

Rooting of *Dracaena sanderiana* cuttings is influenced by chemical sterilization and IBA application

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Abstract

A series of field experiments were conducted at Tropical Foliage and Flower Company (Pvt) Ltd. Perawalawaththa, Badalgama during April-August, 2004 to study the effect of media sterilization and IBA on rooting of Dracaena sanderiana "white". A factorial experiment composed of four sterilization methods (Solarization, Chemical sterilization using Phyzan, Stem sterilization and zero sterilization) and three IBA concentrations, (0, 1600, and 2000 ppm) were tested in a RCBD with four replicates. Initiated roots, average root length and average root dry mass were recorded as parameters to determine the treatment effects after 3, 4 and 5 week intervals. Chemical sterilization showed significantly ($0. \alpha \leq 05$) higher root length throughout the experimental period. A significant increase in the root length due to both sterilization methods and hormone concentrations was observed, when compared to the control at 4 weeks after establishment. Interaction between sterilization methods and hormone concentrations was shown for root length. There was significant ($0. \alpha \leq 05$) increase in root length of Dracaena sanderiana due to chemical sterilization and application of 2000 ppm IBA concentration. It can be concluded that chemical sterilization using Phyzan was the best method of media sterilization for Dracaena sanderiana to meet export market expectation.

Key words: *Dracaena sanderiana*; phyzan; Indole Butric Acid; sterilization

Introduction

The use of ornamental plants has increased all over the world with the realization of the influence of flowers on the quality of life and human feelings. With the expansion of floriculture industry, diversification of the market products is very much needed. The major species such as *Dracaena sanderiana* is frequently used for various purposes. It has a potential to expand cultivation to the international market after improving propagation methods. Therefore, the main objectives of this study were to improve keeping quality of *Dracaena* potted plants through reducing malformed & fungal infected roots, identify appropriate method for media sterilization and to find out the applicability of Indol Butric Acid (IBA) for shortening root initiation.

Methodology

2.5 cm net pots were used to grow *Dracaena sanderiana* "white" cuttings. Four treatments for media sterilization (steam, chemical, solar, & zero sterilization) and three concentrations of IBA (2000, 1600 and 0 ppm) were used. Treatments were arranged in RCBD factorial design with four replicates. Observations; number of initiated roots, length of roots and root mass were measured at 3, 4 and 5 weeks after establishment.

Results and Discussion

Chemical sterilization using Pyzan produced the highest root length at 3 weeks interval and these responses continued until the end of the experiment (Table 1). Root length of *Dracaena sanderiana* was significantly ($\alpha \leq 0.05$) increased by both chemical sterilization using Phyzan and IBA 2000 ppm compared to the control at 4 weeks interval (Table 2). IBA concentration did not show a significant ($\alpha \leq 0.05$) difference on root mass production during experimental period. However, a significant difference on root length was observed at 4 weeks interval. Currently *Dracaena sanderiana* rooted stems are exported at 5 weeks interval. Results suggested that IBA applied cuttings established on chemical sterilized media are ready to export at 4 weeks of interval.

Table 1. Average root length at 3 weeks after treatment application

| Sterilization method | Root length (cm) |
|----------------------------|------------------|
| Chemical | 0.64 a |
| Solarization | 0.59 ab |
| Zero sterilization | 0.52 b |
| Stem sterilization | 0.39 c |
| Sterilization methods (SM) | *** |
| Hormone concentration (HC) | * |
| SM and HC | NS |
| C.V. | 15.37 |
| R-square | 0.74 |

Table 2. Average root length at 4 weeks after treatment application

| Sterilization method | Root length (cm) |
|----------------------------|------------------|
| Chemical | 4.49 a |
| Solarization | 4.48 b |
| Zero sterilization | 4.29 c |
| Stem sterilization | 2.22 d |
| Sterilization Methods (SM) | *** |
| Hormone Concentration (HC) | *** |
| SM and HC | *** |
| C.V. | 10 |
| R-square | 0.9 |

Sterilization methods showed a significant ($\alpha \leq 0.05$) difference for root initiation at 5 weeks interval (Table 3). Significant interaction of sterilization method on average root length ($r^2 = 0.69$) and on root initiation ($r^2 = 0.65$) were observed at 4 weeks interval. IBA 2000 ppm gave significantly higher root length at 4 weeks interval when compared to the control. However, root initiation and root mass of *Dracaena sanderiana* were not affected by IBA for the experimental period. Highest root mass was recorded by chemical sterilization. Increment of root length between 4 and 5 weeks was very low in zero sterilization and 1600 ppm IBA concentration (Fig. 1-5). Findings suggested that chemical sterilization with Phyzan as a useful media sterilization method for obtaining quality exportable *Dracaena sanderiana* plants at 4 weeks after establishment.

