 4.33 days in CGL-17-21 to 5.0 days in CGL-17-5, CGL-17-6, CGL-17-8, CGL-17-10, CGL-17-14, CGL-17-15, CGL-17-17, CGL-17-18, CGL-17-22, CGL-17-24, CGL-17-25, CGL-17-47 and CGL-17-48. The mean value for vase life is 4.70, C.V. is 3.22 and standard error is 0.09.

50% Coconut Water

Fresh weight (g)

Fresh weight is ranged between 11.67 in CGL-17-38 to 43.87 in CGL-17-31 under treatment 50 % coconut water. The mean value for fresh weight is 21.64, C.V.is 5.37 and standard error is 0.67.

Dry Weight (g)

Dry weight is ranged between 5.90 in CGL-17-38 to 18.70 in CGL-17-12 under 50 % coconut water treatments. The mean value for dry weight is 11.05, C.V. is 8.51 and standard error is 0.54.

Water uptake (ml)

Water uptake under 50% coconut water is ranged between 5.77 in CGL-17-11 to 16.57 in CGL-17-44. The mean value for water uptake is 12.28, C.V. is 7.48 and standard error is 0.53.

Vase life (Days)

Vase life ranged between 5.0 days in CGL-17-11, CGL-17-27, CGL-17-28, CGL-17-31, CGL-17-35, to 5.67 days in CGL-17-14 under 50 % coconut water treatments. The mean value for vase life is 5.40, C.V. is 2.59 and standard error is 0.08.

Gibberelic Acid 0.12 mM

Fresh weight (g)

Fresh weight is ranged between 11.23 in CGL-17-38 to 41.77 in CGL-17-22 under treatment GA3 0.12 mM. The mean value for fresh weight is 21.12, C.V.is 5.38 and standard error is 0.66.

Dry Weight (g)

Dry weight is ranged between 5.57 in CGL-17-38 to 17.0 in CGL-17-31 under treatment GA3 0.12 mM. The mean value for dry weight is 9.92, C.V. is 7.64 and standard error is 0.44.

Water uptake (ml)

Water uptake under treatment GA3 0.12 mM is ranged between 9.43 in CGL-17-1 to 21.33 in CGL-17-34. The mean value for water uptake is 16.38, C.V. is 9.47 and standard error is 0.90.

Vase life (Days)

Vase life ranged between 4.0 days in CGL-17-13, CGL-17-23, CGL-17-29, CGL-17-30, CGL-17-33 to 5.0 days in CGL-17-1, CGL-17-2, CGL-17-19, CGL-17-24. The mean value for vase life is 4.57, C.V. is 5.23 and standard error is 0.14.

Gibberelic Acid 0.15 mM

Fresh weight (g)

Fresh weight under treatment GA3 0.15 mM is ranged between 11.67 in CGL-17-51 to 41.13 in CGL-17-22. The mean value for fresh weight is 21.31, C.V.is 5.99 and standard error is 0.74.

Dry Weight (g)

Dry weight under treatment GA3 0.15 mM is ranged between 5.03 in CGL-17-38 to 17.10 in CGL-17-10.The mean value for dry weight is 10.08, C.V. is 8.11 and standard error is 0.47.

Water uptake (ml)

Water uptake under treatment GA3 0.15 mM is ranged between 9.37 in CGL-17-23 to 22.23 in CGL-17-25. The mean value for water uptake is 17.57, C.V. is 7.11 and standard error is 0.72.

Vase life (Days)

Vase life under treatment GA3 0.15 mM is ranged between 4.17 days in CGL-17-27, CGL-17-28, to 5.0 days in CGL-17-1, CGL-17-2, CGL-17-3, CGL-17-4, CGL-17-5,CGL-17-14, CGL-17-15, CGL-17-16, CGL-17-18, CGL-17-19, CGL-17-20, CGL-17-21, CGL-17-22, CGL-17-24, CGL-17-25, CGL-17-28, CGL-17-31, CGL-17-32,CGL-17-34, CGL-17-35, CGL-17-36, CGL-17-38, CGL-17-40, CGL-17-38, CGL-17-40, CGL-17-42, CGL-17-43, CGL-17-44, CGL-17-45, CGL-17-48, CGL-17-49,. The mean value for vase life is 4.80, C.V. is 2.52 and standard error is 0.07.

Genetic variability

Computation of genetic variability presented in Table 3.2 which reveals that in general, phenotypic coefficient of vase life of all the treatment was higher than the genotypic coefficient of variation, indicating considerable influence of environment in the expression of vase life.

The range of genotypic coefficient of variation for vase life of different treatment was found to be 2.91 to 38.38. The highest genotypic coefficient of variation was found under treatment (T1) in fresh weight of flower, followed by under T3 (50% coconut water) fresh weight of flower is 36.36. The lowest genotypic coefficient of variation was observed under treatment T3 (50% coconut water) vase life is 2.91.

