Utilization of pineapple leaf fiber (*Ananas comosus*) as material for false eyelashes production

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Abstract. Pineapple fibers are abundant natural fibers in Indonesia. Its utilization in the world of beauty still needs to be developed. The purpose of this research is to know the feasibility of using the pineapple leaf fiber as a material for making false eyelashes. This research uses the material of forest pineapple leaf fibers. The method of study used is a method of quantitative descriptive approach with the type of experimental research and perform the feasibility test of the utilization of pineapple leaf fiber as a material to make false eyelashes for party and to perform the test result of false eyelash for the party by utilizing pineapple leaf fiber as its manufacturing material. Results feasibility test of the utilization of pineapple leaf fiber as a material to manufacture false eyelashes for the party stated 87% very proper, the test results of false eyelash usage for a party 93% very proper

1. Introduction

The utilization of natural fibers such as fiber palm fiber, coconut fiber fibers, bamboo fibers, banana fiber and other natural fibers such as pineapple fibers can be used as an innovative finding material. Pineapple – leaf fibres are one type of vegetable fibre derived from the leaves of the pineapple plant. Pineapple plants (*Ananas cosmosus*) included in the family Bromeliaceae, generally include the type of seasonal plant.

Pineapple is one of the alternatives of plant-producing fiber that has been only utilized by its fruit as a source of food, while pineapple leaves can be used as a material for the production of textile fibers. Once taken the fruit generally leaves pineapple returned to the land to be used as fertilizer. The intake of pineapple leaf fiber is generally done in the age of plants ranging from 1 to 1.5 years. Fiber derived from the leaves of the young pineapple in general is not long and less strong. Moderate fiber produced from the pineapple plants are too old, especially plants that grow in open nature with high enough sun intensity without protective, will produce short fibers rough and brittle or brittle. Therefore, to get a strong, smooth and soft fiber need to be done selection on the leaves of the pineapple is quite mature that the growth is partly protected from sunlight [1].

Pineapple fibers have the ability to bind moisture high enough, even higher than cotton. Cotton is only able to absorb about 7.8% while the moisture content of pineapple is 81.6% [2]. It is also stated that characteristic of pineapple leaf fibers as natural fibers (natural fibers) are visible on the surface of the fibers, such as smoothness, strength, absorption, and ductility or elasticity [3, 4]. Based on these characteristics, innovation in the development of the field of beauty by utilizing the fiber of pineapple leaves as a material for making false eyelashes is of important. Natural fibre based composites are under intensive study due to their ecofriendly nature and peculiar properties. The advantage of natural fibres is their continuous supply, easy and safe handling, and biodegradable nature. Although natural fibres exhibit admirable physical and mechanical properties, it varies with the plant source, species, geography, and so forth. Pineapple leave fibre (PALF) is one of the abundantly available wastes materials and has not been studied yet as it is required [5].
In beauty makeup, eyes are an important part of being given attention in particular, as the eye becomes the centre of attention from one's appearance. Eyes can emit what is inside one's heart can even make communication run smoothly. In addition, the eye shape can also be changed through makeup on the eye as an action to cover the deficiency that is in the eyes of someone, e.g. the eyes are being larger or make the eyes more expressive and attractive. This can be done among other things with the use of false eyelashes. Numerous cosmetic enhancements and augmentations to the natural appearance of the periorbital area are readily available today [6]. Due to the increasing popularity of these cosmetic procedures, it is important for ophthalmologists to be aware of their potential risks, complications and adverse effects [7]. At present, false eyelashes have become the necessity of cosmetic, become the necessary cosmetic product of woman.

Wilson [8] suggested the reuse of waste within the current life cycle of these products, including waste of human hair. Human hair is considered a waste material in most parts of the world and its accumulation in waste streams causes many environmental problems; however, it has many known uses. Among the application of human hair is in the production of false eyelashes [9]. During this time the eyelash industry is still using human hair, synthetic hair, and animal hair [10] as raw material for making false eyelashes so that the utilization of pineapple leaf fiber is expected to be a new alternative material as alternative material for making false eyelashes in Indonesia. The feasibility of using the pineapple leaf fiber as a material for making false eyelashes was studied. Moreover, the application false eyelashes for the party by utilizing the pineapple leaf fiber as a material manufacture was also investigated through sensory and preference tests.

