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Sex modification in Kartoli (*Momordica dioica* Roxb.) by foliar sprays of silver nitrate ($AgNO_3$)

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Foliar sprays with $AgNO_3$ at preflowering stage induced hermaphrodite flowers on strictly gynoecious vines of Kartoli (*Momordica dioica*) Roxb.) The androecious vines were insensitive to the $AgNO_3$ sprays. Application of 400 ppm $AgNO_3$ could induce 70 to 90 per cent hermaphrodite flowers. Higher concentration caused wilting and senescence, whereas lower level showed less proportion of bisexual flowers.

KARTOLI is a nutritionally rich perennial dioecious cucurbit having a wide range of adaptability. However, its cultivation has several restrictions like unavailability of improved varieties, difficulties in propagation by seeds due to dormancy, low multiplication rate and dormancy of tubers and unpredictable sex ratio in seedling progenies[1].

Being a dioecious crop, planting of 10% male plants in the field is imperative for a good fruitset. This leads to reduction in number of female plants per unit area and thereby the yield. This investigation considers the possibility of inducing hermaphrodite flowers on female vines so as to avoid the planting of male vines[2].

The experiment was conducted at CES, Wakawali during the rainy season of 1992 and 1993. The male and female vines were sprayed with $AgNO_3$ at 400, 500 and 600 ppm in 1992 and with 200, 300 and 400 ppm in 1993 at preflowering stage.

It is revealed that only female vines produced hermaphrodite flowers when treated with $AgNO_3$ (Figure 1), whereas the male vines were insensitive to the chemical treatment. More important, the proportion of hermaphrodite flowers on female vines was the highest due to 400 ppm $AgNO_3$ in both the years. With increase in concentration, there was a sharp fall in the proportion of bisexual flowers (Table 1). The higher concentration of $AgNO_3$ also exhibited senescence and wilting of vine. Spraying with $AgNO_3$ below 400 ppm also reduced the production of bisexual flowers slightly (Table 2). The chemically induced bisexual flowers on female vine could also set fruits even after enclosing them with perforated paper bags. The results indicate that $AgNO_3$ at 400 ppm favours production of hermaphrodite flowers.

Figure 1. Induction of hermaphoditism in female flower by foliar application of $AgNO_3$. **1**, Normal ♂: **2**, Normal ♀. **3**, ♀♂ by 200 ppm $AgNO_3$; **4**, ♀♂ by 300 ppm $AgNO_3$; **5**, ♀♂ by 400 ppm $AgNO_3$.

Table 1. Effect of silver nitrate on production of bisexual flowers in Kartoli during 1992 (No of vines treated: female 7; male 3)

$AgNO_3$ conc. (mg/l)	No. of vines producing bisexual flowers		% of bisexual flowers	
	Female	Male	Female	Male
400	5	–	71.42	–
500	2	–	28.57	–
600	1	–	14.28	–
Control	–	–	–	–

Table 2. Effect of silver nitrate on production of bisexual flowers in Kartoli in 1993 (No. of vines treated: female 10; male 5)

$AgNO_3$ conc. (mg/l)	No. of vines producing bisexual flowers		% of bisexual flowers	
	Female	Male	Female	Male
200	8	–	80	–
300	8	–	80	–
400	9	–	90	–
Control	–	–	–	–

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