

LEAF AND STEM EXTRACT OF GALISMAN (*PORTULACA CLERACEA* L.) AS A POTENTIAL INGREDIENT IN DISHWASHING LIQUID

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ABSTRACT

In this study, the researcher tried to find out if the prepared dishwashing liquid is comparable to the commercially available dishwashing liquid. After the collection of the sample, it was washed, chopped and weighed. Extracted using a traditional juicer and filtered using a cheesecloth. The extracted sample was prepared with CDEA and SLES to become a dishwashing liquid. Physical and chemical properties was also determined. The physical properties of the prepared dishwashing liquid had: a yellowish color, pleasant odor, moderately basic, and was miscible on water and chloroform. The present secondary metabolites were alkaloid and saponins. As to its effectiveness, there was no significant difference between the gulasiman dishwashing liquid and the commercially available dishwashing liquid in terms of its froth test and emulsifying property.

Keywords: gulasiman, dishwashing liquid

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INTRODUCTION

Plants produce a great number of compounds of the various chemical structures. There are constituent presents in smaller quantities in the plant but is of high value. Many higher plants accumulate extractable organics substance in quantities sufficient to be economically useful as chemical feed stocks or raw materials for various scientific, technological, and commercial applications. Economically, important organic compounds of the plants serve as source of industrial oils, resins, tannins, saponins, natural rubber, gums, waxes, dyes, pharmaceuticals and many specialty products.

Portulaca oleracea L. common known as Gulasiman is a very common weed found throughout the Philippines. Gulasiman is nutritious vegetable used for human consumption and provides a rich source of nutritional benefit. In some countries such as Mediterranean region, China, Southeast Asia, Eastern and Central Africa, and Philippines, it is eaten raw as salad and also eaten cooked as a source of soups or a green. It has medicinal use dates back at least 2,000 years, but it was used as food well before this period. Traditional medicinal uses for gulasiman are broad. Ancient romans used gulasiman to treat dysentery, intestinal worms, headache, and stomachache. Dishwashing liquid is used to clean mirrors as well as windows, pest deterrents, ant killer, weed killer, help spread water –borne fertilizer, wash human hair and also been used to deter aphids. In some instances, the prepared dishwashing liquid may be toxic to plant leaves and cause them to burn. Many dishwashing liquid contain perfume which can cause irritant or allergic contact dermatitis. Aquino (2007) studied the extraction of sap

of *Jatropha curcas* (Tubing-bakod) as potential ingredient in dishwashing liquid and found out that the bark had the best satisfactory indication for the presence of saponin. Dalmacion (2003) studied the preparation of the biodegradable liquid detergent using *Dioscorea hispida* Dennst (Korot) root extract. Result revealed that the liquid detergent from korot extract as similar properties of a commercial liquid detergent. The prepared liquid detergent was also found to have a faster rate of biodegradability than the commercial sample.

METHODOLOGY

The researcher used the experimental method in this study. This study utilized and characterized the prepared dishwashing liquid from Gulasiman (*Portulaca oleracea* L.) extract as potential ingredient in dishwashing liquid. This study also assessed physical and chemical properties and the effectiveness in removing grease.

Formulation of Prepared Dishwashing liquid

Using a graduated cylinder, 40 g of SLES and 386 mL of distilled water was measured. The SLES was transferred into a beaker and little water was added. The SLES was stirred very well. About 25 g of CDEA was added to SLES and well mixed using the stirrer. The mixture was stirred continuously until it becomes creamy. Adding distilled water once in a while prevent the mixture from foaming while stirring. Meanwhile, 15 g of STPP was dissolved on a small amount of distilled water was mixed and set aside. A small amount of distilled water was added while continuous mixing until the CDEA-SLES mixture becomes creamy.

When the mixture was foamy, the dissolved STPP was added slowly while stirring continuously. The 6 g table salt or sodium chloride was dissolved on a small amount of distilled water added to the mixture and also the 20 g of pure extract of gulasiman was added which is being mixed continuously. The 8 drops of lemon fragrance was added to the mixture while stirring. The texture was continuously stirred until it thickens and set aside. Once the mixture thickens, this was poured into a clean container and set aside until the suds disappeared. The prepared dishwashing liquid was used after 24 hours.

Analysis of chemical properties of prepared dishwashing liquid

The following procedure was taken from the standard methods by Guevara (2005).

Test for Alkaloid

In this test, the Dragendorff's reagent and the Mayer was used in determining the presence of alkaloid. A positive result is indicated if the result shows orange precipitate in Dragendorff's and white precipitate for Mayer's test.

The 10 mL of prepared dishwashing liquid was placed in an evaporating dish. Then, it was evaporated to a syrupy consistency over a steam bath. Five (5) mL of 2M HCl was added. Then, the solution was heated with stirring for about 5 minutes and then the solution was cooled. Then about 0.5 grams of NaCl was added with stirring the solution and the filtered. The residue is wash with enough 2M HCl to bring the filtrate to a volume of five (5) mL, and then the filtrate was separate in two parts. The first part is with Drangendorff's reagent with 2-3 drops of it and then the other one with Mayer's reagent with 2-3

drops also. The process was repeated thrice and the result was recorded.

Confirmatory Test for Alkaloid

The remaining 5 mL of the filtrate was added with 28% ammonia until the solution was alkaline to litmus paper. The alkaline solution was extracted three times with small portion of less than 10 mL of chloroform extract layer was reserved. Chloroform extract was evaporated to dryness under the fume hood and over a steam bath. The 5 mL of 2M HCl was added to the residue and stirred over a steam bath about two minutes. It was then cooled and filtered. Then the filtrate was divided into 2 portions. One portion was tested for Drangendorff's reagent and the other portion with Mayer's reagent. The procedure was repeated thrice.

