

Synthesizing a Novel Paper Material from *Penicum maximum*

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Penicum maximum is an invasive grass species originated from tropical Africa. It is distributed island-wide and has become naturalized in most ecological zones, ecosystems and habitats such as disturbed forests and scrubland. It can be initiated either by seed or vegetatively from cuttings of roots or rhizomes. This research is mainly focused on utilizing *Penicum maximum* to synthesize a novel paper material. This attempt will eventually add an importance to this weed as it has become a disturbance to important plant growth in Sri Lanka. Completely dried *Penicum maximum* leaves samples of 1.25 cm size were used for the preparation of the pulp along with Sodium carbonate and prepared pulp was beaten along with Beta-D- Glucopyranoside and Aluminium sulfate. Then the conversion of pulp to paper was done and finally the synthesized paper was calendered. Selected physical properties of the developed paper material such as hydrophobicity was studied while thickness, and weight of the final paper product were measured. FTIR analysis was conducted for the paper material to demonstrate that it consists of only organic molecules. Hence the produced material could be renewable and eco-friendly. According to the results it was found that the produced novel paper material was hydrophobic without any coating and the measured contact angle was 125.623°. Average thickness of the produced papers was 0.33 mm and average weight of the produced papers was 0.0156 g cm⁻². In conclusion, *Penicum maximum* is a good raw material for paper production. Therefore, introducing *Penicum maximum* as a novel and better raw material for paper industry will be more important to control the threats of this invasive plant and this is a one way of value addition to a waste material.

Keywords: *Penicum maximum*, Novel paper material, Hydrophobicity, Contact angle, FTIR