

PENGARUH UKURAN PARTIKEL DAN PERLAKUAN *FREEZE–THAWING* PADA BUBUK KOPI ARABIKA (*Coffea arabica* L.) TERHADAP KARAKTERISTIK FISIKOKIMIA MINUMAN KOPI DENGAN METODE *COLD BREW*

INTISARI

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Produksi dan konsumsi kopi khususnya minuman *cold brew* terus meningkat seiring preferensi konsumen terhadap cita rasa yang lebih lembut dan tingkat keasaman yang rendah. Namun, pada metode penyeduhan *cold brew* umumnya membutuhkan waktu ekstraksi yang relatif lama. Perlakuan *freeze–thawing* (FT) berpotensi meningkatkan efisiensi ekstraksi melalui modifikasi struktur sel bubuk kopi. Oleh karena itu penelitian ini bertujuan mengkaji pengaruh *freeze–thawing* dan ukuran partikel terhadap mutu fisikokimia dan sensoris seduhan kopi Arabika metode *cold brew*.

Sampel penelitian berupa bubuk kopi Arabika asal Papua Barat yang disangrai pada tingkat *medium roast*. Penelitian menggunakan rancangan acak lengkap 2 faktor, yaitu ukuran bubuk kopi (tertahan 16 mesh, lolos 16 tertahan 30 mesh, dan lolos 30 mesh) serta perlakuan FT. Bubuk kopi diseduh menggunakan metode *cold brew* dengan rasio kopi dan air 1:10 selama 4 dan 8 jam. Parameter yang dianalisis meliputi pH, TPT, warna, aktivitas antioksidan metode DPPH, serta uji sensori melalui *cupping test*.

Hasil penelitian menunjukkan bahwa perlakuan *freeze–thawing* mampu meningkatkan efisiensi penyeduhan *cold brew* kopi Arabika Papua Barat tanpa menurunkan mutu seduhan. Seduhan selama 4 jam dengan perlakuan *freeze–thawing* menghasilkan karakteristik fisikokimia yang sebanding dengan seduhan kontrol selama 8 jam. Perlakuan *freeze–thawing* pada ukuran partikel lolos 16 tertahan 30 mesh memberikan skor *cupping* tertinggi dengan profil sensoris seimbang yang ditandai oleh catatan *sweetness*, *caramel*, dan *orange*. Secara keseluruhan, aktivitas antioksidan, pH, warna, dan total padatan terlarut tidak menunjukkan perbedaan yang signifikan dibandingkan kontrol, sehingga perlakuan *freeze–thawing* berpotensi diterapkan sebagai metode untuk mempersingkat waktu penyeduhan *cold brew* secara efisien.

Kata kunci: *cold brew*, *freeze–thawing*, ukuran bubuk, kopi Arabika medium roast

THE EFFECT OF PARTICLE SIZE AND FREEZE–THAWING TREATMENT ON ARABICA COFFEE POWDER (*Coffea arabica* L.) ON THE PHYSICOCHEMICAL PROPERTIES OF COFFEE BEVERAGES USING THE COLD BREW METHOD

ABSTRACT

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Coffee production and consumption, especially cold brew beverages, continue to increase in line with consumer preferences for a milder flavor and lower acidity. However, the cold brew brewing method generally requires a relatively long extraction time. Freeze–thawing (FT) treatment has the potential to increase extraction efficiency by modifying the cell structure of coffee powder. Therefore, this study aims to examine the effect of freeze–thawing and particle size on the physicochemical and sensory quality of Arabica coffee brewed using the cold brew method.

The research sample consisted of Arabica coffee powder from West Papua that was roasted at a medium roast level. The study used a completely randomized design with two factors, namely coffee powder size (16 mesh retained, 16–30 mesh retained, and 30 mesh retained) and FT treatment. The coffee powder was brewed using the cold brew method with a coffee to water ratio of 1:10 for 4 and 8 hours. The parameters analyzed included pH, TDS, color, DPPH antioxidant activity, and sensory testing through cupping tests.

The results showed that freeze–thawing treatment was able to increase the brewing efficiency of West Papua Arabica cold brew coffee without reducing the quality of the brew. Brewing for 4 hours with freeze–thawing treatment produced physicochemical characteristics comparable to those of the control brew for 8 hours. Freeze–thawing treatment on particle sizes passing 16 and retained by 30 mesh produced the highest cupping scores with a balanced sensory profile characterized by notes of sweetness, caramel, and orange. Overall, antioxidant activity, pH, color, and total dissolved solids showed no significant differences compared to the control, indicating that freeze–thawing treatment has the potential to be applied as an efficient method to shorten cold brew brewing time.

Keywords: cold brew, freeze–thawing, powder size, medium roast Arabica coffee