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Effect of sucrose, BA and NAA on bulb development in bioreactor culture of garlic

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Objectives

This work was carried out as a preliminary design to set a standard model for multipropagation of garlic seed cloves by improvement of tank liquid culture.

Materials and Methods

1. Material

Plant - Garlic (*Allium sativum* L. cv. Seosan)

2. Methods:

Following the culture for 30 days on MS medium containing sucrose 3%, the shoot-tips of garlic (*Allium sativum* L. cv. Seosan) were transferred to 3 L bioreactor glass vessel containing of 1.5 L of MS liquid medium. The sucrose concentrations of liquid MS media were adjusted to 3%, 8%, 11% and supplemented with various concentrations of BA and NAA to search shoot growth and bulb development.

Results and Discussion

In the bulb size, shoot growth, root weight, bulb diameter, fresh weight and dry weight of bulb after 90 days were increased significantly in the MS liquid medium containing 3% sucrose. According to increasing of sucrose concentration the growth of shoot or development garlic bulbs in the bioreactor were decreased and the phenomena were severe in the medium containing 11% sucrose.

In the liquid medium supplemented with BA and NAA, bulb formation was increased a little in the medium supplement with BA $1 \text{ mg} \cdot \text{L}^{-1}$ and NAA $0.1 \text{ mg} \cdot \text{L}^{-1}$. However, the growth of shoot was most vigorous in the medium supplement with BA $2 \text{ mg} \cdot \text{L}^{-1}$ and NAA $0.2 \text{ mg} \cdot \text{L}^{-1}$ for 2.9 shoots. Four or more bulbs could be formed from a shoot tip and the results indicate that the introduction of bioreactor or tank culture system respond to obvious causal method for multipropagation of virus-free seed cloves of garlic.