FAKULTAS KEDOKTERAN DAN ILMU KESEHATAN
UNIVERSITAS MUHAMMADIYAH MAKASSAR
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"Formulasi dan Penentuan Nilai *Sun protection factor* (SPF) Gel Tabir Surya Ekstrak Etanol Buah Buni (*Antidesma bunius*) dengan Konsentrasi Variasi *Gelling agent* Secara *In-Vitro*"

ABSTRAK

Latar belakang: Buah buni (*Antidesma bunius*) mengandung senyawa flavonoid dan antioksidan yang berpotensi sebagai bahan aktif tabir surya alami. *Sunscreen* atau lebih dikenal dengan tabir surya merupakan sediaan yang digunakan untuk melindungi kulit dari kerusakan dan bahaya lain yang disebabkan oleh paparan sinar ultraviolet. Gel adalah sediaan semipadat tediri atas suspensi yang dibuat dari partikel anorganik yang kecil maupun besar yang dapat berpenetrasi.
Tujuan penelitian: Penelitian ini bertujuan untuk mengetahui aktivitas antioksidan ekstrak etanol buah buni serta mengevaluasi nilai Sun Protection Factor (SPF) dan stabilitas fisik gel tabir surya yang diformulasikan dengan variasi konsentrasi gelling agent.
Metode penelitian: Penelitian ini merupakan penelitian eksperimental yang meliputi proses ekstraksi sampel buah buni (*Antidesma bunius*) dengan metode maserasi, lalu dilakukan penetapan kadar flavonoid total dan antioksidan. Serta penentuan nilai *Sun protection factor* (SPF) gel tabir surya dengan variasi konsentrasi *gelling agent*.
Hasil penelitian: Berdasarkan hasil penelitian Analisis fitokimia menunjukkan kandungan flavonoid, alkaloid, tanin, saponin, steroid, dan fenolik. Kadar flavonoid total ditetapkan dengan metode spektrofotometri menggunakan kuersetin sebagai standar, menghasilkan nilai 16,44 mgQE/g. Aktivitas antioksidan diuji menggunakan metode DPPH dengan nilai IC_{50} sebesar 32,43 µg/mL, tergolong sangat kuat. Gel tabir surya diformulasikan dalam lima variasi konsentrasi HPMC dan karbopol 940. Evaluasi fisik meliputi uji organoleptik, homogenitas, pH, viskositas, daya lekat, daya sebar, serta stabilitas melalui metode cycling test. Penilaian nilai SPF dilakukan secara in vitro menggunakan spektrofotometer UV-Vis. Formula dengan HPMC tunggal memberikan nilai SPF tertinggi (17,322) namun tidak stabil. Formula terbaik diperoleh dari kombinasi HPMC:Karbopol 940 (50:50) dengan nilai SPF 11,155 dan stabilitas fisik yang memenuhi syarat sediaan gel topikal.
Kesimpulan: Penelitian ini menunjukkan bahwa ekstrak buah buni berpotensi sebagai bahan aktif tabir surya alami dengan efektivitas perlindungan UV dan kestabilan fisik sediaan yang baik, khususnya pada formula kombinasi gelling agent.
Kata kunci: *Antidesma bunius*, gel tabir surya, SPF, *Gelling agent*, flavonoid, antioksidan.

FACULTY OF MEDICINE AND HEALTH SCIENCES
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"Formulation and Determination of *Sun protection factor* (SPF) of Ethanol Extract Sunscreen Gel from Buni Fruit (*Antidesma bunius*) with Variations in *Gelling agent* Concentration In Vitro"

ABSTRACT

Background: *Antidesma bunius* fruit contains flavonoids and antioxidants with potential as active ingredients in natural sunscreen formulations. Sunscreen, better known as sunblock, is a product used to protect the skin from damage and other hazards caused by exposure to ultraviolet rays. Gel is a semi-solid preparation consisting of a suspension made from small and large inorganic particles that can penetrate the skin.
Research Objective: This study aims to determine the antioxidant activity of ethanol extracts from buni fruit and evaluate the Sun Protection Factor (SPF) and physical stability of sunscreen gels formulated with varying concentrations of gelling agents.
Research Method: This study is an experimental study that includes the process of extracting buni fruit (Antidesma bunius) samples using the maceration method, followed by determining the total flavonoid and antioxidant content. It also determines the sun protection factor (SPF) value of sunscreen gel with varying concentrations of gelling agents.
Research results: Based on the result of Phytochemical screening confirmed the presence of flavonoids, alkaloids, tannins, saponins, steroids, and phenolics. Total flavonoid content was determined spectrophotometrically using quercetin as standard, yielding 16.44 mgQE/g. Antioxidant activity was assessed using the DPPH method, with an IC_{50} value of 32.43 µg/mL, indicating strong antioxidant potential. The sunscreen gel was formulated in five variations using Hydroxypropyl Methylcellulose (HPMC) and Carbopol 940. Physical evaluation included organoleptic properties, homogeneity, pH, viscosity, adhesion, spreadability, and stability through a cycling test. SPF value was measured in vitro using UV-Vis spectrophotometry. The HPMC-only formula showed the highest SPF (17.322) but lacked adequate physical stability. The optimal formulation was achieved with a 50:50 combination of HPMC and Carbopol 940, resulting in an SPF value of 11.155 and satisfactory physical characteristics.
Conclusion: These findings suggest that *Antidesma bunius* ethanol extract is a promising natural ingredient for sunscreen products, offering strong UV protection and acceptable gel formulation stability when combined with appropriate gelling agents.
Keywords: *Antidesma bunius*, *Sunscreen* gel, SPF, *Gelling agent*, flavonoids, antioxidants.