

# EFFECT OF 8-HYDROXYQUINOLINE SULFATE (8-HQS) ON VASELIFE OF GLADIOLUS (GLADIOLUS GRANDIFLORUS L, CV. AMERICAN BEAUTY) CUT FLOWER

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## ABSTRACT

A laboratory experiment was conducted in Completely Randomized Design with three replications and five treatments i.e. (T1) 0ppm or control, (T2) 200 8-HQS, (T3) 400ppm 8-HQS, (T4) 600ppm 8-HQS, (T5) 800 ppm 8-HQS. The data revealed that different level of 8-HQS significantly influenced the different post-harvest attributes in gladiolus spike. There is highly significant difference on 1st and 50% floret open in which earlier floret open was observed on vase solution containing 600ppm 8-HQS (2.9days) which is followed by 800ppm 8-HQS (3.23days) whereas on control is later. The weight loss of the spike was highly significant influenced by 8-HQS. The highest spike weight loss was observed on vase solution containing 600ppm 8-HQS (15.2gm) which is followed by 800ppm 8-HQS (16.4gm) whereas the lowest weight of spike vase solution containing 0ppm or control (21.83gm). The length rotted observed was maximum on control (18.07333cm) whereas it was observed minimum on vase solution containing 600ppm 8-HQS (9.12cm) which is followed by 800ppm 8-HQS (11.76667cm).

**Key words:** *Gladiolus*, floret open, 8-HQS

## Introduction

*Gladiolus* (*Gladiolus* L.) an ornamental bulbous plant grown commercially for its beautiful flower belongs to the Iridaceae family. It is also known as "queen of bulbous flowers". The name *gladiolus* has been derived from the Latin word "gladius", which meaning is sword as its leaves is like the shape of sword (Makhijani, 1973). *Gladiolus* include some 262 spp. which is very important for its beautiful flower, different variety of spikes which is more famous now a day's which has high market value on both domestic market as well as international market (chanda et al., 2000). It is one of the popular cut flower in the world, but it has very short flowers longevity. Short vase life is one of the major problems of these cut flowers. However, longevity of vase life is an important factor in consumer context.

Microorganisms, mainly bacteria and fungi that grow in preservative solution that adversely affect longevity of cut flowers. These microorganism and their products plug the stem ends and restrict water absorption which reduce the longevity of cut flowers (Van Doorn et al., 1997)

A major form of deterioration in cut flowers is the blockage of xylem vessels by air and microorganisms that cause xylem occlusion (Hardenburg, 1968). The 8-HQS is a very important germicide in preservatives used in floral industry (Nowak and Rudnicki, 1990) and acts as an antimicrobial agent (Ketsa et al., 1995) which can led to increase water uptake (Reddy et al., 1996). The 8-HQS treatment was more effective when sucrose was coupled with it (Pun and Ichimura, 2003).

## Materials and Methods

The laboratory experiment for post harvest attributes of gladiolus spike on different concentration of 8-HQS was conducted from 2nd January 2015 to 1st February, 2015 on Nepal Polytechnic Institute (NPI) Laboratory, Chitwan, Nepal. The experiment was conducted in a completely randomized design (CRD) performing 5 treatment combinations. Single set contained 5 replication of a treatment and each set was replicated thrice in order to control the error while confirming the postharvest behavior of gladiolus.

Treatment combinations:

T1: control or 0ppm 8-HQS	T2: 200ppm 8-HQS
T3: 400ppm 8-HQS	T4: 600ppm 8-HQS
T5: 800ppm 8-HQS	

On every treatment 4% sucrose and 100ppm AgNo<sub>3</sub> were used as base solution.

The Flowers used for experiment was kept on bottle containing 250ml treatment volume each. Weight of fresh flower spike was measured before dipping on vase solution. The thermo hygrometer machine was used for measuring the temperature and relative humidity of laboratory during study period. Each floret open, weight loss, length of stem rot and other observation was made daily for keeping record of physiological changes during experiment. The parameters were recorded and analyzed by using the ANOVA procedure. When the F-test indicated statistical significance at the P = 0.01 and P = 0.05 level, the Duncan's Multiple Range Test was used to compare the difference of the means by using R-Stat.

