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In vitro establishment of gladiolus cv. WHITE FRIENDSHIP and FIDELIO using axillary buds as explant

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ABSTRACT

In vitro establishment of gladiolus using axillary buds as explants was carried out in two gladiolus varieties namely White Friendship and Fidelio. Among the different pH tried for treatment combination of MS + 2 mg/l BAP, establishment of explants was good in pH range of 4.8-5.8. Treatments with 0.1 % $HgCl_2$ for 7 to 11 min. in cv. WHITE FRIENDSHIP and for 7 to 9 min. in cv. FIDELIO were found to be effective for surface sterilization of axillary buds. Similarly treatments with 0.2% $HgCl_2$ for 5 to 7 min. was found effective in both the cultivars. MS basal medium supplemented with BAP 0.5 mg/l, 1 mg/l, 2 mg/l and 3 mg/l gave the 100% establishment of explants. Concentrations of BAP at and above 2.0 mg/l resulted in the swelling of buds, more at the base and took longer time to produce leaves, which resulted in moderate growth of explants.

Key words : *In vitro*, Establishment, Explant, Auxiliary buds, Gladiolus.

In ornamental crops like gladiolus, the availability of healthy planting material is a limiting factor. The superior selections and hybrids developed at various research centers fail to reach the growers due to lack of rapid cloning through conventional method. Gladiolus is commonly propagated by cormels or corms, which is an underground stem with a short, fleshy, vertical axis covered with dried leaf bases. To increase the rate of the multiplication, the corms are cut into small pieces with a bud and a root zone (Gromov, 1972). Micropropagation holds promise for the rapid propagation and dissemination. Because of the immense commercial interest in gladiolus, it is highly desirable to develop a method to speed its rate of multiplication. The diseases transmitted from parent to offspring often can be eliminated through micropropagation technique. External contamination such as bacteria, fungi and insects are removed while cleaning of the explants.

The first step in micropropagation is the proper sterilization and establishment of explants, since the explants normally have cut edges oozing out phenolics and affecting the survival of explants in very first stage of micropropagation. Moreover, when the explants are detached from any organ they have to act independently being separated from the organized plant system of which they were integral part. It therefore, warrants the supplementation of appropriate phytohormones to these explants from external sources. Considering the importance of micropropagation of gladiolus the present study reported here aims at identifying the treatment combinations for *in vitro* establishment of gladiolus using axillary buds as explants in two gladiolus cultivars namely White Friendship and Fidelio.

MATERIALS AND METHODS

The present study was carried out in Plant Tissue Culture Laboratory at Department of Agricultural Botany Dr. P.D.K.V., Akola in year 2000-01. Corms of 3.5 to 5 cm diameter were selected for both the cultivars. The corms were rinsed under running water and the axillary buds were cut out together with a piece of corm tissue 5 mm thick and 2.8 mm wider than the bud. The excised axillary buds were treated with the bavistin (500ppm) for one hour and with ascorbic acid (200 ppm) for half hour, each treatment followed by washing under running water and then with sterile distilled water.

Different pH values ranging from 4.0, 4.2, 4.4,……, 6.2, 6.4 were tried for treatment combinations of MS + BAP 2mg/1. Data was recorded as Nil/ Poor/ Fairly good/ Good establishment of explants. Different combinations of $HgCl_2$ concentrations (0.1% and 0.2%) and treatment duration in minutes (1, 3, 5, 7, 9, 11, and 13) were tried for surface sterilization of explants. Observations were recorded on 2^{nd}, 3^{rd}, 5^{th}, 7^{th}, 9^{th} and 15^{th} day of inoculation and data was recorded on the basis of contamination observed and establishment of explants. The excised axillary buds were cultured on the MS (Murashige and Skoog, 1962) basal medium supplemented with various levels of BAP. Cytokinin (BAP) at different concentration (0.5, 1, 2, 3, 4, 5, 6, 7, 8) either singly or in combination with activated charcoal (3 g/l) was tried for establishment. The explants were kept in establishment medium for 15