Development and Characterization of a Dermocosmetic Lotion Incorporating *Nymphaea erangae* and *Atalantia ceylanica*

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The global cosmetic industry continuously enriches with different novel herbal cosmetics. *Nymphaea erangae* (NE) and *Atalantia ceylanica* (AC) are popular for their remarkable dermocosmetic and medicinal properties. NE contains flavonoids, alkaloids, and tannins, whereas AC contains essential oils, coumarins, and flavonoids that are crucial for skin tone improvement while minimizing damage from oxidative stress, harmful radiation, and carcinogens. However, no evidence has been reported for herbal cosmetic production synergizing their properties. The objective of this study was to develop a novel body lotion combining these herbs and standardize it through a systematic quality evaluation. Treatment 1 (100% chemical formulation), treatment 2 (96% chemical formulation and 4% NE Flower extract (NEFE), 2% AC leaf extract (ACLE)), treatment 3 (commercial cosmetic body lotion). The experimental design was CRD, and two-way Analysis of variance was used to analyze the data using R Studio (version 4.1.1). Comparative analyses were performed on radical scavenging activity (RSA), flavonoid content, sun protection factor (SPF), moisture retention, pH stability, spreadability, and viscosity. The RSA was measured according to the DPPH assay, flavonoid content was determined using Aluminum chloride colorimetric method, SPF was measured using UV spectrophotometric testing and Mansur equation. Moisture, pH and viscosity were measured using moisture meter, pH meter and viscometer respectively. Spreadability was measured using the parallel plate method. The study revealed that treatment 2 (NEFE 4% and ACLE2%) demonstrated the significantly highest RSA, 74.67%, flavonoid content, 536.27 ppm, sun protection factor (SPF, 34.08), and moisture content (58.5%). Physicochemical properties over a 50-day shelf-life showed no significant difference in net change in pH (5.32 to 5.30), spreadability (32.03 cm^2 to 33.71 cm^2), and viscosity (43.43 cP to 43.83 cP). Considering the results, we can elucidate that the NEFE and ACLE-based dermocosmetics occupy significant photo-protective and moisturizing properties, offering a leading-edge solution for aesthetic skin care.

Keywords: *Atalantia ceylanica*, Dermocosmetic, *Nymphaea erangae*, Secondary metabolites