INTISARI

Indonesia merupakan negara beriklim tropis dengan sinar matahari yang memancarkan radiasi UV yang berbahaya untuk kulit. Meskipun kulit memiliki mekanisme fotoproteksi, proteksi tabir surya tetap dibutuhkan. Tabir surya berbentuk gel lebih disukai karena memiliki penyebaran baik pada kulit dan memberikan efek dingin saat aplikasi. Seiring perkembangan tren kosmetik, timbul urgensi untuk mulai mengembangkan formula dengan bahan alam. Salah satu bahan alam yang berpotensi menjadi tabir surya, yaitu daun binahong. Penelitian ini bertujuan untuk mengoptimasi *gelling agent* Carbopol® Ultrez 20 dan humektan propilen glikol untuk menghasilkan formula optimum dengan parameter respon sifat fisik yang baik, serta mengetahui aktivitas perlindungan sinar UV pada gel tabir surya ekstrak etanol daun binahong.

Optimasi formula dan verifikasi formula optimum gel tabir surya dilakukan dengan metode *Simplex Lattice Design* pada aplikasi *Design Expert* versi 13. Pengukuran aktivitas perlindungan sinar UV pada gel tabir surya dilakukan dengan mengukur nilai SPF pada spektrofotometri UV-Vis.

Hasil penelitian menunjukkan bahwa gel tabir surya ekstrak etanol daun binahong memiliki formula optimum dengan komposisi 0,69% Carbopol® Ultrez 20 dan 12,00% propilen glikol dengan profil karakteristik fisik, antara lain viskositas sebesar 8044 *cPoise*; daya sebar sebesar 16,07 cm^2; dan daya lekat sebesar 0,91 detik. Formula optimum gel tabir surya ekstrak etanol daun binahong memiliki efek perlindungan terhadap sinar UV rendah dengan nilai SPF 11,51.

Kata Kunci: ***daun binahong, SPF, gel tabir surya, Carbopol® Ultrez 20, propilen glikol***

ABSTRACT

Indonesia is a tropical country with a high intensity of sunlight that emits UV radiation that is harmful to the skin. Although the skin has a photoprotection mechanism, sunscreen is still needed. Sunscreen gels are more preferred because they spread well on the skin and provide a cooling effect upon application. Along with the development of cosmetic trends, there is an urgency to start developing formulas with natural ingredients. One of the natural ingredients that has the potential to be a sunscreen is binahong leaves. This study aims to determine the UV protection activity of ethanol extract of binahong leaves, as well as compare the difference in SPF values before and after formulation and optimize the gelling agent Carbopol® Ultrez 20 and humectant propylene glycol to create an optimum formula with the best physical properties and stability.

Optimization of sunscreen gel formula was carried out by Simplex Lattice Design method in Design Expert software version 13. The optimum formula was verified with one-sample t-test and the physical stability was measured with the cycling test method for 3 cycles, then analyzed with one-way ANOVA and post-hoc Tuckey to see the stability of the gel through differences in physical properties on each cycle. Measurement of UV protection activity of the extract and sunscreen gel was carried out by measuring the SPF value on UV-Vis spectrophotometry.

The results showed that the sunscreen gel of binahong leaf ethanol extract had an optimum formula, consisting of 0.69% Carbopol® Ultrez 20 and 12.00% propylene glycol with a physical characteristic profile, including viscosity of 8044 cPoise; spreadability of 16.07 cm^2; and adhesion of 0.91 seconds. The optimum formula of the sunscreen gel of binahong leaf ethanol extract had a low UV protection effect with an SPF value of 11.51.

Keywords: binahong leaves, SPF, sunscreen gel, Carbopol® Ultrez 20, propylene glycol