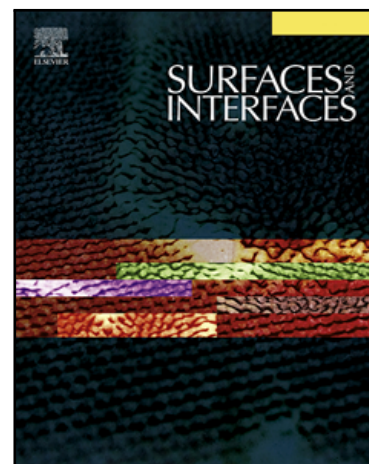


Accepted Manuscript

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PII: S2468-0230(17)30102-5
DOI: [10.1016/j.surfin.2017.09.006](https://doi.org/10.1016/j.surfin.2017.09.006)
Reference: SURFIN 138



To appear in: *Surfaces and Interfaces*

Received date: 17 May 2017
Revised date: 25 July 2017
Accepted date: 12 September 2017

Please cite this article as: Siddhi J. Juikar , N. Vigneshwaran , Microbial production of coconut fiber nanolignin for application onto cotton and linen fabrics to impart multifunctional properties, *Surfaces and Interfaces* (2017), doi: [10.1016/j.surfin.2017.09.006](https://doi.org/10.1016/j.surfin.2017.09.006)

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Microbial production of coconut fiber nanolignin for application onto cotton and linen fabrics to impart multifunctional properties.

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ABSTRACT

Lignin is the second most abundant renewable carbon source available on Earth. It is available in plenty as a by-product of pulp and paper industries, but it has largely been discarded. In this work, controlled microbial hydrolysis process was employed to produce nanolignin from the bulk lignin extracted from coconut fibers. The ligninase secreting fungal isolate, *Aspergillus nidulans* was used for this purpose. The size reduction of lignin was monitored by DLS nanoparticle size analyzer and, once the size reached below 100 nm, the nanolignin was purified and characterized. Nanolignin (size: 27.5 nm \pm 2.7 nm) was applied onto the surface of cotton and linen fabrics by pad-dry-cure method using acrylic binder and characterized by FTIR, SEM and XRD. The finished cotton and linen fabrics showed excellent antibacterial (as per AATCC-100 standard method), UV blocking (as per AATCC-186 standard method) and antioxidant (as per DPPH method) properties. This work demonstrates the newer application of microbial produced nanolignin for multifunctional finishing of cotton and linen fabrics.

Keywords:

Coconut fiber; Cotton; Finishing; Linen; Multifunctional finishing; Nanolignin

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