

ABSTRAK

Penuaan kulit merupakan proses alami yang seiring bertambahnya usia dapat dipercepat oleh faktor internal maupun eksternal, terutama radikal bebas akibat paparan sinar ultraviolet, polusi, dan gaya hidup tidak sehat. Radikal bebas menyebabkan kerusakan sel kulit sehingga memicu penuaan dini. Upaya pencegahan dapat dilakukan melalui penggunaan antioksidan alami. Alga coklat (*Padina australis*) mengandung polifenol, flavonoid, dan karotenoid, sedangkan daun kelor (*Moringa oleifera*) kaya fenolik, flavonoid, tannin, dan vitamin yang memiliki aktivitas antioksidan kuat. Penelitian ini bertujuan memformulasikan lulur scrub berbahan kombinasi ekstrak etanol alga coklat dan daun kelor serta mengevaluasi aktivitas antioksidan dan karakteristik fisikokimianya. Ekstraksi dengan metode maserasi menggunakan etanol 70% menghasilkan rendemen 20,2% untuk alga coklat dan 22,4% untuk daun kelor. Uji antioksidan metode ABTS menunjukkan ekstrak alga coklat memiliki nilai IC_{50} sebesar 787,711 ppm (kategori lemah), sedangkan daun kelor 53,484 ppm (kategori kuat). Total fenolik (TPC) alga coklat sebesar $1,234 \pm 0,166$ mg GAE/g, lebih rendah dibanding daun kelor $27,445 \pm 1,015$ mg GAE/g, yang menegaskan peran penting fenolik terhadap aktivitas antioksidan. Formulasi lulur scrub diuji melalui organoleptik, homogenitas, pH, daya sebar, dan iritasi. Hasilnya menunjukkan aroma green tea, warna putih hingga kuning kehijauan sesuai konsentrasi ekstrak, tekstur kasar yang cocok untuk eksfoliasi, formula homogen dan stabil, pH 6,79–7,42 sesuai standar, serta daya sebar 5,6–5,9 cm. Uji iritasi pada 12 sukarelawan menunjukkan sediaan aman tanpa reaksi negatif. Secara keseluruhan, kombinasi ekstrak alga coklat dan daun kelor menghasilkan lulur scrub dengan karakteristik baik, aman, serta aktivitas antioksidan menjanjikan sebagai kandidat kosmetik anti-aging berbahan alami.

Kata kunci: antioksidan, lulur scrub, *Padina australis*, *Moringa oleifera*, penuaan dini.

ABSTRACT

Skin aging is a natural process that, as we age, can be accelerated by internal and external factors, especially free radicals due to ultraviolet light exposure, pollution, and unhealthy lifestyles. Free radicals cause skin cell damage that triggers premature aging. Prevention efforts can be made through the use of natural antioxidants. Brown algae (*Padina australis*) contain polyphenols, flavonoids, and carotenoids, while moringa leaves (*Moringa oleifera*) are rich in phenolics, flavonoids, tannins, and vitamins that have strong antioxidant activity. This study aims to formulate a scrub made from a combination of ethanol extracts of brown algae and moringa leaves and evaluate its antioxidant activity and physicochemical characteristics. Extraction by the maceration method using 70% ethanol yielded 20.2% for brown algae and 22.4% for moringa leaves. The ABTS method antioxidant test indicated that brown algae extract had an IC₅₀ value of 787.711 ppm (weak category), while moringa leaves had 53.484 ppm (strong category). The total phenolic content (TPC) of brown algae was 1.234 ± 0.166 mg GAE/g, lower than that of moringa leaves at 27.445 ± 1.015 mg GAE/g, confirming the important role of phenolics in antioxidant activity. The scrub formulation was tested through organoleptic, homogeneity, pH, spread ability, and irritation. The results indicated a green tea aroma, a white to greenish-yellow color according to the extract concentration, a rough texture suitable for exfoliation, a homogeneous and stable formula, a pH of 6.79–7.42 according to the standard, and a spread ability of 5.6–5.9 cm. Irritation tests on 12 volunteers showed the preparation was safe without negative reactions. Overall, the combination of brown algae and Moringa leaf extracts produced a scrub with good characteristics, safety, and promising antioxidant activity as a candidate for natural anti-aging cosmetics.

Keywords: antioxidant, *Padina australis*, *Moringa oleifera*, scrub, premature aging.