



# The effectiveness of coconut oil mixed with herbs to promote hair growth

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**Abstract**— Coconut oil (*Cocos nucifera*) consists of lauric acid which has high affinity and low molecular weight that are able to penetrate into hair shaft and promote hair growth. In this project, the main objective is to study the potential of coconut oil towards hair growth. In addition, the coconut oil was mixed with two herbs, *Nigella sativa* and *Aleurites moluccana* to identify their potential in contributing hair growth. *Nigella sativa*, that contain high nutrient of linoleic acid (a short chain fatty acid), are very important in blood circulation. While, *Aleurites moluccana* is traditionally used to promote hair growth. In this experiment, 1L of the fresh coconut milk was heated at 60°C for 15 minutes and cooled at 4°C for 24 hours. The low molecular weight of the substance was separated and mixed with grinded herbs, *Nigella sativa* and *Aleurites moluccana*. The mixture was left for 72 hours to make a homogenous component and then, were filtered two times to get pure oil. The coconut oil, coconut and *Nigella sativa* oil, coconut and *Aleurites moluccana* oil and coconut with mixed herbs were applied on shaven scalp three times per day. The three volunteered respondent was used and the effectiveness of these solutions was evaluated by measuring the length of hair. Hence, the most effective solution was coconut oil mixed with *Nigella sativa*.

**Index Terms**— Coconut oil (*Cocos nucifera*); Habbatus sauda' (*Nigella sativa*); Candlenut seed (*Aleurites moluccana*); lauric and linoleic acid; promotes hair growth.

## I. INTRODUCTION

Hairs are one of the characteristic of mammals that composed of proteins and made of three layers which are medulla, cortex and cuticle. The cuticle of hair consists of hair bulb which is the most important part to promote hair growth. People have had hair problem at all level today and the solutions to these matter quiet blur since lots of chemical product in market. The usefulness of natural product to overcome this problem is quiet small and not widely identified.

In this study, coconut milk is used by extraction method which is done traditionally but based on scientific method. Coconut

oil (*Cocos nucifera*) is used as hair treatment by previous people as it gives hair healthy and also can promote hair growth. The valuable content in coconut oil which is triglyceride component of lauric acid (short chain fatty acid) is a good nutrient that can easily penetrate into hair shaft and promote hair growth. According to Bias (1988), the pure coconut oil is obtained by extraction method which is heated to 60°C for 15 minutes and cooled in refrigerator at 4°C for 24 hours to form two layers. The top layer is the most affinity and low molecular weight where it contains high level of short chain fatty acid. The bottom layer is a water content.

Coconut milk is an emulsion type of insoluble layers that contain of oil and water. The insoluble layer consists of short chain fatty acids that are easily to absorb. *Nigella sativa* or widely known as habbatus sauda' and a candlenut (*Aleurites moluccana*) are also having potential in promoting hair growth. Candlenut, a famous ingredient in cooking and well applied on hair by some Indonesian to promote a healthy hair. According to Noviansyah and Sidharta (2009), *Aleurites moluccana* is used in traditional medicine to prevent hair loss and enhance hair growth. Habbatus sauda' has various potential to treat disease and blood circulation. This study is held to find a new idea by mixing these herbs with coconut oil and observe their potential in hair growth.

The mixture between those herbs with extracted coconut milk is homogenous enough and left about 72 days at room temperature. In this study, four different solutions are made, which is pure coconut oil, coconut oil mixed with *Nigella sativa*, coconut oil mixed with *Aleurites moluccana* and coconut oil mixed with both of herbs. The extracted solutions are filtered two times to get pure oil. The four types of oil solutions were applied on hair that has already smooth shave. In short, the effectiveness of those solutions can be evaluated based on the highest length of hair growth.



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## II. LITERATURE RIVIEW

Coconut oil has been used long time ago to enhances a healthy looking hair. However, undesirable properties such as strongly odour make less of people using it as a treatment. The triglyceride component in coconut oil is lauric acid, a short chain fatty acid that has a high affinity and its low molecular weight with a straight linear chain, make them easily to absorb and is able to penetrate into hair shaft. [11] A study on several types of oil to prevent hair damage, coconut oil is the most effective oil like sunflower that has those properties which are able to penetrate easily (Rele and Mohile,2003).

