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Effect of Storage Temperature and Dehydration Induction Rates to Germeability of Sugarcane Synthetic Seeds

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Abstract

Effect of storage temperature and dehydration induction rates on germeability of sugarcane synthetic seeds were investigated. Compact and white sugarcane (*Saccharum officinarum* L.) embryogenic callus developed from young leaf-rolled cultured on Murashige and Skoong agar medium supplemented with 3 mg/l 2,4-D, 50 mg/l cystein and 5 % coconut water under dark condition at 25 °C. Initiation of embryogenic cell suspension achieved in liquid MS basal medium supplemented with 3 mg/l 2,4-D, 10 % coconut water and 400 mg/l casein hydrolysate and kept in continuous dark at 25 °C. The medium was replaced with fresh medium every 4 days interval to reduced accumulation of phenolic compound. Somatic embryos developed after 6 weeks when transferred embryogenic cell to fresh medium without 2,4-D under 16-h photoperiod. Mature somatic embryos were encapsulated in 3 percent sodium alginate for synthetic seeds production. Sugarcane synthetic seeds were stored in 3 different temperatures (4+1, 15+2 and 25+2 °C) under 16-h photoperiod for 4 weeks. It was found that synthetic seeds stored at 4+1 °C for 4 weeks showed no precoccius germination or death during storage and could be germinated at 35 percent. A hydrated synthetic seeds retained enough water for the encapsulated somatic embryos to germinated during storation. However, germination was blocked when hydrated alginate capsules were dehydrated. It was found that desiccated synthetic seeds with siliga gel until 80 percent water loss showed no precoccius germination and could be germinated at 27 percent after stored for 4 weeks. Therefore, storing hydrated sugarcane synthetic seeds in 4+1 °C and dehydration with silica gel until 80 percent water loss, which might be especially useful for prevent precocious germination during short term sugarcane synthetic seeds storage.

Keywords: Hydrolysate, phenolic compound, somatic embryo, synthetic seed

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