

THESIS

**INNOVATION *OF NANOSPRAY* SHALLOT SKIN EXTRACT (*Allium cepa*
L) WITH OPTIMIZATION OF VEGETABLE OIL DELIVERY SYSTEM
AS SUNBURN PROTECTION**



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ABSTRACT

INNOVATION OF NANOSPRAY SHALLOT SKIN EXTRACT (*Allium cepa* L) WITH OPTIMIZATION OF VEGETABLE OIL DELIVERY SYSTEM AS SUNBURN PROTECTION

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Indonesia is a tropical country with more sunlight overflow, one of which is UV (Ultraviolet) rays, which, if overexposed, will cause side effects such as sunburn, tanning, erythema and premature ageing. Sunburn is a vesicle on the skin with a history of exposure to sunlight, especially RUV (Ultraviolet Radiation) and often occurs in children or adults. One of the metabolite compounds that can block UV rays is quercetin, found in the skin of shallots (*Allium cepa* L.), which is made into a nanospray preparation with the optimization of the vegetable oil delivery system. This research aims to evaluate sunscreen activity in the formulation of shallot skin extract nanospray preparations with optimization of the vegetable oil delivery system. The research method used is laboratory experiments with descriptive analysis, including organoleptic, homogeneity, and Particle Size Analyzer (PSA) and statistical analysis, including testing pH, viscosity and SPF values. Data was processed using the SPSS Oneway ANOVA statistical program and paired-samples T-Test. The comparison of the concentration of vegetable oils and extracts used in each formulation was 3%:0% (F0), 3%:1% (F1), 6%:1% (F2), and 9%:1% (F3). The shallot skin extract nanospray's physical evaluation showed that each organoleptic formula's average result was milky brown, had a pH of 5-6.5, a viscosity of 1-100 cPas, and an SPF value of 15. Based on the research that has been carried out, formula 3 with a concentration of shallot skin extract of 1% and vegetable oil 9% is the best formulation, namely pH value 6, viscosity 35, SPF value >15, particle size 29.41 nm and PDI 0.6.

Keywords: Shallot Skin, nano spray, Vegetable Oil, SPF (Sun Protector Factor)

ABSTRAK

INOVASI *NANOSPRAY* EKSTRAK KULIT BAWANG MERAH (*Allium cepa* L) DENGAN OPTIMASI SISTEM PENGHANTAR MINYAK NABATI SEBAGAI PROTEKSI *SUNBURN*

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Indonesia merupakan negara beriklim tropis dengan limpahan sinar matahari lebih banyak, salah satunya adalah sinar UV (*Ultraviolet*) yang jika terpapar secara berlebihan akan menyebabkan efek samping yaitu *sunburn*, *tanning*, eritema dan penuaan dini. *Sunburn* merupakan vesikel pada kulit dengan riwayat terpapar sinar matahari khususnya RUV (*Radiasi Ultraviolet*) dan sering terjadi pada anak ataupun dewasa. Salah satu senyawa metabolit yang memiliki kemampuan menangkal sinar UV adalah quersetin, terdapat dalam kulit bawang merah (*Allium cepa* L.) yang dibuat sediaan *nanospray* dengan optimasi sistem penghantar minyak nabati. Tujuan penelitian ini untuk mengetahui evaluasi dan aktivitas tabir surya pada formulasi sediaan *nanospray* ekstrak kulit bawang merah dengan optimasi sistem penghantar minyak nabati. Metode penelitian yang digunakan yaitu eksperimental laboratorium dengan analisis deskriptif meliputi organoleptik, homogenitas, dan *Particle Size Analyzer* (PSA) serta analisis statistik meliputi pengujian pH, viskositas dan nilai SPF. Pengolahan data dilakukan pada program statistic SPSS *Oneway ANOVA* dan *paired-Samples T-Test*. Perbandingan konsentrasi minyak nabati dan ekstrak yang digunakan pada setiap formulasi adalah 3%:0% (F0), 3%:1% (F1), 6%:1% (F2), dan 9%:1% (F3). Evaluasi fisik *nanospray* ekstrak kulit bawang merah menunjukkan hasil rata-rata setiap formula organoleptik berwarna coklat susu, memiliki pH 5-6,5, viskositas 1-100 cPas, memiliki nilai SPF 15. Berdasarkan penelitian yang telah dilakukan, formula 3 dengan konsentrasi ekstrak kulit bawang 1% dan minyak nabati 9% menjadi formulasi paling baik yaitu nilai pH 6, viskositas 35, nilai SPF >15, ukuran partikel 29,41 nm dan PDI 0,6.

Kata Kunci: Kulit Bawang Merah, *nanospray*, Minyak Nabati, SPF (*Sun Protector Factor*)

AUTHENTICITY STATEMENT

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I sincerely declare thaht the research contained in this thesis in my own work and does not belong to anyone else. This thesis has never been published before, except for some part with original references.

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FOREWORD

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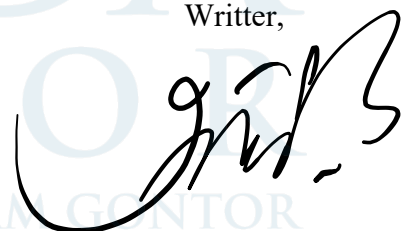
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With humility, the author realises that this thesis still has many shortcomings. Therefore, the author expects criticism and suggestions to improve it. Hopefully, this thesis can be helpful in the advancement of science. Aamiin Allahumma Aamiin.

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Ponorogo, 16 December 2024

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