Phenotypic coefficient of variation was ranged between 3.90 to 40.46. The highest phenotypic coefficient of variation was found under treatment T1 (Tap water) fresh weight is 40.46, followed by in T3 (50% coconut water) fresh weight is 36.75.

The lowest phenotypic coefficient of variation was observed under T3 (50% coconut water) vase life is 3.90. The phenotypic coefficient of variation and genotypic coefficient of variation for dry weight and vase life of flower reported less difference signifying the greater role of genetic factor in expression of these characters. Difference between genotypic coefficient of variation and phenotypic coefficient of variation were observed for dry weight of flower and water uptake showing higher environmental influence. The character *viz.* fresh weight and dry weight of flower exhibiting high genotypic and phenotypic coefficient of variation indicating the existence of substantial amount of variability for these trait between the genotypes. Hence, there is abundant scope for improvement of these characters. The genotypic variance was smaller than phenotypic variance, this indicate that environment have masking effect on the expression of genetic variability.

Heritability

Heritability in broad sense was evaluated for each of the yield contributing character under investigation and presented in the Table 3.2 The highest heritability was recorded for fresh weight of flower under T3 (97.90%) followed by in T4 (97.50%) and T5 (97.20%). The lowest value for heritability was observed for Vase life under T3 (55.70%).

Table.1 Mean Performance of Treatments for Vase Life Study among the *N.nucifera* Gaertn Genotypes

Genotype	Fresh wt (gm)-T1	Dry wt (gm)-T1	Water uptake (ml)-T1	Vase life (Days)-T1	Fresh wt (gm)-T2	Dry wt (gm)-T2	Water uptake (ml)-T2	Vase life (Days)-T2	Fresh wt (gm)-T3	Dry wt (gm)-T3
Mean	22.57	11.21	17.31	4.07	22.27	11.03	13.94	4.70	21.64	11.05
C.V.	12.80	14.56	8.33	2.98	10.33	14.41	7.80	3.22	5.37	8.51
F ratio	27.96	10.77	8.17	14.56	35.83	10.01	16.48	7.24	138.42	36.11
F Prob.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S.E.	1.67	0.94	0.83	0.07	1.33	0.92	0.63	0.09	0.67	0.54
C.D. 5%	4.68	2.64	2.33	0.20	3.73	2.57	1.76	0.24	1.88	1.52
C.D. 1%	6.19	3.50	3.09	0.26	4.93	3.41	2.33	0.32	2.49	2.01
Range Lowest	10.45	6.17	9.47	3.50	11.87	6.97	6.50	4.33	11.67	5.90
Range Highest	49.73	22.40	25.03	5.00	45.80	17.32	18.13	5.00	43.87	18.70

Table.2

Genotype	Water uptake (ml)-T3	Vase life (Days)-T3	Fresh wt (gm)-T4	Dry wt (gm)-T4	Water uptake (ml)-T4	Vase life (Days)-T4	Fresh wt (gm)-T5	Dry wt (gm)-T5	Water uptake (ml)-T5	Vase life (Days)-T5
Mean	12.28	5.40	21.12	9.92	16.38	4.57	21.31	10.08	17.57	4.80
C.V.	7.48	2.59	5.38	7.64	9.47	5.23	5.99	8.11	7.11	2.52
F ratio	26.82	4.77	116.42	30.95	9.22	5.84	103.97	31.04	11.94	16.48
F Prob.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S.E.	0.53	0.08	0.66	0.44	0.90	0.14	0.74	0.47	0.72	0.07
C.D. 5%	1.49	0.23	1.84	1.23	2.51	0.39	2.07	1.33	2.02	0.20
C.D. 1%	1.97	0.30	2.44	1.62	3.32	0.51	2.74	1.75	2.68	0.26
Range Lowest	5.77	5.00	11.23	5.57	9.43	4.00	11.67	6.03	9.37	4.17
Range Highest	16.57	5.67	41.77	17.00	21.33	5.00	41.13	17.10	22.23	5.00

Table.3 Mean Performance of Genetic Parameter for Vase Life of *N.nucifera* Genotypes

