

**MULTISTAGE EXTRACTION TO IMPROVE AGI
(ALPHA-GLUCOSIDASE INHIBITORS) ACTIVITY IN LEMONGRASS
EXTRACT**

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Jennifer Jessie Valerie
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SWISS GERMAN UNIVERSITY
The Prominence Tower
Jalan Jalur Sutera Barat No. 15, Alam Sutera
Tangerang, Banten 15143 - Indonesia

Revision after the Thesis Defense on 4th July 2024

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.



Jennifer Jessie Valerie

Student

11 July 2024

Date

Approved by:



Dr.-Ing Diah Indriani Widiputri, ST., MSc

Thesis Advisor

11 July 2024

Date



Dr. Irvan Setiadi Kartawiria, S.T., M.Sc

Thesis Co-Advisor

11 July 2024

Date



Dr. Hery Sutanto, S.Si., M.Si

Dean

12 July 2024

Date

Jennifer Jessie Valerie

ABSTRACT

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By

Jennifer Jessie Valerie

Dr.-Ing Diah Indriani Widiputri, ST., MSc, Advisor

Dr. Irvan Setiadi Kartawiria, S.T., M.Sc, Co-Advisor

SWISS GERMAN UNIVERSITY

This research aimed to optimize the extraction process of *Cymbopogon citratus* (*C. Citratus*), commonly known as lemongrass, to enhance the yield and preserve the crucial antidiabetic activity, specifically alpha-glucosidase inhibition (AGI), for industrial-scale production feasibility.

A multistage countercurrent extraction approach was employed, utilizing ethanol 50% in water as the solvent. Experiments compared single-stage extraction with two-stage (MS2) and three-stage (MS3) multistage extractions. The extraction yield, total phenolic content (TPC), AGI activity, and productivity were evaluated.

The MS2 extraction exhibited significantly higher extraction yield (22.25%), TPC (12.32 mg GAE/g dry sample), and productivity (4.38 g solute/h) compared to the single-stage method (yield: 17.23%, TPC: 9.32 mg GAE/g dry sample, productivity: 0.88 g solute/h). The AGI activity increased from 28.94% in single stage to 30.30% in MS2. Meanwhile, the MS3 method showed comparable results to MS2, with no statistically significant difference.

The optimized two-stage countercurrent extraction process demonstrated substantial improvements in extraction efficiency, yield, and preservation of antidiabetic properties, offering a promising approach for industrial-scale production of lemongrass extracts with enhanced economic viability.

Keywords: Cymbopogon Citratus, Multistage Extraction, Alpha-Glucosidase Inhibition, Antidiabetic Activity, Productivity.

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DEDICATION

I humbly dedicate this thesis to the relentless pursuit of scientific knowledge and innovation for the betterment of human health in my beloved homeland, Indonesia.

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