THE STUDY OF COCONUT MEAL FOR VASE DESIGN

Somsak Klaysung[*], Sirisak Srangthaisong[**]

[*,**] *Faculty of Fine and Applied Arts, Suan Sunandha Rajabhat University, Bangkok, Thailand*

E-mail: [*]Somsak.kl@ssru.ac.th, [**]S63126615022@ssru.ac.th

ABSTRACT

Coconut Waste Study Project for Vase Design The objectives are as follows: 1) To study and test the properties of coconut meal in molding; 2) To experiment with processing coconut waste as a design material; 3) To design flower vase products from coconut meal. There are three steps to conducting the research: Step 1: Study of information about coconut meal; creating new materials by studying various sources such as books, research articles, theses, journals, and online media. Step 2: Process materials from coconut meal; and Step 3: Design a flower vase from coconut meal.

The results of processing coconut pulp for flower vase design showed that liquid latex rubber can be used as a binder for coconut meal, which allows coconut meal to be harmonized with each other with a mixture ratio of 70% coconut to 30% liquid latex rubber by weight, which will give the resulting product elastic properties. The resulting product is a value-added creation from waste materials and can also be a way to reduce the amount of coconut waste in the industry.

Keywords: coconut meal, materials, vase, design

INTRODUCTION

Coconuts are one of the most economically important crops in the country. Thailand's major coconut-growing area Most of the southern planting areas are Prachuap Khiri Khan (352,813 rai), Chumphon (97,279 rai), Surat Thani (81,111 rai), Nakhon Si Thammarat (67,552 rai), and Pattani (44,463 rai), with the total area of coconut cultivation being about 847,881 rai (Horticulture Research Institute, 2020). About 30 percent of the produce is consumed fresh domestically. 70% is sent to the factory as industrial products. As a result, there is a large amount of coconut waste left over from the production plant, averaging at least 20,000 tons per year (Kasama Thinkarn, 2019).

Coconut meal There hasn't been much utilization yet, leading to it becoming waste and having to find a proper disposal method. Coconut meal that has been juiced out has a chemical composition including protein, fat, ash, fiber, and carbohydrates (Yuwadee Chupraphawan, 2019). We have seen that the use of coconut waste as a component of animal feed may not be the only way to reduce waste. If coconut waste can be used to create materials for home decoration products, it will be an alternative way to use scrap to add value.

OBJECTIVES

1. To experiment with coconut waste processing as a design material.
2. To design flower vase products from coconut meal

RESEARCH SCOPES

The scope of this study is divided into the following:

Content scope

1. Study the properties of coconut meal.
2. Study the process of processing coconut waste as a design material

Scope of design

To design a vase of 1 set of 3 pieces

METHODOLOGY

Research Stage 1 : Study and collection of information about coconut pulp Creating new materials by studying various sources such as books, research articles, theses, journals, and online media.

Research Phase 2: Experimental processing of coconut meal materials

1. Experiment with binders in forming
2. Experiment with molding method

Research Step 3 : Design and development of vases from coconut meal with the following steps:

1. Create a flower vase design concept from coconut meal
2. Vase product sketch
3. Develop vase product designs
4. Make a vase product model with a 3D printer.
5. Drawing for vase production
6. Produce vase prototypes from coconut meal

RESULTS

By studying information on the characteristics, properties, and techniques of coconut waste processing from various sources, such as online media, academic articles and research articles found that.

1) In terms of appearance, coconut meal that has been squeezed into coconut milk will look crumbly and moist, with coconut residue mixed in, still having the smell of coconut and oiliness remaining.

2) In terms of properties, coconut meal can repel some insects and can be made into compost.

3) In terms of processing, it was found that the composition of coconut meal, consisting of moisture, protein, fat, ash, nitrogen-free extract (NFE), carbohydrates, and fiber, can be processed by extrusion technique. Due to the presence of fiber components.