2. Research Methods
This research is an experimental research and method of data collection in this research was obtained from observations, interviews and documentation. The analytical techniques used in this study are a descriptive percentage analysis with a quantitative approach to demonstrate the feasibility of using the pineapple leaf fibers as a material for making false eyelashes for parties and organoleptic test (favorite test) obtained from the results of the use of experimental products. Based on the results of such calculations can be created table of percentage interval and eligibility criteria as given in Table 1.

| Interval Percentage | Criteria       |
|---------------------|----------------|
| 100%-82%            | Very feasible  |
| 81%-63%             | feasible       |
| 62%-44%             | Quite feasible |
| 43%-25%             | Less feasible  |

3. Eyelash Production Steps
3.1 Pineapple Fiber Processing
The intake of pineapple leaf fibers is done manually. Broadly the process of taking pineapple leaf fibers includes 5 stages, namely: a. pineapple leaf selection, b. immersion/washing, c. braking, d. translation, e. coloring.

a. Pineapple leaf selection
The pineapple leaves chosen for fiber are leaves that grow in the middle (not old leaves or young ones), on pineapple plants that grow long enough 1 @ 1.5 years so that the resulting leaves have a sufficient length. Select the leaf with the condition intact.

b. Immersion
The process carried out by microorganisms to separate or make rotten gummy substances that are around the fibers of pineapple leaves to make it easier to take fibers. Immersion is carried out for 2-3 weeks

c. Breaking

The collection of pineapple fibers from the leaves (fibre extraction) is done by hand (manual) through the way of braking to get hair fibers

d. Clothesline

The separated fibers are then washed using poke soap until clean. Then the fibers are dried in the sun to dry quickly for about 15-20 minutes

e. Coloring

Boil pineapple leaf fibers in boiling water with textile dye

3.2. False eyelashes production

a. Stretches the strings used for the cantel process on 2 spikes plugged into the wood. The fiber knots on the strings of strands are used using a hair hook, with a lash length size of 2.5 - 3 cm. the number of fiber strands is adjusted to the desired thickness according to the eyelash model for the party.

b. Straightening the eyelashes of pineapple leaf fibers with ironing before rolling the hair roll on the pipe that was previously coated with toni paper that is given a little water to moist then roll. Preheat in the oven ± 5 minutes. Unroll and tidy up the eyelash shape

4. Research and Discussion Results

Validity assessment in this study was conducted with indicators of eyelashes shape, color, texture, neatness and final results with criteria very feasible, feasible, less feasible and unworthy. Validity assessments of false eyelashes of pineapple leaves were done by beauticians, vocational school teachers, eyelashes craftsmen, and saloon owners. Table 2 describes the results of validity assessment. It was found that all assessment from the four groups generated results of "very feasible". From the product validator's assessment, the results are seen in terms of even color, attractive color combinations, suitable decorative colors for fantasy false lashes, suitable eyelash color for fantasy lashes. In terms of shape, comparing the original and false eyelash, it was obtained that both groups having the same shape and size. Moreover, the strands of false eyelashes between right and left are the
same, the direction of the false eyelashes is regular. In terms of texture, it can be seen from the soft
lashes when touched by hand, flat texture, smooth when seen with the naked eye. In terms of neatness,
cutting the shape of the false lashes is neat, the arrangement of the false eyelashes is neat, the length
of the false lashes between left and right is the same. The response from the product validator was that
false eyelashes made from pineapple leaf fiber are very creative and innovative to be made into new
products; pineapple leaf fiber has a soft texture so that the false lashes can be like ordinary lashes
made from synthetic.

