

INOVATIVE STUDY OF NATURAL SURFACTANT SOURCE IN LIQUID DETERGENT PRODUCT USING SAPONIN EXTRACT FROM *MANIHOT ESCULENTA* LEAVES

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1. Introduction

Liquid detergents that are commonly used as house hold cleaner actually Is not as safe as we thought. Liquid detergent contains harmful chemical substances such as Surfactant, Builders, and oxalic acid. Harmful chemical substances can cause environmental damage and material that are wash. Base on this problem, this study was conducted with aims to innovate natural liquid detergent using saponin extract from *Manihot esculenta*.

2. Problem Statement

Liquid detergent becomes a problem these days because it can lead to environment damage, therefore solutions to overcome this problem is by using saponin extract from *Manihot esculenta* leaves as alternative source detergent.

3. Purpose of the Study

This study aims at innovate alternative source of liquid detergent using saponin extract of *Manihot esculenta* leaves, which will allow a safer liquid detergent for the environment.

4. Research Method

Extraction and identification

Dried *Manihot esculenta* leaves were crushed and sieved into powder and stored in a dry container. Then, the powder was extracted through maceration method with 96% ethanol as solvent. The presence of saponin was identified qualitatively by shaking dissolved saponin and compared it with shacked *Sapindus rarak* as control positive and shacked water as control negative.

Emulsification test

Emulsification test is done by emulsifying water and vegetable oil. If homogeneous mixture was formed, than the extract is proven to have the ability as a surfactant. The result of the extract will be compare with *Sapindus rarak* as a positive control and without treatment as a negative control.

Detergent Formulation

The detergent formulate by mixing *Manihot esculenta*, H₂O₂ (hydrogen peroxide), dan STPP (sodium tripolyphosphate).

Physical and chemical test

The physical and chemical properties of the extract are tested using pH test, Viscosity test, water solubility test, Organoleptic test, foam power test, foam stability test,

Product Test

Natural liquid detergent will be tested by washing fabric with oil stains.

5. Result and Analysis

Manihot esculenta leaves powder had a very light and smooth texture. Dissolved *Manihot esculenta* extract will have a foam after shacked. Table 1 shows the identification result of saponin in *Manihot esculenta* extract.

	Kontrol positif (sari lerak)	Ekstrak	Kontrol negatif (aquadest)
Picture			
Description	A lot of foam (+ + +)	Little foam (+)	No foam (-)

Table 1. Saponin identification result

Table 2 shows the emulsification result of the extract compared with *Sapindus rarak* (Positive control) and Negative control.

	Gambar		Keterangan
	Side View	Top View	
<i>Sapinus rarak</i> (Positive Control)			Emulsified (++++)
Extract			Emulsified (++++)
Water (Negative Control)			Not emulsified (-)

Table 2. Emulsification test result

6. Conclusion

Saponin extract of *Mahinot esculenta* can emulsify oil and water so it can be an alternative source of natural detergent.

7. Reference