Parameter of Treatment	GCV	PCV	h2 (Broad Sense)	Genetic Advancement 5%	Gen. Adv as % of Mean 5%
Fresh wt (gm)-T1	38.38	40.46	90.00	16.92	75.00
Dry wt (gm)-T1	26.27	30.03	76.50	5.31	47.33
Water uptake (ml)-T1	12.88	15.34	70.50	3.86	22.28
Vase life (Days)-T1	6.33	7.00	81.90	0.48	11.81
Fresh wt (gm)-T2	35.20	36.68	92.10	15.49	69.58
Dry wt (gm)-T2	24.97	28.83	75.00	4.91	44.56
Water uptake (ml)-T2	17.72	19.36	83.80	4.66	33.41
Vase life (Days)-T2	4.65	5.65	67.50	0.37	7.87
Fresh wt (gm)-T3	36.36	36.75	97.90	16.03	74.09
Dry wt(gm)-T3	29.11	30.32	92.10	6.36	57.55
Water uptake (ml)-T3	21.94	23.17	89.60	5.25	42.77
Vase life (Days)-T3	2.91	3.90	55.70	0.24	4.47
Fresh wt (gm)-T4	33.37	33.80	97.50	14.34	67.86
Dry wt (gm)-T4	24.14	25.32	90.90	4.71	47.41
Water uptake (ml)-T4	15.67	18.31	73.30	4.53	27.63
Vase life (Days)-T4	6.65	8.46	61.70	0.49	10.76
Fresh wt (gm)-T5	35.12	35.62	97.20	15.20	71.31
Dry wt (gm)-T5	25.67	26.93	90.90	5.09	50.43
Water uptake (ml)-T5	13.58	15.33	78.50	4.35	24.78
Vase life (Days)-T5	5.73	6.27	83.80	0.52	10.81

Genetic advance

The highest amount of genetic advance as percent of mean was observed for fresh weight of flower under T1 (75.00%), followed by fresh weight of T3 (74.09%). The minimum value of genetic advance was estimated for vase life under T3 (4.47%). The trait showing high genetic advance indicates that the trait is governed by additive genes and selection will be satisfying for improvement of such trait. Vase life of flower shows medium to low genetic advance reveals that the character is governed by non-additive genes.

High heritability accompanied with high genetic advance has been recorded for fresh weight of flower in T3 (97.90, 74.09), water uptake in T3 (89.60, 42.77) which indicates that the heritability for these characters is due to additive gene effect and selection for these characters for improvement may be effective. Moderate heritability with low genetic advance was recorded under T3 vase life of flower (55.70, 4.47), which is indicative of non-additive gene action. High heritability and high genetic advance recorded for seed yield per plant are in agreement with the result of Bibi *et al.,* (2013) and Siddiui *et al.,* (2016).

Lotus flower, cut at the late bud stage and placed in water, show petal blackening within about 2 day. Additionally, the bud does not open, and the petal quickly abscises from the closed buds. At present lotus flowers cannot be used in the commercial floral trade, neither in bouquet. We observed that early petal blackening was usually absent in flowers that remained attached to the plant, although in a few flowers slight blackening tended to be present in flowers that did not open as widely as most flowers.

Here, blackening was observed by day 2-3 after the onset of opening. The data thus showed that in attached flowers blackening was mostly absent, or, if it occurred, the first symptoms took place later than in cut flowers. These data suggest that petal blackening is hastened by a stress related to harvesting and postharvest treatment.

Furthermore, attached flowers fully opened. Maximum floral opening was reached within about 3 day after the closed bud stage that is used in the commercial lotus trade. Flower opening in intact plants is in contrast with the bud cut flower which, after being placed in vase water, did not open. A stress related to cutting and postharvest treatment, therefore also seems to prevent the opening of cut flowers. Attached flower that failed to open, show some petal blackening. This suggested the idea that a physiological stress might prevent full flower opening in intact plants, and that this is related to petal blackening. Although we found that 50% coconut water treatment delayed petal blackening in bud cut flowers by 2-3 days, this treatment did not promote the opening of floral buds. The relation between the incidence of petal blackening and lack of flower opening therefore is not very strong.

When the lotus flowers harvested at the bud stage do not open, the outer petals are curled back by hand in order to produce an open flower. We observed that the petal of such flowers blackened at the same time as those in flowers of which the petals were not curled back. Additionally, in the flowers in which the petals were folded back the stamens and styles were observed to blacken. These data shows that blackening occurs throughout the visible floral organ.

According to the result, 50% coconut water solution is the best preservative medium to extend the vase life of lotus flower, similar study has been reported by Mehta *et al.,* (2013) in gerbera cut flower and by Agampodi *et al.,* (2007) in anthurium cut flower. In the present study petal blackening of the flower was observed in 10-20% of the total bud area. The common cause of the vase life termination was the petal blackening. Bluing was the second major condition that has been observed in the senescence of the petals.

A clear visual change in petal colour was observed in control flower after 4 days. At the initial stage, the bluing of the petal is observed; later on it slowly turned into black colour. At about 5 days of vase life, flower in the standard solution showed evidence of senescence. The vase life of control flowers was completed after 4 days. Flowers in the 25% Coconut water having vase life of 4.70 days, 5.40 days in 50% coconut water, 4.57 days under treatment GA3 0.12 Mm, and 4.80 days under treatment GA3 0.15 Mm. Generally, the post harvest life is expressed in days and there are no well defined criteria and condition on evaluating the lasting qualities of cut flowers.

