

An one step bioprocess for phytosteryl oleate production in co-solvent system

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A natural compound contained in various cereals and seeds accompany with cholesterol-lowering and anti-cancer function was called phytosterol. However, it cannot be synthesized by ourself; instead of we should uptake it from normal diet. Since the lower solubility in oil-soluble foods is the major problem for further industrial application, a modification process on phytosterol to produce oil-soluble ester derivatives was therefore developed.

Plant sterol esters are well-known functional ingredients and have been reported to have beneficial effects on plasma cholesterol level for cosmetic, nutraceutical, and pharmaceutical applications. The present work, we planned to biosynthesis of phytosteryl oleate in one step using phytosterol mixture as substrate containing β -sitosterol, campesterol and stigmasterol which are the most abundant compounds in nature. The lipase AY was selected as an optimal biocatalyst with higher competitive activity toward campesterol under different competitive enzymatic reactions such as reaction temperature (25-60 C), reaction time (1-4 days), substrate molar ratio (phytosterol : fatty acid; 1:1-1:6), enzyme concentration (35-60%) and water content (0-20%) etc. The result showed that the highest production yield of β -sitosteryl oleate ($71.6 \pm 3.9\%$), campesteryl oleate ($76.7 \pm 5.0\%$) and stigmasteryl oleate ($65.1 \pm 7.4\%$) was obtained at 40 °C, 1:5 substrate ratio, 50% enzyme amount for 1 day.

Biography

Shu-Wei Chang graduated from Institute of Bioscience and Biotechnology, National Taiwan Ocean University in 2006. She Worked for Chung Hsing University in 2006 and Academia Sinica, in 2007. Since 2008, she became Assistant Professor in Chung Chou Institute of Technology. From 2007-2008, she worked as an Adjunct Assistant Professor in Dayeh University and Chug Chou Institute of Technology. She was also invited as reviewer for various famous international journals and invited as speaker in 98th and 100th AOCS Annual Meeting & Expo from 2007 to date. Now, she is an Assistant Professor in Dayeh University and has published more than 25 papers and got 2 items award. In recent years, she focused on the enzymatic synthesis of various functional ester derivatives (i.e. trehalose ester derivatives), and got some important success.

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