Synthetic seed technology for encapsulation and regrowth of *in vitro*-derived *Gypsophila paniculata* L. shoot-tips

(Received: 20.01.2004; Accepted: 12.02.2004)

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ABSTRACT

Encapsulation of in vitro-derived shoot tips of Gypsophila in different concentrations of Na-alginate dissolved either in MS-salts solution or sterilized distilled water (SDW) as solvent was investigated. The encapsulated shoot-tips were stored 30 and 90 days at 4 ℃ and cultured either on MS basal medium or on MS-medium containing 0.5 mg/l each of NAA and BA. The highest frequency of shoot emergence and maximum number of shoots were recorded for beads encapsulated in 4% Na-alginate dissolved in MS- salt solution which stored 30 days and grown on medium containing BA and NAA. However, the root emergence and the percentage of root formation in shoots obtained by beads dissolved in SDW was higher than that derived from beads dissolved in MS salt solution especially with high levels of Na-alginate. Furthermore, the degree of vitrification was affected by Na-alginate concentration. The degree of vitrification was decreased from 100% to 20% by increasing the Na-alginate concentration from 2% to 4% dissolved in SDW. SDS-PAGE analysis of shoots produced from beads after 90 days storing demonstrated the similarity of produced plantlets in the protein profile. Finally, plants retrieved from the encapsulated shoot-tips coated in 4% Na-alginate were hardened off and successfully established in the growth chamber.

Key words: *Gypsophila paniculata, sodium alginate, encapsulation, shoot-tips, SDS-PAGE, synthetic seed.*

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INTRODUCTION

Gypsophila paniculata L., is an ornamental plant, belonging to the family *Caryophyllaceae*. It is the major species used in commercial cut-flower production. *Gypsophila* is used traditionally as a filler for formal floral arrangements and bouquets, especially with roses. As a result of the sterile nature of *Gypsophila paniculata* plants (do not produce seeds) the real breeding of this plant is a dilemma (Shillo, 1985). Growers propagate *Gypsophila* vegetatively from tip cuttings. The low rooting frequency of cuttings likewise hinders propagation. Alternatively, *Gypsophila* can be propagated