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Maximizing, saponin yield and antioxidant capacity of *Catharanthus roseus* (L.) G Don (Patricia White cultivar) stem by ultrasound-assisted extraction

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Catharanthus roseus (L.) G Don (*C. roseus*) is traditionally known as a medicinal plant; however only its leaf has been investigated for its bioactive compounds. Other plant components, such as the stem and the root have not been studied. Our previous study conducted on the stem revealed a high level of saponins, which have been linked with various biological activities such as antimicrobial, ant herbivore and/or cytotoxic activities. Ultrasound-assisted extraction (UAE) is known as an advanced extraction method because of its effectiveness, simplicity and up-scale capability, thus UAE shows potential for the effective extraction of saponins from the stem of *C. roseus*. Response surface methodology (RSM) has been commonly applied to optimize extraction conditions as it can show the interactive effects between the tested parameters. This study aimed to optimize UAE conditions including temperature, time and power in combination with ratio of sample-to-solvent for the efficient extraction of saponins from stem of *C. roseus* using RSM with Box-Behnken design. The results indicated that either ultrasonic temperature or sample-to-solvent ratio had a significant influence on saponin yield, DPPH and ABTS radical scavenging activities ($p < 0.05$). With the exception of ultrasonic power, the other three parameters (UAE temperature, sample-to-solvent ratio and time) statistically affected ferric reducing antioxidant power (FRAP) and cupric ion reducing antioxidant capacity (CUPRAC). A maximized saponin yield (138.21 mg ESE/g) and high levels of antioxidant activity (8.34, 12.06, 10.53 and 19.15 mg TE/g ABTS, DPPH scavenging capacity, FRAP and CUPRAC respectively) could be obtained under the optimal extraction conditions (ultrasonic temperature of 55°C, ultrasonic time of 35 min, sample-to-solvent ratio of 1/100 (g/mL) and ultrasonic power of 150W). The saponin-enriched extract from *C. roseus* stem can be potentially used for further investigation and application in the nutraceutical and pharmaceutical industries.

Biography

Hong Ngoc Thuy Pham has graduated with a BSc in Food Technology from Nha Trang University, Vietnam in 2004 and then completed her Master's degree in Post-harvest Technology from Nha Trang University, Vietnam in 2009. She is currently a Lecturer of Nha Trang University, Vietnam and a PhD student at the University of Newcastle, Australia. She has published 10 papers in domestic and international journals. She is now working on the research project: Extraction of anticancer compounds from selected medicinal plants as novel agents against pancreatic cancer cells at the University of Newcastle, Australia.

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