

**SUBMISSION FOR EVALUATION
FINAL YEAR PROJECT 2 - RESEARCH PROJECT**

**DEVELOPMENT OF SERUM STICK FROM *Medusomyces gisevii* (KOMBUCHA)
TO RESTORE FACIAL SKIN ASSETS**

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ABSTRACT

DEVELOPMENT OF SERUM STICK FROM *Medusomyces gisevii* (KOMBUCHA) TO RESTORE FACIAL SKIN ASSETS

Kombucha, a fermented tea drink, is praised for its potential health benefits and antioxidant properties. Although studies suggest that kombucha has antioxidant properties, this trend is somehow inconsistent (some journals show that the antioxidant content is lower during fermentation while others show the opposite). This inconsistent research creates a gap in knowledge about the effectiveness of kombucha for topical applications such as wrinkle reduction and increased elasticity. Additionally, traditional liquid serums present challenges in travel and use. This research study investigated the potential of kombucha as an anti-aging agent in skin care, specifically in the form of a serum stick, and found that the antioxidant content in kombucha filtrate increased with fermentation time (comparison between day 7 and day 17), with the highest Total Phenolic Content (TPC) and Total Flavonoid Content (TFC) values observed on day 17, specifically 2411.7647 mg GAE/L and 600 mg QE/L, respectively. The DPPH test confirmed this finding, showing a stronger antioxidant effect on day 17 (lower IC₅₀ value) of 28.0178 mg/L. The antioxidant properties of kombucha are attributed to the presence of bioactive compounds such as polyphenols, and flavonoids, which have been shown to neutralize free radicals, reduce oxidative stress, and promote collagen synthesis, ultimately leading to better skin elasticity and reduce lines and wrinkles. A serum stick formulation incorporating kombucha filtration has been developed with a skin-friendly pH of 4.721, suitable for facial topical use. Patch testing showed good tolerance across different testers. User experience testing (organoleptic testing) identified areas for improvement regarding product smoothness and ease of use, with formulation 2 found to be superior to formulation 3.

TABLE OF CONTENTS

ABSTRACT	iii
ABSTRAK	iv
ACKNOWLEDGEMENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
CHAPTER 1 INTRODUCTION	
1.1 Background of study	1
1.2 Problem statement	3
1.3 Research questions	5
1.4 General objectives	5
1.5 Significance of study	6
1.6 Expected outcomes	6
CHAPTER 2 LITERATURE REVIEW	
2.1 Skincare	8
2.2 Serum	8
2.3 Skin aging	9
2.3.1 Extrinsic aging	11
2.3.1.1 Ultraviolet radiation (UVR)	12
2.3.1.2 Air pollution	13
2.4 <i>Medusomyces gisevii</i> (kombucha)	17
2.4.1 Antioxidant actions	26
CHAPTER 3 METHODOLOGY	
3.1 Material	
3.1.1 Raw material	27
3.1.2 Chemical	27
3.1.3 Apparatus	27
3.1.4 Instrument	28
3.2 Methods	28
3.2.1 Preparation of kombucha fermented tea solution	28
3.2.2 Preparation of kombucha stock solution	29
3.3 Antioxidant assays method	30
3.3.1 Determination of total phenolic content (TPC)	30
3.3.2 Determination of total flavonoid content (TFC)	31
3.3.3 Determination of DPPH scavenging capacity	32
3.4 Development of serum stick	33