

INTISARI

Kulit yang sehat memerlukan kadar kelembapan yang optimal untuk menjaga fungsi penghalang (*barrier*) dan mencegah kehilangan air transepidermal (*Transepidermal Water Loss* atau TEWL). Penelitian ini bertujuan untuk menganalisis pengaruh penambahan gliserin (humektan) dan skualana (emolien) dalam sediaan *Nanostructured Lipid Carrier* (NLC) nano ekstrak teh hijau (*Camellia sinensis L.*) terhadap kelembapan kulit, yang diukur melalui parameter TEWL. Penelitian eksperimental ini menggunakan tiga formula: F1 (Tanpa pelembap), F2 (Dengan tambahan *squalane*), F3 (Dengan tambahan gliserin). Subjek uji melibatkan dua belas sukarelawan sehat. Evaluasi yang dilakukan meliputi karakteristik fisikokimia sediaan (organoleptik, pH, viskositas, ukuran partikel, PDI, dan potensial zeta), aktivitas antibakteri, efisiensi penyerapan (*entrapment efficiency*), serta nilai TEWL sebelum dan sesudah aplikasi. Data dianalisis menggunakan uji normalitas *Shapiro-Wilk* yang dilakukan pada seluruh waktu pengukuran (15, 30, 45, dan 60 menit), hasil menunjukkan nilai p -value $> 0,05$ untuk semua kelompok formula, yang berarti data berdistribusi normal. Kemudian dilanjutkan uji homogenitas varians (*Levene Test*) dan data varians dinyatakan homogen sehingga dilanjutkan dengan *One Way ANOVA*. Karena seluruh nilai p -value $< 0,05$, maka terdapat perbedaan signifikan pada penurunan TEWL antar formula di setiap waktu pengamatan. Berdasarkan uji *Post Hoc Tukey HSD*, formula F1 (tanpa tambahan pelembap) memberikan efek penurunan TEWL yang paling signifikan secara statistik dibandingkan formula lainnya ($p < 0,05$). Formula dengan *squalane* (F2) menunjukkan keunggulan yang lebih signifikan dalam menurunkan TEWL dibandingkan formula dengan gliserin (F3) setelah pengamatan memasuki menit ke-45.

Kata kunci: Teh Hijau, *Nanostructured Lipid Carrier*, gliserin, *squalane*, *Transepidermal Water Loss* (TEWL)

ABSTRACT

Healthy skin requires optimal moisture levels to maintain its barrier function and prevent transepidermal water loss (TEWL). This study aims to analyze the effect of adding glycerin (a humectant) and squalane (an emollient) into Nanostructured Lipid Carrier (NLC) formulations of green tea (*Camellia sinensis* L.) nanoextract on skin moisture, measured through TEWL parameters. This experimental study utilized three formulas: F1 (without moisturizer), F2 (with added squalane), and F3 (with added glycerin). The test subjects involved twelve healthy volunteers. Evaluations conducted included the physicochemical characteristics of the formulation (organoleptic properties, pH, viscosity, particle size, PDI, and zeta potential), antibacterial activity, entrapment efficiency, as well as TEWL values before and after application. Data were analyzed using the Shapiro-Wilk normality test across all measurement times (15, 30, 45, and 60 minutes); the results showed a p -value > 0.05 for all formula groups, indicating that the data were normally distributed. This was followed by a variance homogeneity test (Levene's Test), and since the variance data were declared homogeneous, the analysis proceeded with a One-Way ANOVA. Because all p -values were < 0.05 , there was a significant difference in the reduction of TEWL among the formulas at each observation time. Based on the Post Hoc Tukey HSD test, formula F1 (without added moisturizer) provided the most statistically significant TEWL reduction effect compared to the other formulas ($p < 0.05$). The formula with squalane (F2) demonstrated a more significant superiority in reducing TEWL compared to the formula with glycerin (F3) after the observation reached the 45th minute.

Keywords: Green Tea, Nanostructured Lipid Carrier, glycerin, squalane, Transepidermal Water Loss (TEWL)