From the analysis of characteristics, properties, and processing, it was found that coconut waste can be processed by pressing. as follows

Table 1: Experiment with binders in forming

ingredient	process	processing effect	suitable	inappropriate
1) 2 cups latex glue 2) 7 cups coconut meal	1) Take 7 cups of coconut meal and blend thoroughly. 2) Mix 2 cups of latex glue with 7 cups of coconut. 3) Mix well and press into the mold.			✓
1) 2 cups tapioca flour 2) 10 cups of water 3) 7 cups coconut meal	1) Take 7 cups of coconut meal and blend thoroughly. 2) Mix 2 cups of tapioca flour with 7 cups of water and boil until cooked. 3) Mix coconut meal with tapioca starch and press into a mold.			✓
1) 3 cups glutinous rice flour 2) Half a tablespoon of baking powder 3) 5 cups of water 4) 7 cups of coconut meal	1) Take 7 cups of coconut meal and blend thoroughly. 2) Mix coconut meal with glutinous rice flour, baking powder, water. 3) Compress into a mold and bake for 30 minutes at 100 degrees.			✓

ingredient	process	processing effect	suitable	inappropriate
1) 1 cup latex 2) 2 cups coconut meal	1) Take 7 cups of coconut meal and blend thoroughly. 2) Mix coconut meal with rubber. 3) Pressed into mold		✓	

According to Table 1, binders 1–3 do not adhere well enough when they are dry, and there are still looseness and cracks. High flexibility, no debris falling off.

Table 2: Experiment with molding methods

technique	technique	result
Papermache		It is quite difficult to adhere and the skin is not smooth
3-section mold		It has smooth and strong skin

According to Table 2, the 3-part mold molding technique is optimal because the surface of coconuts is smooth and not easy to fall off.

Design and development of vases from coconut meal

1) Create a concept in design (Concept)

"Vaseco" It refers to vases and coconuts, with the shape of the coconut being used as a design concept. It is an environmentally friendly product and also helps reduce the amount of coconut waste.

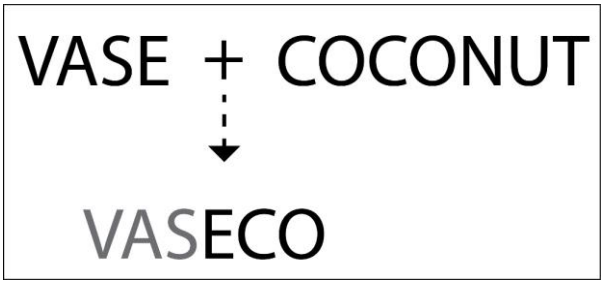

Figure 1. Design concept
source : Sirisak Srangthaisong, 2023

2) Sketch of vase products by adopting the characteristics of coconut balls in various shapes to design the shape of a flower vase.

