THESIS

FORMULATION AND EVALUATION OF ALOE VERA *(Aloe vera Linn.)* EXTRACT GEL FACIAL WASH AS AN ANTIOXIDANT

Prepared By:

Gita Fazriah Daniyati
NIM 422021718034

PHARMACY DEPARTMENT
FACULTY OF HEALTH SCIENCES
UNIVERSITY OF DARUSSALAM GONTOR
PONOROGO
2024

VALIDITY SHEET

VALIDITY SHEET

It is hereby stated that the thesis with the title:

FORMULATION AND EVALUATION FACIAL WASH GEL FROM ALOE VERA *(Aloe vera Linn.)* EXTRACT AS AN ANTIOXIDANT

Written:

Gita Fazriah Daniyati
422021718034

Has been tested and approved & before the Thesis Examiner Board

On:

Examiner Board:

Supervisor I
Yulisa Raras Dewi, M. Farm
NIY. 180709

Supervisor II
Dr. Solikah Ana Estikomah, M. Si
NIDN. 0223048501

Examiner
Apt. Fauziyyah Al Hasanah, M.Farm
NIDN. 0705089602

Aproved by,

Head of Pharmacy Department
Faculty of Health Science, University of Darussalam Gontor

Apt. Nadia Iha Fatihah, M.Clin.Pharm.
NIDN. 0714059105

i

AUTHENTICITY STATEMENT

AUTHENTICITY STATEMENT

It is hereby declared by,

Name	: Gita Fazriah Daniyati
NIM	: 422021718034
Faculty	: Health
Department	: Pharmacy
Thesis Title	: Formulation And Evaluation Gel Facial Wash Aloe vera *(Aloe vera Linn.)* Extract As An Antioxidant

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

If in the future it is found that this work is plagiarism, I am ready to be given administrative and academic sanctions.

Ponorogo, 09th January2025

Writer,

Gita Fazriah Daniyati

NIM. 422021718034

ABSTRACT

FORMULATION AND EVALUATION OF ALOE VERA (Aloe vera Linn.) EXTRACT GEL FACIAL WASH AS AN ANTIOXIDANT

Gita Fazriah Daniyati
NIM 422021718034

Aloe vera (Aloe vera Linn.) has long been recognized as a natural ingredient beneficial for skincare due to its moisturizing, soothing properties, and antioxidant content. The antioxidants in Aloe vera, such as polyphenols, aloin, and quercetin, play a crucial role in protecting the skin from damage caused by free radicals triggered by UV exposure, pollution, and other environmental factors. By incorporating Aloe vera extract into gel facial wash formulations, not only can effective cleansing be achieved, but also a synergistic delivery of antioxidant, moisturizing, and soothing benefits directly to the skin. This study aims to evaluate the physical quality, assess the antioxidant activity, and identify the optimal formulation of Aloe vera extract-based gel facial wash. The methods employed include physical stability tests such as pH, viscosity, and foam height evaluations, along with antioxidant activity assessment using the IC50 method. The results indicate that all formulas (F1, F2, and F3) demonstrated good physical stability over 14 days of storage, despite some changes in viscosity. Formula 2 (F2) exhibited the best antioxidant activity, with an IC50 value of 6.57 µg/mL, followed by Formula 3 (F3) at 9.18 µg/mL, and Formula 1 (F1) at 28.61 µg/mL. The superior performance of F2 is attributed to the optimal concentration of Aloe vera extract, which enhances the effectiveness of active compounds. In contrast, F1 showed lower activity due to insufficient extract concentration, while F3 experienced diminished activity, likely due to saturation effects at higher extract concentrations. To maximize antioxidant activity, it is recommended to optimize the concentration of Aloe vera extract within the formulation, with preliminary studies suggesting an optimal range around 4%. Furthermore, conducting hedonic tests is crucial to assess consumer acceptability and preference for the final product.

