

# Use of Silver Thiosulfate and Gibberellic Acid for induction of hermaphrodite flower in Gynoecious lines of Bitter gourd (*Momordica charantia* L.)

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Bitter gourd is considered as one of the most nutritious gourds and grown for its fruits and leaves which have medicinal properties. The genetic manipulation which has shown potential for increasing sex stability and uniform flowering is the characterization and introduction of the hermaphroditic character (1). Cucumber hybrids made using hermaphrodites have been hypothesized to be sexually more stable under conditions of environmental stress (2). The predominant sex form in bitter gourd is monoecious, however, gynoecious sex form (only female flower in a plant) has been reported in two spontaneous seedling population (DBGy 201 and DBGy 202) at Indian Agricultural Research Institute, India (3). At the beginning these two lines have been maintained using sib-mating which resulted into very few gynoecious plants in subsequent generations. With the help of in vitro techniques a large number of plants has been generated for sex modification study using DBGy 201 genotype. The present study was undertaken to determine chemicals threshold concentration and dosage of  $GA_3$ , Silver Nitrate and Silver Thiosulfate which would cause gynoecious genotypes to produce hermaphrodite flowers.

Recommended cultural practices and plant protection schedule were followed. Silver Thiosulphate at 6M and 3M, Silver Nitrate at 250ppm and 200 ppm and  $GA_3$  at 1500 ppm and 1000 ppm were treated at after appearance of 1<sup>st</sup> female flower. Treatments were arranged in a randomized complete block design

with 4 replications having 2 subsamples. Plants were allowed to grow throughout the life cycle.

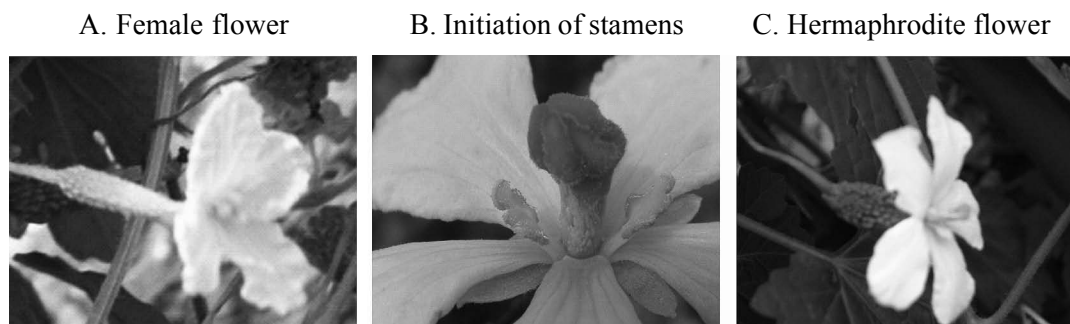
Data were observed on node at which 1<sup>st</sup> female flower appear, ovary length of female flower (cm) and hermaphrodite flower (cm) and number of female flower and hermaphrodite flower per plant during the growing period. The results depicted in table 1 showed the effectiveness of Silver Thiosulfate 6M for sex modification in bitter gourd. Silver nitrate did not show any response in sex modification in both concentrations. It was found that there was comparatively less fruit set in the hermaphrodite flower compared with the female flower those were pollinated with pollen of hermaphrodite flowers of same plant (Fig. 1). This may be because of the splitting of stigmatic surface of hermaphrodite flowers. Hence, further experimentations are in progress to find out threshold concentration and dosage of Silver Thiosulfate for obtaining functional hermaphrodite flowers in gynoecious genotype.

## References

1. Kubicki, B. 1965. New possibilities of applying different sex types in breeding. Genet. Pol. 6:241-249.
2. Pike, L.M. and W.A. Mulkey. 1971. Use of hermaphrodite cucumber lines in the development of gynoecious hybrids. HortScience 6:339-340.
3. Behera, T. K., S. S. Dey, and P. S. Sirohi. 2006. DBGy-201 and DBGy-202: two gynoecious lines in bitter gourd (*Momordica charantia* L.) isolated from indigenous source. Indian J Genet 66: 61-62.

**Table 1. Conversion of female flower into hermaphrodite flower in gynoecious genotype of bitter gourd, DBGy 201.**

Treatment	Node at which 1 <sup>st</sup> female flower appear	Ovary length of female flower (cm)	Ovary length of hermaphrodite flower (cm)	Number of female flower/ plant	Number of hermaphrodite flower/ plant
Silver Thiosulfate 6M	7.13	1.31	3.02	70.22	95.60
Silver Thiosulfate 3M	7.46	1.18	3.11	103.34	79.70
Silver Nitrate 250ppm	7.6	1.35	0	54.45	0
Silver Nitrate 200 ppm	7.33	1.34	0	133.11	0
GA <sub>3</sub> 1500 ppm	7.26	1.24	2.53	77.22	12.00
GA <sub>3</sub> 1000 ppm	6.93	1.38	2.67	60.34	13.90



**Figure 1. Sex conversion in gynoecious bitter gourd genotype by using Silver Thiosulfate 6M.**