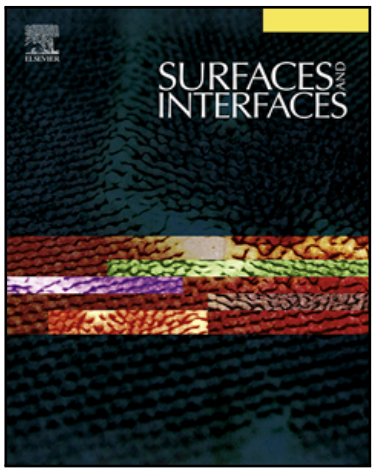


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# Microbial production of coconut fiber nanolignin for application onto cotton and linen fabrics to impart multifunctional properties.

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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 ± 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