Table 3. Initiation of rooting and average root length after 5 weeks

| | Average root length | No. of initiated roots |
|----------------------------|---------------------|------------------------|
| Sterilization Methods (SM) | *** | *** |
| Hormone Concentration (HC) | NS | NS |
| SM and HC | NS | NS |
| C.V. | 12.67 | 17.16 |
| R-square | 0.68 | 0.65 |

Conclusion

Chemical sterilized medium with Phyzan was the best method for establishment of *Dracaena sanderiana* “white” propagation. Media sterilization and application of 2000 ppm IBA are needed to reduce nursery period (only 4 weeks) for exportation.

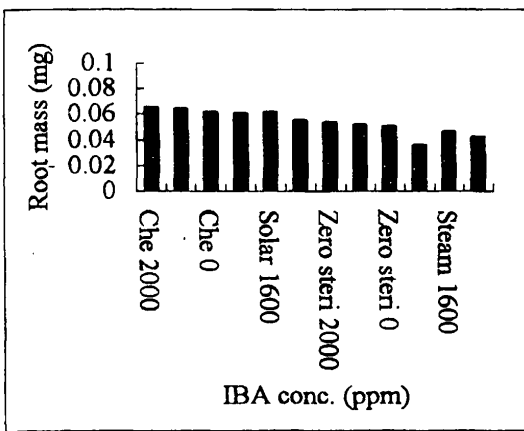


Fig. 1: Average root mass after 5 weeks

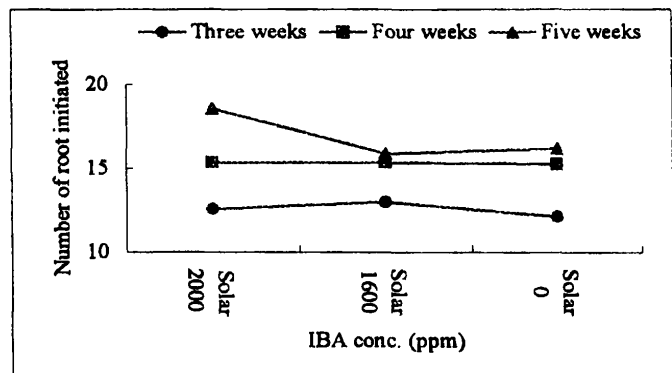


Fig. 2: Effect of chemical sterilization on root initiation

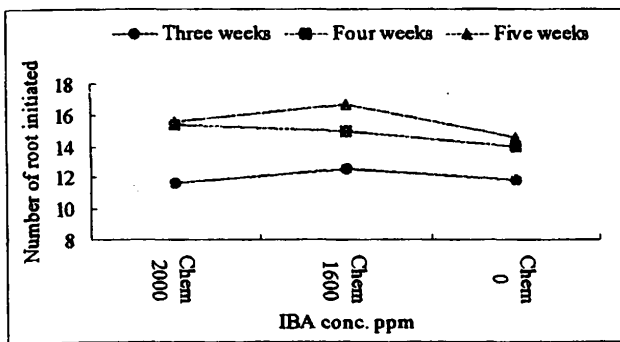


Fig. 3: Effect of solarization on root initiation

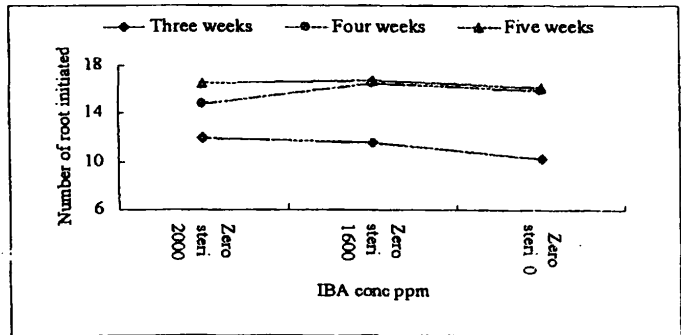


Fig. 4: Effect of zero sterilization on root initiation

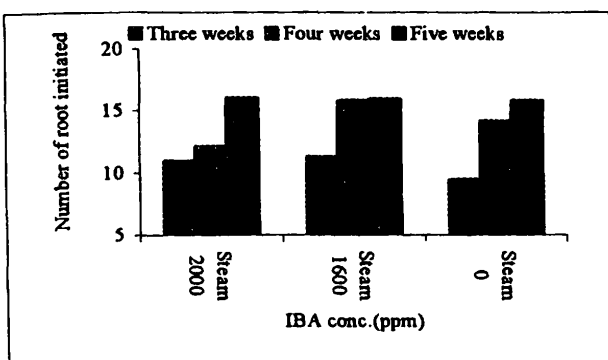


Fig. 5: Effect of steam sterilization on root initiation

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