

UNI

VERSITI

THE 11TH INTERNATIONAL INNOVATION, INVENTION & DESIGN COMPETITION INDES 2022

EXTENDED ABSTRACTS BOOK



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ENRICHED AND ENHANCED VIRGIN COCONUT OIL (2EVCO)

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ABSTRACT

The awareness about the skin problems and hair growth among the teenagers and adults has become the main reason for us to invent the product which can help them to cure the problems using 100% natural sources that we get from the school herbs garden. This paper provides the result of the of the production and nutritional contents of Enriched and Enhanced Virgin Coconut Oil (2E VCO) which was enriched, and odor enhanced with aloe vera and pandan leaves respectively. Different types of hair and skin can benefit from different treatment methods to promote hair health and growth and formation of the new skin cells. External factors like exposure to the sun, smoking, malnutrition of fatty acids and the used of the chemotherapy drugs can cause damage existing hair and impair hair and skin growth. The product of this invention was applied to several teachers, and student to treat skin problems and to promote the hair growth. One of the teachers in our school who was the cancer patient (Breast and thyroid cancer), used the VCO to reduce the appearance of the operation scar and to speed up the hair growth due the hair fall that caused by chemotherapy drugs. Her hair took about 4 months to grow in 4 to 5 inches, covering bald patches, compared to normal grow of hair after chemotherapy that took about 6 months. 3 stages of the production of 2EVCO were done that were, sedimentation, fermentation and filtration of the raw materials, and finally, the product was sent to the accredited lab (MARDI) for the test certificate of the Nutritional Contents. The finding clearly indicated the contents of fatty acid in 2EVCO (Lauric acid, 49.10 g/100g, Myristic acid, 18.28 g/100g, Palmitic acid, 8.10 g/100g,) benefits the growth of hair and skin cells. The innumerable benefits of Aloe Vera consist around 96% of water, amino acids, vitamins and sterols improve skin conditions.

Keywords: hair treatment, virgin coconut oil, Enriched and Enhanced Virgin Coconut Oil (2E VCO)

1. INTRODUCTION

Coconut oil is a type of organic oil that has been touted for its health-promoting properties (Brazier, 2019). In fact, several studies found the benefits of coconut oil for skin. It produces the best result with the combination of aloe vera and pandan leaves, speeding the healing process. The use of chemical-based skin care products that contain many dangerous chemicals substance could worsen skin problems. Dangerous chemical substances used in skin care ranges include parabens, formaldehyde, sodium lauryl sulfate and synthetic fragrance. These chemical substances can cause health and skin disorders, proven carcinogens, DNA damage, hormone disruption, hyper pigmentation and adversely affect hair growth (Noorhuzaimi et al., 2018).

Since skin problems and delayed hair growth have been a problem in cosmetics field, we would like to make use of the full benefits of the organic coconut oil, aloe vera and pandan leaves that are planted around the school and in the herbs garden (Soule, 2011). The benefits of virgin



coconut oil and aloe vera for our skin and hair growth are extensive. It will act as moisturizer, rejuvenator and could help with dry and irritated skin and promote hair growth. One of the best benefits of virgin coconut oil is that it lasts longer in comparison to others (Gunner, 2020). This is due to the benefits of fatty acid found in virgin coconut oil that is medium-chain triglycerides (MCT) which consists of three main fatty acids; Lauric acid, Capric acid, and Caprylic acid. Lauric acid (C 12) which possesses antiviral, antibacterial, and anti-protozoal properties in treating skin problems. For hair treatment, Lauric acids reduce protein loss and damage when wet, can easily be absorbed into hair shaft; thus, protecting hair from environmental damage like sun and smoke and hair loss prevention due to excessive grooming. Meanwhile, Capric acid (C 10) is used to moisturize skin, remove make up and treat yeast infection due to candida yeast. Caprylic acid (C 8): helps in skin infection and acne, is a natural support for healthy skin and yeast fighting component.

Other than that, a high content of Myristic acid (C 14) and Palmitic acid (C16) in virgin coconut oil helps skin to appear hydrated, plump, and more youthful. The saturated fatty acid and myristic acid are used as a cleansing, surfactant and opacifying agent in cosmetics and personal care products. Aloe vera has a high vitamin A, C and E content that act as antioxidants to protect the body by neutralizing free radical (Soule, 2011). Numerous minerals such as calcium, magnesium, copper, sodium, potassium, and zinc are essential for the proper functioning of various enzyme systems. The organic acid found Aloe Vera, such as sorbate, salicylic acid and uric acid possesses anti-inflammatory and antibacterial properties (Soule, 2011).

2. METHODOLOGY

This product was innovated with the objectives to commercialize the products that can be produced from the School Herbs Garden that can benefits all students, teachers and parents, to create awareness among the students and other people about the harms of using commercial chemical- based products to the skin and hair, to promote the use of organic skin care product which is free from dangerous chemicals, and to inculcate the STEM practice among the students and teachers. The following methodology was carried out in the development of this product:

- i. 500 grams of coconut milk, 500 grams of aloe vera and 500 grams were blended for 15 minutes.
- ii. The mixtures were transferred into the 1000ml beaker and wrapped with thin plastic for the sedimentation and fermentation process of the mixture.
- iii. The mixtures fermented at room temperature for 48 hours.
- iv. After 48 hours, the upper layer of the mixtures was removed.
- v. The second layer of the mixtures was then filtered into the filter funnel by using filter paper.
- vi. When the filtration process was finished, the filtrate was transferred into the transparent plastic bottle and sealed.
- vii. The product was sent to MARDI for the nutritional analysis and test certificate.



3. FINDINGS

The following is an analysis of fatty acids in organic virgin coconut oil:

Amount (g/100g)
49.10
18.28
9.66
6.95
8.10

Table 1 Amount of Fatty Acid in Organic Virgin Coconut Oil.



Figure 1 Amount of Fatty Acid in Organic Virgin Coconut Oil.

During the production of organic virgin coconut oil, the involvement of the students was 100%. They learned various scientific skills during the experiment, applying the scientific concept along the test. The raw materials, such as coconuts, aloe vera, and pandan leaves were easily found around the school and herbs garden and therefore they did not incur any cost. The product produced is 100% organic which does not contain dangerous chemical substances. The product is easily sold to the school staff and students. The product is produced under hygienic conditions.

However, virgin coconut oil cannot be produced in large amounts to fulfill the request from students, teachers, school staff and parents. Limited amount of virgin coconut oil produced due to constraint of time, labor, and place. The nutritional test of the product cannot be run at the school because of lack of equipment.

4. CONCLUSION

This project brings benefits to the students as they can apply the science concept in their daily life. During the production of virgin coconut oil, they learned the concept of density,



fermentation, hydrophilic and hydrophobic properties of the substance, how the test report is prepared and handling of the experiment in correct techniques. By producing this organic product, teachers and parents could encourage and support their students and children to use organic skin care products instead of using dangerous chemical-based products.

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