

Original Article

## Characterization of the Second Generation Cryopreserved *Dendrobium* Bobby Messina Using Histological and RAPD Analyses

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### Abstract

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**Key words:**

morphology, histology,  
molecular analysis,  
*Dendrobium*,  
cryopreservation

**Article information:**

Received: 29 Dec. 2013  
Accepted: 27 Mar. 2015  
Published: 27 Nov. 2015

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**Cite this paper as:**

This study was conducted to detect the morphological, histological and molecular differences in the second generation of the PVS2 cryopreserved *Dendrobium* Bobby Messina [DBM] (18 months old culture) plantlets. Morphological analyses indicated that similarities and differences in cryopreserved DBM plantlets comparing to control stock culture based on selected morphological criteria. Morphological criteria, such as root length, number of shoot per explant and shoot length displayed differences, while the other three criteria, leaf diameter, leaf length and PLBs size were similar in cryopreserved compared to the control stock culture plant. Higher amount of homogenous cell population and denser cytoplasm were observed in cryopreserved PLBs compared to control stock culture PLBs based on histological analysis. This suggests the existence of somatic embryogenesis development mechanism taking place during the recovery and regeneration of the cryopreserved PLBs. However, RAPD analyses based on 10 primers indicated that cryopreserved DBM regenerated from vitrification method generated a total of 20 to 39.9% polymorphic bands as compared to stock culture indicating potential somaclonal variation. Hence, an increase percentage of polymorphics bands in cryopreserved plantlets 18 months post cryopreservation as compared to previous report of 10% polymorphic bands in cryopreserved DBM 3 months post cryopreservation.

Antony, J. J. J., Wai, L. K., Oyunbileg, Yu., & Subramaniam, S. 2015. Characterization of the second generation cryopreserved *Dendrobium* Bobby Messina using histological and RAPD analyses. *Mong. J. Biol. Sci.*, 13(1-2): 13-18.

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### Introduction

Orchids are widely distributed and can be found in all apart from the most extreme terrestrial environment. Recently, orchids are became main ornamental plants in the world as cut flowers or blooming potted plants (Sujjaritthurakarn & Kanchanapoom, 2011). *Dendrobium* orchids are the largest genus in the family Orchidaceae, have become a major cut flower crop for export (Sujjaritthurakarn &

Kanchanapoom, 2011).

Many orchid species are now at the edge of extinction as a result of extensive interruption of their natural habitat and unsystematic harvesting of naturally growing plants (Poobathy *et al.*, 2012). Therefore, immediate action should be taken to ensure the continuation of the orchid species, especially wild orchid. So, critical mission nowadays is to protect as well as