

Rambutan (*Nephelium Lappaceum*) Peels as A Lignocellulosic Material for Making Paper

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Abstract

Paper is a basic material which plays an important role in our daily lives. Several kinds of paper have different purposes to make human lives easier, so an increasing rate of paper amounting to 413 million tons in 2016 was recorded and it increased by 400 million tons annually. Paper production impacted the environment since the use of inorganic and organic raw materials gave rise to pulp and paper mills, hence, alternative resources which are abundant, sustainable, and economical are necessary. This research was conducted to determine the potential of Rambutan (*Nephelium lappaceum*) peels as an alternative lignocellulosic material for making paper. Varying concentrations of Rambutan peels (RP) and used newspapers (NP), which served as additives, such as 25%RP+75%NP, 45%RP+55%NP, 65%RP+35%NP, and 100%RP were used to make papers. Tests for thickness, absorbency and durability were performed in 3 replicates with 3 trials. Statistical analysis using one-way analysis of variance revealed that the treatments were significantly different with each other as to the different parameters. Thickness test revealed that treatment 100%RP had the highest mean thickness of 105.33. Absorbency test and durability tests revealed that treatment 25%RP+57%NP had the highest mean absorbency of 11.33, and highest mean durability of 40. Sensory evaluation was performed among select respondents to evaluate the paper based on texture, opacity, and printability. Results showed that treatment 25%RP+75%NP was the smoothest and produced the clearest print. Meanwhile, treatment 100%RP was the most opaque. Therefore, it can be concluded that Rambutan peels can be utilized as lignocellulosic material for paper production. This may serve as a primary investigation to seek for alternative materials of making paper, hence, reducing the adverse effects of harmful paper production to the environment. Further investigation and extensive tests may be conducted to provide comprehensive and in-depth analysis on the efficacy of Rambutan peels-based paper for mass production.

Keywords: *Lignocellulosic materials, Nephelium lappaceum, Rambutan peels, paper, thickness, absorbency, durability, sensory evaluation*