Table 2. Results of Validity Assessment

| Criteria    | Expert 1 | Expert 2 | Expert 3 | Expert 4 |
|-------------|----------|----------|----------|----------|
| Shape       | 4        | 3        | 3        | 4        |
| Color       | 3        | 4        | 4        | 4        |
| Textures    | 4        | 4        | 3        | 3        |
| Neatness    | 4        | 3        | 3        | 3        |
| Harmony     | 4        | 3        | 4        | 4        |
| Total       | 19       | 17       | 17       | 18       |
| %           | 95 %     | 85 %     | 85 %     | 90 %     |


The sensory test assessment of false eyelash products made from pineapple leaves fiber were
carried out by 3 expert panelists, i.e. vocational school teacher, saloon owner, and false eyelashes
home industry owner. Table 3 explains the results of sensory test. The three groups gave results of
"Very Appropriate". Assessment was given in terms of even color, attractive combination color,
suitable decorative color for fantasy false eyelashes, suitable color for fantasy eyelashes. It was
observed that the false eyelashes have the same size and shape with those of original eyelashes. The
strands of right and left false eyelashes are the same with order direction. In terms of texture, the false
eyelashes were soft, smooth and flat texture. In terms of neatness, the cutting shape as well as the
arrangement of false eyelashes is neat. The length of the left and right false eyelashes is the same.
Based on the assessment results, the expert panelists stated that false eyelashes made from pineapple
leaves fiber were very good and could be used for fantasy make-up purposes.

Table 3. Results of Sensory Test

| Criteria    | Expert 1 | Expert 2 | Expert 3 | Average |
|-------------|----------|----------|----------|---------|
| Shape       | 3        | 3        | 4        | 3.33    |
| Color       | 4        | 4        | 4        | 4       |
| Texture     | 4        | 3        | 3        | 3.33    |
| Neatness    | 4        | 3        | 3        | 3.33    |
| Total       | 17       | 17       | 18       | 17.33   |
| %           | 85 %     | 85 %     | 90 %     | 86.67   |

Preference test rated by semi-trained panelists were given by 15 respondents, i.e. students of
beauty education program who had used false eyelashes made from pineapple leaf fiber for practical
subject of fantasy make-up courses nor used it for daily application. The results are given in Table 4.
Semi-trained panelists gave judgment of "extremely like" in terms of even coloration, attractive color
combinations, suitable ornate colors for fantasy false lashes, suitable eyelash color for fantasy
eyelashes. In terms of neatness, cutting the shape of the false lashes is neat, the arrangement of the
false eyelashes is neat, the length of the false lashes between left and right is the same. In terms of
installation, false lashes are easy to put on; false lashes can be used more than once, convenient after
false eyelashes are attached. The false eyelashes enhanced the appearance of fantasy makeup.
Table 4. Results of Preference Test

| No | Shape | Color | Ease of Use | Neatness | Total | %  | Information   |
|----|-------|-------|-------------|----------|-------|----|---------------|
| 1. | 3     | 4     | 3           | 4        | 14    | 88%| Very feasible |
| 2. | 4     | 4     | 3           | 3        | 14    | 88%| Very feasible |
| 3. | 3     | 4     | 3           | 4        | 14    | 88%| Very feasible |
| 4. | 3     | 4     | 4           | 3        | 14    | 88%| Very feasible |
| 5. | 3     | 3     | 4           | 3        | 13    | 81%| Feasible      |
| 6. | 4     | 3     | 3           | 4        | 14    | 88%| Very feasible |
| 7. | 4     | 4     | 4           | 4        | 16    | 94%| Very feasible |
| 8. | 4     | 4     | 3           | 4        | 15    | 94%| Very feasible |
| 9. | 4     | 4     | 4           | 4        | 16    | 100%| Very feasible |
| 10.| 4     | 4     | 4           | 4        | 16    | 100%| Very feasible |
| 11.| 4     | 4     | 4           | 4        | 16    | 100%| Very feasible |
| 12.| 4     | 4     | 3           | 3        | 14    | 88%| Very feasible |
| 13.| 4     | 4     | 4           | 4        | 16    | 100%| Very feasible |
| 14.| 4     | 4     | 4           | 4        | 16    | 100%| Very feasible |
| 15.| 4     | 4     | 4           | 4        | 16    | 100%| Very feasible |
| Total| 56 | 58 | 54 | 56 | 224 | 93%| Very feasible |

5. Conclusion

Based on the results of the feasibility test analysis conducted by experts shows the criteria are very feasible (88.75%) based on indicators of shape, color, texture, neatness and harmony while in organoleptic tests or favorite tests based on usage results show very feasible criteria (93%) based on indicators of shape, color, ease of use and neatness.

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