Habbatus sauda' (*Nigella sativa*) provides a rich supply of short chain fatty acids. [6] According to Matthaus and Ozcan(2011), *Nigella sativa* contains significant proportions of protein, carbohydrates and essential unsaturated fatty acids, linoleic acid and gamma linolenic acid (omega3 & 6). These ingredients play a key role in blood circulation, consequently promotes hair growth. The fatty acid compositional analysis of the *Nigella sativa* seeds oil revealed the content of linoleic acid to be the highest. This chemical can help people which facing hair loss problem and premature graying.[5] According to Kalonji (2010), regular application of Habbatus sauda' oil to the hair scalp and repeat for one week, the loss of hair will stop completely. It also stops falling of hair, and gives a new life to dry, damage, dull unmanageable hairs and prevent premature graying of hair. *Nigella sativa* also contain short chain of fatty acid and low molecular weight that able to penetrate into the hair root and leading to hair growth. It can be explained when the essential oils, that is, low molecular weight combined with lipophilic, allow them to penetrate into cell membrane more quickly than other substances.

Candlenut oils contain substantial amounts of anti-aging component known as omega-3 fatty acids, helps to strengthen and restore radiance to the hair and skin. Candlenut boast one of the highest concentrations of omega-rich oils (omega-3, omega-6 and omega-9), besides of vitamin A and E as antioxidants that can penetrate into hair scalp and keep hair looking younger and shinier. [8] According to Noviansyah and Sidharta (2009), candlenut's oil is always used as an ingredient for traditional medicine to prevent hair loss and enhance hair growth. It also used in modern cosmetic to enhance hair growth.

## III. PURPOSE OF THE STUDY

Coconut oil has many potential benefits on hair growth that are yet to be discovered. By doing this study, it is hoped that coconut oil would enhance the hair growth by mixed with herbs, *Nigella sativa* and *Aleurites moluccana*. So that, a findings could help people reach other alternative in hair treatment.

## IV. METHOD AND MATERIAL

### *Extraction of coconut oil*

Fresh coconut milk about 1000 ml and four 250ml beakers were prepared which has been sterilized using autoclave at 120°C for 1 hour. The fresh coconut milk was poured into each of 250ml sterile beaker which has been labelled with A, B, C and D. Then, the fresh coconut milk was heated to 60°C pasteurized for 15 minutes on slow flame. The thermometer was putted into the beaker to observe temperature change and also to control temperature level. After heating the fresh coconut milk, the solution was cooled at room temperature. Those beakers were wrapped with aluminium foil to avoid any contaminant. Then all the samples were kept in refrigerator and set up for 4°C for 24 hours.

### *Extraction of herbs with low molecular weight of coconut milk*

250 grams of coarse candlenut and black seed were prepared. Both of those herbs were grinded separately by using a pestle and mortar to a fine powder and kept aside. After 24 hours, the coconut milk was observed, 2 different layers were formed in those beakers. The top layers from all of those beakers which is A, B, C and D were took off and then melting them in room temperature to form coconut oil. Next, the coconut oil were mixed with the grinded herbs which are habbatus sauda' and candlenut. Beaker A was contain pure coconut oil, beaker B contain pure coconut oil mixed with candlenut, beaker C contain coconut oil with habbatussauda' and beaker D contain coconut oil mixed with both of the herbs. After that, swirl both solution and they were left about 72 hours at room temperature.

### *Filtration*

The samples of coconut oil and the mixture were filtered to remove debris using rough filter. Then centrifuge machine was used to checked their molecular weight and their homogenous condition. Finally the solutions were filtered again using filter paper to get the pure oil.

### *Application*

The four samples of coconut oil solution were applied on three respondents' hairs that have been shaven about five regions. The applied region of shaven hairs were observed its hair growth and length were measured each 3 days for about four weeks.

## V. ANALYSIS AND RESULT

The shaven regions of hair show an increase sign of hair growth within a week, as it will be fully visible and hair begin grow heavily after four weeks.