Test for Saponins

In this test, the capillary tube was used to determine the presence of saponins. If the level of prepared dishwashing liquid in the capillary tube is half or less than in the other tube containing water, the presence of Saponins may be inferred. Load a capillary tube was with the prepared dishwashing liquid by immersing the tube a height of 10 mm in the plant extract. Likewise, load another capillary tube with distilled water and left the capillary tubes to keep both in a vertical position to allow the liquid inside to flow out freely. And then after sometimes, compare the height of the liquids in the two tubes. The procedure was repeated thrice and the result was recorded.

Confirmatory Test for Saponin

About 1 gram of Gulasiman leaf and the stem was being taken. It was cut into small stripes and soak in 10 mL of 80% ethyl alcohol. It was allowed to stand for 30 minutes. It was filtered and 2 mL of the extract serve as the as the standard. Ten (10) mL of distilled water was added to the test tube. The test tube was stoppered and shaken vigorously for 30 seconds. The result of the prepared dishwashing liquid was compared with that of the standard. A more than 2 cm high "honeycomb" for that persists after 10 minutes on the surface of the extract is considered positive for saponin content.

Test for Tannin

The prepared dishwashing liquid was centrifuged for 15 minutes to allow the solid particles of the prepared dishwashing liquid to settle down at the bottom of the test tube. A clear supernatant liquid was then decanted and tested for the presence of tannin.

About 2 mL of prepared dishwashing liquid was added to a few drops of 1% lead acetate. A yellowish precipitate indicates the presence of tannin. The procedure was repeated thrice and the result was record.

Determination of the effectivly of the prepared dishwashing liquid

Statistical computation was used to determine if there is a significant difference between the prepared dishwashing liquid and the standard dishwashing liquid.

Foam Test

About 50 mL of the prepared dishwashing liquid was diluted with 200 mL distilled water and mixed in a blender for 5 minutes. The blender mixture was transferred to a graduated cylinder and the volume of the foam produce was measure by recording the highest foam

formation. The process was repeated thrice and the result was recorded.

Emulsifying Property

To check the emulsifying property of the dishwashing liquid formulated from the Gulasiman sap, shaken with 10 mL of distilled water and with 10 mL mineral oil. Observation after 5 minutes was recorded. Repeated with 10 mL of each of the solution and 10 mL of oil. The product has a good emulsifying property if it is able to keep the oil emulsified for a longer time. The process was repeated thrice with each every dishwashing liquid.

Effect on Hard Water

The calcium chloride solution was used as sample on hard water. The 2 mL diluted calcium chloride was added to 10 mL prepared dishwashing liquid and shake, observe. Then 10 mL of household water was added to 20 mL of prepared dishwashing liquid, shaken and observed again.

Repeat with the use of 10 mL of commercially available dishwashing liquid, the 2 mL diluted calcium chloride was added to the commercially available dishwashing liquid and shake, observed. And in other test, the 2 mL of household water was combined to 10 mL commercially available dishwashing liquid and shake. The quantity of suds form in each tube was compared. The result was recorded and the procedure was repeated thrice.

Effect of Grease

The three evaporating dish was prepared, and then an equal mass of oil was applied in each to form grease and fats on evaporating dish. Make sure that the grease was on the same size and set aside. After three hours that the grease was fully adhered to the evaporating dish,

placed 10 mL distilled water as the control, placed another 10 mL prepared dishwashing liquid and another 10 mL of commercially available dishwashing liquid to the evaporating dish. The time was noted and it was observed with the changes of the evaporating dishes on removing the grease faster.

Test on physical properties of prepared dishwashing liquid was done in this study in terms of the color, odor, pH value, solubility and texture. Experimental method was done in this study and used to determine the secondary metabolites and on the affectivity of the prepared dishwashing liquid.

RESULTS AND DISCUSSION

Table 1. Physical properties of the prepared dishwashing liquid

PHYSICAL PROPERTIES		RESULT
Color		Yellowish
Odor		Pleasant
pH Value		Moderately Basic
Solubility in	Water	Miscible
	Chloroform	Miscible
	Oil	Immiscible
	Benzene	Immiscible
Texture		Sticky

The prepared dishwashing liquid was yellowish in color, pleasant odor and had sticky texture according by the respondents. It had pH value of 9.85 that indicates moderately basic and it was

miscible in water and chloroform which are polar solvents while immiscible on oil and benzene which are non-polar solvents. This means that the prepared dishwashing liquid was polar.

Table 2. Summary of secondary metabolites

SECONDARY METABOLITES	RESULTS		INTERPRETATION
Alkaloids	Dragendorff's reagent	Mayer's reagent	Positive
	Orange precipitate was formed	No white precipitate was formed	
Saponin	Reference standard	Prepared dishwashing liquid	Positive
	No honeycomb formed	More than 2cm honeycomb was formed	
Tannin	No yellowish precipitate formed		Negative

The secondary metabolites that are present on prepared dishwashing liquid are alkaloid and saponin and negative in the presence tannin.

The prepared dishwashing liquid had a significant difference on its effect on grease but there is none in emulsifying property. While on its effect on hard water, the prepared dishwashing liquid worked on diluted calcium chloride, there was no precipitation occurred which means that the precipitate was diminished through cleansing process of the prepared dishwashing liquid and on standard dishwashing liquid, it produces turbid color due to the formation of scum or precipitate since the calcium ions formed into a soluble precipitate. The prepared dishwashing liquid is not comparable to commercially available dishwashing liquid.

CONCLUSIONS

The prepared dishwashing liquid was polar and had a sticky texture. The secondary metabolites of prepared dishwashing liquid that was present were

alkaloid and saponins. The prepared dishwashing liquid is not comparable to standard dishwashing.

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