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Harmless Liquid Soap Experiments by Exchanging Hazardous Contents to Plant Extracts: First Results

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Abstract: *Among the contents of liquid soaps used are synthetic substances such as surfactants (sodiumlaurethsulfate=SLES, cocoamides), formaldehyde (stabilize), citric acid (pH adjuster), stynthetic colorants, odorants and antimicrobials. Harmful effects of these substances have been determined scientifically. Nevertheless, they are preferred because of the cost efficient-high production avidity. We aimed to search the feasibility of the usage of sumac (Rhus coriaria L.) extract, a known condiment, in coloring, pH adjusting, stabilizing and antimicrobial effects. So that we prepared a cost effective base soapsing SLES, Cocoamide, trace amount of NaCl, grounded sumac seed extract and boiled water. We found the ratio of the appendable extract amount by experiment series, without losing the standard soap character. Related parameters of final product were evaluated.As a result, sumac extract has potential to make harmless liquid soap.*

Keywords: *Liquid Soap, PlantExtracts, Rhus coriaria L, SLES, Sumac*

1. INTRODUCTION

It is well known that plants synthesize and stock some substances which are known and have been used as dyestuff, drug, food and so forth in different industrial fields, since several centuries [1, 2, 3]. Antimicrobial, antioxidant, colorant and odorant effects of these content have been reported by some researchers [4, 5].

Phenolic compounds, which are secondary metabolites in plant materials are known to be responsible for antioxidant effect [6]. One of those plants is *Rhus coriaria* L. (leather manufacturer sumac). Its fruits contain a redor orange colored pigments named ficetin ($C_{15}H_{10}O_6$) and Quercetin ($C_{15}H_{10}O_7$) which are used as dyestuff in textile colorizing. Different parts of the plant so contain gallic acid ($C_7H_6O_5$) [7,8]. This compound may be used in pH adjustment with its acidic property, and also has antimicrobial effects.

Our aim was, searching the potential of sumac seed extract usage as colorant and antimicrobial agent in harmless liquid soap preparation.

2. MATERIALS AND METHODS

A base liquid soap prepared by mixing sodium laurethsulfat and Glicerin (4: 100 w/w). Dried and grinded sumac plant seeds (5 gms) and were extracted in 200 ml pure water and added into the base soap, and mixed with magnetic equipment by 20 minutes. Then NaCl added into the final soap upto the Standard usage density (20-50 gms) and mixed well by 20 minutes and then the pH adjusted to 5. 5. Because of acidic property of sumac seed extract we did not need to add sitric acid into the solution for pH adjustment.

Then, stability, viscostity, foaming parameters were tested according to the TS 11885/1.2.2 standart procedure [9]. Bacterial contaminational so was evaluated using Micro Count Combi Kit. Stability of the product is examined by waiting the product, at room conditions, for 2 years. In addition, to obtain different colored liquid soaps we performed an experiments set, using different solvents for sumac and other plant extracts, and also preparing different concentration mixtures. For the cost effectivity comparison between our and commercial products, we performed a price survey. Then calculated a mean price for commercial products, and than compared with our products cost.

3. RESULTS AND DISCUSSION

3.1 Test results of liquid soap

Table 1: *Standart compliance of our experimental soap*

Tests	Experimental Soap	Standart Soap
Stability	+	+
pH	5.5	5-7
Foaming	+	+
Viscosity	+	+
Colourness	Yellow-orange	+
Bacterial contamination	-	+

Fig 2: *Color experiments by adding 1: 1 (v/v) extract mixtures plant extracts in to base soap.*

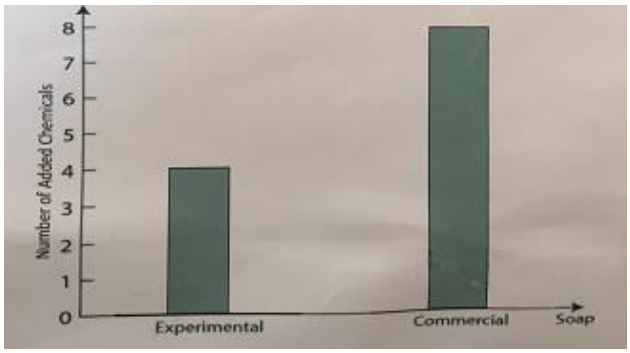

Fig 3: *Comparision of harmless soap contents betwwen our experimental and commercial soap*

Results of new soap color producing experiments are summarized in figüre 2. The results of performed stability, viscosity, foaming and antibacterial tests and the comparison between our product and commercial liquid soaps are given in Table 1 and Figure 3 respectively. The self life withouth any destabilization or contamination was more than 2 years, under ordinary room conditions. Our product was found that approximately 28% cost effective when compared with commerical liquid soaps.

3.2. Discussion

According to our data, it can be said that usage of sumac seed extract may eliminate the addition of at least three hazardous chemicals (citric acid for pH adjustment, formaldehyte for prevention of contamination and synthetic dyes for colorization), to our knowledge this is the first study that both eliminates some harming chemicals amoung the ingredients and adds the usage of sumac seed extracts instead in liquid soap preparation [10]. We could not find any study about liquid soap contenting sumac extract in literature.

4. CONCLUSIONS

Based on our results, liquid soap containing sumac extract, was suitable for TS11885 standards and had 5. 5 pH, orange-browncolor; -28% lower cost, at least 2 years of shelf life without any microbial effects or destabilization. Contributing to the elimination of some hazardous contents, sumac extract usage gave promision results. Therefore, further replacing efforts of natural ingredients instead of harmful substances may be useful. Sumac seed extract has a potential of taking place in liquid soap production, and this may lead less hazardous and cost effective products with long shelf life.

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