1) *Results of the length hair growth for three respondents for a month and average for three respondents is shown as table below:*



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No. of respondent	Length of hair growth (cm)				
	Control	VCO	VCO <i>Nigella sp</i> + <i>Aleurites sp</i>	VCO <i>Aleurites sp</i>	VCO <i>Nigella sp</i>
1	1.09	2.4	1.44	2.54	2.7
2	1.09	2.2	1.5	2.45	2.57
3	1.09	2.3	1.57	2.52	2.54

The mean results of the length hair growth in three respondents :

Mean Length of hair growth (cm)				
Control	VCO	VCO <i>Nigella sp</i> + <i>Aleurites sp</i>	VCO <i>Aleurites sp</i>	VCO <i>Nigella sp</i>
1.09	2.3	1.5	2.5	2.6

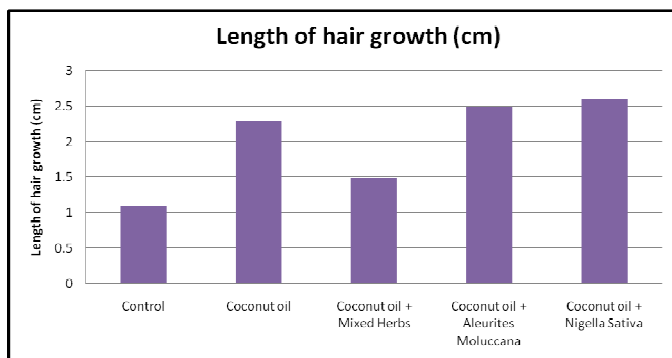


TABLE 1 Graph for average result of hair growth by three persons against type of solution for a month

## VI. DISCUSSION

Pure coconut oil can be obtained by extraction process of fresh coconut milk by heating method. It was heated at 60°C pasteurized for 15 minutes as the optimum temperature to gain short chain fatty acid that has potential to promote hair growth. According to Mohammad Fariz (2009), the effective temperature required to maintain the nutrient of coconut oil (short chain fatty acid) and it was found to be 60°C. Temperature heating of coconut milk must be controlled because at the higher temperature, the enzyme (short chain fatty acid) will denature and less effective to hair growth. The heated solution was cooled in refrigerator at 4°C in order to form two layers which is the top layer one must be taken because it riches with short chain fatty acid that potential to enhance hair growth while the bottom layer is water content.

In addition, new study were set up to identify the effectiveness by mixing coconut oil with *Nigella sativa* and *Aleurites moluccana* that have potential to contribute hair growth. *Nigella sativa* contain high nutrient of linoleic acid (short chain fatty acid) that showed a potential to promote hair growth and *Aleurites moluccana* that contain essential content as coconut oil and *Nigella sativa* have. The mixture must be homogenous enough before they were filtered. According to Parcerisa, Casals and Boatella (2000) states that 90% olive oil with 10% hazelnut oil is the best ratio for oils mixture. So that, 3g of herbal mix with 25ml coconut milk solution for each beaker to form homogenous solution. The filtration process is to remove debris from the solutions and separate pure oil where it will be applied on scalp that have been smooth shaven.

In this study, three respondents were taken in order to test the growth of hair by applying these oils on their hair scalp. All of them were shaven about five regions, that is for control (no treatment applied), pure coconut oil, coconut oil mixed with *Nigella sativa*, coconut oil mixed with *Aleurites moluccana* and coconut oil mixed with both herbs were applied on those regions. Finally, the effectiveness of coconut oil solution can be evaluated by comparing the normal hair growth at control region with the other regions. According to Eugene, Richard and Steinmuller (1957), the normal hair growth for a month is 1.09cm. So, the most effective solution is coconut oil mixed with *Nigella sativa* that has higher length of hair growth which is 2.60cm for a month than normal hair growth length which is 1.09cm. In the other hand, coconut oil mixed with *Nigella sativa* can be as alternative treatment instead of using some chemical based products that is so expensive and may be affected to people in a long term usage.

The nutritional component in *Nigella sativa*, which is omega 3 and omega 6 are already known as bio molecule that promotes blood circulation especially when it is taken orally. So this study proved that the low molecular weight of linoleic acids also may penetrate easily when do apply on surface. They may contribute in blood circulation as well, especially on head area and hence promotes hair growth.

## VII. CONCLUSION AND RECOMMENDATIONS

The mixture among coconut oil and *Nigella sativa* is the most effective to promote hair growth than others, thus it has potential as alternative way to be used for hair treatment in the future. Further study is suggested to identify the effectiveness of coconut oil and olive oil with *Nigella sativa* extracts in promoting hair growth.

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