Water uptake rate is higher under treatment of GA3 0.15 mM, thereafter in tap water, lowest water uptake is recorded under treatment of 50 % coconut water, it may be possible due to the wounding-induced xylem occlusion in the stem end has been found reported by (Vaslier and van Doorn, 2003; Jain Alka, *et al.*, 2004). Coconut water contains lot of reducing sugar. With increase of coconut water percentage in the preservative medium reducing sugar concentration also increases that provide favorable condition for the growth of the bacteria on the cut surface of flower stalk and thereby block water conducting tissues. For lotus, stalk clogging and subsequent decline in water uptake has been related to lower the vase life of flower, hence 50% coconut water perform better than other 25% coconut water and GA3 treatment, similar results were reported in anthurium cut flower by Agampodi and Jayawardene (2007) and Shubhashree, *et al*., (2015).

Treatment with GA3 induced the vase life of lotus flower, but it had invariably no effect on the rate of transpiration, this may be due to delayed xylem occlusion that is not due to bacteria, air or latex, but to plant- induced phenomenon. As reported by Imsabai Wachiraya, *et al.*, 2013. This data indicate that petal blackening, which is due to early adverse water relations, can be delayed with and without improvement of water relations.

It is concluded that the early petal blackening in cut lotus flower as compared to the flower attached to the plant is due to the development of xylem occlusion in the stem xylem that leads to the prevent air uptake, water uptake on later stage, that accelerate the rate of petal blackening. By this experiment the lotus stem xylem occlusion can be reduced by application of GA3 and coconut water that helps to increase the vase life by 1 to 1.7 days than tap water.

In this study, 50 % coconut water from 6-8 months old nuts had been effectively used to extend the vase life of lotus genotypes collected from different pond, reservoirs from seven districts of Chhattisgarh plains up to 1 to 1.7 days more than tap water. This treatment also shows high genetic variability, heritability and genetic advancement under fresh weight of lotus flowers.

References

Agampodi V. A., Jayawardena B. M. 2007. Effect of coconut water in extending the vase life of anthurium cut flower variety wild pink, Tropical agricultural research vol.19:202-209 (2007)

Bibi, T., Mahmood, T., Mirza, Y., Mahmood, T. and Hasan, E. U. 2013. Correlation studies of some yield related traits in linseed, *Linum usitatissimum*. J. Agric. Res., 51(2): 121-131.

Imsabai Wachiraya, Leethiti Preeyapon, and Netlak Petcharat, Van Doorn g. Wouter: Petal blackening and lack of bud opening in cut lotus flowers (*Nelumbo nucifera*): Role of adverse water relations. Post harvest Biology and Technology 79 (2013)32-38. https://doi.org/10.1016/j.postharvbio.2012.12.017

Jain Alka, Singh R S, Singh Birkumar H., 2004. Economic evaluation of Lotus (*Nelumbo nucifera* Gaertn.) cultivation in Sanapat Lake, Manipur Valley, Natural Product Radiance Vol 3(6) November- December.

Mehta R Nishkruti, Patel P Ekta, Patani V Pragnesh, Shah Biren, 2013. *Nelumbo nucifera* (Lotus): A review on Ethanobotany, Phytochemistry and pharmacology, Indian Journal of Pharmaceutical and Biological Research.; 1

(4):152-167 https://doi.org/10.30750/ijpbr.1.4.26

Shubhashree M N, Shantha T R, RamaRao V, *et al.*, 2015. A Review on Therapeutic uses of Flowers as depicted in classical texts of Ayurveda and Siddha, J. Res. Edu. Indian Medicine, Vol, XXI Jan-March

Siddiqui, A., Shukla, S., Rastogi, A., Bhargava, A., Niranjan, A and Lehri, A. 2016. Relationship among phenotypic and quality traits in indigenous and exotic accessions of linseed. Pesq. Agropec. Bras. Brasília, 51(12): 1964-1972. https://doi.org/10.1590/s0100-204x2016001200007

Vaslier, N., van Doorn, W. G., 2003. Xylem occlusion in bouvardia flowers: evidence for a role of peroxidase and catechol oxidase. Postharvest Biol. Technol. 28,231–237.
https://doi.org/10.1016/S0925-5214(02)00197-7

How to cite this article:

Rajeshwari Sahu, J. Singh, Nandan Mehta, T. Tirkey and Saxena, R. R. 2023. Role of Coconut Water, Gibberelic Acid in Vase Life of Existing Lotus (*Nelumbo nucifera* Gaertn) Genotypes in Chhattisgarh Plains. *Int.J.Curr.Microbiol.App.Sci.* 12(04): 220-229. **doi:** https://doi.org/10.20546/ijcmas.2023.1204.025