CRYOPRESERVATION OF JACKFRUIT (ARTOCARPUS HETEROPHYLLUS LAMK.)

WITAYAPORN PORNCHUTI 4637438 SCBT/M

M.Sc. (BIOTECHNOLOGY)

THESIS ADVISORS: KANCHIT THAMMASIRI, Ph.D., UNCHERA SOOKMARK, Ph.D., PIYARAT CHAREONSAP, Ph.D.

ABSTRACT

Jackfruit (Artocarpus heterophyllus Lamk.) is an important commercial fruit crop especially in Thailand. Jackfruit seeds are recalcitrant; therefore, they cannot be stored for a long time. Cryopreservation is a method that can store germplasm for a long term by cooling at ultra-low temperature (-196 °C). It is also significant to maintain germplasm of important or endangered species.

To organize an improved protocol for cryopreservation of jackfruit, a vitrification method was applied. The cryopreserved embryonic axes were able to develop into the whole plantlets. The optimal conditions were precultured embryonic axes for 3 d in MS liquid medium supplemented with 0.4 M sucrose plus 2.0 M glycerol. For vitrification, the embryonic axes were loaded with 0.4 M sucrose plus 2.0 M glycerol in MS liquid medium for 20 min and exposed to plant vitrification solution 2 (PVS2) which consisted of 30% (w/v) glycerol, 15% (w/v) ethylene glycol, and 15% (w/v) dimethyl sulfoxide in MS liquid medium for 150 min at 25 ± 2°C. Then the embryonic axes were plunged into liquid nitrogen. After thawing at about 40°C for 2 min, embryonic axes were unloaded with MS liquid medium containing 1.2 M sucrose for 20 min and cultured on recovery medium (MS agar medium with 5 mg/l 6-benzylaminopurine). For the triphenyl tetrazolium chloride test (TTC), the survival was about 50%. According to the morphology and the amplified fragment length polymorphism (AFLP) profiles of regenerated plantlets, the genetic fidelity of the cryopreserved jackfruit materials were the same as non-cryopreserved ones.

KEY WORDS: CRYOPRESERVATION/ JACKFRUIT/ EMBRYONIC AXES/ VITRIFICATION

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