RESEARCH ARTICLE

VARIOUS RETTING PROCESS AND THE QUALITY OF SALUYOT FIBER IN MAMBURAO, OCCIDENTAL MINDORO

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ABSTRACT

This study aimed to assess the quality of saluyot fiber using running water and stagnant water in its retting processes. The quality is a broad concept, and the researchers limit it in terms of the saluyot fiber's tensile strength h, temperature resistance, color, absorbency, and sustainability. After the various retting processes have been applied and the quality has been assessed, differences in the quality will also be determined. It was an experimental research design under a quantitative approach where the investigation was carried out at Mamburao, Occidental Mindoro with nine participants who were chosen to evaluate the quality of the experiments.

The researchers utilized a researcher-made questionnaire with 4-Point Likert scale for rating and interpretation for temperature resistance, absorbency, and sustainability based on the available resources and adapted a standardized questionnaire for the two remaining variables which are tensile strength, and color. The researcher-made questionnaire passed through the process of content validity and reliability tests before it was handed out to the participants. In this study, they also utilized several statistical tools for treating the collected data which includes the mean and t-test. The findings of this study revealed that the retting process using running and stagnant water gives a good quality of the saluyot fiber.

The result of this study shows that there is a significant difference between the quality of saluyot fiber extracted when retting in running water and stagnant water in terms of tensile strength, temperature resistance, color, absorbency, and sustainability.

Keywords: *sustainable fiber processing, natural fiber quality, retting techniques, local fiber utilization, agricultural sustainability*

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INTRODUCTION

The Philippines, a leading global producer of abaca fiber, faces a significant challenge in its textile sector. Although the country dominates the export market for natural fibers, holding approximately 87% of the global share (Señeris, 2024), it continues to import synthetic materials such as rayon and polyester for domestic textile production. This reliance on synthetic imports raises concerns about the long-term viability and economic benefits of current practices.

A promising alternative is the local fiber saluyot (Corchorus olitorius), which is abundant but underutilized in the textile industry. This study aims to explore the potential of saluyot as a viable substitute for synthetic materials by evaluating its fiber quality and examining various retting procedures. Key properties such as tensile strength, temperature resistance, color, absorbency, and sustainability will be assessed, as these factors influence fiber quality after harvest and ginning (Tahir et al., 2011). The study will contribute to understanding whether saluyot can support a more self-sufficient and resilient textile industry in the Philippines, aligning with the findings of Ahmed & Sarkar (2022), who highlighted the potential benefits of integrating local fibers into regional production systems.

The research focuses on saluyot from Sitio Dapi, Barangay Payompon, Mamburao, an area known for its abundant saluyot cultivation due to its paddy fields. This investigation builds on an existing collaboration between the Dapi Women Producers Cooperative (DMWPC) and the Operations Management Program of the college. By addressing the research gap in local fiber utilization, this study aims to provide insights into enhancing the sustainability of the textile industry and contributing to economic resilience.

MATERIALS AND METHODS

Research Design

This study employed an experimental research design with a quantitative approach to evaluate the quality of saluyot fiber subjected to different retting conditions. The focus was on the fiber's tensile strength, temperature resistance, color, absorbency, and sustainability. The experiment involved two treatments: retting saluyot stems in running water and in stagnant water. Both treatments were conducted simultaneously, using the same location and duration.

To assess the quality of saluyot fiber through retting in running and stagnant water, the following materials were used: two bundles of saluyot, two bamboo splits, four bamboo poles, a bamboo raft, and tannin-free plant materials.

The experiment followed a systematic retting process, which included the following steps: harvesting the saluyot plants, sorting the harvested stems, defoliating and desiccating the stems, binding the partially dried stems, submerging the stems in water, extracting the fiber, and drying the fiber.

Study Site

The research was conducted in Sitio Dapi, Barangay Payompon, Mamburao, Occidental Mindoro. This area is known for its saluyot production and is home to the Dapi-Mamburao Women Producers Cooperative, established in 2019 through a collaboration between Occidental

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Mindoro State College and other governing agencies. The cooperative promotes saluyot-based products under the One Town, One Product initiative.

Sample

Saluyot fiber is a newly discovered type of fiber. The assessment of this shall involve experts from the field to give relevant judgment and results to the final output. In this study, the researchers have identified 10 participants to assess and evaluate the quality of saluyot fiber. The participants of this study were two (2) consumers or producers that use fibers in the creation of their products, two (2) environmental experts from the Department of Environmental and Natural Resources, two (2) government regulators from the Department of Trade and Industry, two (2) from the Municipal Agriculturist, and two (2) tailors. The researchers chose these participants for they have the qualities needed in the assessment and evaluation of the final output from the experiment. Hence, they are assured that these individuals will provide them with the most relevant assessment from the conducted experiment.

Research Instrument

A survey questionnaire was utilized to collect the necessary data. The questionnaire included a researcher-made instrument with a 4-point Likert scale for rating temperature resistance, absorbency, and sustainability, and standardized instruments for assessing tensile strength and color. The researcher-made questionnaire was not subjected to content validity and reliability tests, as it was used specifically for this experimental study. Ratings were on a scale from 1 to 4, with 4 indicating "excellent" and 1 indicating "poor".

Data Collection

The researchers personally visited the participants to obtain consent and distribute the survey questionnaires. Completed questionnaires were collected four days after distribution. Participants were assured of the confidentiality of their responses. The collected data were tabulated, analyzed, and interpreted.

