

FORMULASI *HAIR SERUM* EKSTRAK ETANOL DAUN KAKAO (*Theobroma cacao* L.) DAN UJI AKTIVITAS ANTIOKSIDAN

ABSTRAK

Rambut yang sering terpapar radikal bebas, sinar UV, dan polusi lingkungan membutuhkan perlindungan intensif berupa produk kosmetik yang kaya akan antioksidan. Daun kakao (*Theobroma cacao* L.) berpotensi sebagai sumber antioksidan alami karena mengandung senyawa metabolit sekunder seperti flavonoid, saponin, dan tanin. Penelitian ini dilakukan untuk memformulasikan ekstrak etanol daun kakao ke dalam sediaan *Hair Serum* serta menguji mutu fisik dan efektivitas aktivitas antioksidannya. Metode maserasi dengan pelarut etanol 96% digunakan untuk memperoleh ekstrak daun kakao. Sediaan *Hair Serum* dirancang dalam empat variasi konsentrasi ekstrak, yaitu F0 (0%), F1 (1%), F2 (2%), dan F3 (3%). Evaluasi kualitas fisik sediaan meliputi uji organoleptis, homogenitas, nilai pH, viskositas, daya sebar, serta uji stabilitas penyimpanan selama 28 hari pada suhu kamar. Pengujian aktivitas antioksidan dilakukan menggunakan metode DPPH (2,2-diphenyl-1-picrylhydrazyl). Hasil penelitian menunjukkan rendemen ekstrak kental daun kakao yang diperoleh sebesar 28,65%. Seluruh formula memiliki homogenitas yang baik, tekstur kental yang nyaman, dan terbukti stabil selama penyimpanan. Karakteristik fisik sediaan memenuhi standar parameter, dengan nilai pH berkisar antara 5,98 hingga 6,39 (sesuai pH kulit kepala 4,5–6,5) dan kemampuan daya sebar berkisar antara 5,17 hingga 6,17 cm (sesuai standar 5–7 cm). Analisis antioksidan mengungkapkan nilai IC₅₀ untuk F1 sebesar 212,78 µg/mL (kategori lemah), F2 sebesar 150,69 µg/mL (kategori sedang), dan F3 sebesar 92,12 µg/mL (kategori kuat). Dapat disimpulkan bahwa ekstrak etanol daun kakao berhasil diformulasikan menjadi sediaan *Hair Serum* yang memenuhi persyaratan parameter mutu fisik yang baik. Formula 3 (F3) dengan konsentrasi ekstrak 3% merupakan formula terbaik karena menghasilkan efektivitas antioksidan tertinggi yang masuk dalam kategori kuat.

Kata Kunci: *Hair Serum*, Daun Kakao (*Theobroma cacao* L.), Mutu Fisik, Antioksidan, DPPH.

FORMULATION OF *HAIR SERUM* FROM ETHANOL EXTRACT OF COCOA LEAVES (*Theobroma cacao* L.) AND ANTIOXIDANT ACTIVITY TEST

ABSTRACT

Hair that is frequently exposed to free radicals, UV rays, and environmental pollution requires intensive protection through antioxidant-rich cosmetic products. Cocoa leaves (*Theobroma cacao* L.) have the potential to serve as a natural antioxidant source due to their secondary metabolite content, such as flavonoids, saponins, and tannins. This study was conducted to formulate the ethanol extract of cocoa leaves into a hair serum dosage form and to evaluate its physical quality and antioxidant activity. The maceration method using 96% ethanol was employed to obtain the cocoa leaf extract. The hair serum was designed in four variations of extract concentration: F0 (0%), F1 (1%), F2 (2%), and F3 (3%). Evaluation of the physical quality of the preparation included organoleptic, homogeneity, pH value, viscosity, spreadability, and stability tests during 28 days of storage at room temperature. The antioxidant activity was tested using the DPPH (2,2-diphenyl-1-picrylhydrazyl) method. The results showed that the yield of the thick cocoa leaf extract was 28.65%. All formulations exhibited good homogeneity, a comfortable thick texture, and remained stable during storage. The physical characteristics fulfilled the standard parameters, with pH values ranging from 5.98 to 6.39 (matching the scalp pH of 4.5–6.5) and spreadability ranging from 5.17 to 6.17 cm (matching the standard range of 5–7 cm). The antioxidant analysis revealed IC₅₀ values of 212.78 µg/mL for F1 (weak category), 150.69 µg/mL for F2 (moderate category), and 92.12 µg/mL for F3 (strong category). This study concludes that the ethanol extract of cocoa leaves was successfully formulated into a hair serum that meets good physical quality parameters. Formula 3 (F3) with a 3% extract concentration was the best formulation as it generated the highest antioxidant effectiveness, falling into the strong category.

Keywords: Hair Serum, Cocoa Leaves (*Theobroma cacao* L.), Physical Quality, Antioxidant, DPPH.