

**DEVELOPMENT OF HEAT AND FIRE-RESISTANT CLOTHING**

**OUT OF SUGAR PALM (*Arenga pinnata***

**(Wurmb) Merr.: Arecaceae) FIBERS**

**Research Study**

**YVONNE DIANNE L. DE CHAVEZ**

**LEMMOR C. PARIAN**

**RAVE PAULO PIOLO V. SIERRA**

**Science High School**

**CAVITE STATE UNIVERSITY**

**Indang, Cavite**

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**DEVELOPMENT OF HEAT AND FIRE-RESISTANT CLOTHING OUT OF  
SUGAR PALM (*Arenga pinnata* (Wurmb) Merr.: *Arecaceae*) FIBERS**

A Research Study  
submitted to the faculty of the  
Science High School, College of Education,  
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Indang, Cavite

In partial fulfillment of the  
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**YVONNE DIANNE L. DE CHAVEZ  
LEMMOR C. PARIAN  
RAVE PAULO PIOLO V. SIERRA  
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## ABSTRACT

**DE CHAVEZ, YVONNE DIANNE L., PARIAN, LEMMOR C., SIERRA, RAVE PAULO PIOLO V.** Development of heat and fire resistant clothing out of sugar palm (*Arenga pinnata* (Wurmb) Merr.: *Arecaceae*) fibers. Applied Research III. Science High School, College of Education, Cavite State University, Indang, Cavite, May 2017. Adviser: Dr. Hosea D. Matel

The study entitled “Development of heat and fire resistant clothing out of sugar palm (*Arenga pinnata* (Wurmb) Merr.: *Arecaceae*) fibers” was conducted at Mahabang Kahoy Cerca Barangay Hall, Indang Cavite to produce a clothing out of sugar palm fibers. It also aimed to differentiate the produced cloth of the best treatment (after conducting the tests) and the polyester cloth (control experiment) after the flammability and thermal resistance in terms of visual appearance, texture, and feel of the cloth to the skin and to determine the cost of production in producing the cloth.

The researchers used the following treatments: T<sub>1</sub> – 75% polyester fiber + 25% sugar palm (*Arenga pinnata*) fiber; T<sub>2</sub> – 60% polyester fiber + 40% sugar palm (*Arenga pinnata*) fibers; T<sub>3</sub> – 50% polyester fiber + 50% sugar palm (*Arenga pinnata*) fibers.

The sugar palm fibers were washed and foreign objects were removed. The sugar palm fibers were set out to dry and then woven with polyester into cloth. A swathe of clothing was tested for its flammability resistance by putting it directly on a gas stove on medium setting. Another was tested for thermal resistance by placing it on an induction heat stove set to 220 degrees Celsius. The cloths were evaluated by thirty participants based on its visual appearance and texture using sensory and physical evaluation parameter.

Based on the results of the test, the best treatment is T<sub>3</sub> with a mean duration of 214 seconds in terms of flammability resistance and 471 seconds in terms of thermal resistance.



Based on the results of the survey, the treatments containing sugar palm fibers contributed little to the visual appearance of the cloth but contributed no improvement to the texture and feel of the cloth to the skin in general.

Treatment 0 was obviously appealing, not rough, and comfortable having all of its parameters a mean of 1.0000. Treatment 1 is slightly appealing, slightly rough and slightly comfortable, having consecutive means of 2.4667, 2.4333, and 2.4333. Treatment 2 is slightly appealing, slightly rough, and slightly comfortable, having consecutive means of 2.2333, 2.3000, and 2.3000. The last treatment is appealing, rough, and slightly not comfortable, having consecutive means of 1.6000, 2.7000, and 3.1667.

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# **DEVELOPMENT OF HEAT AND FIRE RESISTANT CLOTHING OUT OF SUGAR PALM (*Arenga pinnata* (Wurmb) Merr.: Arecaceae) FIBERS**

Parian, Lemmor C.  
de Chavez, Yvonne Dianne L.  
Sierra, Rave Paulo Piolo P.

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## **INTRODUCTION**

Fibers, according to Eusebio, et. al., (2011), are small threadlike structures that are extremely long in a relation to its width. There are two kinds of fiber: natural and manufactured fibers. Fibers that are taken from plants are called “hard fibers” or “cordage fibers” because they are principally used to make ropes.

The fibers of *Arenga pinnata* are found at the base of the petioles and are manufactured into ropes, cleaning brushes, filters, and thatching materials. These fibers are called *yunot* or *cabo negro*.

Sugar palm, according to Stuart Jr. (2009), is considered the “official” sugar palm, the highest producer of the world’s many sugar-producing palms. Possibly the highest