

**UNIQUENESS OF GARLIC (*Allium sativum*): PHYTOCHEMICAL
SCREENING AND ANTIBACTERIAL ACTIVITY OF *Allium sativum* AND
ITS POTENTIAL AS HANDWASHING SOAP'S ADDITIVE**

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**Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Applied Chemistry
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

AUGUST 2022

ACKNOWLEDGEMENT

First of all, Alhamdulillah, in the name of Allah S.W.T. the most merciful, the most gracious, the most powerful of all, with His blessing, finally I managed to complete this final year project (FYP) with the given time. I would like to express my heartfelt gratitude to my supervisor, Madam Shafinas binti Abdullah, for the continuous support during my research project, for her patience, encouragement, guidance, useful ideas, immense knowledge and motivation. I am proud, respect and great privilege to work and study under her guidance.

My greatest gratitude towards my parents and my sisters for their unflagging love, prayers, understanding and support throughout my life and studies. Besides that, I would never forget to all my friends and close friend for their unyielding support during this stress and difficult moments. Thank you, Allah, for sending me a lot of people to help me from the beginning until the end of my study directly or indirect.

Last but not least, congratulation dear self for surviving, struggling and never quitting throughout this journey.

Ommy Madina binti Abdul Halim

ABSTRACT

UNIQUENESS OF GARLIC (*Allium sativum*): PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL ACTIVITY OF *Allium sativum* AND ITS POTENTIAL AS HANDWASHING SOAP'S ADDITIVE

Allium sativum known as garlic is a bulbous flowering plant species that belongs to the *Amaryllidaceae* family and is related to the onion, leeks, and chives. *Allium sativum* has been acknowledged as a natural product for daily life and it is extensively used in cooking and as vegetable. Due to the biomolecules with nutritional and therapeutic characteristics such as antibacterial properties and antioxidants, garlic has been commercialized in many industrial products such as healthcare supplements. Thus, this study was conducted to extract *Allium sativum* and examine its antibacterial activity as well as its potential as a handwashing soap. *Allium sativum* was extracted by using Soxhlet extraction and 24.73% extraction yield was obtained. Next, the *Allium sativum* extracts was characterized using FTIR and phytochemical screening analysis to identify the functional group and the presence of phytochemical constituents. From FTIR analysis, the predominant functional group in the extracted *Allium sativum* was 1016.14 cm^{-1} for an organosulfur compound comparable to the previous research study. Besides that, phytochemical constituents such as saponins, flavonoids, and phenolics were detected at high amounts while amino acids were detected only at trace amounts and it is consistent with many published studies. Moreover, antibacterial activity was conducted to represent the ability of extracted *Allium sativum* to inhibit the bacterial growth which potential as antibacterial handwashing soap. By that, the handwashing soap from extracted *Allium sativum* was successfully prepared. The prepared handwashing soap from extracted *Allium sativum* has a pH of 9.97 which demonstrated it is safe to be used on skin. As a result, extracted *Allium sativum* has a high ability for health therapeutic products such as handwashing soap formulation with the proven antibacterial activity.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

COVID-19 represents “Coronavirus disease 2019” which is an outbreak of acute respiratory infection from novel coronavirus. On March 2020, World Health Organization (WHO) was revealed the COVID-19 outbreak as a global pandemic that needs to undertake effective measures to reduce the spread of the virus. Transmission of COVID-19 specifically between people direct, indirect which contaminated from any objects or surface and close contact with infected people (Cucinotta and Vanelli, 2020). Therefore, the most effective recommendation from WHO to prevent COVID-19 is by washing hands frequently in correct ways.

Washing hand is the best way to defend ourselves because it is the major prevention step to avoid germs from spreading. Bernaldez and Vicencio, 2021, stated that germs are microorganisms like bacteria and viruses that can cause disease. Specifically, most surfaces and objects are come in contact and covered in germs. In addition, exposure to infectious disease is