

JOINT EVENT

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Characterization of antifreeze activity in apoplastic extract of *Deschampsia antarctica***Fariás J G, Short S and Bravo L A**
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Deschampsia antarctica Desv. is a vascular plant species that colonized maritime Antarctica exhibiting extreme freezing tolerance (-27°C). This has been associated with apoplastic antifreeze activity. Antifreeze proteins (AFPs) have the ability to bind to the growing surface of ice crystals inhibiting their growth; however, this activity has been poorly characterized in this species. Therefore, the aim of this work is to characterize the antifreeze activity of apoplastic extracts from *D. antarctica*. To understand how this plant can tolerate freezing temperatures year-around, and in order to evaluate the potential antifreeze activity of apoplastic proteins from *D. antarctica* as future applications, experiments have been developed in cold-acclimated and non-acclimated plants. To identify the best apoplastic proteins accumulation after plant cold-acclimation, apoplastic extracts were quantified every four days for 21 days of low temperature exposure. Antifreeze activity was determined by ice recrystallization inhibition (IRI), thermal hysteresis activity (TH) and ice crystal growth in dilution series of apoplastic extracts. The results indicate that the minimum IRI activity was evident in extracts with a concentration equal to 0.005 µg/µl at cold-acclimated condition, while in non-acclimated plants the IRI activity was lost at 0.05 µg/µl. At concentration equal to 2.5 µg/µl, ice crystals showed a bipyramid shape and a TH equal to 0.4°C. In conclusion, we observed that cold-acclimation increased apoplastic antifreeze activity, obtaining higher IRI but low TH in these apoplastic extracts. This high IRI is remarkable and further studies are needed to characterize the apoplastic extract to associate this activity to apoplastic antifreeze proteins which could be of interest for later studies as a cryoprotectant.

Biography

Fariás J G is the Associate Professor and Director of the Chemical Engineering Department, Universidad de La Frontera. His research interest is in Pharmaceutical Biotechnology, focusing on Molecular Therapeutics and Drugs Production. He has published 51 articles in reputed journals.

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