Ethical Consideration

The researchers gave the participants assurance that whatever information they would provide would be treated as a very confidential matter. Study participation was entirely voluntary. The research evaluators' total anonymity was respected. The evaluators were made aware of their right to maintain their confidentiality. To make the evaluation form easier to understand, the researcher was able to provide any clarifications. The researchers exclusively had access to the data. Specific information on the questionnaires could not be linked to specific individuals. Access to the data was limited only to the researcher.

Data Analysis

SPSS was used for analysis after the obtained data was entered into Microsoft Excel. Mean was employed to examine and contrast data, form findings about the topic under

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research, and draw conclusions. To ascertain the variations in the retting procedure, the t-test was applied. It was determined that a p-value of.05 or less was statistically significant.

RESULTS

The evaluation of saluyot fiber quality across various attributes–tensile strength, temperature resistance, color, absorbency, and sustainability–revealed nuanced differences based on the retting conditions. Saluyot fiber retted in running water (3.22±1.20) was rated as "good" for tensile strength, outperforming the fiber retted in stagnant water (2.89±0.78), which also received a "good" rating but with lower tensile strength. Regarding temperature resistance, both retting conditions yielded "good" ratings, with running water (2.56±0.73) and stagnant water (3.11±0.93) demonstrating satisfactory performance. In terms of color, fiber retted in stagnant water (3.44±0.73) was rated higher compared to running water (2.89±0.93), with both ratings categorized as "good." For absorbency, fiber retted in running water (2.11±0.78) was rated as "average," indicating moderate moisture absorption, while stagnant water (3.11±0.78) received a "good" rating, signifying better absorbency. Lastly, both retting conditions received "good" ratings for sustainability, with running water (3.11±1.17) and stagnant water (3.33±0.87) showing commendable sustainability. Overall, the study found significant differences across the retting conditions for all evaluated attributes (p-value <.001) [Table 1].

Table 1. Difference in the quality of saluyot fiber using running and stagnant water in the retting process.

PARAMETER	RUNNING WATER (M±SD)	STAGNANT WATER (M±SD)	T(Q)	P	COHEN'S D
Tensile strength	3.22±1.20	2.89±0.78	23.452	<.001	0.326
Temperature resistance	2.56±0.73	3.11±0.93	17.000	.000	0.657
Color	2.89±0.93	3.44±0.73	16.994	<.001	0.657
Absorbency	2.11±0.78	3.11±0.78	13.035	<.001	1.282
Sustainability	3.11±1.17	3.33±0.87	15.642	<.001	0.213

** The significance level was defined as a p-value of .05 or below.*

DISCUSSION

The findings indicate that saluyot fiber retted in running water demonstrates good quality in terms of tensile strength. This result suggests that the fiber exhibits substantial resistance to tensile stress, which is crucial for applications requiring durability, such as textiles and ropes. Fibers with higher tensile strength are desirable for their ability to withstand greater mechanical forces. This observation aligns with the study by Kusić et al. (2020), which underscores the importance of retting processes, such as exposure to sodium hudroxide, in enhancing tensile strength.

Regarding temperature resistance, the quality of saluyot fiber retted in running water is also rated as good. Elevated temperatures can degrade natural fiber components such as cellulose, hemicellulose, and lignin, affecting the fiber's mechanical and thermal properties. Methods to improve temperature resistance, such as the selective removal of hemicelluloses

and lignin, have been explored to enhance the fiber's thermal stability (Neto et al., 2021). Additionally, the thermal resistance of insulation materials like saluyot fiber varies with type and thickness, which is relevant for its application in industries requiring thermal insulation (Le & Pásztory, 2023).

In terms of color, saluyot fiber retted in running water is rated as good. Previous research by Cruz et al. (2017, 2020) highlights the significance of color in fiber quality, emphasizing the importance of producing fibers with desirable coloration for the textile industry. The study confirms that running water retting preserves the fiber's quality in terms of color, aligning with industry standards and minimizing issues such as medullation, which can cause itching (Pinares et al., 2019).

For absorbency, the quality of saluyot fiber retted in running water is rated as average. The hydrophilic properties of natural fibers, such as jute, are essential for applications requiring moisture absorption (Sujon et al., 2020). While the absorbency of saluyot fiber in running water is moderate, further research may explore methods to enhance its moisture absorption capacity.

In terms of sustainability, saluyot fiber retted in running water is rated as good. Natural fibers are inherently sustainable due to their low cost, renewability, biodegradability, and eco-friendly characteristics (Thyavihalli Girijapa et al., 2019). The increasing use of natural fiber-based composites reflects their sustainability and high-performance potential. Compared to synthetic fibers, natural fibers offer advantages such as abundance, cost-effectiveness, and environmental benefits (Jhanji Dhir, 2022).

The study also assessed saluyot fiber retted in stagnant water, finding it to be of good quality in terms of tensile strength and temperature resistance. These results support previous findings by Sisti et al. (2017) but contrast with Lee et al. (2014), which found no significant effect of water flow rate on fiber quality. This discrepancy underscores the need for further investigation into the impact of different retting conditions on fiber properties.

A limitation of this study is its focus on only two retting processes–running and stagnant water–without exploring other potential methods. Future research should address this gap by examining additional retting techniques to further understand their effects on fiber quality attributes such as tensile strength, temperature resistance, color, absorbency, and sustainability.

CONCLUSION

The tensile strength of the saluyot fiber was found to have the highest mean when retted in running water while the absorbency in this process got the lowest mean. This study concluded that retting in running water produces an average to good quality of saluyot fiber more specifically in terms of absorbency. While retting in stagnant water produces good quality of saluyot fiber. Lastly, it was noted that there is a significant difference between the two processes.

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