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WELLNESS INDUSTRY**

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New Trend and Opportunities”

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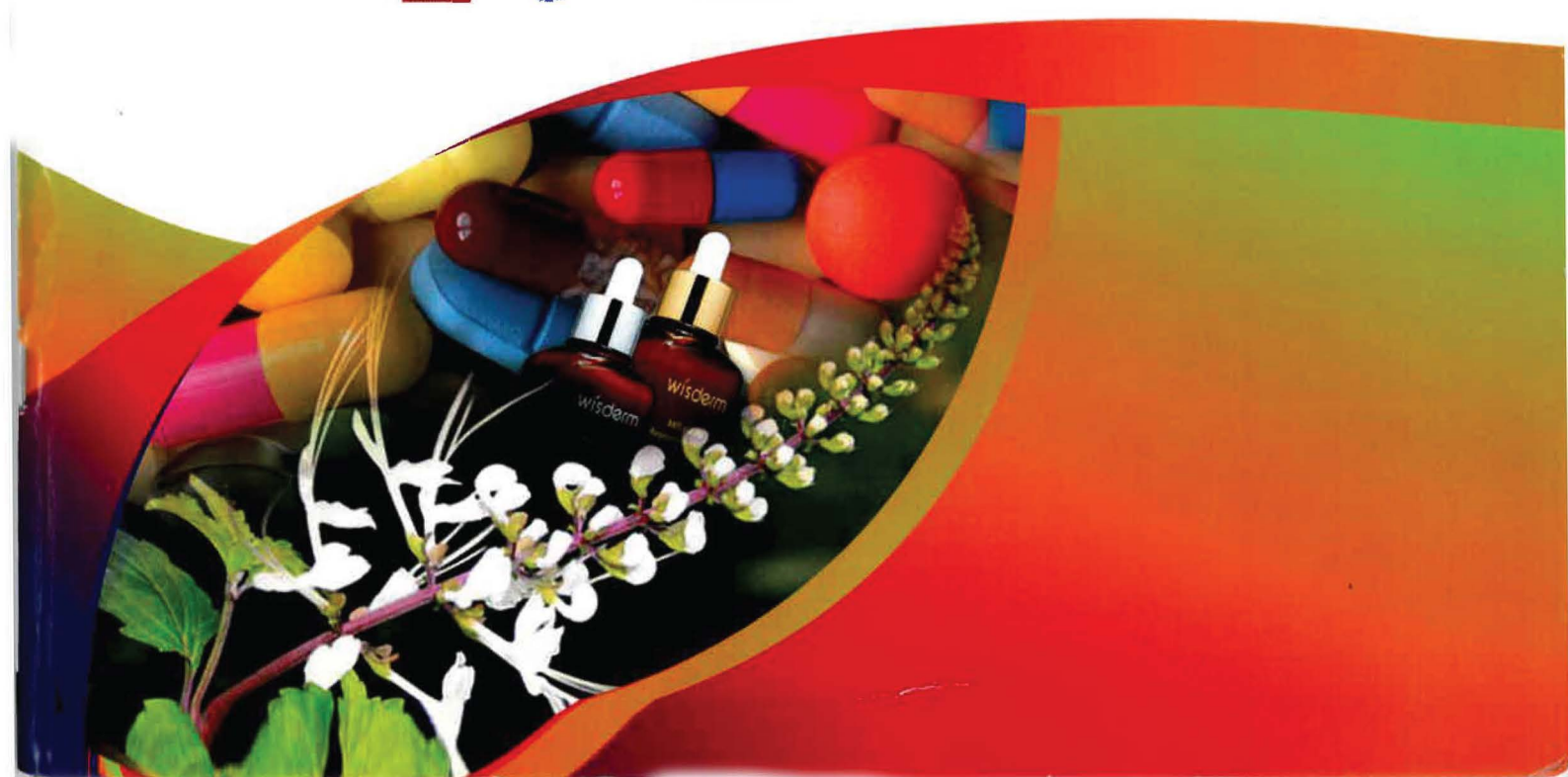
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## ABSTRACTS FOR POSTER PRESENTATION

PS1-27

**Effect Of Ultrasound And Enzyme On The Extraction Of Tongkat Ali****He Yuhai<sup>1</sup>, Ahmad Ziad Bin Sulaiman<sup>1</sup>**

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**Abstract**

Tongkat Ali, or *Eurycoma Longifolia*, is a traditional Malay and Orang Asli herb used as aphrodisiac, general tonic, anti-Malaria, and anti-Pyretic. It has been recognized as a cashcrop by Malaysia due to its high value for the pharmaceutical use. In tongkat ali, eurycomanone, a quassinoid is usually chosen as a marker phytochemical as it is the most abundant phytochemical. In this research, ultrasound and enzyme were used to enhance the extraction of Eurycomanone from Tongkat Ali. Ultrasonic assisted extraction (USE) enhances extraction by facilitating the swelling and hydration of the plant material, enlarging the plant pores, breaking the plant cell, reducing the plant particle size and creating cavitation bubbles that enhance mass transfer in both the washing and diffusion phase of extraction. Enzyme hydrolyses the cell wall of the plant, loosening the structure of the cell wall, releasing more phytochemicals from the plant cell, enhancing the productivity of the extraction. Possible effects of ultrasound on the activity of the enzyme during the hydrolysis of the cell wall is under the investigation by this research. The extracts was analysed by high performance liquid chromatography for the yields of Eurycomanone. In this whole process, the conventional water extraction was used as a control of comparing the performance of the ultrasound and enzyme assisted extraction.

**Keywords:** *Eurycoma Longifolia*, extraction, eurycomanone, ultrasound, enzymes.

PS1-28

**Effect of Ultrasound and Enzymes on the Extraction of Gallic Acid from *Labisia Pumila* (Kacip Fatimah)****Noor Adilah Binti Md Salehan, Ahmad Ziad Bin Sulaiman, Azilah Binti Ajit**

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**Abstract**

Ultrasound and enzymes are unified to extract gallic acid from *Labisa pumila* (Kacip Fatimah). Gallic acid has anti-fungal and anti-viral properties and acts as an antioxidant, which helps to protect cells against oxidative damage. Gallic acid also shows cytotoxicity against cancer cells, without harming healthy cells. Besides the effect of ultrasound and the activity of *Trichoderma reesei* cellulase on the extraction productivity, solid-liquid mass transfer limitations were investigated. The effects of extraction time, extraction temperature, solvent-to-solid ratio, and sonication power on the extraction of gallic acid were parameters considered into account for the research. The unified ultrasound and enzymatic extraction were carried out at low intensity sonication (2.4-11.8 W/cm<sup>2</sup>) using a sonicator probe in a designed reactor with optimum conditions for the cellulase reaction (pH 4.8, 40-50 °C). Formation of cavitation bubbles by applying ultrasound enhances both extraction process and enzyme activity through the solid-liquid mass transfer by enlarging the plant pores, breaking the plant cell and reducing the plant particle size. The cellulolytic activity increased by some changes in the spatial structure of enzyme molecules, which supported the formation of enzyme substrate complex and improved the absorption of cellulase on insoluble cellulose. Enzyme hydrolysis enhancing the productivity of the extraction by loosening the network of the cell wall, then releasing more intracellular compound from the plant cell. The extraction of gallic acid was analyzed by using high performance liquid chromatography. Meanwhile the conventional water extraction was used as a control by comparing the performance of the ultrasound and enzyme assisted extraction.

**Keywords:** extraction, gallic acid, ultrasound, cavitation, cellulose, hydrolysis.



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