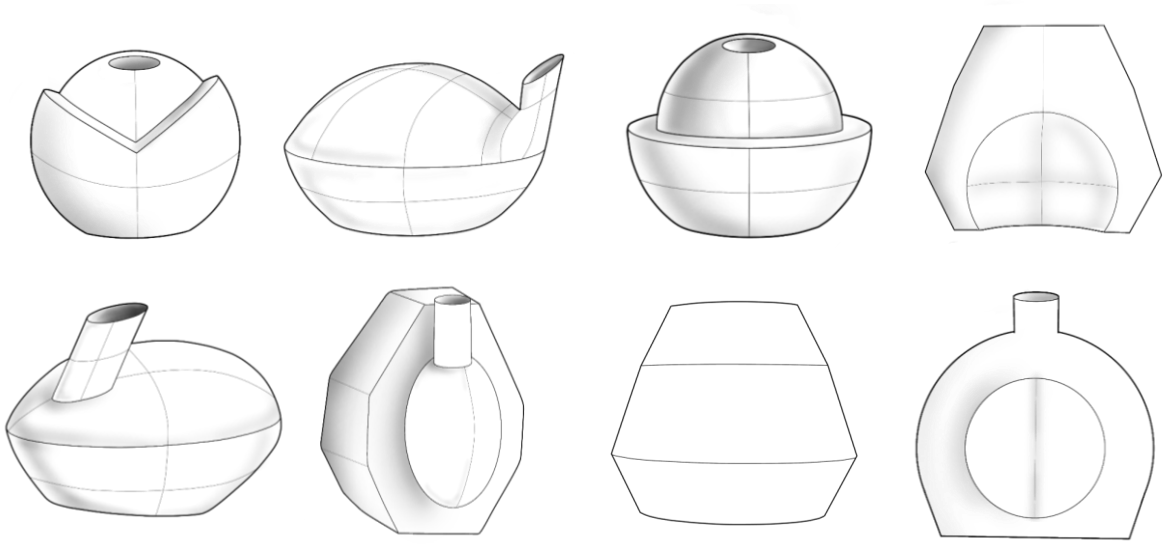

Figure 2. Sketch Design
source : Sirisak Srangthaisong, 2023

3) Develop vase product designs by using the characteristics of coconut balls to create patterns for flower vases.

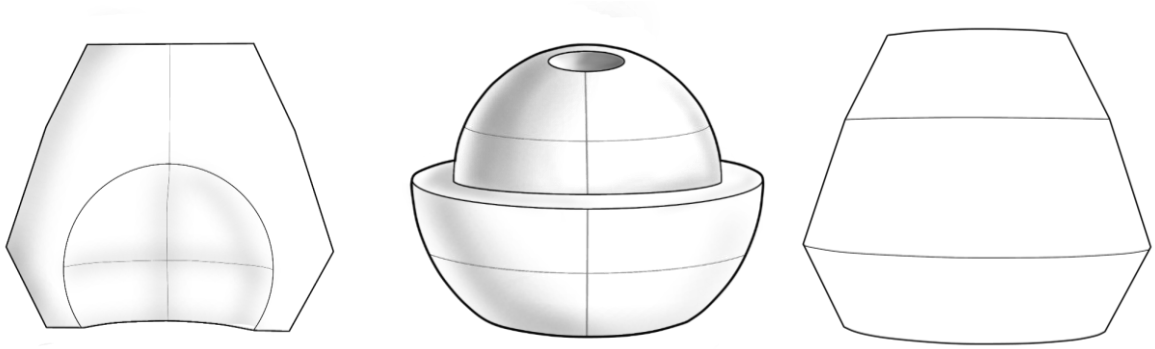

Figure 3. Image of the development of vase patterns.
source : Sirisak Srangthaisong, 2023

4) Make a vase product model with a 3D printer

Figure 4. Vase product model image
source : Sirisak Srangthaisong, 2023

5) Produce vase prototypes from coconut meal

Figure 5. Flower vase product pictures
source : Sirisak Srangthaisong, 2023

CONCLUSION

From the research project on the study of coconut waste for vase design, data was studied and collected for analysis and design, and the results were summarized as follows:

1. Coconut pomace Its distinctive feature is the coconut pomace. Coconut meal can be processed using extrusion techniques.

2. From the experiment of coconut meal processing In conclusion, the suitable materials to be used to make flower vase products are divided into two types:

2.1 The main material is coconut pomace, which is a waste material from coconut milk processing in order to use waste to create value and reduce waste.

2.2 With the use of liquid latex rubber as a binder, the resulting product has elastic properties, and thanks to the simple processing process, an environmentally friendly product is obtained.

3. The process of processing coconut meal is a three-part mold using a ratio of 70% coconut meal to 30% liquid latex rubber by weight. The coconut meal is thoroughly blended before being mixed with liquid latex rubber, which gives the flower vase high strength and elasticity.

From the conclusion: It has been found that coconut meal can be processed into flower vases. In addition to being developed into flower vase products, it is also an environmentally friendly substitute. This is in line with Chanoknart Mayusoh, Supawadee Juysukha, and Siracha Samleetong (2023), who present ways to combine natural resource capital with cultural capital through jewelry design that can promote tourism and create sustainable added value.

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