

ABSTRAK

Anggriani Br. Pasaribu, NIM 4211220008 (2025). Analisis Kandungan Senyawa Fitokimia dan Aktivitas Senyawa Antioksidan Minyak Atsiri Cascara Kopi Robusta (*Coffea canephora*)

Cascara kopi Robusta (*Coffea canephora*) merupakan hasil samping pengolahan kopi, masih kurang dimanfaatkan dan sering menimbulkan permasalahan lingkungan. Padahal, cascara diketahui mengandung senyawa bioaktif dengan potensi antioksidan yang dapat dikembangkan, salah satunya dalam bentuk minyak atsiri. Penelitian ini bertujuan mengidentifikasi kandungan fitokimia minyak atsiri cascara serta mengevaluasi aktivitas antioksidannya. Sebanyak 200 g cascara kering diekstraksi dengan metode soxhletasi menggunakan pelarut etanol, menghasilkan minyak atsiri 8 mL (rendemen 4,75%). Analisis GC-MS mendeteksi 17 senyawa, yaitu Hydrazine, 1,1-dibutyl; 2,5-Dimethyl-4-hydroxy-3(2H)-furanone; 2,5-dioxo-3-isopropyl-6-methylpiperazine; 2,3-Dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one; Di-2-ethylhexyl amine; 1,2-Benzenediol; 2-Furancarboxaldehyde, 5-(hydroxymethyl); 1,4-Benzenediol; Resorcinol (1,3-Benzenediol); Cyclooctasiloxane, hexadecamethyl-; Quinic acid; 4-Pyridinamine, 2,6-dimethyl-; Caffeine; Hexadecanoic acid; β -Sitosterol; serta 5'-Methyl-[2,2'] Bithiophenyl-5-Carboxylic Acid (2-Oxo-1,2-Dihydroindol-3-Yl). Senyawa dominan yang terdeteksi adalah kafein (62,12%). Analisis bioaktivitas menggunakan basis data PubChem dan prediksi melalui PASS Online mengindikasikan bahwa senyawa fitokimia yang terdeteksi memiliki potensi sebagai antioksidan. Uji DPPH memperlihatkan persen inhibisi >50% pada konsentrasi 80 mg/L dengan nilai IC_{50} dalam kategori kuat. Dengan demikian, minyak atsiri cascara kopi Robusta berpotensi sebagai sumber antioksidan alami yang aplikatif di bidang pangan, farmasi, dan kosmetik.

Kata kunci : Cascara Kopi Robusta, Minyak Atsiri, Antioksidan, GC-MS, DPPH

ABSTRACT

Anggriani Br. Pasaribu, NIM 4211220008 (2025). Analysis of Phytochemical Compounds and Antioxidant Activity of Essential Oil from Robusta Coffee Cascara (*Coffea canephora*)

Cascara of Robusta coffee (*Coffea canephora*), a byproduct of coffee processing, remains underutilized and often causes environmental issues due to organic waste accumulation. However, cascara is known to contain bioactive compounds with antioxidant potential that can be further developed, particularly in the form of essential oils. This study aimed to identify the phytochemical constituents of cascara essential oil and evaluate its antioxidant activity. A total of 200 g of dried cascara was extracted using Soxhlet apparatus with ethanol solvent, yielding 8 mL of essential oil (4.75%). GC-MS analysis identified 17 compounds, namely Hydrazine, 1,1-dibutyl; 2,5-Dimethyl-4-hydroxy-3(2H)-furanone; 2,5-dioxo-3-isopropyl-6-methylpiperazine; 2,3-Dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one; Di-2-ethylhexyl amine; 1,2-Benzenediol; 2-Furancarboxaldehyde, 5-(hydroxymethyl); 1,4-Benzenediol; Resorcinol (1,3-Benzenediol); Cyclooctasiloxane, hexadecamethyl-; Quinic acid; 4-Pyridinamine, 2,6-dimethyl-; Caffeine; Hexadecanoic acid; β -Sitosterol; and 5'-Methyl-[2,2'] Bithiophenyl-5-Carboxylic Acid (2-Oxo-1,2-Dihydroindol-3-Yl). Caffeine was the dominant compound, accounting for 62.12%. Bioactivity analysis using the PubChem database and prediction through PASS Online indicated that the identified phytochemical compounds possess antioxidant potential. Antioxidant activity determined by the DPPH method showed inhibition above 50% at 80 mg/L with an IC_{50} value categorized as strong. These findings indicate that Robusta cascara essential oil has promising potential as a natural antioxidant source with possible applications in food, pharmaceutical, and cosmetic industries.

Keyword : Cascara Robusta Coffee, Essential Oil, Antioxidant, GC-MS, DPPH.