

PENGARUH PERBEDAAN WAKTU EKSTRAKSI TERHADAP KADAR KAFEIN BIJI KOPI ROBUSTA YANG DIEKSTRAKSI DENGAN METODE *ULTRASOUND-ASSITED EXTRACTION*

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Intisari

Latar Belakang: Kopi merupakan minuman khas yang mengandung senyawa kafein yang sering dikonsumsi oleh masyarakat. Jenis kopi robusta memiliki kandungan kafein yang lebih tinggi daripada jenis kopi lain. Kandungan kafein dalam kopi robusta dapat dipengaruhi oleh metode dan waktu ekstraksi. Metode *Ultrasound Assisted Extraction* (UAE) dengan variasi waktu ekstraksi dapat menghasilkan kadar kafein yang berbeda dibandingkan metode konvensional dan metode modern lainnya.

Tujuan Penelitian: Penelitian ini bertujuan mengetahui pengaruh perbedaan waktu ekstraksi menggunakan metode UAE terhadap kadar kafein pada biji kopi robusta dari Lampung Barat.

Metode: Serbuk kopi robusta diuji organoleptis, pengukuran kadar air, uji alkaloid dan diekstraksi menggunakan metode UAE dengan pelarut etanol 70%. Kemudian ekstrak dipekatkan dengan penangas air pada suhu 60°C pada variasi waktu 15 menit, 30 menit dan 45 menit. Ekstrak kental yang diperoleh dilakukan pengukuran nilai kadar air pada ekstrak, nilai rendemen dan *scanning* panjang gelombang. Analisis kuantitatif dengan metode Spektrofotometri UV-Vis untuk menetapkan kadar kafein pada biji kopi robusta dengan perbedaan waktu ekstraksi, sehingga dianalisis statistik dengan SPSS terhadap hasil masing-masing kelompok yang menyatakan data terdistribusi normal, homogen dan berbeda signifikan.

Hasil: Hasil penelitian menunjukkan serbuk biji kopi berwarna coklat gelap, aroma khas kopi, rasa pahit dan tekstur halus secara organoleptis serta mengandung alkaloid dengan uji pereaksi Mayer, Wagner dan Dragendorff. Hasil rendemen dan % kadar air ekstrak biji kopi pada waktu menit ke-30 (36,938%;6,39%) lebih tinggi daripada menit ke-15 (24,111%;6,07%) dan menit ke-45 (22,170%;6,37%). Ketiga ekstrak kafein diidentifikasi keberadaan alkaloid pada panjang gelombang 273 nm. Kadar kafein biji kopi sebesar $0,977 \pm 0,018$ mgCE/mg pada menit ke-15, $0,792 \pm 0,054$ mgCE/mg pada menit ke-30 dan $0,979 \pm 0,026$ mgCE/mg pada menit ke-45.

Kesimpulan: Waktu ekstraksi dapat mempengaruhi nilai kadar kafein pada ekstrak biji kopi robusta.

Kata kunci: *Coffea canephora*, Kafein, Spektrofotometri UV-Vis, UAE, Waktu Ekstraksi

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THE EFFECT OF EXTRACTION TIME DIFFERENCE ON THE CAFFEINE CONTENT OF ROBUSTA COFFEE BEANS EXTRACTED BY ULTRASOUND-ASSISTED EXTRACTION METHOD

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Abstract

Background: Coffee is a typical drink that contains caffeine and is often consumed by people. Robusta coffee has a higher caffeine content than other types of coffee. The caffeine content in robusta coffee can be affected based on the method and time of extraction. The variations in extraction time in ultrasound- assisted extraction (UAE) produce different caffeine contents than conventional and modern extraction methods.

Objective: This study aims to determine how the difference in extraction time using the UAE method affects caffeine contents in robusta coffee beans from West Lampung.

Method: Robusta coffee powder was tested organoleptically, measuring water content, alkaloid testing and extracted using the UAE method with 70% ethanol solvent. Then the extract was concentrated in a waterbath at a temperature of 60°C for varying times of 15 minutes, 30 minutes and 45 minutes. The thick extract obtained was measured by measuring the water content value of the extract, yield value and wavelength scanning. Quantitative analysis using UV-Vis Spectrophotometry was used to determine the caffeine content in coffee beans with different extraction times, so the results of each group were analyzed using SPSS software which stated that the distributed data were normal, homogeneous and significantly different.

Results: The results of the study showed that coffee bean powder was dark brown, had a distinctive coffee aroma, bitter taste, and smooth texture organoleptically, and contained alkaloids with the Mayer, Wagner, and Dragendorff reagent tests. The yield and % water content of extract at 30 minutes (36.938%; 6.39%) were higher than at 15 minutes (24.111%; 6.07%;) and 45 minutes (22.170%; 6.37%). The three caffeine extracts were identified for the presence of alkaloids at a wavelength of 273 nm. Caffeine contents were 0.977 ± 0.018 mgCE/mg at the 15th minute, 0.792 ± 0.054 mgCE/mg at the 30th minute and 0.979 ± 0.026 mgCE/mg at the 45th minute.

Conclusion: The difference in extraction time impacted the caffeine content of the robusta coffee bean.

Keywords: *Coffea canephora*, Caffeine, UV-Vis Spectrophotometry, UAE, Extraction Time.

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