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Combinational application of methyl jasmonate and a solubilizing agent enhances stilbene production in cell cultures of *Vitis vinifera*

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Grapevine (*Vitis vinifera*) stilbenes are a well-known family of plant polyphenolics that have been confirmed to have many biological activities in relation to health benefits. Stilbenes have phytoalexin activity and are derivatives of the monomeric unit trans-resveratrol. The use of trans-resveratrol and its derivative (viniferin) obtained from plants is increasing due to the high demand for these compounds as ingredients in the cosmetic, nutraceutical and pharmaceutical industries. In the present study, the production of resveratrol and viniferin in response to various elicitation conditions were investigated in cell suspension cultures derived from grapevine calli. As a first step, we investigated the expression patterns of major genes (VvSTS and VvROMT) involved in stilbene biosynthesis in response to various elicitors, such as Methyl Jasmonate (MeJA), Abscisic Acid (ABA), Salicylic Acid (SA), chitosan, ethephon, Flagellin22 (Fla 22), Methyl Viologen (MV), and UV. The expression of VvSTS gene was highly induced by MeJA, ABA and SA elicitation. In addition, piceid was produced in grapevine suspension cells elicited with MeJA. However, SA and ABA did not affect its production. In this study, we found that co-treatment of MeJA and a solubilizing agent PX improved δ–viniferin production (up to 700 mg/L) in the cell culture media. Furthermore, the scale-up of grapevine suspension cell cultures in a 3 L bioreactor greatly increased production of resveratrol, -viniferin and ε-viniferin. Taken together, our results suggest that the combined treatment of MeJA and PX in grapevine cell cultures provides a valuable strategy for enhancing stilbene production.

Biography

Yu Jeong Jeong received her Master's Degree in microbiology from Gyeongsang National University. She is a PhD student at Korea Research Institute of Bioscience and Biotechnology (KRIBB). Her project is producing useful materials from grape callus. She aims to develop and industrialize the technology to produce useful substances from plant callus that are difficult to obtain from nature.

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