

**EXTRACTION OF VOLATILE COMPOUNDS FROM
PANDAN LEAVES (*Pandanus amarylifollius Roxb.*) USING
PRESSURISED LIQUID EXTRACTION (PLE)**

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ABSTRACT

EXTRACTION OF VOLATILE COMPOUNDS FROM PANDAN LEAVES (*Pandanus amarylifolius* Roxb.) USING PRESSURISED LIQUID EXTRACTION (PLE)

Pandan (*Pandanus amarylifolius* Roxb.) leaf is a source of natural flavouring and colouring widely used in South-east Asia. The major constituent of *Pandanus amarylifolius* has been reported 2-acetyl-1-pyrroline which is responsible for flavour. Usually pandan flavour available in the market is synthetic, so that this study is to introduce a natural pandan flavour based on the extraction. Commonly conventional method have disadvantages like long extraction time and thermally destructive process, so that the study to introduce Pressurised Liquid Extraction (PLE) as one of applicable method to extract pandan volatile oil. The objective of this research is to determine the flavour profile, quality and sensory acceptability of the extracted oil by using PLE, hydrodistillation and Soxhlet extraction. In this research, the method of drying, extraction, separation and analysis are used and the sample is separated from the solvent by using a rotary evaporator to get the essential oil. Almost 80% of water in pandan leaves can be removed by drying. Yields of PLE extracts were greater when compared to hydrodistillation and Soxhlet extraction. The total yield of extracts were obtained by PLE the highest yield ($39.5 \pm 0.12\%$) followed by Soxhlet ($17.16 \pm 0.12\%$) and hydrodistillation ($0.17 \pm 0.08\%$). The 2-acetyl-1-pyrroline was analysis by GC-MS to identify the component of *Pandanus amarylifolius*. The major component in *Pandanus amarylifolius* leaves is 2-acetyl-1-pyrroline that was obtained highly by using PLE (0.42g/100g) and the minor components which are phytol, 2,4-bis(1,1-dimethyl-ethyl) phenol, squalene and stigmasterol also present. In this study, it shows that PLE is more advantages than both conventional methods (Soxhlet and hydrodistillation) in term of time, solvent consuming and extraction efficiency.

ABSTRAK

PENGEKSTRAKKAN KOMPAUN MERUAP DARIPADA DAUN PANDAN (*Pandanus amarylifolius* Roxb) MENGGUNAKAN TEKNIK PENGEKSTRAKKAN CECAIR BERTEKANAN TINGGI (PLE)

Daun pandan (*Pandanus amarylifolius* Roxb.) merupakan sumber bau semulajadi yang banyak digunakan di Asia Tenggara. Kompaun terbanyak dalam *Pandanus amarylifolius* Roxb. yang telah direkodkan ialah 2-acetyl-1-pyrroline yang mana bertanggungjawab untuk bau. Kebiasaannya perasa pandan yang boleh didapati dipasaran adalah tiruan, oleh itu kajian ini adalah untuk memperkenalkan perasa pandan semulajadi menggunakan teknik pengekstrakkan. Pada kebiasaannya, kaedah tradisional mempunyai kekurangan seperti masa pengekstrakkan yang lama dan tidak tahan pada suhu yang tinggi, oleh sebab itu kajian ini memperkenalkan Pengekstrakkan Cecair Bertekanan Tinggi (PLE) merupakan kaedah yang boleh diaplikasikan untuk mengekstrakan minyak pandan yang meruap. Objective kajian ini adalah untuk menentukan profil rasa, kualiti dan penerimaan deria rasa minyak diekstrak dengan menggunakan PLE, penyulingan air dan pengekstrakan Soxhlet. Kajian ini menggunakan kaedah pengeringan, pengekstrakkan, pemisahan dan analisis di mana sampel dipisahkan daripada pelarut dengan menggunakan alat penyejatan berputar untuk mendapatkan pati minyak. Hampir 80% air di dalam daun pandan boleh disingkirkan melalui kaedah pengeringan. Hasil Pengekstrakkan Cecair Bertekanan Tinggi (PLE) lebih tinggi berbanding penyulingan air dan pengekstrakan Soxhlet. Nilai hasil keseluruhan minyak diekstrak paling tinggi ialah PLE ($39.5 \pm 0.12\%$) diikuti oleh Soxhlet ($17.16 \pm 0.12\%$) dan penyulingan air ($0.17 \pm 0.08\%$). Kompaun *Pandanus amarylifolius* boleh dianalisis melalui GC-MS untuk mengenalpasti 2-acetyl-1-pyrroline. Kompaun terbanyak yang diperolehi dalam *Pandanus amarylifolius* ialah 2-acetyl-1-pyrroline dengan menggunakan teknik PLE (0.42g/100g) dan kompaun sampingan lain ialah phytol, 2,4-bis(1,1-dimethyl-ethyl)phenol, squalene dan stigmaterol. Dalam kajian ini, telah menunjukkan PLE mempunyai banyak kelebihan berbanding kaedah tradisional (penyulingan air dan pengekstrakan Soxhlet) dari segi masa, penggunaan pelarut yang banyak dan pengekstrakan yang efisien.