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Cryopreservation of *In Vitro* – Grown Shoot -Apices of Yam (*Dioscorea batatas*) by Encapsulation-Dehydration

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Objectives

The goal of this research was to develop an efficient cryopreservation protocol and *in vitro* micropropagation for several yam genotypes (*Dioscorea* spp.), that were cultivated widely in Korea.

Materials and Methods

Material : *In vitro*-grown shoot tips of *D. batatas*

Cryopreservation methods : Desiccation, preculture – dehydration, vitrification, encapsulation-dehydration

Thawing method : Room temp. or 30~50℃ for 3 min.

Postculture medium : MS + 30 g/L sucrose + 2g/L gelrite + 0.2 mg/L kinetin + 0.2mg/L BAP

Culture condition : 26± 1℃

Results and Discussion

Comparative studies with four other cryogenic techniques and subsequent experiments for shoot regeneration and mass propagation were conducted. *In vitro*-grown shoot-apices of the *D. batatas* were successfully cryopreserved by encapsulation-dehydration. The maximum survival of shoot-apices could be achieved when the precultured (with 0.3 M of sucrose for one day) and encapsulated (with a 3% Na-alginate solution) apices were dehydrated for 3.5~4 h prior to direct immersion in liquid nitrogen. The thawing method markedly affected survival of the cryopreserved apices, and thawing at 40 ℃ for 3 min produced the best results. When cryopreserved apices were post-cultured on the post-culture medium (MS), supplemented with 0.2 mg/L of BAP and 0.2 mg/L of kinetin, they showed direct shooting without callusing. With these optimized parameters, 29 and 40% of cryopreserved apices survived for two yam cultivars 'Ma1' and 'Db037', respectively. Plantlets could be *in vitro* propagated through nodal-piece cultures, with sequential subculturing at 6-week intervals on medium containing 0.5 mg/L of kinetin.

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