***Keywords**: Aloe vera, Antioxidant, Gel facial wash, IC50, Physical stability.*

ABSTRAK

FORMULASI DAN EVALUASI *GEL FACIAL WASH* DARI EKSTRAK LIDAH BUAYA *(Aloe vera* Linn.*)* SEBAGAI ANTIOKSIDAN

Gita Fazriah Daniyati
NIM 422021718034

Lidah buaya *(Aloe vera Linn.)* telah lama dikenal sebagai bahan alami yang bermanfaat untuk perawatan kulit karena sifatnya yang melembapkan, menenangkan. Kandungan antioksidan dalam lidah buaya, seperti polifenol, aloin, dan quercetin, berperan penting dalam melindungi kulit dari kerusakan akibat radikal bebas yang dipicu oleh paparan sinar UV, polusi, dan faktor lingkungan lainnya. Penambahan ekstrak lidah buaya pada sediaan gel *facial wash* diharapkan tidak hanya memberikan efek pembersihan tetapi juga manfaat antioksidan, melembapkan, dan menenangkan kulit. Penelitian gel *facial wash* dengan variasi ekstrak lidah buaya bertujuan untuk mengevaluasi mutu fisik, menilai aktivitas antioksidan, dan menentukan formulasi terbaik pada sediaan gel facial wash berbasis ekstrak lidah buaya. Metode yang digunakan meliputi uji stabilitas fisik seperti pH, viskositas, dan tinggi busa, serta uji aktivitas antioksidan menggunakan metode IC50. Hasil penelitian menunjukkan bahwa semua formula (F1, F2, dan F3) memiliki stabilitas fisik yang baik selama penyimpanan 14 hari, meskipun terdapat perubahan viskositas. Formula 2 (F2) menunjukkan aktivitas antioksidan terbaik dengan nilai IC50 sebesar 6,57 µg/mL, diikuti Formula 3 (F3) sebesar 9,18 µg/mL, dan Formula 1 (F1) sebesar 28,61 µg/mL. Aktivitas F2 optimal karena konsentrasi ekstrak lidah buaya mendukung efektivitas senyawa aktif, sedangkan F1 rendah akibat konsentrasi ekstrak yang terlalu kecil dan F3 menurun karena kemungkinan saturasi pada konsentrasi ekstrak yang terlalu tinggi. Disarankan untuk melakukan optimasi konsentrasi ekstrak lidah buaya pada formulasi, khususnya sekitar 4%, untuk menghasilkan aktivitas antioksidan yang lebih baik. Selain itu, uji hedonik dapat ditambahkan untuk mengevaluasi preferensi konsumen terhadap produk.

Kata Kunci: *Aloe vera,* Antioksidan, gel *facial wash,* IC50, Stabilitas Fisik.

PREFACE

Bismillahirohmanirrahim,

Assalamu'alaikum Warahmatullahi abarakatuh,

All praise and gratitude are due to Allah SWT, for the abundant mercy, guidance, and blessings that enabled the author to complete this thesis titled "Formulation and Evaluation of Aloe Vera *(Aloe vera Linn.)* Extract Gel Facial Wash as an Antioxidant." May prayers and peace be upon our noble Prophet Muhammad SAW, along with his family, companions, and followers until the end of time (Ameen). His thesis is submitted in partial fulfillment of the requirements for the completion of the undergraduate program in Pharmacy at the Faculty of Health Sciences, Universitas Darussalam Gontor.

The author gratefully acknowledges the invaluable guidance, support, and assistance received from numerous individuals throughout the course of this research.With profound respect and appreciation, the author expresses gratitude to the following:

1. Al-Ustadz Prof. Dr. Hamid Fahmi Zarkasyi, M.A, M.Phil, the Rector of Universitas Darussalam Gontor, for providing the opportunity and facilities during the course of study.
2. Al-Ustadz apt. Amal Fadhola, S.Si, M.Si, the Dean of the Faculty of Health Sciences at Universitas Darussalam Gontor, for his guidance and support.
3. Al-Ustadzah apt. Nadia Iha Fatiha, M.Clin Pharm, Head of the Pharmacy Study Program, for her invaluable knowledge and motivation throughout the author's education.
4. Al-Ustadzah Yulisa Raras Dewi, M.Farm, and Al-Ustadzah Dr. Solikah Ana Estikomah, M.Si, the supervising lecturers, for their patience, guidance, and valuable suggestions during the preparation of this thesis.
5. All the lecturers of the Pharmacy Study Program, Universitas Darussalam Gontor, for sharing their knowledge and valuable experiences during the course of study.
6. The author's beloved and cherished parents, Dadan Dimyati and Sunia Anti Rusmawati, for their endless love, prayers, and unwavering support.

7. The author's admirable siblings, Suci Sundari Wage Syella and Faisal Hening Sasana, for their encouragement and motivation.
8. Fellow students of the Pharmacy Study Program, class of 2021, for their support, camaraderie, and assistance during the study and thesis preparation.

The author is fully aware that this thesis still has shortcomings. Therefore, constructive criticism and suggestions are highly appreciated to improve this work. It is the author's hope that this thesis can provide benefits, serve as an inspiration to readers, and become a source of lasting knowledge for all.

Finally, may Allah SWT bless all the efforts and knowledge shared, and may it be fruitful for everyone.

Wassalamu'alaikum Warohmatullahi Wabarokatuh.

Ngawi, 04 Jumadil Akhir 1446 H
05 December 2024 M

Author,

Gita Fazriah Daniyati