

Short Communication

Effect of growth regulators on sprouting of tubers of *Gloriosa superba*

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Effect of certain growth regulators (GA₃, Kinetin, Ethrel) on the sprouting tuber of glory lily was assessed and the result shows that ethrel at 500 ppm recorded maximum sprouting percentage (100 %), earlier sprouting of tubers (6.33 days), maximum plant height (99.32 cm) and maximum number of leaves per plant (34.04) and plant girth (1.81 cm).

Key words: Glory lily, growth regulators, sprouting, ethrel.

INTRODUCTION

Gloriosa superba L. commonly known as Kalahari (Hindi), glory lily, superb lily is an export oriented medicinal plant. Its origin is reported to be tropical Asia and Africa and is a member of Liliaceae family. In Tamil Nadu, it is referred as kalappaikilangu, kanvalikizhangu, kandhalmalar, karthigai kizhangu and is recognized as the state flower of Tamil Nadu. Glory lily is commercially propagated by 'V' or 'L' shaped tubers which sprout during the month of July under typical dry belt in Tamil Nadu. About 800kg of tubers are required to plant in one acre. The cost involved towards planting material (tubers) alone accounts to 2.0 lakhs @ Rs 250 per kg of tuber prevailing for the last three years. But the sprouting of tubers is irregular and in a period of 30 days they sprout to an extent of 60 per cent. Hence this experiment was aimed at standardizing the effect of growth regulators on sprouting of tubers of *Gloriosa superba*.

MATERIALS AND METHODS

Healthy tubers of *Gloriosa superba* were collected from farmer's field, Mulanur of Tirupur district. The experiment was carried out adopting Completely Randomized Design comprising seven treatments with three replications. These tubers were soaked in different growth regulators viz., Kinetin (25 ppm & 50 ppm), GA₃

(100 ppm and 200 ppm) and Ethrel (250 ppm and 500 ppm) for one hour. After that, tubers were planted in the medium size pot filled with pot mixtures containing sand, red earth and FYM (1:2:1). Observations were recorded for two months after planting.

RESULTS AND DISCUSSION

Gloriosa superba is propagated mainly during the rainy season (June-July) by V-shaped tubers. Vegetative propagation is very slow as the maximum number of daughter tubers produced per year is two. Sprouting of the tubers is irregular and reaches about 60 % in 30 days (Krause, 1988).

In the present study, the effect of various growth regulators (GA₃, kinetin, ethrel) on sprouting of tubers were studied (Table 1). It was found that ethrel at 500 ppm concentration gave the highest sprouting percentage (100 %) and days for sprouting (6.33 days). Similar reports were earlier reported in *Gloriosa* (Rajaram et al., 2002) and Suh (1989) and Puja et al. (2003).

In the present study, treatment of tubers with GA₃ 200 ppm recorded higher sprouting rate of 86.66%, with earliness in sprouting (6.66 days). According to Groot and Karssen (1987), gibberellins either endogenous (or) exogenous was considered to be an important factor in inducing sprouting. The effect of gibberillic acid in inducing the formation of hydrolytic enzymes may be a factor which might have regulated the mobilization of reserves, ultimately resulting in early sprouting with GA₃. This is also in close conformity with reports of Bhattacharjee et al. (1994) who reported that GA₃

Abbreviation

Gibberellic Acid (GA₃),
Farm Yard Manure (FYM)

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Table 1. Effect of growth regulators on plant characters of *Gloriosa superba*.

Treatment	Growth regulator	Sprouting percentage (%)	Days for sprouting (days)	Plant height (cm)	No. of leaves per plant	Stem girth (cm)
T ₁	Kinetin 25 ppm	60.00 (50.76)	7.22	39.11	24.5	0.93
T ₂	Kinetin 50 ppm	73.33 (59.20)	9.66	27.65	13.53	0.80
T ₃	GA ₃ 100 ppm	80.00 (67.85)	7.44	59.86	28.11	0.97
T ₄	GA ₃ 200 ppm	86.66 (72.07)	6.66	86.22	33.88	1.35
T ₅	Ethrel 250 ppm	66.66 (59.78)	6.88	56.87	26.11	0.57
T ₆	Ethrel 500 ppm	100 (89.37)	6.33	99.32	34.04	1.81
T ₇	Control	53.33 (46.91)	10.44	21.57	27.10	0.56
Mean		74.28 (63.717)	7.8071	55.8019	27.74	0.99
SE(d)		11.5436	0.5483	20.4899	6.4551	0.3454
CD (0.05)		24.7613	1.1761	43.9513	13.8464	0.7408

(10-100 ppm) at all concentrations recorded earlier sprouting of bulbs of tuberose.

The present investigation also showed that ethrel 500 ppm significantly increased the plant height, number of leaves and girth of the plant followed by GA₃ at 200 and 100 ppm. Similar result was reported by Puja (1999), who reported that tubers treated with 500 ppm ethrel gave better vegetative growth and tuber yield. Increased vegetative growth and tuber yield were observed in *G. superba* due to treatment with ethrel at 500 ppm. The results are in accordance with the findings of Jayachandran and Sethumadhavan (1979) in ginger who reported that 200 ppm of ethrel resulted in maximum leaf production.

The increased plant height recorded by GA₃ 200 ppm in the present study might be due to its role in cell division and cell enlargement and are largely controlled by endogenous level of gibberellic acid which has been proved in number of crops. The increased cell division and cell elongation reflected in increased plant height was observed in hybrid lilies (Gorden et al., 1980).

Tallest plants with more number of leaves were produced in gladiolus when the corms were treated with 300 ppm GA₃ as reported by Rajesh and Ajaykumar (2007). Similar results were obtained with GA₃ in day lily (Das et al., 1992), *Lilium longiflorum* (Sujatha and Bhattacharjee, 1992), gladiolus (Bhattacharjee, 1984) and in *Zephyranthes* (Sujatha and Bhattacharjee, 1990).

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