## Result and Discussion

### Days to Floret Open of Flower

**Table 1. Effect of 8-Hydroxyquinoline Sulfate (8-HQS) on floret open of gladiolus spike at Chitwan, Nepal, 2015.**

Treatment	First floret open(days)	50% floret open(days)
T1 8-HQS 0PPM	4.06a	12.266a
T2 8-HQS 200ppm	4.06a	11.933ab
T3 8-HQS 400ppm	3.70a	11.60bc
T4 8-HQS 600ppm	2.9b	10.4d
T5 8-HQS 800ppm	3.23b	11.16c
LSD(5%)	0.4***	0.46***
CV (%)	5.96	2.26
Mean	3.59	11.473

LSD= Least significant difference, CV= Coefficient variation, \*\*\*= highly Significant level.

As shown in table 1, the treatment 600ppm8-HQS recorded the minimum number of days for 1st floret open (2.9) and which was followed by 800ppm(3.23). The control 0ppm 8-HQS recorded the maximum number of days (4.06). The longest days taken for 50% floret open was recorded on flower of vase containing 0ppm 8-HQS (12.266days) followed by flower of vase solution containing 200ppm 8-HQS(11.933). The minimum days taken for 50% floret open was recorded on the flower of vase solution containing 600ppm8-HQS(10.4days). It might be due to high solution uptake by 600ppm 8-HQS.

## Weight Loss of Gladiolus Spike

**Table 2. Effect of 8-Hydroxyquinoline sulfate (8-HQS) on weight loss of gladiolus spike at Chitwan, Nepal, 2015.**

Treatment	Weight loss(gm)
T1 (8-HQS 0PPM)	21.83a
T2( 8-HQS 200ppm)	20.80a
T3 (8-HQS 400ppm)	19.03b
T4 (8-HQS 600ppm)	15.2d
T5( 8-HQS 800ppm)	16.4c
LSD0.05	1.2***
CV (%)	3.53
Mean	18.65

LSD= Least significant difference, CV= Coefficient variation, \*\*\*= Significant at 5% level  
 The maximum weight loss was recorded in the flower of vase solution containing 0ppm 8-HQS (21.83gm) followed by flower of vase solution containing 200ppm 8-HQS(20.83gm). The minimum weight loss was recorded in the flower of vase solution containing 600ppm 8-HQS(15.2).The data show that a solution of 600 Ppm 8-HQC and 4% sucrose was the most beneficial for gladiolus. Spikes held in this concentration of 8-HQC and sucrose sustained greater fresh weight and elongated more than spikes held in other combination of 8-HQC or sucrose singly or water (F. J. Marousky,1968).

It could be noticed from the results that 8-HQS treatments led to maximize the fresh weight gain of cut flowers tested in this study. The increment in fresh weight may be due to its additional role in increasing water uptake (Hassan et al., 2003).

## Length Rot of Spike

**Table 3. Effect of 8-Hydroxyquinoline sulfate (8-HQS) length rot of gladiolus spike at Chitwan, Nepal, 2015.**

Treatment	Length rotted (cm)
T1 (8-HQS 0PPM)	18.07333a
T2 (8-HQS 200ppm)	14.40667b
T3( 8-HQS 400ppm)	12.96000c
T4 (8-HQS 600ppm)	9.12000e
T5( 8-HQS 800ppm)	11.76667d
LSD0.05	1.017750***
CV (%)	4.21722
Mean	13.26533

LSD= Least significant difference, CV= Coefficient variation, \*\*\*= Significant at 5% level

The spike rot cause the occlusion of stem tissue which might have decrease the vase life of flower in vase solution containing on as shown in table 3, 8-HQS 0ppm(18.07333cm) which is maximum length rot where as lowest was observed on 8-HQS 600ppm(9.12000cm) which is followed by 8-HQS 800ppm(11.7666cm).

## Conclusion

From the experiment, the result was observed that the vase solution containing 600ppm 8-HQS gave appropriate result among all vase solutions. The water uptake by spike in 600ppm 8-HQS was higher in comparison to other vase solution that delayed withering of spike, minimum length rotted of spike, lower weight loss and short first floret days, termination of flower which result the longer vase life of cut gladiolus. Performance of 600ppm 8-HQS was better in all parameters. The vase life of gladiolus cut flowers increased with the increase in concentration of 8-HQS in vase solution so the flower in 600ppm 8-HQS resulted better. But the uses of high concentration of 8-HQS affect the spike so the performance of spike in 800ppm 8- HQS was not given better result as compare to 600ppm 8-HQS. It showed 8-HQS had positive effect on increasing vase life of flowers. But synergistic researches on different energy substrate and ethylene scrubber has to be done making increasing vase life and promoting post-harvest behavior of flowers in economical way.

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