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Development of a liquid-liquid extraction method of resveratrol from cell culture media using solubility parameters

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The extraction of bioactive compounds, produced by plant cell cultures, directly from their culture medium, which contains other by-products, is a great challenge. Resveratrol extraction from its grapevine cell cultures is considered here as an example to improve the extraction processes from plant cell cultures using solubility parameters. Successive liquid-liquid extraction (LLE) processes were exploited to extract resveratrol from the culture medium with an extraction ratio approaching 100%, high selectivity and minimum amounts of solvents. The calculations of partition coefficients as a function of solubility parameters demonstrated that benzyl benzoate is the most suitable intermediate solvent to extract resveratrol from its aqueous medium at a benzyl benzoate/medium ratio of 1:100 v/v. The calculations also illustrated the high ability of methanol and ethanol to extract resveratrol from benzyl benzoate. The physicochemical properties of benzyl benzoate and processing conditions were exploited to separate it from aqueous media and organic solvents. The agitation method, component ratios and extraction time were studied to maximize the extraction yield. Under the best studied conditions, the recovery of resveratrol from different culture media approached approximately 100% with a selectivity of approximately 92%. Ultimately, the improved extraction processes of resveratrol are markedly efficient, selective, rapid and economical.

Biography

Mohamad Houssam Al Balkhi has obtained his PhD in 2009 from the University of Picardie Jules Verne, France. He has worked as an Assistant Professor at the University of Damascus, Syria for many years. Actually, he is a Post-doctoral Fellow at the University of Picardie Jules Verne working on Plant Biotechnology and the development of extraction methods of active compounds. He has published many papers in reputed journals.

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